DESIGN AND DEVELOPMENT OF A MAKE-UP SERVICE PORTAL IN KUDUS REGENCY USING THE CUSTOMER SATISFACTION INDEX METHOD

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Abstract - Cosmetology services play an important role in enhancing an individual's self-confidence. In Kudus Regency, many make-up service providers still rely on manual ordering methods which are prone to recording errors, limited information on service availability, and miscommunication between customers and service providers. This condition hampers operational efficiency and reduces the level of customer satisfaction. This research aims to develop a digital-based make-up service portal to improve service quality and customer satisfaction, which consists of the stages of needs analysis, system design, implementation, testing and maintenance The research method used is qualitative research, data is collected through in-depth interviews with customers, which consists of the stages of needs analysis, system design, implementation, testing and maintenance. The system developed has main features such as online ordering, service catalogues, as well as CSI-based customer satisfaction evaluations that measure aspects of price, service quality and user experience. Evaluation using the CSI method shows a customer satisfaction level of 88% with 300 respondents, which indicates that this system is effective in improving user experience and operational efficiency of service providers. In conclusion, the development of this digital-based make-up service portal has succeeded in increasing customer satisfaction and the competitiveness of make-up service providers in Kudus Regency. Further development recommendations are integration with digital payment systems and the use of artificial intelligence technology for more personalized service recommendations.

Keywords: Makeup service, Customer Satisfaction Index, online booking system, SDLC, digital platform.

I. INTRODUCTION

Make-up is one of the most essential aspects of appearance as it can enhance a person's self-confidence. Nowadays, looking attractive and beautiful has become a daily necessity, especially for facial appearance. Make-up is used for various types of events, both formal and non-formal. In Kudus Regency, numerous make-up service providers offer a wide range of quality and pricing options. Among these, the researcher selected Naisella Make Up as the subject of this study. Naisella Make Up was established in 2018 and is located at Jl. Kyai Mojo, Jepangpakis, Jati, Kudus. Besides offering make-up and hairdo services, Naisella Make Up also provides costume rentals, including kebaya, traditional attire, wedding gowns, and suits. Unlike its establishment year, the rental service started in 2023 and has served a total of 300 customers. Naisella Make Up offers two make-up packages: regular and team. The regular package is handled personally by the service owner and is commonly used for engagements, graduations, or bridesmaids. Meanwhile, the team package is intended for weddings, where the service is managed by a team of four professionals. Currently, order management at Naisella Make Up is conducted manually, where the service owner records each booking in a notebook. The recorded data includes the customer's name, booking date, selected make-up and attire package, and payment process. The large volume of data makes the manual system inefficient, as it consumes significant time and effort and leads to various issues. Common problems include incorrect booking dates, mismatched make-up packages, or inappropriate attire selection, resulting in miscommunication between the service provider and customers. Additionally, the lack of comprehensive information regarding available booking dates and in-stock attire makes the reservation process challenging for customers.

According to the make-up service information systems, Lyaiyoh Make Up conducts transactions manually. Customers must visit the salon in person to make a booking, and the service provider records the order in a notebook. The common issues include errors in order recording and the absence of facilities providing complete information about Lyaiyoh Make Up. To address these problems, the researchers designed a web-based make-up service information system using the waterfall method. This system is intended to streamline data management, reduce errors in order recording, simplify the booking process, and serve as a promotional platform for Lyaiyoh Make Up [1].

Similarly, a study on Vera Yonas Salon found that its operational system still relies on conventional methods. The salon uses social media for marketing and Microsoft Excel to manage transaction records. However, the use of social media has not been maximized, as orders are not well-documented, and promotional information is not effectively communicated. Additionally, errors in Microsoft Excel, caused by viruses, have led to data loss with no backup system. Therefore, researchers proposed designing a web-based application for bridal attire rental and make-up bookings to overcome these issues. This information system is expected to facilitate customers in accessing service information and making reservations without the hassle of visiting the salon in person [2].

Design of a booking and information application for makeup services, explained that makeup artists in Bengkalis still use conventional methods. They promote their services through social media and word of mouth. However, the provided information is often incomplete, and order recording is challenging since they must manually check each customer's message. Through social media, customers also struggle to find a makeup artist who meets their preferences. Due to the lack of a dedicated application, the researcher was interested in developing an Android-based makeup service booking application using the Rapid Application Development (RAD) method. This method aims to create a system that meets user needs and reduces the time required for redevelopment after implementation [3].

Journal article on a makeup and bridal attire search and booking application, explaining that makeup artists in Bandar Lampung face challenges in their business. The issues arise because booking systems rely on social media or WhatsApp. One major challenge is scheduling conflicts, where multiple customers request services on the same day, forcing the makeup artists to cancel some orders. Based on this issue, the researchers proposed designing an Android-based application for searching and booking makeup services and bridal attire. This application is expected to serve as a platform for providing information and addressing the previously encountered problems [4].

Makeup service and kebaya rental information system, explained that Audria Makeup uses social media as its promotional platform. Customers can obtain information about Audria Makeup through their Instagram account. However, the information provided is incomplete, leading customers to frequently ask various questions. As a result, the service provider faces difficulties in scheduling appointments, monitoring orders, and managing kebaya stock in an organized manner. Based on these issues, the researchers proposed developing a makeup service and kebaya rental information system. This system aims to enhance efficiency, expand market reach, and improve service quality [5].

The design of a customer satisfaction assessment system at Parfume Corner Bandar Lampung reported survey results indicating that 91% of customers were satisfied with the services provided. However, interviews with Parfume Corner revealed that the number of customers placing perfume orders had declined due to the increasing number of new perfume stores and the impact of the pandemic. This decline resulted in a 20% decrease in profits. Additionally, Parfume Corner lacked

the resources to analyze customer satisfaction levels regarding their products and services. Therefore, the researchers planned to develop a customer satisfaction assessment system using the Customer Satisfaction Index (CSI) to help analyze customer feedback and improve service quality at Parfume Corner Bandar Lampung [6].

The design of an assistive system for determining customer satisfaction levels explained that business owners implement various strategies to enhance customer appeal. In the sales process, the primary factors influencing customer satisfaction include service quality, showroom appearance, vehicle quality, and customer satisfaction measurement. Based on this, the researchers planned to develop a decision support system to assess customer satisfaction using the CSI method. This method is considered flexible and can accommodate various existing data, while analyzing quantitative data in the form of the percentage of satisfied customers from customer satisfaction surveys [7].

The urgency of this research lies in the need for a more efficient and modern makeup service booking system in Kudus Regency. Currently, many makeup service providers still rely on manual booking methods, which are prone to scheduling errors, mismatched service packages, and miscommunication between customers and service providers. Additionally, the lack of real-time information on service availability and stock makes it difficult for customers to plan their bookings. Without an integrated system, operational efficiency remains low, potentially reducing customer satisfaction and weakening the competitiveness of service providers amidst the growing demand for high-quality makeup services. By developing a digital makeup service portal integrated with the CSI method, this study offers an innovative solution that not only simplifies the booking process but also helps service providers evaluate customer satisfaction objectively. This system enables more accurate data recording, provides real-time service information, and enhances user experience in selecting makeup services that suit their needs. The implementation of this system is expected to improve the professionalism of makeup services in Kudus, increase customer satisfaction, and strengthen the competitiveness of service providers in today's digital era.

II. STUDY SIGNIFICANCE

A. Literature Study

Customer satisfaction

Satisfaction is the level of a person's feelings after comparing the level of performance or results received with his expectations. So, the level of satisfaction is a function of the difference between perceived performance and expectations [8]. Basically, the definition of customer satisfaction includes the difference between the level of importance and the perceived performance or results. Regarding service guarantees that can provide benefits in the following cases:

a. Focus on customers. The company identifies customer needs and recovers them when deviations occur, for this reason there is always a survey to find out how the needs that have been identified can continue to reach customers.
b. Set clear standards. Specific needs create clear standards and responsibilities for providers.
c. Guarantee feedback. Dissatisfied customers will feel there is an incentive to bring it to the attention of the company because the company cares about them.
d. Build customer loyalty. Guarantees reduce risk, make expectations explicit, and build market share by keeping dissatisfied customers from leaving the company.

System Development Method

The system development phase is an essential step in the system creation process. This study adopts the System Development Life Cycle (SDLC) method, specifically the waterfall approach. The waterfall model describes software development as a sequential process, starting from analysis, design, coding, and other support stages.

1. Software Requirements Analysis
   Before starting development, it is crucial to understand the users' needs for the system. This process is conducted through observations, interviews, and other methods. The collected information is then processed and analyzed to gain a comprehensive understanding of the system to be developed.
2. Software Design
   Software design is a process that involves several steps, focusing on program structure, software architecture, user interface representation, and coding procedures. At this stage, the analyzed software requirements are transformed into a design ready for implementation in the next phase.
3. Program Coding
   At this stage, a database is created according to the designed structure, followed by coding until completion, ensuring that the system functions correctly.
4. Testing
   The next step involves a thorough examination and testing of the system to detect potential errors, ensuring that the results meet the expected outcomes.
5. Support and Maintenance
   In the final stage, the developed software is deployed for user utilization and maintenance. Maintenance includes bug fixes, implementation improvements, system upgrades, and adjustments based on evolving requirements.

System Design Method

In the evolution of object-oriented programming technology, there are standard modelling languages used in software development, such as the UML for software modelling and the Entity Relationship Diagram (ERD) for database design. The UML method enables the identification, mapping, and documentation of a software system through a visual approach, utilizing diagrams and text to present information about the system.

Customer Satisfaction Index Method

The CSI method is an index used to determine overall customer satisfaction levels by considering the importance level of measured attributes. This method utilizes performance and importance values, which are then processed using the following calculations: Mean Importance Score (MIS), Mean Satisfaction Score (MSS), Total Weight Factors (WF), Total Weight Score (WS), CSI. To evaluate the effectiveness of the system in improving service quality, the CSI method was applied. The steps include:

a. Distributing a post-usage questionnaire to 300 respondents who had completed a service booking through the system.
b. Measuring satisfaction based on key attributes: service quality, price, ease of booking, and user experience.
c. Calculating the Mean Importance Score (MIS), Mean Satisfaction Score (MSS), Weight Factors (WF), Weight Score (WS), and finally, the overall CSI percentage.

The CSI calculation consists of the following four steps:

1. Determine the Mean Importance Score (MIS) and Mean Satisfaction Score (MSS). These values are derived from the average importance and performance levels of each measured attribute.

$$MIS = \frac{\sum_{i=1}^{n} Yi}{n} \quad \text{dan} \quad MSS = \frac{\sum_{i=1}^{n} Xi}{n} \qquad (1)$$

Where:
n = Number of respondents
Yi and Xi = Importance Value of the i- attribute
i = Performance value of the i-th attribute*Weight Factors (WF)*
This value is the percentage of MIS value per attribute in the total MIS of all attributes

2. Create a Weight Score (WS)
This value is the product of WF and the average MSS satisfaction level
WSi = WF x MSS (2)
Where:
i = i-th attribute

3. Determine the Customer Satisfaction Index (CSI)

$$CSI = \frac{\sum_{i=1}^{P} WSi}{5} \times 100\% \qquad (3)$$

Where:
P = Number of important attributes
5 = Number of Scales

Maximum scale used. Interpretation of CSI values can be seen in Table 1

Table 1. Customer Satisfaction Index Interpretation [9]

Index Number	Interpretation
X ≤64%	Very poor
64%<X≤71%	Poor
71%<X≤77%	Cause for concern
77%<X≤80%	Borderline
80%<X≤84%	Good
84%<X≤87%	Very Good
87%<X	Excelent

B. Methodology

System Design Analysis

The results of the system design phase involve utilizing the UML approach for software modeling and designing the database structure using the Entity Relationship Diagram (ERD) along with table relation definitions.

1. Software Design

a. System Class Diagram

A use case describes each function of a system from the perspective of system users [10], [11]. The Make-Up Service Portal in Kudus Regency Using the Customer Satisfaction Index Method is designed based on user interactions. Figure 1 illustrates the system use case diagram that has been developed.

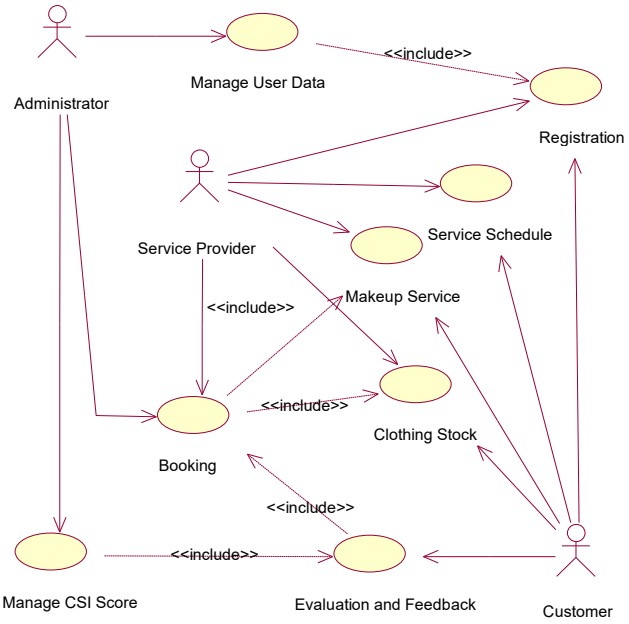

Figure 1. Class Diagram

The Class Diagram represents the static structure of the system, defining classes, attributes, methods, and relationships among objects within the Make-Up Service Portal.

b. Entity Relationship Diagram (ERD)

The Entity Relationship Diagram (ERD) is designed for database modelling. The UML method facilitates identification, mapping, and documentation of the software system using a visual approach that integrates diagrams and descriptive text to convey system information [12], [13], [14], [15].

Below is the ERD design after incorporating descriptive attributes, as shown in Figure 2.

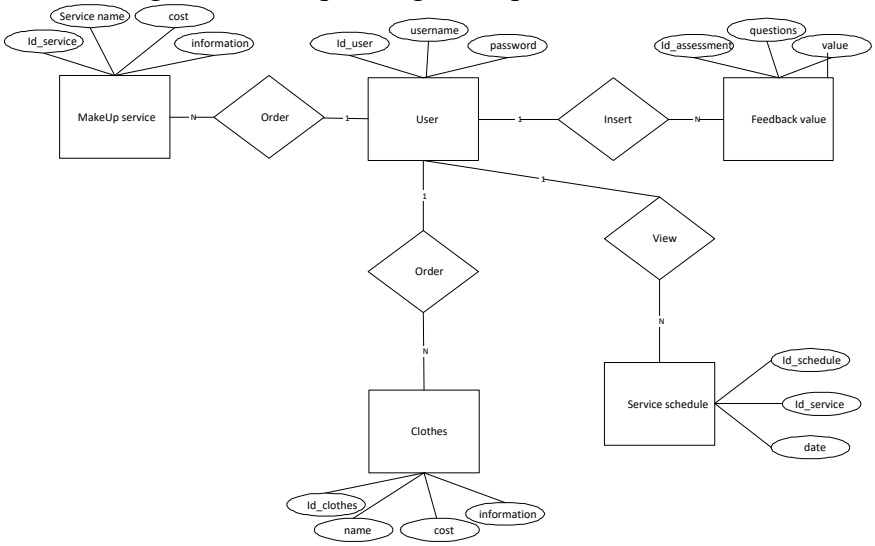

Figure 2. Entity Relationship Diagram

The analysis stage includes the formulation of functional and non-functional system requirements based on user input. The system was modelled using UML for use cases and class diagrams, and the Entity Relationship Diagram (ERD) for database design. These models served as the blueprint for implementing system features such as: Online booking, Real-time schedule availability, Clothing inventory tracking, Customer satisfaction evaluation using CSI.

2. Data Collection

The data collection process was conducted to gather comprehensive information regarding the problems faced by the current manual booking system and to identify user needs. The methods used include:

a. In-depth interviews: Conducted with 10 service providers and 300 customers of Naisella Make Up to explore the challenges and expectations related to make-up service management.
b. Observation: Performed on existing business processes to identify system inefficiencies, scheduling issues, and service documentation problems.
c. Literature study: Used to review relevant studies and determine the appropriate methods and technologies for system development and customer satisfaction measurement.

III. RESULTS AND DISCUSSION

The system interface of the Make-Up Service Portal for Kudus Regency Using the Customer Satisfaction Index Method.

1. Main Page Interface

The main menu is the menu used to display the main page. The image of the main menu can be seen in the figure.

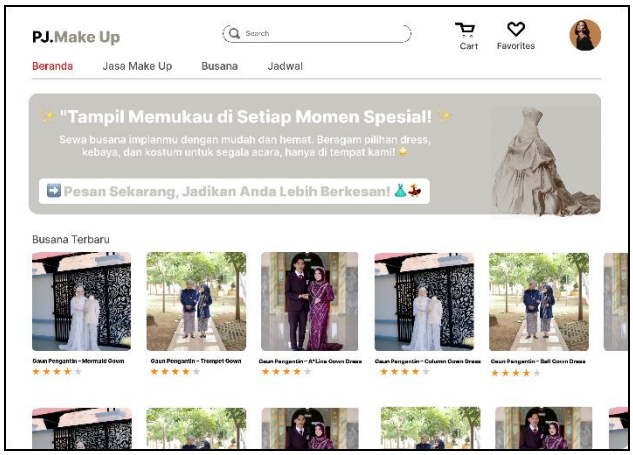

Figure 3. Main page display

Figure 3 shows the main page interface of the developed digital make-up service portal. This display is designed with an intuitive and responsive structure, displaying the main navigation menus such as Home, Make-up Services, Clothing, and Schedule. In addition, there are Cart and Favorites features that make it easier for users to manage the services or clothing they are interested in. The middle of the main page displays the latest fashion catalog visually, which speeds up the product exploration process by users. This interface design aims to provide a comfortable and efficient user experience in accessing various make-up services and other supporting information in real-time.

2. Detail Page View

The detail page menu is a menu to display the main page of details about clothing. The main menu image can be seen in the figure.

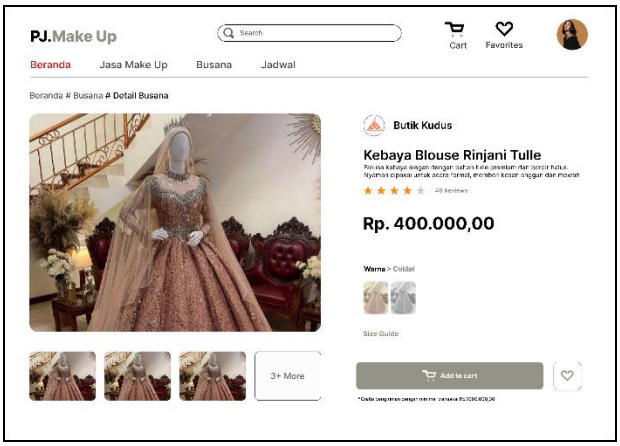

Figure 4. Details page display

Figure 4 illustrates the detail page interface that displays comprehensive information about a selected clothing item. This page is accessed when a user selects a specific outfit from the catalogue. It presents key details such as the clothing name, type, rental price, and an image preview to give users a clear visualization of the product. The layout is designed to support user decision-making by offering precise and visually accessible information. Positioned within the main navigation structure, this detail page ensures seamless integration with other features, such as booking and clothing availability, thereby enhancing the overall user experience in selecting and reserving outfits through the platform.

3. Clothing Data Menu Display

The clothing data page menu on the service provider dashboard is a menu for displaying clothing data. The images can be seen in the figure.

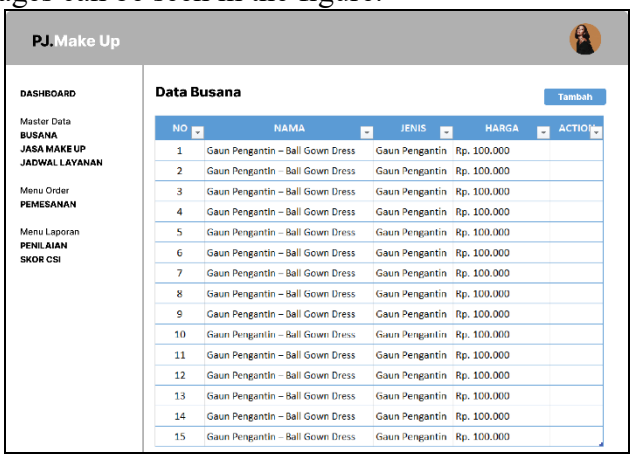

Figure 5. Clothing Data Menu Display

Figure 5 presents the interface of the clothing data menu found on the service provider's dashboard. This section is designed to manage and display a list of available clothing items, including their names, types, rental prices, and corresponding action buttons for editing or updating the data. The layout is organized in a tabular format, allowing service providers to efficiently oversee inventory and perform administrative tasks. This feature plays a crucial role in ensuring accurate data management, which directly supports the reliability of the booking system and enhances the overall efficiency of the digital service platform

4. CSI Questionnaire Menu Display

CSI questionnaire menu page menu that will appear after the order is completed. The images can be seen in the figure.

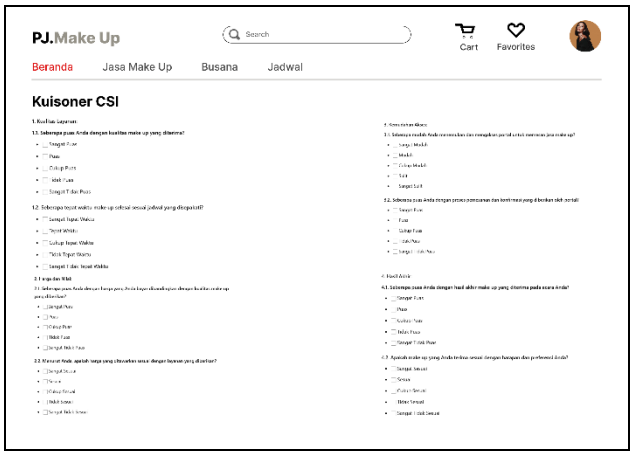

Figure 6. CSI Questionnaire Menu Display

Figure 6 illustrates the CSI questionnaire menu interface that appears after a customer completes an order. The interface is designed to collect customer feedback regarding their experience with the make-up service. It features a clean and user-friendly layout, integrated into the main navigation of the portal, ensuring easy access for users. This page serves a critical role in evaluating service quality by enabling customers to rate various aspects such as service performance, pricing, ease of use, and overall satisfaction. The data collected through this interface is then processed to calculate the CSI score, which helps service providers assess and improve their offerings based on customer insights.

The manual management of orders at Naisella Make Up has several issues that affect operational efficiency and customer satisfaction. The manual recording system using books is prone to various errors, such as inaccurate date entries, the selection of make-up or attire packages that do not match customer requests, and difficulties in tracking schedule availability and stock of clothing. These issues often lead to miscommunication between the service provider and the customers, ultimately lowering trust and satisfaction levels.

Additionally, the lack of real-time information regarding available booking dates and clothing stock makes it difficult for customers to place orders. Customers have to contact the service provider directly to obtain this information, which not only consumes time but also has the potential to cause inefficiency in the service. To address these issues, a digital system in the form of an integrated and user-friendly make-up service portal is needed. This portal is designed to provide convenience for customers in searching for and booking make-up services according to their needs. With this system, customers can view schedule availability in real time, easily select make-up and attire packages, and get accurate information without the need for repetitive direct communication.

In addition to booking and recording features, this portal will also be equipped with the CSI method to measure customer satisfaction with the services provided. CSI will help evaluate service quality based on several key aspects, such as price, make-up quality, and overall customer experience. The data generated from this method will allow Naisella Make Up to continuously improve their services in line with customer needs and expectations. With the implementation of this service portal, it is expected that Naisella Make Up can improve operational efficiency, reduce recording errors, and enhance customer satisfaction and trust. Moreover, this system will also help Naisella Make Up become more competitive in the make-up service industry in Kudus Regency, enabling them to expand their market reach and improve their competitiveness amid numerous similar service providers.

Table 2. Overall Test Results

Aspect	Actual score	Ideal score	Percentage (%)	Criteria
Fuctinonality	90	100	90 %	Very good
Usability	91	100	91 %	Very good
Reliability	85	100	85 %	Good
Total	266	300	88 %	Good

The system evaluation was conducted through a user-based testing approach involving 300 respondents, who were customers of Naisella Make Up that had interacted with the newly developed portal. The respondents were asked to evaluate the system based on three main criteria: Functionality, Usability, and Reliability. Each criterion was scored out of 100, and the overall CSI percentage was calculated by summing up the individual scores and dividing by the ideal total score (300). The final CSI score of 88% was interpreted as falling under the "Good" category according to the predefined satisfaction scale. However, there are several credibility concerns that may affect the reliability of these results:

a. Respondent Selection Bias: The entire respondent group was drawn from a single service provider (Naisella Make Up), potentially limiting the generalizability of the findings to a broader user base or other service providers.
b. Lack of Clarity on Evaluation Instruments: The evaluation criteria and scoring mechanisms lack transparency. It is unclear whether standardized instruments or validated survey tools were used, which may affect the objectivity of the scores.
c. Limited Evaluation Scope: Only three criteria were used to assess the system, excluding other essential quality attributes such as security, scalability, or accessibility. This narrow focus may lead to an overestimation of system effectiveness.
d. Subjective Scoring: The scoring method appears to rely heavily on subjective user input without clear metrics or weighting factors per criterion, which may skew results based on individual perception rather than consistent measurement standards.
e. No Mention of Testing Environment: The absence of information regarding testing conditions, such as device types, internet connection quality, or user experience levels, limits the ability to replicate or verify the reliability of the results.

IV. CONCLUSION

This study successfully designed and developed a digital make-up service portal in Kudus Regency, integrated with the CSI method. The system was designed to address various issues in manual booking processes, such as schedule recording errors, mismatches in service packages, and limited information on service availability and clothing stock. The implementation of this digital system significantly improved operational efficiency and enhanced customer experience. The system evaluation involved 300 respondents, consisting of active customers of the make-up service. The results showed a customer satisfaction level of 88%, which falls into the "good" category. This indicates that the system effectively met customer expectations, particularly in terms of service quality, pricing, and booking convenience. These findings highlight the importance of integrating CSI-based evaluation features in maintaining and improving service quality on a continuous basis. Despite the system's positive performance, several challenges remain, such as integration with digital payment systems, the need for training for service providers, and customer adaptation to the new system. Therefore, future development should focus on adding flexible digital payment features, providing operational training for service providers, and utilizing artificial intelligence (AI)-based features to offer personalized service recommendations. In conclusion, this system not only serves as a solution to existing problems but also holds potential as a sustainable innovation to enhance the competitiveness of make-up service providers in the digital era.

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