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Design and Development of a Makeup Artist Data Management Application

Rahmi Anisa[1], Dian Ramadhani[2]

[1,2]Departments of Informatics Engineering, Faculty of Engineering, Universitas Riau, Indonesia

E-Mail: [1]rahmianisa27@gmail.com, [2]dianramadhani@lecturer.unri.ac.id

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Corresponding Author: Dian Ramadhani

Abstract

The growing beauty industry requires efficient management tools for Makeup Artist (MUA) teams, who often face operational challenges due to the use of manual or non-integrated digital tools. This study contributes by providing an integrated, mobile-first workflow that directly links bookings, schedules, and financial records with role-based access and automated reminders, reducing fragmentation from manual or separate tools and offering consolidated insights for MUAs' decision-making. The application's quality was validated through Black-Box testing, achieving a 100% success rate across 35 functional test cases that covered all main features. Usability was then evaluated in a case study with a professional MUA and two team members (N=3) who used the application for one week before completing the Computer System Usability Questionnaire (CSUQ). The results yielded an overall mean score of 6.52 out of 7, indicating very high user satisfaction, with subscale scores showing that users found the system both helpful and easy to navigate. Future development may include expanding the dashboard's analytical capabilities or integrating a direct client payment gateway.

Keyword: android, makeup artist, data management, prototype model, Black-Box testing, CSUQ

1. INTRODUCTION

The rapid development of the creative economy has positioned professions like the Makeup Artist (MUA) as a significant and growing sector within the beauty industry. Market analysis indicates a substantial growth projection for the beauty and personal care industry in Indonesia, which is expected to reach a revenue of 12 billion U.S. dollars by 2030 [1]. This growth increases competition and demands that MUAs, who predominantly operate as Small and Medium-sized Enterprises (SMEs), adopt more professional and efficient management practices. However, MUA operational management often lags behind. Many still rely on disorganized manual notes, a practice reflective of a broader trend where a study found that 84.62% of Indonesian SMEs still record transactions manually [2]. Meanwhile, for those who do adopt digital tools, a new challenge arises from using separate, non-integrated applications for different tasks resulting in the probability of data mixing between customers and the unavailability of schedules, which will also be a problem for customers [3].

For MUAs, this lack of integration often translates into lost client records, difficulties in verifying whether payments match scheduled jobs, and limited visibility into overall financial performance. These problems make it harder to monitor business health and to make informed decisions about future work. In practice, this gap most visibly appears when MUAs need to verify whether a finished job has a matching payment record and when they try to review month-to-month performance, which is difficult to do from scattered notes or separate apps. Studies also show that MSEs tend to use mobile apps mainly to seize opportunities quickly, rather than to analyze data for decision-making, which reinforces the importance of providing integrated analytical features [4]. The lack of system integration will certainly affect business efficiency, where financial records that are not integrated with client details and related schedules will make it difficult to cross-verify payments with service records and accurately track client history [5]. Meanwhile, the implementation of an integrated system has a significant impact on increasing bookings, flexibility, consumer trust, and the ability to respond well to market changes [6]. Another benefit that will be directly felt by MUAs is the ease of collecting data and being able to see the progress of business development [7].

Previous studies have explored digital solutions for MUA service management. For instance, a study developed an Android-based application that enables customers to search for makeup service providers, view profiles and prices, and place orders directly [8]. Other study designed a desktop-based scheduling system to help MUAs manage work schedules and resources, but without direct customer interaction or booking features, resulting

in a relatively simple workflow [9]. While these applications cover parts of MUA service management, there is still no integrated mobile-first platform that combines booking, scheduling, finance, and team coordination in one place. They also lack automated reminders for both MUAs and clients.

This study is conducted to bridge that gap by developing a tool that addresses the operational problems of MUA. It focuses on the need for a centralized and automated system, including automated reminders, to replace inefficient manual methods. The system is designed to streamline operational workflows by integrating scheduling, client communication, financial tracking, and team coordination in one platform. Therefore, the main objective of this study is to design, develop, and evaluate an integrated management application for MUA teams. The evaluation will be carried out through functional testing using the Black-Box method and usability testing with the Computer System Usability Questionnaire (CSUQ) to ensure the application is both functional and user-friendly.

2. MATERIALS AND METHOD

This study employed a Research and Development (R&D) methodology to produce and validate a new product [10]. The application development itself utilized the Prototype Model, which includes the following stages [11]:

1. Communication: Define objectives and known requirements with stakeholders.
2. Quick plan & modeling quick design: Create a brief plan and initial design focusing on key features.
3. Construction of prototype: Build the prototype based on the quick design.
4. Deployment, delivery & feedback: Present the prototype, gather feedback, and use it to improve the system

The research methodology for the MUA data management application is illustrated in Figure 1.

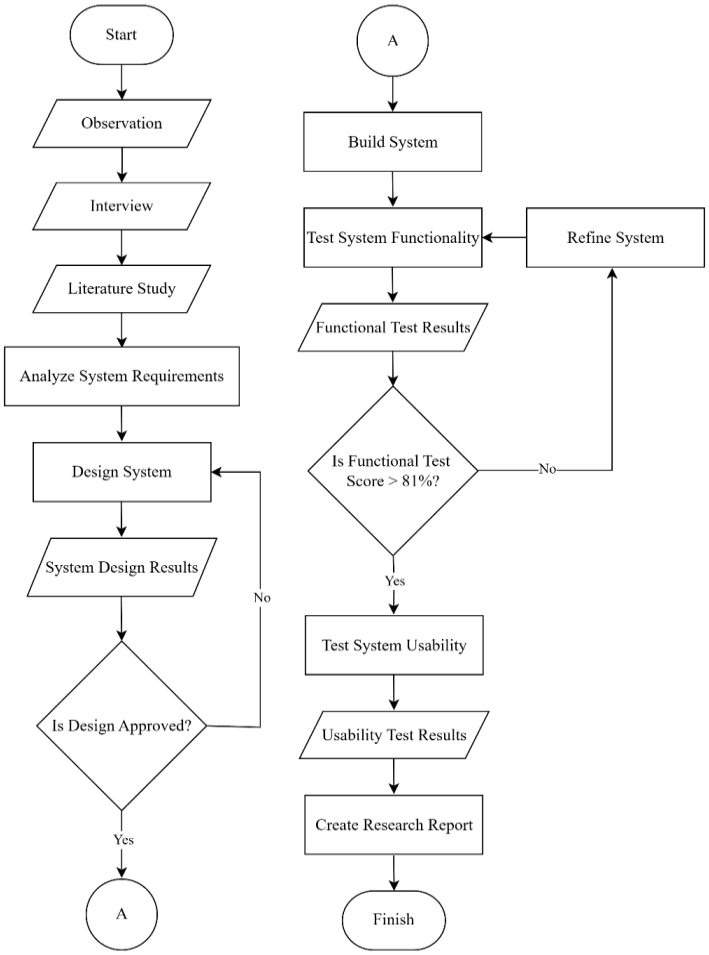

Figure 1. Research Methodology

2.1 Research Phase

The research phase began with data collection, corresponding to the communication stage in the prototype method. The process included:

1. Observation, to obtain an initial understanding of the operational problems faced by makeup artist (MUA) and teams.

2. Interviews, to gather detailed information on user needs and workflows.
3. Literature study, to review relevant theories, prior research, and existing technological solutions.

2.2 System Requirements Analysis

The data gathered during the research phase was analyzed to define the system's specifications. This process produced a detailed list of functional requirements which became the foundational guide for the entire development and testing process. The system was designed to meet the following functional requirements:

1. The system must allow the MUA to add, view, and remove team members.
2. The system must provide an MUA role with full access to manage all features, including team members, schedules, finances, and the main business dashboard.
3. The system must provide a team member role with limited access to view only their assigned schedule, update the schedule data, add payment records from a schedule, and view a personal dashboard
4. The system must automatically record all payments as income transactions linked to their respective client bookings. The MUA has full access to manage all financial records, including the ability to manually add and manage operational expenses.
5. The system must provide a main dashboard for the MUA that displays a summary of business performance, including financial recapitulation and an overview of all team schedules.
6. The system must provide a personal dashboard for team members that displays a summary of their own activities, such as a recapitulation of schedules, without showing any financial data.
7. The system must automatically send notifications for incoming booking requests that have not been confirmed, as well as schedule reminders one day prior (H-1) to the MUA, the assigned team member, and the client.

2.3 Development Phase

The development phase began with the quick plan and modeling quick design stages. First, a brief plan was formulated to define the scope of the initial prototype, prioritizing the key features identified in the research phase. This plan was then translated into a visual design through system modeling. As shown in Figure 2, the use case diagram illustrates the interactions between actors, including the MUA, team member, and client and the features they can access.

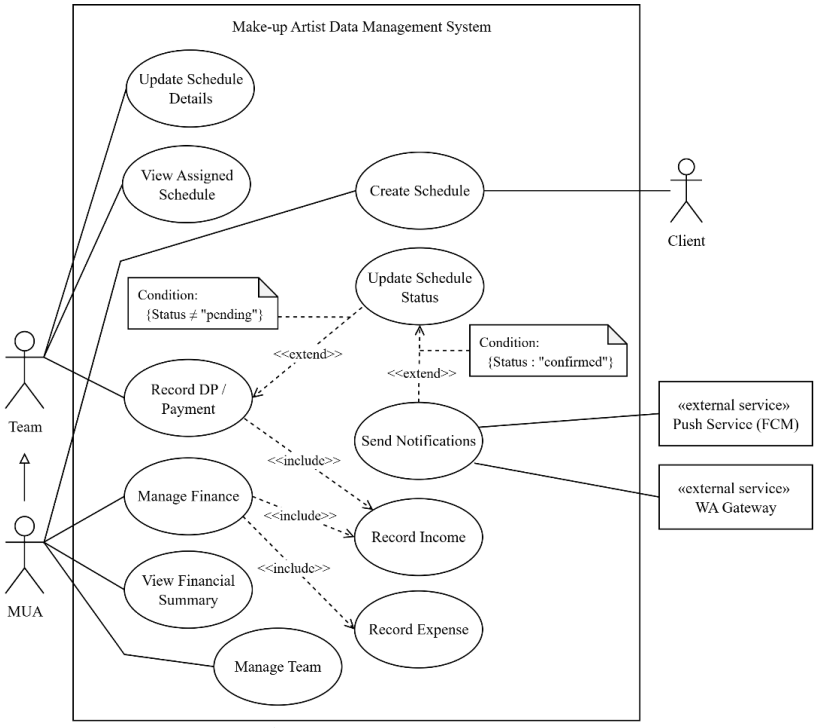

Figure 2. Use Case Diagram

Following this, Figure 3 shows the Entity Relationship Diagram (ERD), which defines the main entities and their relationships to support the core functionality of the application.

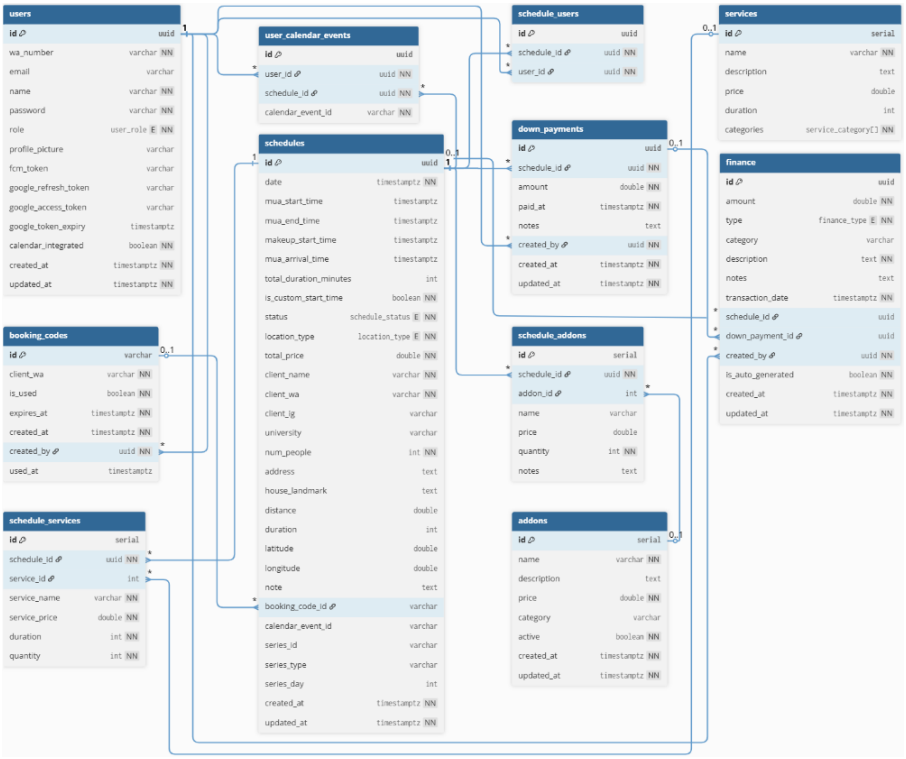

Figure 3. Entity Relationship Diagram (ERD)

The workflows of the system are illustrated in a series of activity diagrams. Figure 4 presents the booking & scheduling activity diagram, which depicts the process from booking creation by the MUA, the client filling out the booking form, approval of the booking, sending of reminders, and completion of the scheduled service.

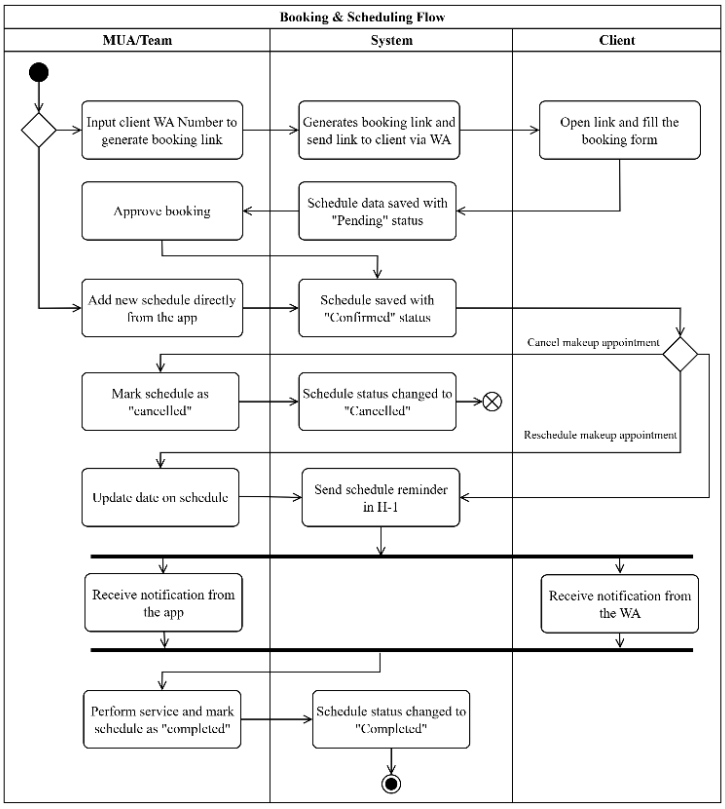

Figure 4. Booking & Scheduling Activity Diagram

Figure 5 shows the financial recording activity diagram, explaining how income and expenses are recorded either automatically from confirmed schedules or another financial data manually entered by the MUA, and how the updated financial information is displayed in the dashboard.

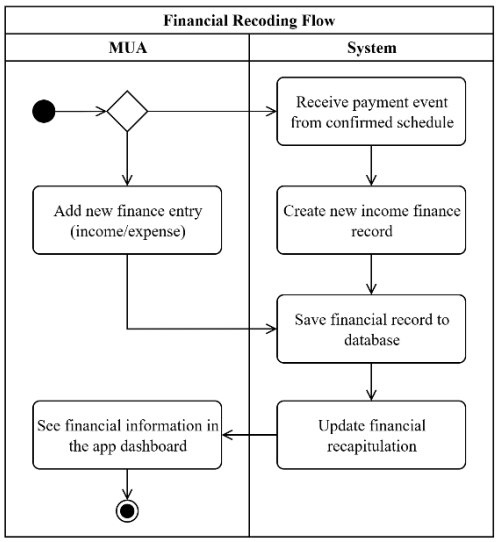

Figure 5. Financial Recording Activity Diagram

Figure 6 illustrates the team management activity diagram, outlining the process where the MUA invites a new team member, the system creates an account with a temporary password, sends the credentials via WhatsApp, and the invited member logs in, changes the password, and gains access to the application.

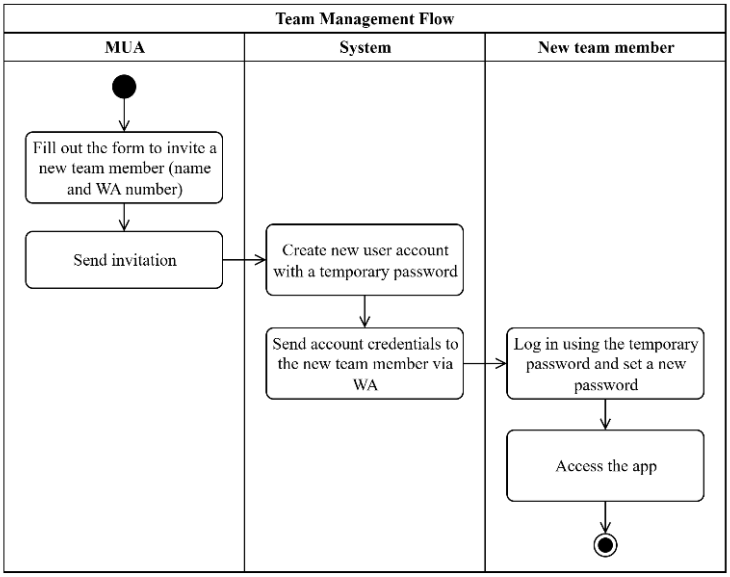

Figure 6. Team Management Activity Diagram

All of these designs were reviewed and validated with stakeholders. Once the designs were approved, the prototype was constructed based on the agreed specifications. Functional testing was then carried out using the Black-Box method, which focuses on testing the system's functionality based on inputs and expected outputs without examining the internal code structure [12]. All functional tests were conducted by the researcher based on the predefined requirements. The percentage of functional suitability was calculated using the following formula [13]:

$$Success\ Percentage = \frac{i}{r} \times 100\% \quad (1)$$

where i is the number of functional requirements successfully implemented, and r is the total number of functional requirements tested. The results were interpreted according to the criteria shown in Table 1 [13].

Table 1. Categories of Evaluation Results

Score (%)	Interpretation
0-20	Very Unworthy

21-40	Not Feasible
41-60	Feasible Enough
61-80	Feasible
81-100	Very Feasible

A score of 81% or higher was categorized as very feasible and considered to have met the functional suitability requirement. Any feature that failed to meet the success criterion of >81% was refined and re-tested.

2.4 Deployment and Feedback Phase

Once the prototype passed functional testing, usability testing was carried out to evaluate the system's ease of use, effectiveness, and efficiency from the end-user perspective. The assessment used the Computer System Usability Questionnaire (CSUQ), which consists of 16 items measuring overall satisfaction as well as three subscales: System Usefulness (items 1–6), Information Quality (items 7–12), and Interface Quality (items 13–15) [14]. Responses for each item were collected on a 7-point Likert scale, with 1 representing "Strongly Disagree" and 7 representing "Strongly Agree". The collected data was then analyzed to calculate the mean score and standard deviation for each subscale [15]. The CSUQ evaluation involved three participants (N=3), consisting of one professional MUA and two team members who used the application in their daily workflow for one week before completing the questionnaire.

The feedback collected through the CSUQ provided the final basis for evaluating the developed product. All stages of the research and development process, along with the corresponding results, were compiled into a research report, which served as the final deliverable of this study.

3. RESULTS AND DISCUSSION

The MUA data management application was developed as an Android-based system according to the specified requirements. This section details the outcomes of this work, beginning with a presentation of the core features and their user interfaces, followed by an analysis of the functional and usability testing results which validate the application's quality.

3.1 Dashboard

Figure 7 shows the MUA's dashboard, which serves as a real-time control center by displaying key financial metrics such as income, expenses, and profit margin. This feature directly addresses the need for consolidated business insights to replace inaccurate manual tracking and support decision-making.

Figure 7. MUA's Dashboard Screen

3.2 Schedule Screen

Figure 8 displays the main schedule screen, which organizes jobs into a list that can be filtered by status (e.g., Pending, Confirmed, History). Each entry provides key appointment details and allows the MUA to perform actions, such as marking a job as complete.

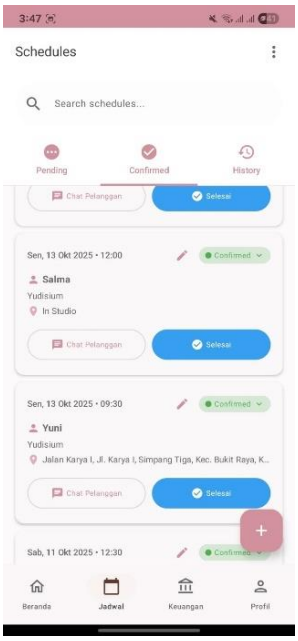

Figure 8. Schedule Screen

3.3 Finance Screen

The finance screen acts as the application's central ledger for all financial activities. As shown in Figure 9, this screen displays a list of all transactions, distinguishing between income and expenses. Income from client bookings is automatically logged, while operational costs can be added manually by the MUA.

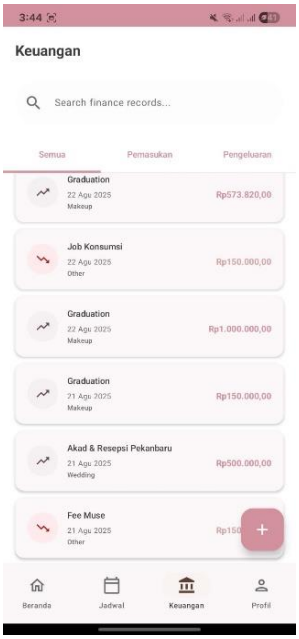

Figure 9. Transaction List in Finance Screen

3.4 Team Management Screen

The team management screen allows the MUA to control team member access, facilitating secure task delegation. As illustrated in Figure 10, the application provides a streamlined onboarding process. When a new member is added, the system automatically creates their account, generates a temporary password, and sends the login credentials via WhatsApp.

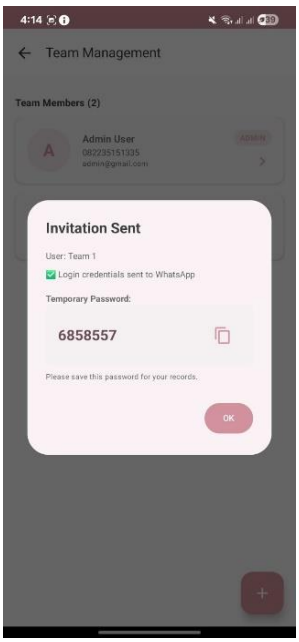

Figure 10. New Member Invitation in the Team Management Screen

3.5 Notification & Reminder

Figure 11 shows an example of a system notification alerting the MUA to a new, unconfirmed booking request, providing essential details such as the client's name and service date. In addition to booking requests, the system also sends automated reminders one day prior to appointments to the MUA, the assigned team member, and the client.

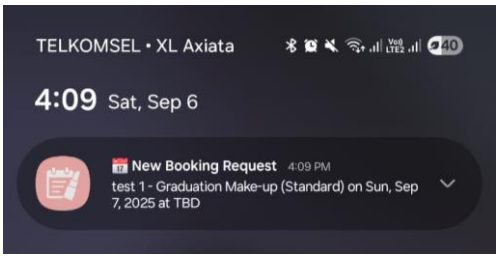

Figure 11. New Booking Request Notification

3.6 Functional Testing Results

Functional testing was conducted using the Black-Box method across 35 test cases, covering all core features defined in Section 2.2 (System Requirements Analysis). All test cases were executed by the researcher as the tester and passed successfully, yielding a functional suitability score of 100%. According to the criteria outlined in the methodology, this result is categorized as "Very Feasible," indicating that the application functions as intended and has met all specified requirements.

3.7 Usability Testing Results

Usability was evaluated through an in-depth case study involving a professional MUA and two of her team members (N=3) in Pekanbaru. The participants used the application in their daily workflow for one week, after which they completed the Computer System Usability Questionnaire (CSUQ). The overall mean score of 6.52/7 indicates very high user satisfaction, while the subscale means (System Usefulness 6.67; Information Quality 6.28; Interface Quality 6.67) suggest that users found the application both helpful for their work and easy to navigate. The detailed CSUQ results are summarized in Table 2.

Table 2. Summary of CSUQ Results (N=3)

Assessed Aspect	Mean Score (1-7)	Std. Deviation
System Usefulness	6.67	0.49
Information Quality	6.28	0.57
Interface Quality	6.67	0.50
Overall Satisfaction	6.52	0.55

3.8 Discussion

The evaluation provides converging evidence: complete functional coverage (35/35) demonstrates technical robustness, while CSUQ scores (overall 6.52/7; subscales 6.28–6.67) indicate very high perceived usability by target users. In other words, the system is technically robust and highly satisfying to its target users in practical use. Together, these results confirm that the system is not only functional but also effective and well-accepted in practice.

This research advances the field by offering a mobile-first management tool. While previous studies often focused on singular aspects like customer booking platforms or basic desktop scheduling, this application successfully integrates team management, automated finance, and centralized scheduling into a single platform. Beyond feature aggregation, the contribution lies in the explicit coupling of schedules and finance with role-aware operations and automated reminders, which directly addresses issues commonly reported in the field such as fragmented records, and the lack of consolidated financial insights for decision-making.

4. CONCLUSION

This study presents an integrated management application for Makeup Artist (MUA) operations that unifies booking, scheduling, role-based teamwork, automated financial recording, and H-1 reminders. Evaluation confirmed its quality: all 35 functional test cases passed, and a CSUQ-based usability test with a professional MUA team (N=3) yielded an overall mean of 6.52/7, indicating very high user satisfaction.

The contribution of this research lies in offering an integrated workflow that directly links client bookings with schedules and financial records, while also differentiating access between MUAs and assistants. This integration not only reduces the fragmentation that often occurs when MUAs rely on separate or manual tools, but also provides consolidated information that can support better decision-making and long-term business planning for MUAs.

A limitation of this study is the small number of participants and the short evaluation period. Therefore, future research should involve larger and more diverse MUA teams over longer usage periods to strengthen the generalizability of the findings. In addition, MUAs themselves expressed interest in further system capabilities, such as integrating a payment gateway so that client transactions are recorded directly into the system, making financial tracking more practical and transparent. Expanding dashboard analytics, for example by visualizing revenue trends or client booking patterns, is also a promising direction to provide MUAs with clearer insights for strategic decision-making and business growth.

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