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Design of Mobile Food Ordering Application at PT Susi Catering Using Waterfall Method

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Abstract

PT Susi Catering is a catering company that provides food services for events such as weddings, offices, and religious celebrations. The manual ordering process, typically handled via WhatsApp or phone calls, often leads to errors and inefficiencies. To address these challenges, this study developed a mobile food ordering application using Android Studio and Firebase. The system was built with the Waterfall method through stages of requirement analysis, system design, implementation, and testing. The application supports two roles: user and admin. Features include user registration, login, food package selection, order forms, pondokan menu options, order history, and real-time chat. Admins can manage orders and communicate with users. Testing demonstrated that the application improved efficiency and accuracy compared to the manual process. The research highlights the effectiveness of mobile applications in enhancing catering service operations.

Keywords: *Android, Firebase, Food Ordering, Pondokan, Waterfall*

1. Introduction

PT Susi Catering often faces delays in the ordering process, which is carried out manually and can lead to customer dissatisfaction. This manual process frequently results in errors in order recording, delivery delays, and a lack of transparency in the information provided to customers [2]. In addition, the use of traditional methods in processing order data also leads to low efficiency, where customers have to wait a long time to receive their ordered meals, thereby reducing convenience and customer satisfaction [4].

An Android-based application can help reduce order recording errors in restaurants, especially during peak hours. This digitalization process not only speeds up the ordering time but also improves the accuracy of recorded data. Research results show that mobile-based ordering systems have an accuracy rate of up to 95%, while also minimizing obstacles in managing order queues [5]. Therefore, it is important to identify and design a system that can address these issues by utilizing information technology.

To resolve the aforementioned problems, the waterfall method was chosen as the approach in application design. This method has advantages in terms of clear structure and well-defined stages, which facilitate systematic development and testing of the application [6]. Although the waterfall method has drawbacks, such as limited flexibility in accommodating changes during the development process, this approach remains relevant for projects with clear and stable specifications [7]. Previous studies have shown that the use of the waterfall method in developing food ordering information systems has successfully improved efficiency and accuracy in order data management [8].

The expected outcome of this application design is the creation of a food ordering system that is efficient, fast, and easy for customers to use. Through this application, customers are expected to easily access the menu, place orders, and obtain the necessary information without difficulties. In addition, the application is also expected to assist PT Susi Catering in managing order data more effectively, thereby improving customer satisfaction and the company's operational efficiency [9].

2. Research Methodology

This research applied the Waterfall development model, consisting of sequential stages: requirement analysis, design, implementation, and testing. The study was conducted at PT Susi Catering from November 2024 to April 2025. Data were collected through interviews with the catering owner and literature reviews.

The stages of the Waterfall method include:

1. Requirement Analysis: identifying user and system needs, including order recording, real-time updates, and data storage.
2. System Design: database schema design (SQLite and Firebase), use case diagrams, and UI mockups created with Figma.
3. Implementation: development using Android Studio and Java, with Firebase Authentication and Realtime Database integration.
4. Testing: functionality testing with Black Box Testing and validation across Android devices.

Table 1. Research Schedule

No	Activity	Nov 2024	Dec 2024	Jan 2025	Feb-Mar 2025
1	Problem Formulation	✓			
2	Data Collection		✓		
3	Analysis & Design			✓	
4	Implementation				✓
5	Evaluation & Testing				✓
6	Report Writing				✓

To ensure the research process was structured and systematic, a detailed research schedule was created. The schedule covered the period from November 2024 to April 2025 and outlined activities such as problem formulation, data collection, analysis and design, system implementation, testing, and report writing. This schedule ensured that each stage of the Waterfall method was allocated sufficient time and resources.

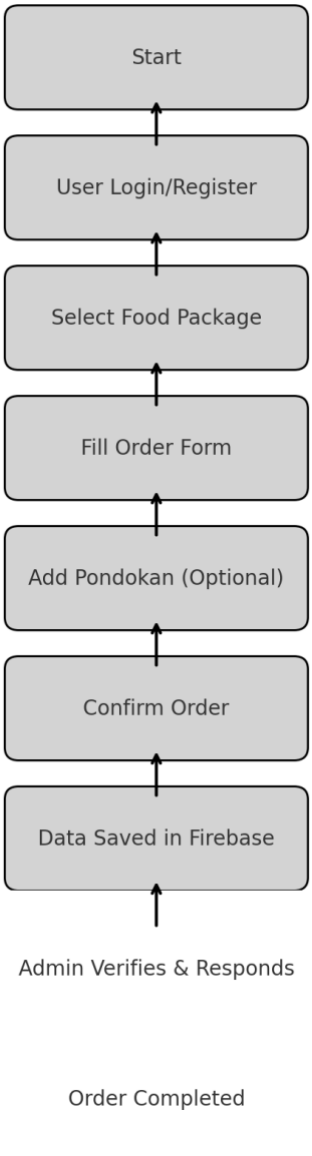

Fig. 1: shows the flowchart of the food ordering process.

3. Results and Discussion

The developed application includes two roles: user and admin. Users can register, log in, choose food categories (wedding, office, boxed meals, rice bowls, aqiqah, and breakfast), fill in order forms, add pondokan menus, track order history, and communicate with admins through chat. Admins can access orders, manage user data, and respond to chats.

Database structures were designed to manage customers, menus, orders, and order details efficiently. Tables for customers, menu items, orders, order details, and admins were implemented to ensure structured data management. Order data are stored in Firebase Realtime Database with each user's UID, ensuring accurate and non-overlapping records.

Table 2. Use Case Summary

Actor	Use Case	Description
User	Order Food	Select food packages and confirm orders
User	Track Orders	Monitor order status and history
Admin	Manage Orders	View, confirm, and update orders
Admin	Chat with User	Respond to user inquiries

Figures below illustrate selected application interfaces, including login, dashboard, food package selection, and admin features.

Fig. 2: Login Page

This interface allows users to log in with registered accounts or sign up as new users. Validation ensures no empty fields are submitted.

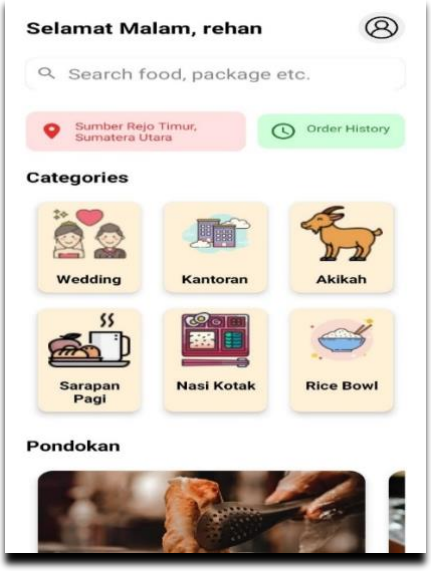

Fig. 3: Dashboard

The dashboard provides access to main features including food categories, order history, and chat with admin.

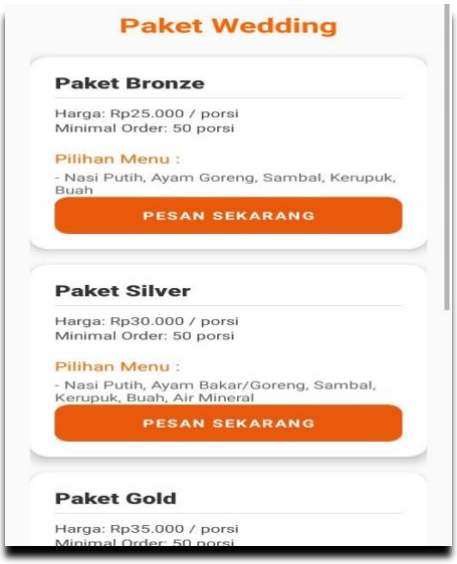

Fig. 4: Food Package Selection

Users can browse and select from various catering packages such as wedding, office meals, and special events.

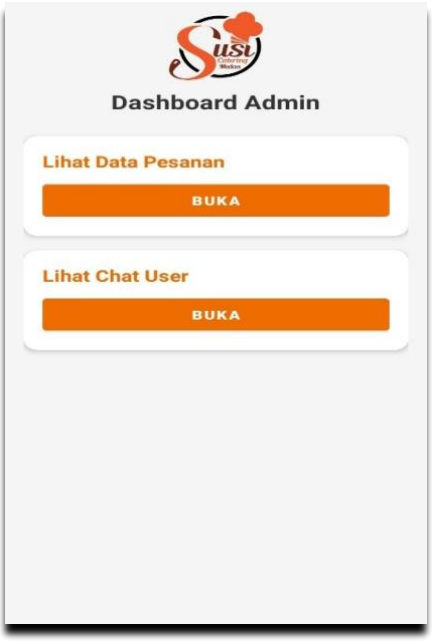

Fig. 5: Admin Panel

Admins can view incoming orders, manage user data, and respond to messages

Testing results confirmed that the application functions effectively. Black Box Testing validated input fields for login and registration, ensuring no empty or invalid entries were accepted. Firebase successfully stored and retrieved order data in real-time, supporting chat functionality. Compared to the manual system, the application reduced order errors, improved transparency, and enhanced efficiency. Strengths: efficient digital ordering, structured data storage, real-time communication, and intuitive UI. Limitations: available only on Android, no integrated online payment, and no delivery tracking system.

4. Conclusion

Based on the results of the research and the implementation of the Android-based mobile food ordering application at PT Susi Catering, several conclusions can be drawn as follows:

1. The Android-based food ordering application was successfully developed with features that make it easier for customers to choose meal packages according to categories such as Wedding, Breakfast, Meal Boxes, Office Meals, Rice Bowls, Aqeeqah, and additional Pondokan menus.
2. The ordering process has become more practical, faster, and more structured. The use of Firebase Authentication and Firebase Realtime Database simplifies real-time and centralized data management. Each order and user chat is stored based on each user's UID, ensuring that data does not overlap and can be accessed accurately by the admin.

3. The application supports two different roles: user and admin. Regular users can place orders and chat, while admins have access to view the list of all users who have placed orders or chats, respond to messages, and view complete order details from each user.
4. The Pondokan feature was successfully added dynamically, allowing customers to select various additional menu variations for events, with data stored in Firebase list structures. This enriches customer choices and adds value to the catering services. The user-friendly interface, along with supporting features such as order confirmation, order history, and automatic price calculation, provides a convenient and efficient user experience. The modern design, dominated by Susi Catering's signature orange color, ensures a consistent and attractive visual identity.

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