Financial information system at krustyzone playground based on android

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Abstract

The development of information technology encourages the need for efficient and mobile systems, especially in the small business sector such as playgrounds. This research aims to design and develop an Android-based Financial Information System at Krustyzone Playground to overcome the obstacles of manual recording, report delays, and lack of real-time data. The method used is Rapid Application Development (RAD), which allows a fast development process through design iterations and direct feedback from users. The system was developed using the CodeIgniter framework and MySQL database, and modeled with UML (Use Case Diagram, Activity Diagram, and Class Diagram). The implementation results show that the system is able to record income and expenses, display real-time financial reports, and manage users with different access rights. Tests through the Black Box Testing method prove that all functions run as expected. Validation by users shows the application is easy to use, efficient, and responsive. In conclusion, this system supports more accurate, secure, and structured financial management, as well as being an appropriate technology solution in assisting businesses in making decisions based on actual data.

Keywords*: Android Application, Digital Finance, Financial Information System, Mobile-Based System, Playground Management.*

1. Introduction

The deployment of an Android-based Financial Information System (FIS) at Krustyzone Playground can make a substantial contribution to the achievement of the United Nations Sustainable Development Goals (SDG) [1]. Such digital solutions encourage financial inclusion, transparent management, and innovation (SDG 9) by employing accessible technology to expedite financial operations and reporting. Mobile financial services play an important role in promoting financial inclusion (SDG 8 and SDG 10), particularly by increasing access to unbanked and underserved groups, which boosts economic growth and reduces inequality. According to research, these solutions promote efficient financial recordkeeping for small firms, increase financial literacy, and improve decision-making—all of which strengthen business resilience and support SDGs linked to industry, growth, and responsible institutions [2]–[4]. Furthermore, digital financial systems are strongly associated with positive social outcomes such as women's empowerment, green finance, and enhanced governance, all of which are directly aligned with the SDG framework. To summarize, the use of Android-based FIS at venues such as Krustyzone Playground exemplifies digital technology's revolutionary potential to accelerate SDG attainment through innovation, inclusion, and sustainable development.

Advances in Information Technology (IT) have changed many modes of activity in every field. IT has become the backbone for many sectors [5]. The development of information and communication technology (ICT) has changed various aspects of life, including in the entertainment and recreation sector. One form of application of information technology that is increasingly developing is a mobile application-based financial information system [6]–[8]. This system is a practical solution to overcome various problems in recording transactions, financial reporting, and real-time data management, especially in small and medium-sized business units such as playgrounds [4][5]. Business systems are increasingly trending using the term e- commerce or m-commerce which takes place virtually through a number of information technology-based applications. The COVID-19 global pandemic has further strengthened IT-based business activities. IT is here to meet the demands of these needs. With IT, all

activities can still be carried out without violating health protocols that apply not only in Indonesia but also throughout the world [9], [10]. Many playgrounds still rely on manual records that are prone to human error, lost records, and late reports. This condition hinders business owners in making decisions due to the lack of real-time-based financial data [6]. The use of Android applications has proven effective as a mobile solution that is easily accessible to various levels of users. This application provides features such as transaction history, financial reports, and access restrictions according to roles (user level), thus supporting more secure and structured financial management [7].

Financial technology and services have evolved into online business models that enable fast and remote transactions. This research discusses advances in information technology (IT) that affect payment systems, especially in the Fintech field [6]. One of the recommended system development methods for building applications quickly and responsively to user needs is Rapid Application Development (RAD). RAD emphasizes rapid initial prototyping, design iterations with direct user feedback, and continuous system adjustments until development is complete [11]. Various previous studies have shown the successful application of RAD in the development of information systems, including financial reporting systems, management systems, and mobile and web-based applications. RAD has been shown to increase the efficiency of and accuracy of results because it involves users directly in the design and evaluation cycle [12], [13]. In addition, the concept of developing Android-based financial systems has been widely researched in various contexts ranging from personal finance applications to financial management of organizations/institutions with high benefits to operational efficiency [14]. Technological advances in the field of long-distance or mobile wireless communication have expanded the number of mobile phone users, and this has also accelerated the development of e-commerce. The rapid development of the portable commerce business and the increasing number of consumers using mobile phones have strengthened the role of versatile applications as an important tool in making mobile payments in this field. Multipurpose Mobile Payments are currently quite prominent and are of concern to buyers in making purchases from merchants as an alternative to the use of cash or credit cards [15], [16]. Go-Pay and OVO are Fintech services that accommodate digital payment methods via smartphones [17]. The purpose of making an application is to get more efficient results in using a computer depending on the purpose of making the program. Application means solving a problem based on a calculation technique or data processing so as to produce a desired or expected data or processing by the user or user [18]. financial recording is the practice of recording and archiving all financial transactions that occur in business operations. This includes purchases, sales, expenses, receipts, and other financial activities. The goal is to create organized and accurate records that provide insight into the financial health of the business [19][20].

This article's research aims are to create and deploy an efficient, user-friendly financial information system that is specifically customized to the operational demands of Krustyzone Playground. The study's goal is to create a mobile Android application that streamlines financial data management, such as transaction recording, expense tracking, and income reporting, to improve accuracy and accessibility. Furthermore, the study aims to assess the system's performance in boosting financial transparency, decreasing manual errors, and enabling real-time financial decision-making for playground management. Ultimately, the goal is to deliver a scalable digital solution that streamlines financial processes while also contributing to Krustyzone Playground's overall operational efficiency.

The contribution of the article "Financial Information System at Krustyzone Playground Based on Android" lies in presenting a customized, mobile-based financial management solution specifically designed for small to medium-sized recreational facilities. By leveraging Android technology, the study offers a practical and accessible tool that simplifies financial record-keeping, enhances real-time financial monitoring, and minimizes errors commonly associated with manual bookkeeping. This contribution is significant in demonstrating how tailored digital systems can improve operational efficiency and transparency in niche business environments like playgrounds. Moreover, the research provides a foundation for further development and adaptation of financial information systems in similar recreational and service-oriented settings, promoting broader adoption of mobile financial management technologies.

2. Research Method

This project's research methodologies include applied research focusing on system development, mixed qualitative and quantitative data collection, and Rapid Application Development (RAD). The study uses requirement analysis, observation, interviews, and user acceptance testing to collect primary data on user needs and system efficacy, as well as secondary data from literature reviews and financial record analysis, which is similar to methods used in studies of Android financial apps for small businesses [21].

RAD offers rapid, iterative prototyping with active stakeholder feedback, which improves usability and tailors the system to the playground's specific requirements. This holistic approach ensures a user-centered, efficient financial management solution for specific business situations, backed up by broader fintech and mobile finance research approaches [22]–[24].

2.1. Research Type

The research type for this article is applied research, which focuses on system creation and evaluation through qualitative and quantitative methodologies [25], [26]. It entails requirement analysis, agile or extreme programming-based system design and execution, and usability testing, which is similar to research on Android banking apps for small businesses. The study also investigates IT integration in management information systems to improve financial decision-making and reporting accuracy, employing qualitative descriptive methodologies and a literature analysis. Quantitative assessments of system quality's impact on user satisfaction are consistent with research in local government and MSME banking systems. This method produces a useful mobile digital banking system suited to specific business scenarios [21], [27], [28].

2.2. Data Collection Methods

This article's data collection methods include both primary and secondary methodologies, which enriches the research with substantial, multi-perspective evidence. Primary data is collected using direct techniques such as observation of playground financial workflows, in-depth interviews with staff and management, and field documentation of system usage—methods used in several studies on Android-based financial applications for small businesses and MSMEs [29]. Secondary data is gathered through literature reviews, analyses of linked financial records, and examinations of past studies to offer context, validate findings, and inform design, similar to procedures used in systematic reviews and digital finance research [30]. This combination of primary user-focused and secondary literature-driven data allows a thorough assessment of the financial information system's effectiveness and applicability to management needs at Krustyzone Playground.

2.3. System Development Method

This project's system development strategy is Rapid Application Development (RAD) [31], which stresses short, iterative cycles and active user participation throughout the development process [13], [32], [33]. RAD (Fig. 1) is divided into phases that include requirements gathering, rapid prototyping, iterative user input, and progressive refining until the final system is complete. This approach allows for faster delivery of a functional application that matches changing user needs, as each prototype is developed based on real-time stakeholder feedback, assuring excellent usability and relevance. The usage of RAD has proven effective in Android-based finance systems for small enterprises and foundations, allowing for agile adaption to changing requirements and reducing time-to-market.

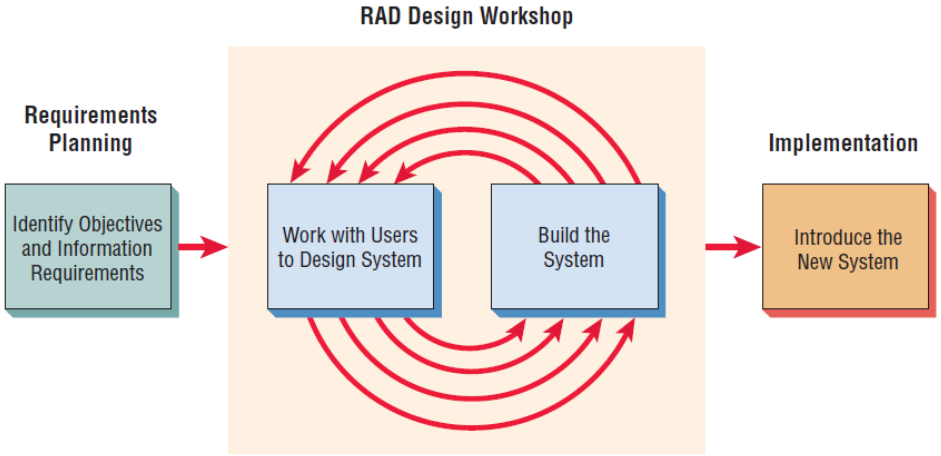


Fig. 1 Stages of the Rapid Application Development Method

The RAD method consists of three main stages: 1) Requirement Planning. At this stage, the author analyzes the data that has been obtained to identify existing problems, so that the system is built according to user needs. This process aims to identify the purpose of the desired application and find the information requirements needed based on these objectives. To obtain an analysis of the needs needed in making the system, the activities carried out involved direct observation of the Krustyzone Playground and interviews with the Owner's sources, 2) RAD Design Workshop. At this stage, the author designs and visualizes the proposed system as a guide in the application development process. This activity is likened to a workshop where business processes are made from live data and visualized into use case diagrams, activity diagrams, clsas diagrams, and 3) Implementation. In the implementation stage, the author will apply the design that has been made into a program to make it an application that can be used by users. This stage involves testing running functions, including application creation and business and non-technical aspects of the agency or company. After obtaining approval and results from the systems created, the new system or part of the system will be tested and the results will be presented to the organization or company.

2.4. Class Diagram Design

The class diagram (Fig. 2) depicts the system's static structure by describing the classes, their characteristics, methods, and the relationships between them. It serves as a roadmap for the development process, demonstrating the logical structure of major system components like as user roles, financial transactions, reporting, and data management modules on the Android platform. The class diagram usually avoids UI containers such as activities or fragments that are unrelated to business logic, instead focusing on core classes that enable the system's functionality and data flow. This technique is consistent with best practices in Android UML modeling [34], in which the structure highlights the system's logical levels, such as presentation, business, and data access. By modeling these relationships and class responsibilities, the system design ensures that the system architecture is clear and makes implementation and maintenance easier.

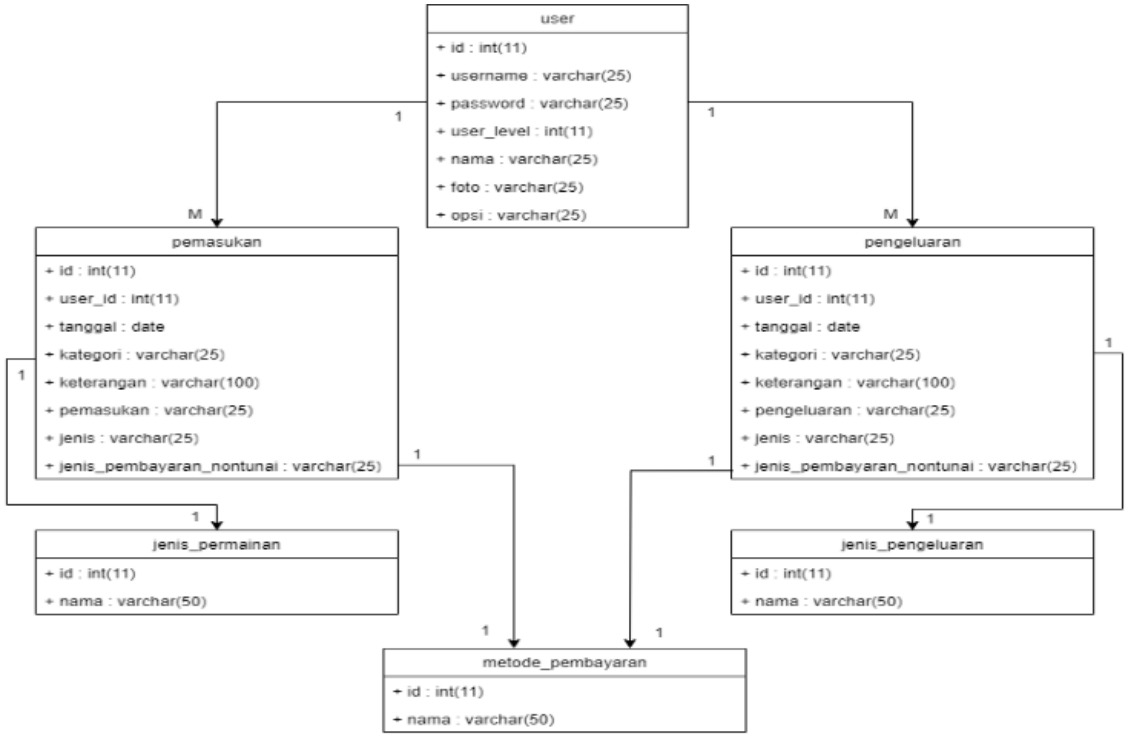


Fig. 2 Class Diagram Design

2.5. Data Analysis using USE Questionnaire

A crucial technique for assessing how well and quickly users can engage with a system is usability testing, which guarantees that the final product satisfies user requirements and satisfaction

standards. Lund asserts that the USE questionnaire [35], which evaluates factors such Usefulness, Ease of Use, Ease of Learning, and Satisfaction, can be used to gauge usability.

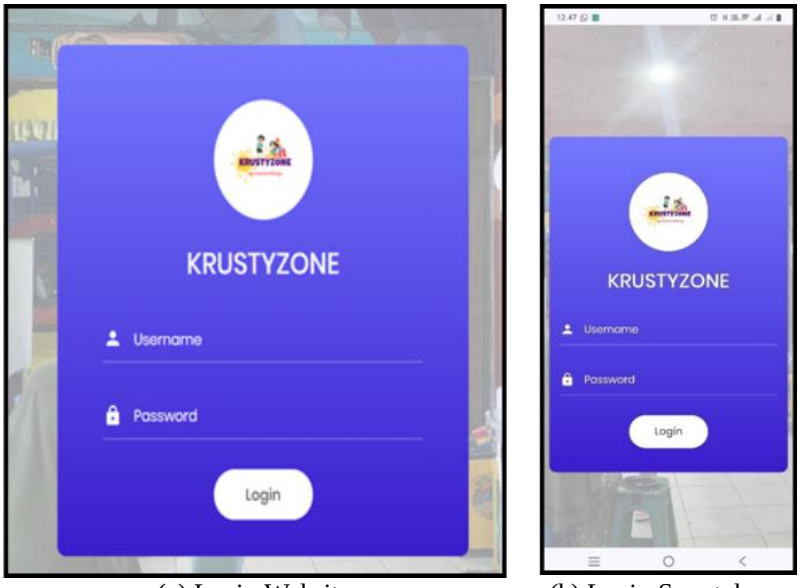
A popular psychometric tool in surveys and usability testing, the 5-point Likert scale [36] is particularly useful for gauging user attitudes and perceptions in systems like mobile applications and financial information systems. Usually falling between "strongly disagree" and "strongly agree," it allows respondents to indicate how much they agree or disagree with statements.

3. Result and Discussion

This information system successfully provides an efficient and easy-to-use financial transaction recording feature. Through the Android app, Krustyzone Playground staff can directly record financial receipts and expenditures, including admission ticket revenue, food and beverage sales, and other transactions. Real-time data recording minimizes the possibility of input errors and allows for more accurate data collection.

3.1. Login Page

The login page (Fig. 3) is the initial interface displayed when a user opens the application. This page serves primarily as a gateway to the system, requiring each user to undergo an authentication process. This involves entering a registered username and password to ensure that only authorized users can access the system. After successfully logging in, users are redirected to the main page, which corresponds to their role, such as cashier, admin, or owner. Therefore, the login page plays a crucial role in maintaining security and managing access rights to the application's features.



(a) Login Website (b) Login Smartphone

Fig. 3 Login Display

3.2. Dashboard Page

The Dashboard page (Fig. 4.) is the main display after users successfully log in to the Krustyzone financial information system. This display is designed to present a real-time summary of financial information with simple, easy-to-understand visualizations. At the top of the dashboard (Fig. 4.a), there are two main information panels: total income and total expenses for the day. The income panel is displayed in green with an up arrow icon, while the expenses panel is displayed in red with a down arrow icon, providing a direct overview of daily financial conditions.

(a) Website Dashboard

(b) Smartphone Dashboard

Fig. 4 Dashboard Page

In addition to summary information, this page also features an interactive bar graph that illustrates the comparison of income and expenses over a specific time period. This graph makes it easy for users, especially owners and admins, to analyze daily financial trends. The navigation menu on the left side provides easy access to other features such as inputting income and expenses, user management, and logging out. This dashboard design is responsive and functional to support the need for fast and efficient financial monitoring via Android devices (Fig. 4.b).

3.3. Revenue Input Page

Cashiers can record revenue based on daily transactions such as ticket purchases or ride rentals. The Revenue Input page (Fig. 5) is a feature used by cashiers or admins to record daily revenue transactions at Krustyzone amusement parks. The interface of this page is designed to be simple and systematic to facilitate user data input quickly and accurately.

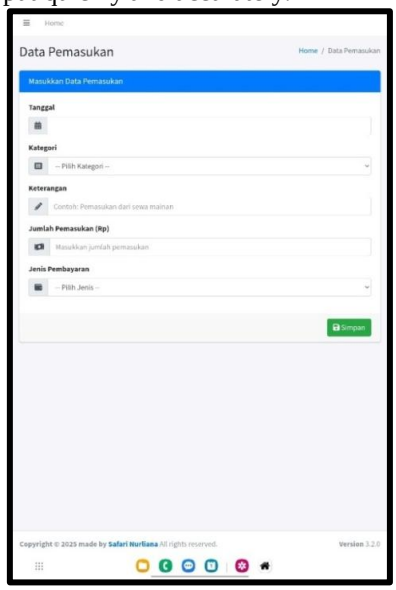


Fig. 5 Revenue Input Page

The form on this page consists of several main components, namely: 1) Date, 2) Category, 3) Description, 4) Income Amount (Rp.), and 5) Payment Type. Once all data has been filled in correctly, the user can click the Save button at the bottom to save the data to the system.

3.4. Expense Input Page

Recording of expense data (Fig. 6) in this system is restricted to users with the admin role. This access is granted to ensure better control of the recording process and to prevent input errors by unauthorized parties. Admins are responsible for recording all daily operational expenses, such as equipment purchases, maintenance costs, and other needs related to the operation of the facility. This restriction also aims to maintain the security and accuracy of financial data. Through this feature, admins can input expense data by selecting a category, providing a description, and specifying the amount and type of payment. This information is immediately stored in the database and can be displayed in financial reports. This allows for more systematic and centralized expense data management.

The Expense Input page is used to record all operational expense transactions at the Krustyzone amusement park. This feature aims to facilitate admins in systematically entering expense data for more accurate and controlled financial reports. The available form includes several important components, namely: 1) Category, 2) Description - Functions regarding expenses, 3) Expense Amount (Rp.), and 4) Payment Type. Once all fields are complete, users simply click the Save button in the bottom right corner to enter the data into the system. This feature makes the expense recording process more organized and documented, simplifying analysis and the creation of periodic financial reports.

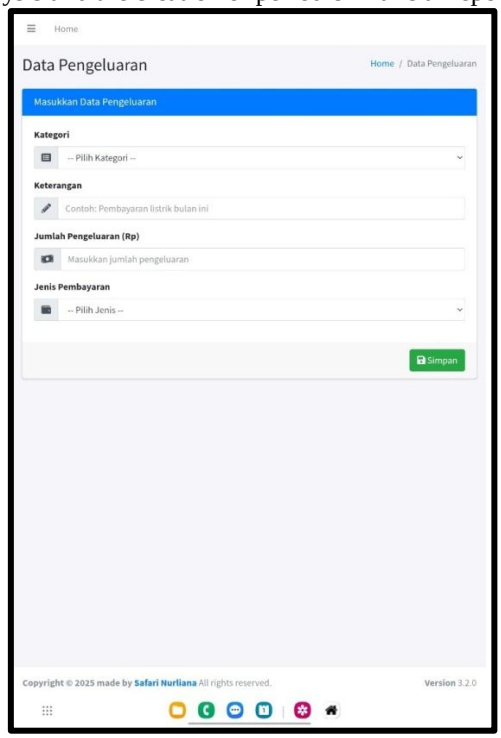


Fig. 6 Expend Input Page

3.5. Transaction List Page

The Income Transaction List page (Fig. 7) displays all income data recorded in the system. At the top of the page, there's a search filter based on date range, category, and payment type. This feature makes it easy for users to quickly and accurately find specific transaction data. Below, there's a data table containing detailed income information, such as username, transaction date, category, description, income amount, and payment type. Each transaction row also has an "Update" button in the action column, allowing users to update the data if necessary. The system also displays the total income at the bottom of the table, and pagination is useful for organizing large amounts of data for easy access.

Fig. 7 Class Diagram Design

3.6. Usability Testing

The Financial Information System at Krustyzone Android-based amusement park was analyzed using the USE Questionnaire (USE-Q), an effective method for assessing user experience in digital applications. The USE-Q (Fig. 8) consists of a number of questions with a rating scale designed to measure user perceptions of the application's usability, appeal, efficiency, and satisfaction. The USE-Q instrument in this study was given to four users at the Krustyzone store, namely the owner, admin, and two cashiers. The questionnaire data was then processed using Microsoft Excel to systematically calculate the score for each USE-Q dimension. The results of the processing were grouped into categories according to USE-Q standards (Tabel 1), making it easier to analyze the user experience objectively.

Table 1. USE-Q Calculation.

Dimension	Respondent Score	Maximum Score	Percentage (%)
Usefulness	133	160	83%
Ease of Use	180	220	82%
Ease of Learning	67	80	84%
Satisfaction	116	140	83%

The measurement results for the Usefulness dimension obtained a respondent score of 133 out of a maximum score of 160, resulting in a percentage of 83%. Based on the suitability category table, this value falls into the “Very Suitable” category. Thus, it can be concluded that the tested application has a

high level of usefulness for users. For the Ease of Use dimension, the respondent score obtained was 180 out of a maximum score of 220, resulting in a percentage of 82%. This value indicates that the application is classified as "Very Suitable" in terms of ease of use by users. The measurement results for the Ease of Learning dimension show a respondent score of 67 out of a maximum score of 80, resulting in a percentage of 84%. This means that the tested application is easy for users to learn. In the Satisfaction dimension, the respondents' score was 116 out of a maximum score of 140, resulting in a percentage of 83%. This percentage also falls into the "Very Suitable" category, meaning that the application provides a good level of satisfaction for users.

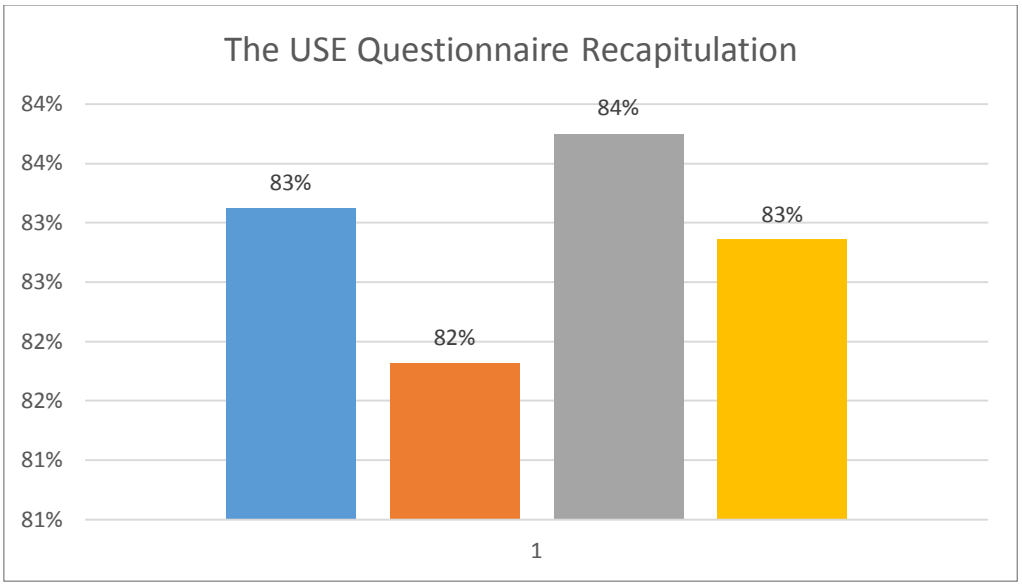


Fig. 8 The USE Questionnaire Result

Overall, the usability measurement results yielded a total respondent score of 496 out of a maximum score of 600, with a percentage value of 82.7%. Based on the acceptability category, this value falls within the range of 81%–100%, so it can be concluded that the tested application has a very acceptable level of usability for use.

3.7. Discussion

After the system testing process was completed, validation was conducted with potential system users, namely cashiers, admins, and Krustyzone owners. Validation was conducted through direct interviews and system usage trials. The following are the validation results:

1) Ease of Use. Users stated that the application was easy to use and not confusing. The simple interface and clearly labeled buttons made it easy to understand the application's functions without requiring special training.
2) More Practical and Faster Financial Recording. The process of recording income and expenses is faster because it can be done directly from an Android device. This system replaces manual recording, which was previously prone to errors and delays.
3) Real-Time Report Monitoring. Owners found the financial report feature very helpful, which can be accessed anytime and anywhere. The daily reports and financial graphs displayed make it easy for owners to monitor financial developments instantly.
4) Responsive System Performance. The application was assessed as having good access speed. Response times when opening pages, entering data, and loading reports were relatively fast, so it did not hamper operations during peak hours.
5) Role-Based Access Rights. Each user has access rights limited by their role, such as cashier, admin, and owner. This ensures data security and prevents users from making changes beyond their scope of responsibility.

4. Conclusion

Based on previous theoretical studies and research, it can be concluded that the development of an Android-based Financial Information System contributes significantly to improving financial management efficiency, particularly in business sectors such as amusement parks. This system not only supports real-time transaction recording and user mobility but also facilitates monitoring processes for business owners. The implementation of the CodeIgniter framework and MySQL database has proven effective in providing a lightweight and responsive backend, suitable for small to medium-sized applications. The use of UML modeling helps visually depict the system's structure and functions, thereby streamlining the development and documentation processes. System testing using the Black Box Testing method showed that the system functions according to user needs. Overall, the developed system introduces updates from previous research through Android platform integration, more comprehensive testing, and the implementation of role-based user authorization, which has not been extensively studied in previous studies.

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