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Analysis and Design of a Web-Based Queue Ordering and Monitoring Information System for Mavera Fried Chicken MSMEs

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Abstract: *This study aims to analyze and design a web-based ordering and queue monitoring information system for Ayam Geprek Mavera MSMEs. The business faces several operational challenges, including long customer queues, manual order recording, uncertain order completion times, and online ordering that still relies on WhatsApp. To address these issues, a web-based system was designed using the Waterfall development method, while data and references were collected through a literature review approach. The resulting system design consists of UML models, including flowcharts, use case diagrams, activity diagrams, sequence diagrams, class diagrams, and website interface mockups. The proposed system provides features for online ordering, payment processing, queue management, and real-time order tracking. The design is expected to improve service efficiency, reduce recording errors, and support the digital transformation of culinary MSMEs.*

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Introduction

The resilience of Indonesia's macroeconomic structure depends heavily on the vitality of the micro- to medium-sized business sector. Amidst the acceleration of contemporary technological disruption, the business continuity of these commercial entities imperatively demands comprehensive digital adaptation as an instrument of global competitiveness (Yolanda & Hasanah, 2024). By 2023, the number of MSMEs will reach approximately 66 million units,

encompassing approximately 99% of the total business units in Indonesia. MSMEs' contribution to Gross Domestic Product (GDP) reaches 61%, equivalent to IDR 9,580 trillion, while absorbing approximately 117 million workers or approximately 97% of the total national workforce. This data confirms that MSMEs are not merely economic drivers, but the main foundation of the nation's economic resilience.

Within this strategic context, MSMEs act as the driving force of the economy, driving growth, creating jobs, and advancing public welfare. However, with the rapid development of information technology, MSMEs are required to participate in digital transformation to survive and compete. The use of the internet and social media has changed consumer behavior and the way companies conduct their business, while digital marketing offers significant opportunities for MSMEs to increase sales at lower costs. This makes digitalization no longer just an option, but a fundamental necessity for business continuity in the modern era (Niqotaini et al., 2025).

InAmidst the demands of digitalization, there are still many MSMEs who carry out their business operations manually, which gives rise to various problems (Lahandi & Arisandi, 2025). Digital technology is advancing with the times and has become a crucial aspect in increasing the effectiveness and efficiency of industrial sector development (Niqotaini et al., 2024). In today's digital era, the use of information technology has a significant impact on various sectors, including the culinary industry. Manual systems create various problems such as inefficient record keeping, delays in order management, and the potential for errors in the ordering process..This condition encourages the need for an integrated technology-based solution to support the operations of culinary MSMEs (Aziza et al., 2025).

One MSME sector experiencing rapid growth but vulnerable to operational issues is the culinary sector. Website development for culinary MSMEs can increase marketing reach, speed up the ordering process, and improve operational efficiency. Furthermore, a web-based ordering system can help customers obtain product information and conduct transactions more easily without being limited by space and time (Akbar et al., 2023). Therefore, utilizing information technology is a crucial step in supporting digitalization and increasing the competitiveness of culinary MSMEs in the digital era (Zulfikar, 2024).

A common problem encountered by culinary MSMEs is unstructured customer queue management. A website-based queue information system is expected to assist service providers who require automated queue management, thereby simplifying queue system management and improving the quality of service to customers. Without an organized queue system, customers often experience inconvenience due to unmeasured waiting times, which ultimately results in decreased customer satisfaction and loyalty (Germecca et al., 2024).

Ayam Geprek Mavera, a small and medium-sized culinary business, is still facing similar challenges. The walk-in ordering process and manual recording have led to queues during peak hours, the potential for order data loss, and the difficulty of real-time queue monitoring by managers. Digitizing operational management at the MSME level has been shown to improve work effectiveness and the overall quality of customer service. Therefore, a technology-based solution is needed that can integrate the ordering process and queue monitoring in a single, easily accessible platform (Febriani & Heriyanto, 2026).

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Various studies have proven that the implementation of a web-based ordering information system in MSMEs can facilitate the ordering, marketing, and business management processes through integrated features, thus providing a real contribution to the development of the MSME digitalization model. This approach is in line with the needs of Ayam Geprek Mavera in creating a more structured, transparent, and efficient service ecosystem. Based on this background, this study aims to analyze and design a Web-Based Ordering Information System and Queue Monitoring in the Ayam Geprek Mavera MSME. The designed system is expected to be a comprehensive digital solution in overcoming existing operational problems, while supporting the digital transformation efforts of culinary MSMEs in Indonesia.

Research Methods

This study uses a qualitative research approach with a system development research (SDR) method. The qualitative approach was chosen because the research focuses on problem identification, user needs analysis, and web-based information system design at Mavera MSMEs. System development was carried out using the Waterfall method, which consists of the stages of needs analysis, system design, implementation, and report preparation and conclusion drawing. This method was chosen because it has a systematic and structured workflow, thus facilitating the system development process according to user needs. Data sources in this study consist of primary and secondary data. Primary data was obtained through problem identification and system needs analysis at Mavera MSMEs, which is the object of the research. Meanwhile, secondary data was obtained through a literature review by reviewing various relevant literature, such as scientific journals, books, research articles, and other references related to information systems, web technology, startup management, and software development methods. These various sources are used as a theoretical basis in the system design and development process.

The data collection techniques used in this research were literature review and system requirements analysis. The literature review was conducted by collecting and reviewing various references related to the development of web-based information systems, information system architecture, and relevant supporting technologies. Furthermore, system requirements were identified through observations of the operational conditions of Mavera MSMEs to identify the problems faced and determine the functional and non-functional requirements that must be met by the system to be developed. Data analysis was conducted descriptively and qualitatively by interpreting the results of problem identification, user needs, and information obtained from the literature review. The collected data were analyzed to determine system requirements specifications, which were then used as a basis for the design process using Unified Modeling Language (UML). Furthermore, the analysis results were applied to the implementation stage by creating a mockup of the web-based system interface. The final stage was an evaluation of the suitability of the system design to the needs of Mavera MSMEs, which then became the basis for compiling the research conclusions.

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Results and Discussion

The next stage is to create a design using UML (Unified Modeling Language) to describe how the system works, both in terms of process flow, user interaction, and data structure as well as depicting flow diagrams or flowcharts.

Flow chart

A flowchart is a diagram that depicts the processes of a program system. The following is a flowchart of the web-based ordering system at the Mavera MSME.

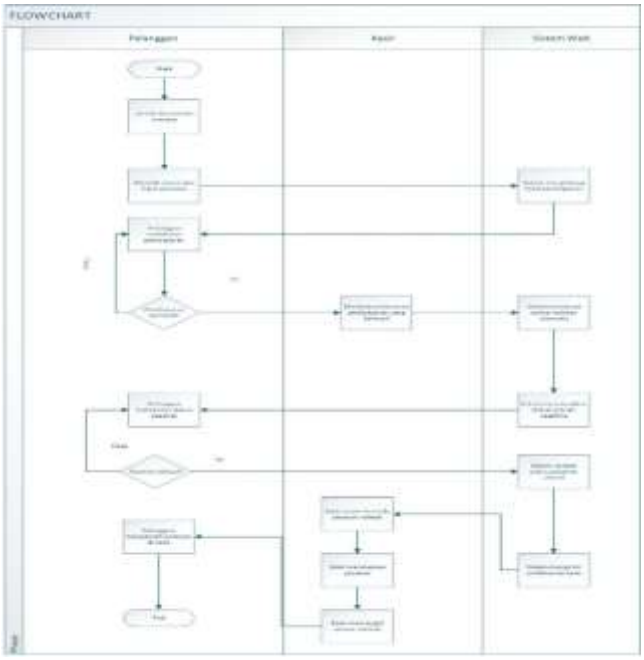

Figure 1. Flowchart of the Web-Based Ordering Information System at Mavera MSMEs

The flowchart involves three main entities: the Customer, the Cashier, and the Web System. The process is outlined as follows:

1. Initiation and Order Input Stage

The process begins when a customer accesses and opens the official Mavera website. Upon entering the main page, they can select and view the available menus and then input their order according to their wishes. The order data is immediately forwarded to the web system, where the system will automatically calculate the total payment fee the customer must pay.

Transaction and Validation Stage

Once the total cost appears, the customer is directed to make payment. This involves a validation process with a branching window with the following condition: "Was the payment successful?"

1. If Not: The customer will be returned to the payment page to try again.
2. If Yes: Information about the success of the transaction will be received in parallel by the Cashier, and the Web System will immediately display the queue number automatically for the order.

Queue Monitoring Stage (Real-time)

After a queue number is issued, the Web System displays real-time queue status

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information for customers to monitor directly. During this stage, regular checks are performed on the processing status: "Is the order complete?"

1. Otherwise: The status on the Customer page will remain in monitoring mode.
2. If Yes: The Web System will update the status to "Completed" and send a notification to the cashier.

Order Completion and Delivery Stage

The cashier receives information that the order has been completed and immediately prepares the physical order. Once the order is ready, the cashier will call the customer's queue number. The customer approaches the counter to collect their order, and the entire ordering process is complete.

Use Case Diagram

Use Case Diagram is a diagram that describes the interaction between actors and the system and shows the functions that can be accessed by users [8].

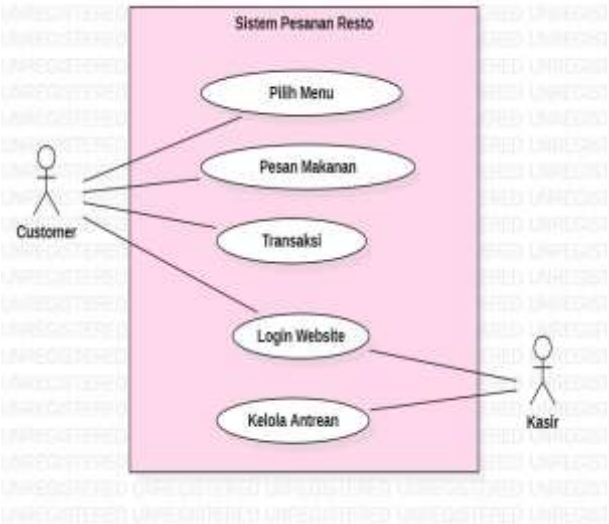

Figure 2. Mavera Use Case Diagram

Based on the use case diagram in Figure 2, this system is designed with two actors, namely the Cashier and the Customer, Customers can access the web to take a queue and order food by registering on the web, customers can also monitor how far the queue is and when it is their turn to take their order. The cashier can log in to access and manage the customer queue after which the cashier will call each queue one by one to give the finished order.

Activity Diagram

Activity Diagrams are used to visualize the flow of activities or the sequence of processes that occur within a system [9]. Activity Diagrams are visual models in UML (Unified Modeling Language) that describe the workflow, business processes, or procedural logic of a system from start to finish.

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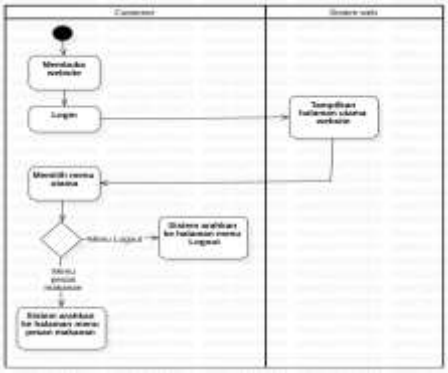

Figure 3. Activity Diagram Select Menu

This diagram illustrates the user navigation process after successfully logging into the website. After opening the website and logging in, the system displays the main page. The user then selects a menu item from the main page. If the user selects the food ordering menu, the system directs them to the food ordering page. If the user selects the logout menu, the system directs them to the logout page to end the session. This diagram shows how the user moves from the main page to the desired feature.

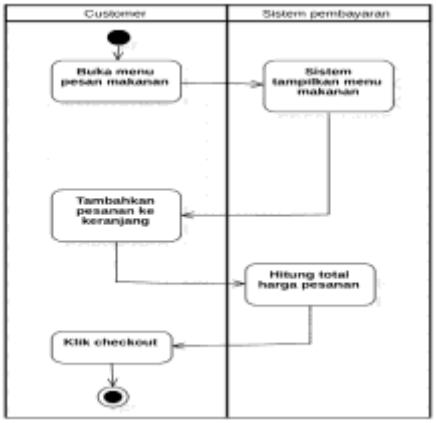

Figure 4. Food Ordering Activity Diagram

This diagram illustrates the process of a customer ordering food through the system. The process begins when the customer opens the food ordering menu. The system then displays a list of available menu items. The customer then selects and adds food to the cart. The system calculates the total order price based on the selected items. Once the total price is displayed, the customer proceeds to checkout to proceed with the payment process. The process ends when the customer successfully completes the payment process.

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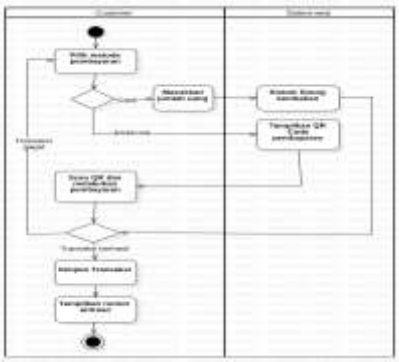

Figure 5. Transaction Activity Diagram

This diagram explains the payment process for an order made by a customer. The customer first selects a payment method, either cash or electronic. If cash is selected, the customer enters the amount and the system calculates the change. If electronic payment is selected, the system displays a QR code that the customer uses to make the payment. After payment is made, the system checks the transaction status. If the transaction fails, the customer must repeat the payment process. If the transaction is successful, the system saves the transaction data and displays a queue number as proof that the order has been placed in the service queue.

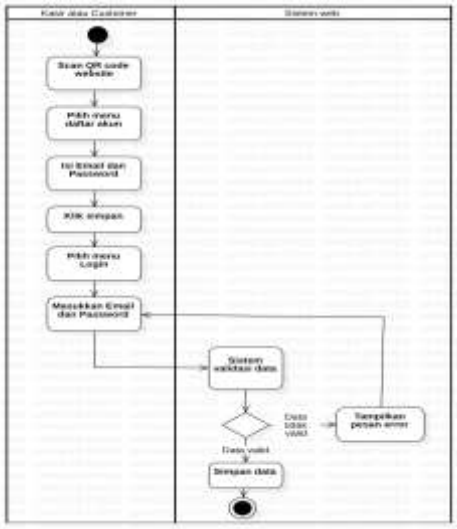

Figure 6. Website Login Activity Diagram

This diagram shows the account registration and login process on the system. The process begins when the user scans the website's QR code and then selects the "Register Account" menu. The user enters their email address and password, then saves the registration information. After successfully creating the account, the user enters the login menu and enters their email address and password. The system validates the data. If the entered data is invalid, an error message is displayed and the user is prompted to re-enter the login information. If the data is valid, the system saves the login information, and the process is complete.

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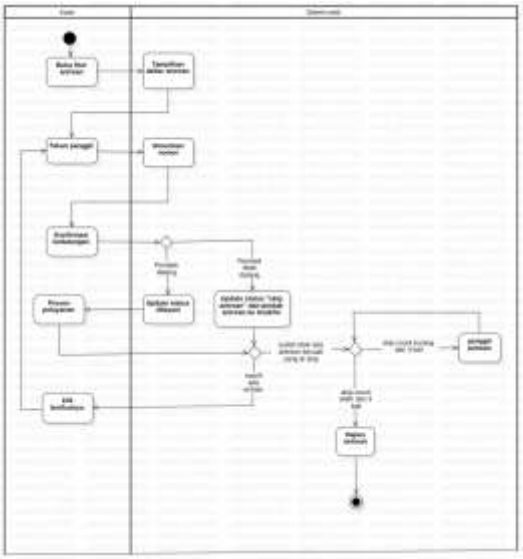

Figure 7. Queue Management Activity Diagram

This diagram illustrates the process of managing a customer queue by a cashier. The cashier opens the queue feature and the system displays a list of available queues. The cashier calls a queue number, and the system announces the number called. The cashier then confirms the customer's arrival. If the customer arrives, the system updates the queue status to "served," and the cashier continues the service process. If the customer does not arrive, the system changes the queue status to "skip queue" and moves the queue to the last position.

The system then checks the status of the remaining queues. If there are still others in the queue, the cashier can call the next queue. If only queues with skipped status remain, the system checks the number of skips. Queues that have been skipped more than three times are removed from the queue list, while queues with fewer than three skips are recalled. The process ends when the queue is cleared or all services are processed.

Sequence Diagram

Sequence Diagrams describe the sequence of information exchange between objects in a system chronologically (Latief et al., 2025).

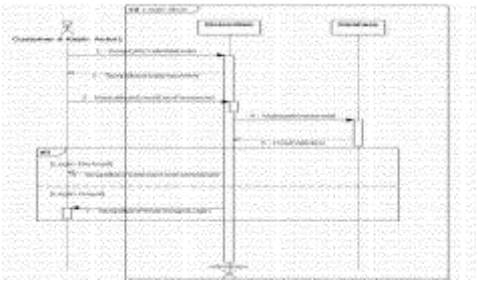

Figure 8. Account Log In Sequence Diagram

Based on Figure 8, the login process is the first step when a customer or cashier opens the website through a browser. The web system then displays a login page to the user. The user enters their email and password in the provided form, then the system validates the credentials by checking the data against the database. If the login is successful, the system will display the

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website's main page and the user can select the available main menu. If the user selects the order food menu, the system will direct them to the ordering page, while if they select the logout menu, the system will direct them to the logout page. If the login fails due to an incorrect email or password, the system will display a login failure message as a notification to the user.

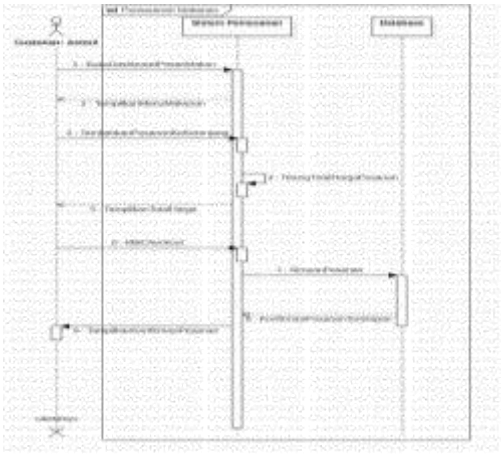

Figure 9. Food Ordering Sequence Diagram

Based on Figure 9, this process begins after the customer logs in and then opens the dashboard to view the food menu. The system will then display the available food and drinks. Customers can select and add orders to the cart, then the system automatically calculates the total order price and displays it to the customer. After the customer presses the checkout button to confirm the order, the system saves the order data into the database. The database provides confirmation that the order has been saved, then the system displays an order confirmation to the customer as a sign that the order process has been successfully completed.

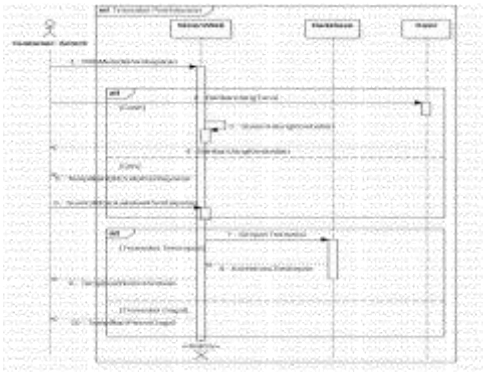

Figure 10. Payment Transaction Sequence Diagram

After the customer selects a menu item and presses the checkout button, the system displays the transaction page. The customer can choose between cash or QR code payment. If the customer chooses cash, the customer enters the amount to be paid, and the system automatically calculates and displays the change. If the customer chooses electronic or QR code payment, the system displays a QR code, which the customer scans and pays through their app. After the payment process is completed using either method, if the transaction is successful, the system will save the transaction data to the database and display a queue number to the customer. If the transaction fails, the system will display a transaction failure message to the customer.

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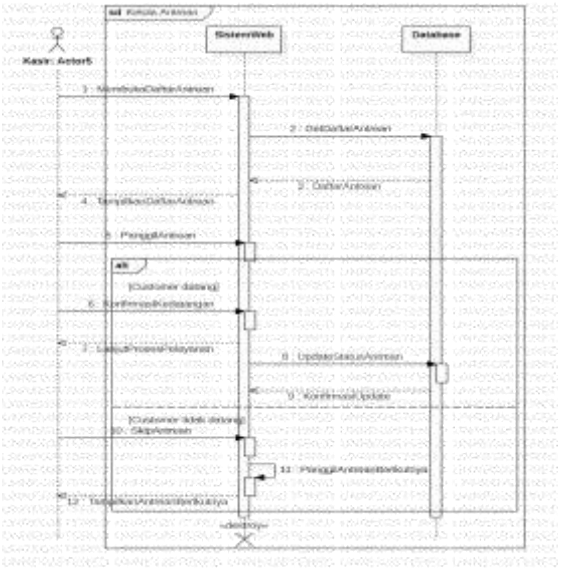

Figure 11. Queue Management Sequence Diagram

This process begins when the cashier opens the queue list in the system. The system retrieves queue data from the database and displays the entire list of running queues to the cashier. The cashier then calls the queue. When a customer arrives, the cashier confirms the customer's arrival in the system, the service process continues, the system updates the queue status in the database, and the cashier calls the next person in line. If the customer does not arrive after being called, the cashier skips the queue so the system automatically calls the next queue number and displays it to the cashier.

Class Diagram

A Class Diagram is a diagram that describes the static structure of a system consisting of classes, attributes, methods, and relationships between classes [9].

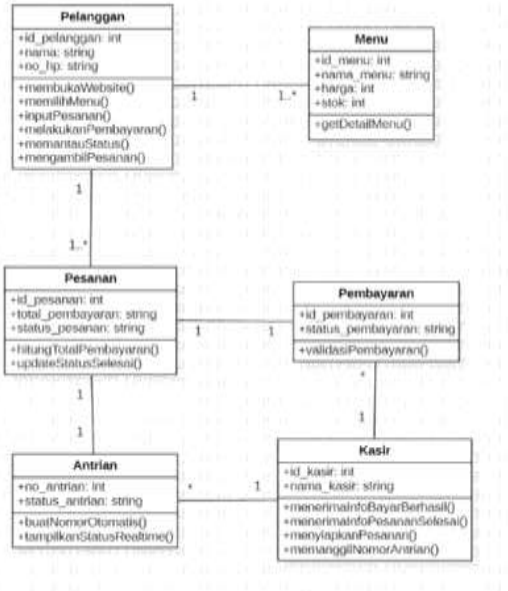

Figure 12. Class Diagram of the Mavera Web System

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A class diagram illustrates how data and processes are interconnected within the web-based system at Mavera MSMEs as part of the system documentation. The figure shows six classes: Customer, Menu, Order, Payment, Cashier, and Queue. The data flow begins when a customer accesses the website to view the menu, check prices, and check stock availability. After selecting their desired menu, the customer enters their order, and the system automatically calculates the total cost.

Once the total payment appears, the customer is directed to complete the transaction. The system then validates whether the payment was successful. If successful, the information is immediately forwarded to the cashier for order preparation, while the system automatically creates a new queue number. As the order is processed by the cashier, the queue status is continuously updated in real time for customers to monitor directly. Once the cashier has completed preparing the order, they will update the status in the system to "completed" and call the queue number so the customer can immediately pick up their order.

User Interface

The user interface is the visual display of a website that connects the user with the running system. The user interface is designed to make it easier for customers. The following is a display of the user interface of the Geprek Mavera website.

1. Login View

Figure 13. Login Page

As seen in the image above, it contains a login form consisting of a username and password that the customer must enter. The login form uses an email address and password.

2. Dashboard View

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Figure 14. Dashboard

After the customer has successfully logged in, the next display is a dashboard that displays popular menus, promo info, menu categories, a plus sign to add the menu to the cart, notification info, in this dashboard the customer can select the desired order.

3. Order & Transaction View

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Figure 15. Product Menu Display

In the Cart & Transaction menu there are accumulated orders and the total price to be paid, there are payment options in the form of qris and cash.

4. View Tracking Order In Customer Tracking Order

In Order Tracking, customers receive an estimated completion date and can also see in real time what queue number it's in. Customer orders and the total price are also displayed.

Figure 16. Order Tracking Display

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Conclusion and Recommendation

Based on the results of our design, we can conclude that the implementation of a web-based system with a Unified Modeling Language (UML) approach is able to provide an efficient solution to the problems of manual recording and queues that are not real-time, which are challenges for the Mavera MSME. This system is designed to facilitate the management of order data, payment transactions, customer queue systems, and facilitate real-time order status monitoring. The resulting web-based system is able to improve operational efficiency and can reduce the risk of recording errors. In addition, several features such as order input, payment validation, and queue number monitoring can be accessed online, so that the Mavera MSME can conduct regular monitoring and evaluate sales performance more quickly and accurately. So overall, this web-based system design can be a digital solution that supports the transformation of MSME businesses towards more modern, effective, and integrated business management with information technology.

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