Journal of Computer Science and Technology Studies
ISSN: 2709-104X
DOI: 10.32996/jcsts
Journal Homepage: www.al-kindipublisher.com/index.php/jcsts

JCSTS
AL-KINDI CENTER FOR RESEARCH AND DEVELOPMENT

| RESEARCH ARTICLE

Application of Rest Api Technology in Android-Based Beauty Salon Service Reservation System

Tuty Anjarsari[1] ✉ **and Farida Ardiani**[2]
[12]*Informatics Study Program, Faculty of Science and Technology, Universitas Teknologi Yogyakarta, Indonesia*
Corresponding Author: Tuty Anjarsari, **E-mail**: anjarsarituti@gmail.com

| ABSTRACT
The beauty business is experiencing rapid growth along with the changing times, where almost all activities now adopt digital technology. This transformation has had a significant impact on the beauty business world, especially in salons like Elsa Eyelash Salon. Although some salons have switched to online booking, there are still some that use a manual system. To overcome this challenge, this research develops an Android-based reservation system application with Rest API. The development method applied is the waterfall method, with an emphasis on requirements analysis, design, implementation, and testing. The implementation results show an intuitive user interface, making it easier for customers to make reservations online. Functional tests were conducted using the black box testing method, which successfully identified potential bugs before the application was widely used. The hope is that this application can improve the quality of service in beauty salons and provide a better customer experience. Thus, this application is expected to be an effective solution to support the development of the beauty industry in the future.

| KEYWORDS

Reservation, Rest Api, Android, Java, Beauty Salon

| ARTICLE INFORMATION

ACCEPTED: 02 December 2023 **PUBLISHED:** 28 December 2023 **DOI:** 10.32996/jcsts.2023.5.4.21

1. Introduction

Social changes in modern society, which are changing along with the fourth industrial revolution, have led to the development of a beauty and consumer convenience market that provides different services (Moon & Yang, 2021). The beauty industry has experienced rapid growth in line with technological changes and shifts in people's views on lifestyle. Women and men are now increasingly concerned about looking attractive and taking care of their appearance as part of an effort to perfect themselves and cover up any shortcomings that may be felt. One form of beauty service that is in high demand by women is a salon. A beauty salon is a hair and makeup treatment place that generally serves female customers (Dharma & Putra, 2020). Beauty salons, specifically for women, offer a series of beauty treatments that include hair treatments such as creambath, haircut, smothing / rebonding, coloring and so on. In addition, the salon also provides various facial treatments, including facials, eyelash extensions, and eyelash curling, in an effort to provide the best service to customers. Nowadays, some beauty salons have adopted a special service in the form of an ordering system via Whatsapp chat or Instagram DM.

However, almost all beauty salons in some areas still use a manual ordering system to serve their customers, one of which is Elsa Eyelash Salon, located at Bangbayang No.08 Cicurug District, Sukabumi Regency. Until now, salon owners and customers have experienced many problems when it comes to daily salon needs in the salon industry. Customers who come to make reservations are asked to choose the services they want; then, customers are asked to make payments. One of the main problems that customers face is that they have to wait in long queues at the salon to get their work done. They cannot leave the queue to come back later because the place will be occupied by someone else when they leave (Haleem, n.d.). This results in a long waiting time for

customers. In addition, customers also do not have the option to make bookings online without having to come directly to the salon location. The increasing interest of visitors, especially on important days, causes visitors the trouble of having to queue and wait for a long time.

In this context, to handle the problem, the author designed an innovative solution in the form of an Android-based reservation system application by implementing the Rest API system. Currently, the reservation system in the salon and spa industry has become very developed. Salons and spas use a wide variety of online reservation solutions, mobile applications, or booking platforms that integrate with other management systems, such as inventory, payment, or customer management (Permatasari et al., 2023). Rest API (Application Programming Interface) is a collection of commands and protocols that allow different software or applications to communicate and interact with each other. Rest describes a set of resources and a set of operations that can be called on the resources (Surwase, 2016). The operations in the REST API can be invoked from any HTTP client, including client-side JavaScript code running in a web browser (Michael, 2015). In the context of creating an Android-based reservation system application, implementing an API system can facilitate integration between the application and various external resources, such as databases, third-party services, or online reservation platforms. This allows the application to access and exchange information efficiently, improve functionality, and provide a better user experience. This application aims to provide convenience to beauty salon customers in accessing information about the services offered and prices, as well as facilitate the online booking process. This can significantly facilitate the event management process by offering flexibility and efficiency (Coulter, 2014). This application is based on Android and has been tested in the beauty field, like a beauty salon. With some recommendations from this application, users can consider beauty salons that suit their needs, budget and suitability of the type of treatment provided based on user needs (Rosmawarni, 2017). Thus, it is expected to improve customer experience and overcome the problem of long queues and uncertainty in ordering. This application design is expected to be an effective solution to improve the quality of beauty salon services and provide satisfaction to customers.

2. Literature Review

A literature review is a piece of academic writing that demonstrates knowledge and understanding of the academic literature on a particular topic placed in context. For a number of research questions, a literature review can be the best methodological tool to provide answers (Snyder, 2019). The following is a literature review of this study:

1. Research conducted by Prof. Rashmi Kannake et al. resulted in an innovative web application. This application makes it easier for users to schedule appointments between clients, salons and stylists online. Users can easily book or cancel appointments, with the main goal of reducing customer waiting time, advancing salon business marketing, and supporting local vendors in displaying their artwork globally on the internet (Kannake et al., 2023).

2. Research by Faiza Renald et al. created a system using Rest API technology. This system combines parameters from bookings and travel packages and performs comprehensive calculations. The goal is to give travelers many choices to combine their travel packages automatically, creating efficient integration between hotel, transportation, and private ticket booking transactions that were previously carried out separately (Renaldi et al., n.d.).

3. Research by Yaman Goya et al. produced a web application that provides easy access to booking inpatient rooms online in hospitals. This system connects consumers to an online interface to register their identity and book inpatient rooms on behalf of patients. On the other hand, the hospital can register the patient and provide details, reducing chaos in the booking process. In addition, this application improves time efficiency and saves hospital operating costs (Goyal et al., 2022).

3. Methodology

3.1 Waterfall Method

The research method involves conducting research that seeks to obtain information and investigate data. In this study, the authors used the waterfall method. The waterfall model is an astatic model, and it approaches systems development in a linear and sequential manner, completing one activity before the other (Goyal et al., 2022). According to Fowler, the waterfall style breaks down projects based on activities: needs analysis, design, coding, and testing (Fowler, 2004). Figure 3.1 The following are the stages of the waterfall method in making the system.

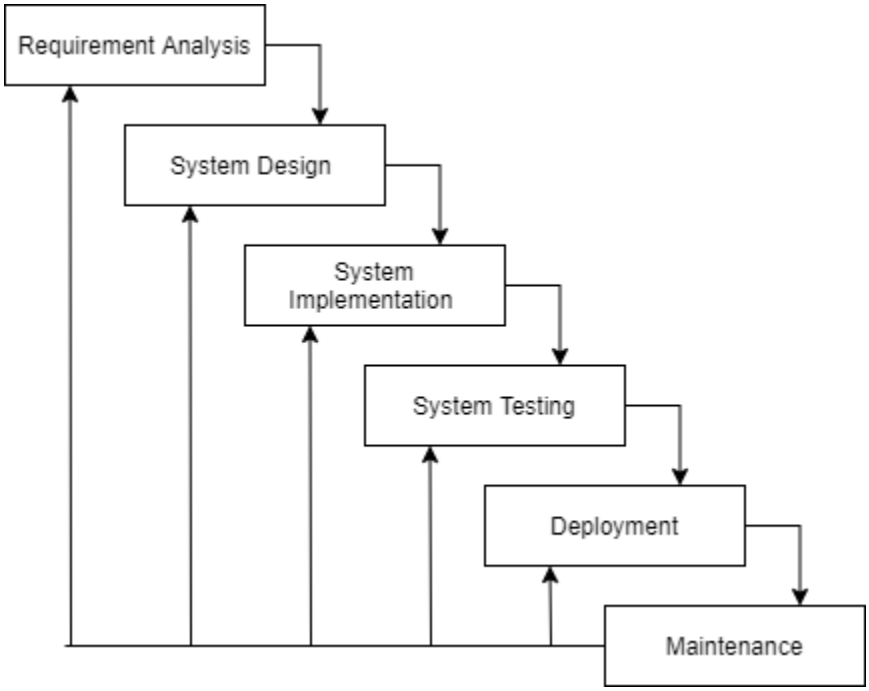

Figure 3.1 Metode Waterfall

1. *Requirement Analysis*
   The initial stage in using the waterfall method of analyzing the needs of a salon reservation system involves identifying services and performance, user interface design, and integration with other systems. Regulatory compliance and maintenance are also considered to support the development of a responsive and secure application according to the needs of the salon.

2. *System Design*
   The design of a salon reservation system includes the database structure, business logic, and user interface. These components must be integrated with each other to ensure service continuity, operational efficiency, and a good user experience.

3. *System Implementation*
   The implementation of the beauty salon reservation system involved the development of an Android-based application, integration with a database to store and manage reservation information, and setting up an intuitive user interface. This process ensures that the online booking, payment, and customer schedule management functions run smoothly according to the salon's business needs.

4. *System Testing*
   Beauty salon reservation system testing includes evaluation of booking, schedule management, and payment features. Functionality, security, and performance tests are conducted to ensure the application runs as expected. User acceptance tests help identify improvements based on user feedback.

5. *Deployment*
   Beauty salon reservation deployment is the stage where the created system is installed and enabled for use. It involves server configuration, interface customization, and trial runs before the official launch. After deployment, users can access the system to make salon service reservations.

6. *Maintenance*
   Beauty salon reservation maintenance involves regular upkeep and improvement of the system after implementation. This includes performance monitoring, bug handling, software updates, and feature customization based on user feedback to maintain the sustainability and reliability of the system.

3.2 Business Rule

1. Ongoing System Architecture

The current reservation system in several beauty salons, including Salon Elsa Eylash, is depicted in the flowmap in Figure 3.2. From the flowmap, it can be seen that the reservation process at this beauty salon is still done manually. Customers who come to the salon are asked to choose a service from the price list. If the salon is serving another customer, the next customer is asked to wait until their turn arrives. This can cause a long waiting time for customers, so there is a possibility that customers will cancel their reservations because of this.

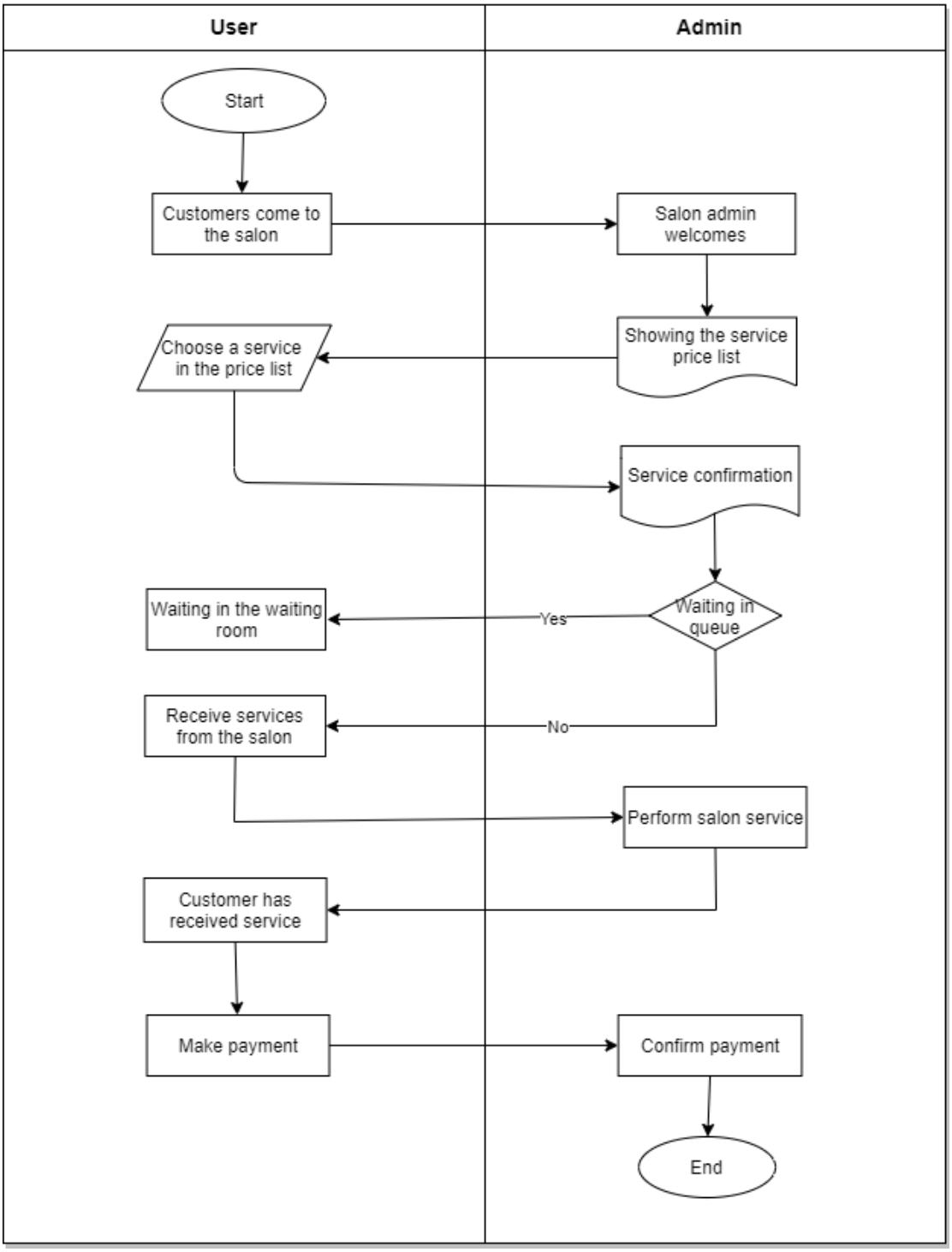

Figure 3.2 Ongoing System Architecture

2. Proposed System Architecture

The proposed system is an Android-based application where customers do not need to come to the salon to place an order simply by opening the Salon Elsa Eylash application on their smartphone. After logging in, customers will be directed to the main page, where they can choose the services needed. After that, the customer can specify the date and time of the booking by clicking "Booking" to process it. The proposed system flow can be seen in Figure 3.3.

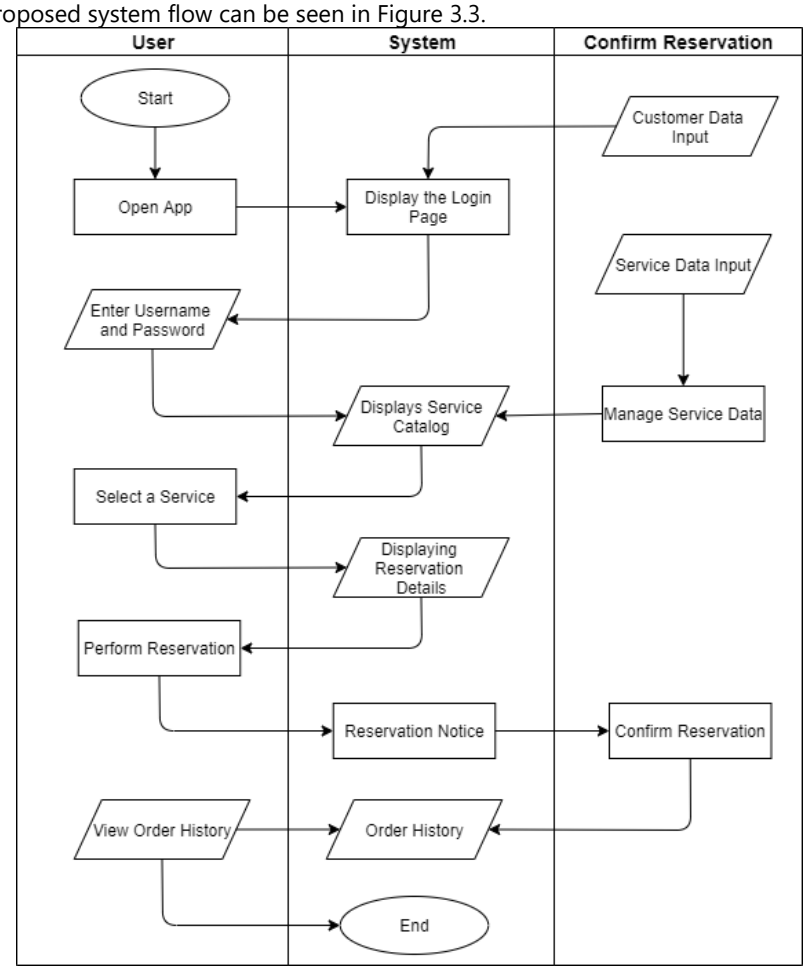

Figure 3.3 Proposed System Architecture

4. Results and Discussion

4.1 System Implementation

The following is an analysis of the supporting needs of the system that will be created later, such as software for development, devices for testing, and so on. These needs include hardware and software.

1. The software used to build this system is as follows:
    a. Android Studio
    b. Visual Studio Code
    c. Google Chrome
    d. 000webhost
    e. Draw.io

2. The hardware used to operate this system is as follows:
    a. Axioo Slimbook 14 R3
    b. Processor AMD R3-3200U
    c. Ram 8 Gb
    d. Harddisk 256 Gb
    e. OPPO A54

4.2 User Interface Implementation

1. Home Page Display

The home view or main page in the beauty salon reservation system is the first interface that appears after the customer has successfully logged in. On this display, customers can find various service options provided by the salon, see a price list, and get information related to promotional advertisements that are currently taking place at the salon. This main page is designed to provide an informative user experience and make it easier for customers to choose the desired service.

Figure 4.1 Home Page Display

2. Reservation Page

On the reservation page, users can make reservations for hair treatments available at the beauty salon. Users need to fill out a form with information such as date and time. The booking name will be automatically filled in according to the registered account, eliminating the need to enter the name again. The choice of services ordered will also be automatically filled in according to what the user selected on the home page, as can be seen in Figure 4.2.

Figure 4.2 Reservation Page

3. Payment Gateway User Interface Page Admin Dashboard Page

The payment gateway view is an application page or interface that allows customers to make payments online. In this view, customers can select the desired payment option, enter payment details, and complete the transaction. After the payment is successfully processed, the system will provide confirmation to the customer regarding the success of the transaction. The payment gateway interface is designed to facilitate and ensure a smooth digital payment process, as can be seen in Figure 4.3.

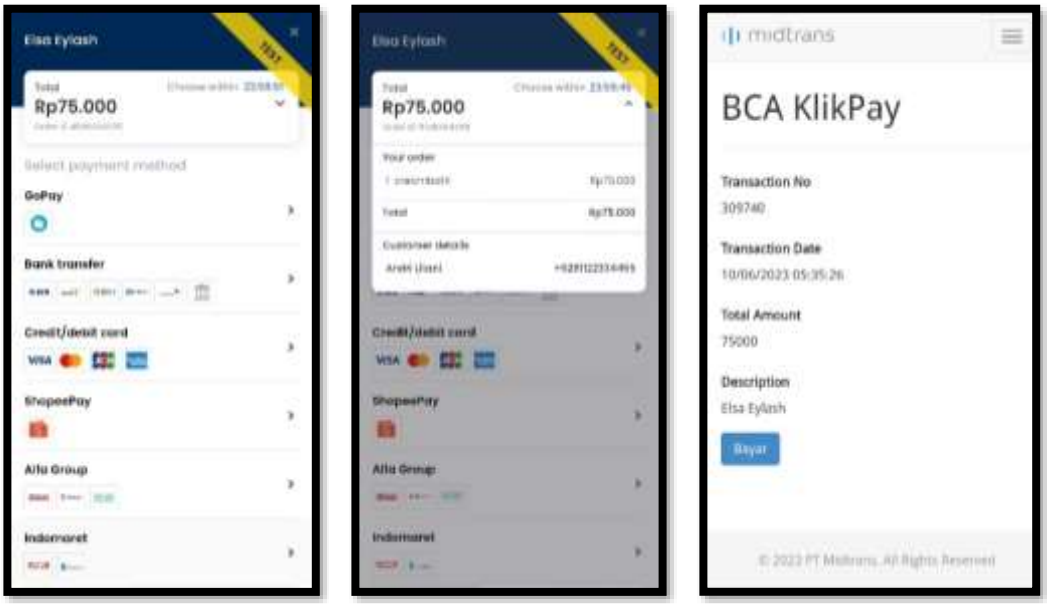

Figure 4.3 Payment Gateway User Interface

4.2 Admin Interface Implementation

1. Admin Dashboard Page

The admin dashboard is an exclusive page that can only be accessed by administrators. This page displays a list of bookings with two action buttons, namely "Finish" and "Delete". The "Done" button is used to complete the booking, while the "Delete" button is to remove it from the list. The payment gateway view, on the other hand, provides convenience to customers in making online payments through the options provided. The transaction process is done in this view, and upon successful payment, a confirmation is given to the customer.

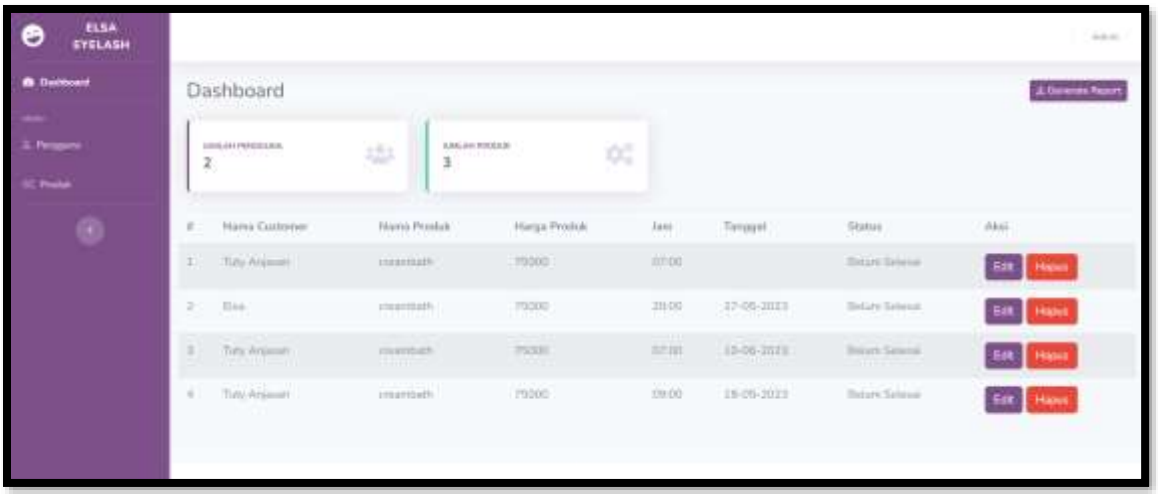

Figure 4.4 Admin Dashboard Page

2. Service Data Page

The Service Data page displays the list of services available at Salon Elsa Eylash. Here, users can view information related to each service, such as service name, description, price and image. Additionally, the salon has the ability to add new services by filling out an input form that includes service details such as the new name, description and price. With this feature, salons can manage and update the list of services according to their needs and business development.

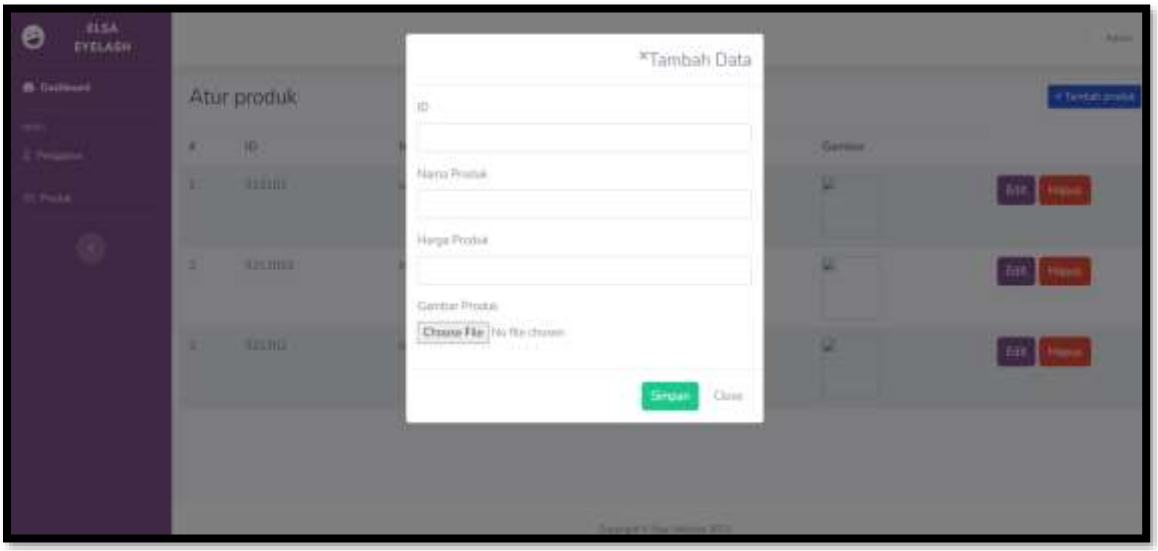

Figure 4.5 Service Data Page

3. Payment Gateway Admin Detail Page

This view displays complete information about customers who have made online payment transactions. Each customer entry includes details such as name, address, contact number, type of service selected, payment amount, and payment status. In addition, the admin can easily track the transaction history of each customer for recording and reporting purposes. This feature makes it easier for salon administration to manage customer data and ensure a smooth service process.

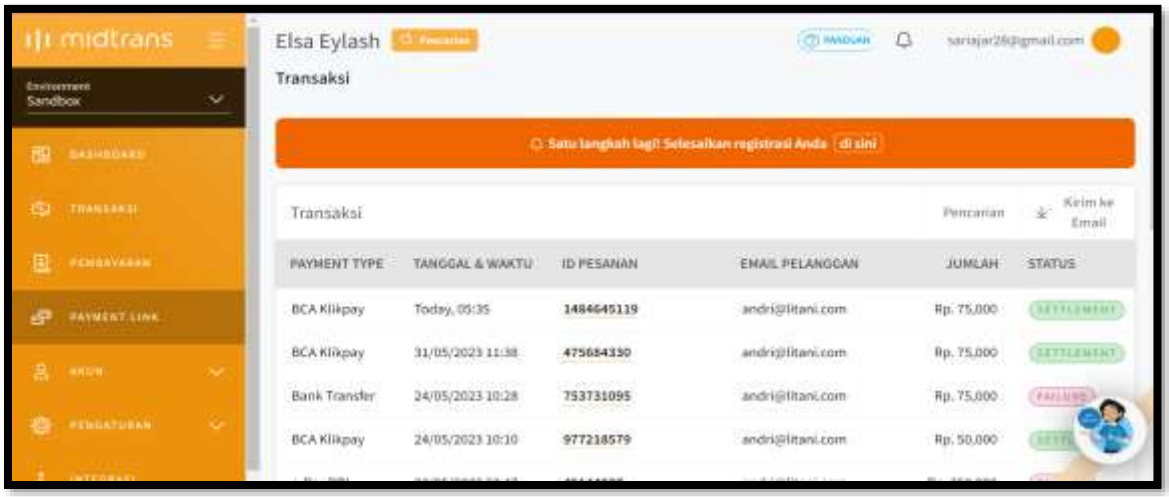

Figure 4.6 Payment Gateway Admin Detail Page

4.2 Black Box Testing

The functional testing stage of the application system is carried out using the black box testing method, which focuses on external functionality without paying attention to the internal structure. Black Box Testing is testing without knowing the internal workings of the application being tested (AUT). Also known as functional testing or input output based testing. A software testing technique in which the internal workings of the item under test are unknown to the tester (Kumar et al., 2015). Test cases are designed to cover usage scenarios, such as login, service selection, order form filling, and payment process. The main goal is to ensure every

feature of the application functions correctly and in accordance with user expectations. By conducting these tests, we can identify and fix potential bugs or functional issues before the app is launched.

Table 4.1 Android Application Testing Results

Pengujian	Realisasi Yang Diharapkan	Hasil Pengujian	Kesimpulan
Login	The system can validate and display the home page	The system successfully displays the home page by entering the username and password that has been registered.	[✓] Accepted [ ] Rejected
Access Service	Display available services	The system successfully displays available services	[✓] Accepted [ ] Rejected
Reservation Service	The system can display the service reservation input as selected and go to the payment transaction.	The system successfully displays the input of service reservation details and displays payment transactions.	[✓] Accepted [ ] Rejected
Reservation Details	System can display reservation details.	The system successfully displays the details of reservations that have been booked.	[✓] Accepted [ ] Rejected
Identity Update	System can update data according to input.	The system successfully displays the user's identity according to the updated one.	[✓] Accepted [ ] Rejected
Logout	System displays login	The system successfully logs out of the system	[✓] Accepted [ ] Rejected

Table 4.2 Admin Website Testing Results

Pengujian	Realisasi Yang Diharapkan	Hasil Pengujian	Kesimpulan
Home	The system can display the details of the booking reservation data	The system successfully displays details of reservation data based on work status.	[✓] Accepted [ ] Rejected
User identity input	System can add user data as inputted	The system successfully adds data according to what is inputted	[✓] Accepted [ ] Rejected
Update user identity	System can update user data	The system successfully updates user data according to what is inputted.	[✓] Accepted [ ] Rejected
Delete user identity	User data is deleted	The system successfully deletes user data according to what is selected	[✓] Accepted [ ] Rejected
Input service data	System can add services as inputted	The system successfully adds service data as inputted.	[✓] Accepted [ ] Rejected
Update service data	System can update service data	The system can update the service data as inputted.	[✓] Accepted [ ] Rejected
Delete service	Service data is deleted	The system successfully deletes service data as selected	[✓] Accepted [ ] Rejected

5. Conclusion

Based on the research that has been conducted, the author succeeded in producing an innovative solution in the form of an Android-based reservation system application using the Rest API system, which aims to solve the problem of long queues and uncertainty of reservations at beauty salons, with Elsa Eyelash Salon as a case study. The application of the waterfall method has successfully created an intuitive user interface, making it easier for customers to choose, book and pay for services online. With a focus on operational efficiency and customer satisfaction, the system implementation results show the potential to improve the quality of beauty salon services and provide a better customer experience. The functional tests conducted successfully identified and fixed potential bugs prior to use. Nevertheless, this application still has some shortcomings. For example, the absence of a sudden order cancellation feature can harm customers by potentially reducing satisfaction and creating inconvenience. Meanwhile, the non-integration of customer feedback and salon ratings can reduce transparency in assessing service quality, limiting salon owners' evaluation. So, to overcome these shortcomings, it is expected that in future development, other advanced features will be added, such as more flexible order cancellation capabilities, the collection of customer feedback, and salon ratings, which should be a priority for continuous improvement. By improving these shortcomings, it is hoped that future applications can be an effective and sustainable solution that supports the development of the beauty industry as a whole.

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflict of interest.

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers.

References

[1] Adenowo, A., Adenowo, A and Adenowo, B. A. (2013). Software Engineering Methodologies: A Review of the Waterfall Model and Object-Oriented Approach, *Article in International Journal of Scientific and Engineering Research*, [Online]. Available: http://www.ijser.org

[2] Dharma K and Putra, K (2020). Geographic Information System for Booking Beauty Salon and Barber Shop with an Android-Based E-CRM Approach. [Online]. Available: www.ijcat.com53

[3] Fowler, M. (2004). UML Distilled a Brief Guide to the Standard Object Modelling Language, *Boston: Pearson Education, Inc.*.

[4] Goyal, Y., Mishra, A.K and Gambhir, A. (2022). A Novel Healthcare Application for Hospital Bed Booking System, *International Journal of Innovative Research in Computer Science & Technology*. 46–53, May 2022, doi: 10.55524/ijircst.2022.10.3.9.

[5] Haleem, M.A. (n.d). MY SALON-SALON RESERVATION APPLICATION.

[6] Kannake, P.R., Gabhane, T., M, and Boyar, K. (2023). Online Salon Booking App," *International Journal of Innovations in Engineering and Science*, doi: 10.46335/ijies.2023.8.6.5.

[7] Kumar, M. (2015). *International Journal of Advance Research in Computer Science and Management Studies, [Online]. Available: www.ijarcsms.com.*

[8] Moon J.H and Yang, E.J. (2021). The Effect of Quality of Online Reservation System in Beauty Salon on Customer Satisfaction and Intention to Continued Use, *Journal of the Korean Society of Cosmetology*. 770–778, Jun. 2021, doi: 10.52660/jksc.2021.27.3.770.

[9] Michael P. D. A. (2015). Adding Rules on Existing Hypermedia APIs," *International World Wide Web Conference - WWW '15 Companion Proceedings of the 24th International Conference on World Wide Web, 1515-1517, 2015-05-18*, 2015.

[10] MRS. P. and DDA. (2014). Coulter, "Fundamentals of Management. Pearson.

[11] Permatasari, H., Purwanto, E and Duta U. (2023). Bangsa Surakarta, ANALYSIS OF THE ROLE OF RESERVATION SYSTEMS IN IMPROVING CUSTOMER EXPERIENCE IN THE SALON AND SPA INDUSTRY: LITERATURE REVIEW,

[12] Renaldi, F., Suryanto, H and Talib B. A. (n.d). Integrating Travel Booking Management System Using Rest-API."

[13] Surwase, V. (2016). REST API Modeling Languages-A Developer's Perspective. [Online]. Available: www.ijste.org

[14] Rosmawarni, N. (2017). Perancangan Sistem Rekomendasi Untuk Pengembangan Aplikasi Salon Terpadu Berbasis Android, *Rekayasa Inf*, vol. 6. 61–70, 2017.

[15] Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines," *J Bus Res*. 333–339, Nov. 2019, doi: 10.1016/j.jbusres.2019.07.039.