Design and Development of a Mobile Application for Social Assistance

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Abstract

The economic crisis triggered by the COVID-19 pandemic has made people unable to meet their basic daily needs. Social assistance, or social assistance, is a program offered by the government to underprivileged communities to support and improve the welfare of disadvantaged people. It is known that many social aids program implementations are not on target. Even judging from the latest data, there are still many double recorded and reach around 70% double data. From the existing problems, the AYO BANSOS application was designed to help implement social aid programs more quickly. The usability test results of the application, conducted with 20 respondents using the System Usability Scale (SUS) method, resulted in an average SUS score of 72, categorizing it as a "good" grade on the scale. This mobile-based recording can help in terms of administration because data is integrated online, so it can be easier and more transparent to be accessed by local governments and the public. In addition, there is also an online social aid program delivery feature that helps people make it easier to distribute social aid to local governments.

Keywords: Social Assistance, Information System, Mobile Application

1. INTRODUCTION

Economic crises are something that cannot be avoided by humans, especially during the current pandemic. The impact of this pandemic is felt by all social strata in Indonesian society and around the world. The COVID-19 pandemic has had a significant impact on the resilience of micro, small, and medium-sized enterprises (MSMEs) [1]. According to survey results, as many as 96% of business operators have experienced negative effects from the pandemic, which includes 1,785...
cooperatives and 163,713 MSME operators, with 75% of them experiencing a significant decline in sales [2, 3].

The economic crisis triggered by the COVID-19 pandemic has made it difficult for people to meet their basic daily needs [4, 5, 6]. Social assistance, often referred to as "bansos," is a program offered by the government to support and improve the well-being of less fortunate individuals and communities affected by the COVID-19 pandemic [7]. The provision of social assistance has both positive and negative impacts [8, 9]. One positive impact of social assistance is that it alleviates the burden on less fortunate individuals, while the negative impact is that there is often confusion in the social assistance system, which needs to be improved [10].

Based on media monitoring, on April 21 to June 9, 2020, DKI Jakarta, West Java Province, Maros Regency (South Sulawesi), Bandung Regency, and East Nusa Tenggara Province highlighted two major problems. The first problem was the lack of coordination and unclear mechanisms for distributing income assistance, and the second problem was inaccurate information about social assistance recipients [11]. These two problems necessitated an overhaul of the social assistance system during the pandemic.

Protests and opposition from the public in West Java Province and Maros Regency regarding problematic social assistance distribution during this pandemic have been observed. Opposition to social assistance emerged from residents to village officials in several areas in West Java. This opposition stemmed from the inaccuracy of available information, resulting in uneven distribution and incorrect targeting of social assistance [12]. There were protests by residents in Maros Regency because some individuals in need did not receive the social assistance [11], and even the head of the Financial and Development Supervisory Agency (BPKP), Muhammad Yusuf Ateh, stated that at least 20% to 30% of Beneficiary Families (KPM) had not received social assistance [13].

Previous research on the effectiveness of social assistance programs in the community of Palu City discussed and analyzed the Group Business Assistance (Kube) program in Palu and the challenges it faced. The research was conducted using a qualitative descriptive approach through direct observation and interviews with informants who understood the Kube program. The analysis results indicated that the implementation of the Kube program in Palu was less effective and suboptimal. This was due to several aspects not functioning effectively, which were the responsibility and authority of the Palu City Social Services Department [14]. This supports the ongoing research to design an application system that can assist in the implementation of social assistance on a global scale.

Another study focused on designing a responsive web-based social assistance mapping system. Motivated by the ongoing COVID-19 pandemic, which has not
yet been resolved and has weakened the economy, a web-based social assistance mapping system was developed. The research produced an application that can help government agencies at the department and village levels manage social assistance effectively, efficiently, and transparently in the eyes of the public [15]. This research differs from the ongoing research in terms of the platform used, which is mobile, making it easy for users to access anytime and anywhere using a mobile device.

As is known, many social assistance programs have been misdirected, and even from the latest data, there are still many cases of double registration, reaching approximately 70% of double data [16]. Recognizing the existing issues, an application has been designed to assist and facilitate the government in identifying and collecting data on social assistance recipients in every region of Indonesia. The application has been designed and named AYO BANSOS to assist individuals who wish to participate in registration and understand the rules for providing social assistance. The presence of a social assistance application system can help reduce the spread of COVID-19 because there is no longer a need to leave home to register at social assistance distribution points. Furthermore, both the government and the general public can track the targeted distribution of social assistance, eliminating any confusion in the distribution process.

2. METHODS

This research was conducted through several stages, starting with literature review, needs analysis, system design and planning, and reporting. Overall research stages can be seen in Figure 1.

The research process commenced with the initial stage, which was dedicated to conducting a comprehensive literature review. This entailed delving into the
historical context and intricacies of issues pertaining to social assistance activities within the Indonesian context. In the course of this phase, meticulous scrutiny of existing research studies concerning social assistance and the design of related applications was undertaken. Furthermore, this initial stage involved the critical analysis of prior research efforts, enabling the research team to garner valuable insights and identify potential areas of improvement and innovation in the realm of social assistance and application development.

The next stage entailed an examination of the requirements associated with social assistance activities that could be aided or streamlined through the use of a mobile application. During this stage, the primary objective was to gain a profound understanding of the specific needs of those receiving social assistance and how a mobile app could bridge the gap between these needs and the delivery of social aid. This process involved in-depth research and thorough investigations into the necessities of vulnerable communities in need of social assistance, as well as the ways mobile technology could enhance accessibility and the efficiency of aid provision. All the insights derived from this analysis played a pivotal role in shaping an effective and pertinent solution for supporting social assistance activities.

In the design and planning phase, the Waterfall software development method was employed, which involves several sequential sub-stages. The first stage involves identifying project requirements, including preparing the necessary tools for application development, data requirements, necessary sensors, and machines. Subsequently, the application design is created, detailing the system architecture, user interface, and application components, using tools such as UML. Once the design phase is completed, the development team begins its implementation in the form of actual code, utilizing the Java programming language with the assistance of Android Studio tools. The verification and validation stage is carried out to ensure that the application aligns with initial requirements and design, with validation in this research conducted using the System Usability Scale (SUS) method. Meanwhile, the operation and maintenance stage marks the active usage of the application and ongoing improvements as needed over time.

The final stage of this research is reporting, meticulously documented in the form of a comprehensive journal. This last stage plays a crucial role as it serves as a bridge between the research findings, conclusions, and the dissemination of valuable insights to a broader academic and professional community. Consequently, the reporting stage in the form of a journal represents a synthesis of the entire research process, making the findings and recommendations more accessible to a wider audience and fostering the growth and development of knowledge in the fields of social assistance and technology applications.
3. RESULTS AND DISCUSSION

3.1 Use Case Diagram

The use case diagram is a graphical representation that serves to illustrate and outline the various actors, both human and non-human, within a system, as well as the specific activities, functions, or roles these actors perform or interact with in that system [17]. It provides a visual framework for understanding how different entities interact with and utilize the system, offering a comprehensive view of the system's functionality and the relationships between its various components, thereby aiding in the design, development, and communication of software systems and their intended functionality [18]. The design of the use case diagram for the application system being developed can be seen in Figure 2.

![Use Case Diagram](image)

**Figure 2.** Use Case Diagram

The application has two user roles: user and admin. The user role can be defined as a general user who can register as a member and has features to view user profiles, participate in social assistance activities, track the delivery of social assistance, and view the history of social assistance deliveries. On the other hand, the admin role is not open to the general public and can only be accessed by the
local government. The admin role includes features to view and manage user data, perform social assistance deliveries, track the delivery of social assistance, and view the history of social assistance deliveries.

### 3.2 Class Diagram

The class diagram is a diagram that illustrates the interaction relationships between classes within the system to be developed and how classes collaborate with each other [19]. The class diagram can also be interpreted as a model of the system's structure in operation and represents the flow of a database in the system to be built [20]. The class diagram for this research can be seen in Figure 3.

![Class Diagram](image)

**Figure 3. Class Diagram**

As shown in Figure 3, there are 5 classes: user, bansos shipment, bansos history, confirm bansos, and track bansos. The user class is used to store all information about users and admins, including their names, ID numbers, addresses, and so on. The bansos shipment class is used to store data related to user requests to send social assistance, which can be confirmed by the admin. The bansos history class is used to store all the history of social assistance activities that have been carried out by users within the system. The confirm bansos class is used to store data confirming the completion of social assistance deliveries. The track bansos class is used to store location data for ongoing or active social assistance deliveries.
3.3 Activity Diagram

The activity diagram is a diagram that models the workflow of all activities performed by users and the system. The emphasis in this activity diagram is on system activities or activities that can be carried out by the system [21]. The activities that are designed are made as effective as possible to be more user-friendly [22, 23]. There are several activity diagrams built in the system design, including the bansos confirmation activity, bansos history activity, track bansos activity, and user profile activity.

![Figure 4. Activity Diagram for Bansos Confirmation](image)

Figure 4 represents the activity process that occurs in bansos confirmation to illustrate the confirmation process of social assistance received by the user. If the social assistance has not been sent, the admin will send the social assistance. However, if the social assistance has been sent but has not arrived and exceeds the estimated time, the system will automatically send a notification to the admin, and the admin must ensure the location of the social assistance in the warehouse. Social assistance that has arrived at the location must be confirmed by the user, and the system will record the arrival time and the social assistance ID received by the user.
Figure 5. Activity Diagram for Bansos History

Figure 5 represents the activity process that occurs in bansos history to display social assistance history to the user. When the user selects the bansos history menu, the system will request the history data from the admin and display it to the user.

Figure 6. Activity Diagram Track Bansos
Figure 6 represents the activity process that occurs in track history to show the current location of social assistance to the user. When the user selects the track bansos menu, the system will request the location data of social assistance from the admin and display it to the user.

![User Profile Diagram](image)

**Figure 7. Activity Diagram User Profile**

Figure 7 represents the activity process that occurs in the user profile to display the user's profile and also allows the user to edit their profile. When the user selects the user profile, the system will display the user's profile, and the user can edit the profile. Once the editing process is completed, the system will save the changes made by the user.

### 3.4 Application Prototype

![Login Page](image)

**Figure 8. Login Page**
In Figure 8, we can see the interface of several pages designed with a consistent brown color scheme, making the user interaction more comfortable to use. The first image represents the loading screen that appears when we open the AYO BANSOS application. If the application is successfully opened, the screen will display as shown in the following image. Press the "tap to start" button to access the login page. On this page, users are prompted to enter their email address and account password to log in. This page also provides a button for users who have forgotten their password or do not have an account to sign up.

Upon successful login, the screen will display the main menu page. In the main menu, there are seven buttons, each with its respective function. First, at the top right, there is a notifications button. Then, if we look at the middle of the screen, there are four interaction buttons: track, confirm, register, and history. Finally, if we look at the bottom of the screen, there are home and profile buttons.

Figure 9. Sign Up Page

In Figure 9, the page is shown that will appear when a user signs up or registers. From the login page, there is a "sign up" button that, when used, will take the user to the account registration page. On this page, users are asked to fill in several personal information fields that will be used to create an account. After completing this step, the user can press the "register" button and will be taken to the next page containing the terms and conditions. After accepting or pressing the "OK" button on the terms and conditions page, the user has successfully created an account.

In essence, Figure 9 emphasizing the critical role that terms and conditions play in this process. By guiding users through the meticulous process of providing personal information and making informed choices about their engagement, the system not only simplifies the onboarding experience but
also fosters a climate of transparency, trust, and responsible use of its services, ultimately enhancing the overall user experience and platform integrity."

If users forget their account password, AYO BANSOS provides a feature to reset their password by following several steps as shown in Figure 10. First, on the login page, there is a "forgot password" button. After users press this button, they will be prompted to enter the email address associated with their account. After filling in the email address and pressing the "send code" button, a five-digit verification code will be sent to the user's email address, which will be requested on the next page. After users enter the code and successfully confirm it, they will be taken to the next page to create a new password.

![Figure 10. Forgot Password Page](image-url)

Figure 10. Forgot Password Page

If users forget their account password, AYO BANSOS provides a feature to reset their password by following several steps as shown in Figure 10. First, on the login page, there is a "forgot password" button. After users press this button, they will be prompted to enter the email address associated with their account. After filling in the email address and pressing the "send code" button, a five-digit verification code will be sent to the user's email address, which will be requested on the next page. After users enter the code and successfully confirm it, they will be taken to the next page to create a new password.

![Figure 11. Edit Profile Page](image-url)

Figure 11. Edit Profile Page
In Figure 11, at the bottom of the screen, we can see interaction buttons to switch between the main menu (home) and the profile (profile) page. On the profile page, users can edit their name, residential address, phone number, email address, and ID number associated with their user account.

In the main menu, there is a "track" button that allows users to track social assistance. As we can see in Figure 12, when the user presses the "track" button, they will be taken to the track bansos page, which shows the estimated arrival of the social assistance being delivered, along with the Bansos ID, and a detailed tracking of how far the social assistance has reached. The tracking shows the time, date, and location of where the social assistance has arrived. Users can also check for the latest updates in notifications located at the top right of the main page.
In Figure 13, from the main menu, when the user presses the "confirm" button, the screen will display the social assistance that has been sent to the user, along with the Bansos ID, date, and time of delivery. If the user has received the social assistance, they can press the button to confirm. When successfully pressed, the user will see a page with the message "BANSOS confirmed successfully" and can return to the main menu.

![Figure 14. Bansos Registration Page](image)

In addition to having tracking and confirmation features, AYO BANSOS also provides a social assistance registration service. As shown in Figure 14, starting from the main menu, users can press the "register" button. After that, users will be taken to a page filled with questions that need to be answered carefully, as they will be used for registering users for available social assistance programs.

![Figure 15. Bansos History Page](image)
AYO BANSOS also provides a list of the history of social assistance received by users. In Figure 15, we can see a "history" button. When users press this button, they will be taken to the history page, which displays a complete list of social assistance that the user has received, along with the Bansos ID, date, and time when the social assistance was completed or received and confirmed.

The last feature provided by AYO BANSOS is the logout feature. In Figure 16, from the main menu, users can go to the profile page. On the profile page, there is a logout button. When pressed, it will display a confirmation asking whether the user really wants to log out or not. This is useful to ensure that users do not accidentally log out if they press the logout button, as it will not log them out immediately.

### 3.5 Evaluating of Usability

As part of evaluating the usability of the system that has been developed, a test was conducted using the System Usability Scale (SUS) method. This method is employed to measure how effectively and efficiently the system can be utilized by its users. The measurement process involved distributing questionnaires to a group of respondents, which, in this case, comprised 20 prospective system users, namely churchgoers and church officials. The questionnaire used adhered to the template of the System Usability Scale itself, as referenced in Table 1.

<table>
<thead>
<tr>
<th>No</th>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I think I will use this system again.</td>
</tr>
<tr>
<td>2</td>
<td>I find this system complicated to use.</td>
</tr>
<tr>
<td>3</td>
<td>I find this system easy to use.</td>
</tr>
</tbody>
</table>
4. CONCLUSION

The implementation of social assistance by local government is often understood by the public as not reaching the intended recipients, due to issues like duplicate data and unclear distribution mechanisms. The AYO BANSOS application is designed to simplify the implementation of social assistance programs and address the main problems in this research. This application can help solve issues such as duplicate data. The mobile-based recording system can improve administrative processes by integrating data online, making it easier and more transparent for both the local government and the public to access. The application provides an online social assistance submission feature, making it easier for the public to provide assistance to the local government without the need to visit distribution centers or carry out distribution themselves. The local government will receive notifications from the application to dispatch drivers for the collection and distribution of social assistance. This application also supports efforts to break the chain of COVID-19 transmission, as people no longer need to go out or gather in public places for social assistance activities, as these activities are facilitated through the application.

REFERENCES


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