

Designing Community Complaints and Disaster Reporting Application to Babinsa Based on IOS

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ABSTRACT

The role of telecommunications in facilitating communication and information exchange is very important, especially in emergencies such as natural disasters and unexpected events in the community. The application of mobile technologies such as apps is an alternative to improve response and address such issues. Mobile technology allows people to easily report disaster events or security issues through apps or short message services. The application of this technology supports faster communication between the community and Babinsa. Communities can quickly submit reports, convey important information, and share photos or videos as evidence of events. The reporting application is an implementation of mobile technology that can be more efficient in responding to reports and taking the necessary actions based on the information received to facilitate two-way communication between officers and the community. This research was conducted to develop an application that can facilitate the community and babinsa in responding to an event more efficiently, the results of this development prove that the application has an efficiency level of around 75% and also the learnability level reaches 80% which indicates that the application is ready to be launched to the general public and can be easily used for all groups.

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1. INTRODUCTION

Indonesia's geographical location, characterized by its position along the Pacific gulf plate and the archipelago islands, makes it vulnerable to various natural disasters. The

impact of these disasters is not only felt economically, but also socially, often causing huge losses and increasing the vulnerability of communities to rapid and large disasters. In addressing these challenges, the application of technology is key importance to mitigate risks, provide rapid response, and reduce the negative impacts caused [1], [2].

application is the use of technology to manage and respond to natural disasters. The application of this technology can help in mitigating the impact of natural disasters. Through this application, users can easily report emergency conditions, request assistance, or provide important information to officers or related parties. The purpose of this application is to increase efficiency in disaster management and provide easier access for the community to participate in disaster management efforts.

Sociologically, Indonesian society is characterized by ethnic diversity. This diversity can affect disaster recovery and relief efforts, as community sensitivities and local practices are often unreliable in providing aid and relief [3]. Thus, a mobile-based reporting system can be an effective tool in providing assistance and support to disaster victims as well as assisting in the coordination of emergency response.

Learning from previous events, the Indonesian government, including the Indonesian National Army (TNI), has realized the importance of pre-disaster risk reduction and their role in saving lives and minimizing damage [4]. Babinsa, as part of the TNI responsible for the community, serves as a vital link between the military and civilians [5], [6]. Babinsa need a special reporting system to respond to natural disasters in a fast and coordinated manner, the solution to this problem is the design of a special mobile-based reporting application to improve the effectiveness and efficiency of communication in the field, such as the Covid-19 information collection system [7], [8], [9]. Through specialized mobile applications, Chapters can collect real-time data from affected communities, thus enabling fast and accurate data collection of the situation on the ground [11], [12].

This mobile application must also be compatible with many devices, one of which is iOS. By making this application accessible on iOS devices [13], the Indonesian National Army (TNI) hopes that Babinsa can efficiently obtain information from a variety of mobile devices commonly used by the public. Compatibility with iOS devices is the main basis, considering that Android and iOS devices are the most widely used devices in Indonesia [14], [15], [16].

The development of this IOS mobile-based application is intended for various IOS devices, including people who use the latest and older IOS devices, for example IPHONE series X, XR and 12, therefore this is one of the main things in testing during application development, testing carried out on various types of IPHONE and also system testing with the blackbox method aims to ensure the application runs without problem to ensure the satisfaction of its users above 70 percent on the user acceptance test (UAT) before launch it for public use.

The purpose of this research is to develop a reporting application that can be used on iOS devices so that people and Chapters who use iOS smartphones can use this

application and contribute to a more efficient and effective disaster response process, greatly helping to save lives and reduce the impact of disasters on the people of Indonesia.

2. METHOD

The waterfall method is software development approach that involves sequential stages, from requirements analysis, design, implementation, and testing, to implementation and maintenance[17], [18]. This research uses the waterfall method as a framework to develop an iOS-based complaint and disaster reporting application. The development process will be carried out sequentially, starting from planning and analyzing needs, then continuing with application interface design, application coding, testing, and finally, application implementation to users. The waterfall approach is expected to provide a clear and directed structure in the application development to ensure optimal success and quality in answering the needs of community complaints and disaster reporting to Babinsa.



Figure 1. Waterfall method

3. RESULTS AND DISCUSSION

3.1. Use Case Diagram

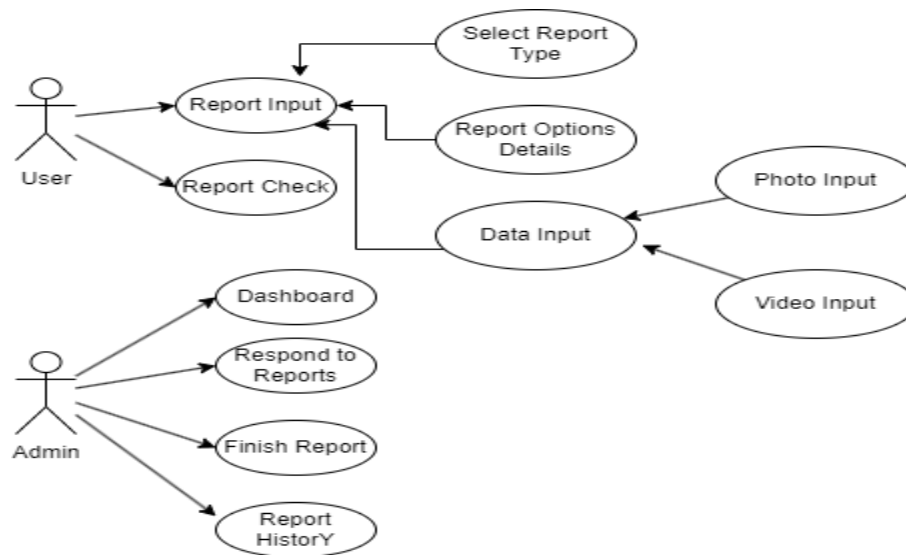


Figure 2. User Activity Diagram

A use case diagram is a visual representation of the interactions and connections between users and a system. Figure 2 is an example of a Use Case Diagram of a Complaint and Disaster Reporting System that shows what the admin and user can do in the application.

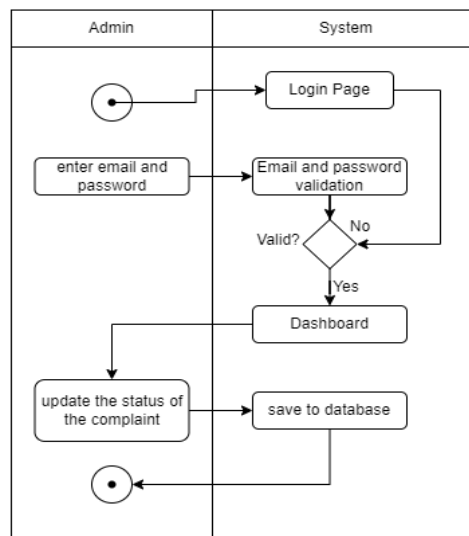


Figure 3. Admin Activity Diagram

In the activity diagram depicting the administrative functionalities, the flow begins with the admin initiating the login process. Should the login attempt fail, the system proceeds to verify whether the provided email is registered within the system. If the email is not registered, the application prompts the admin to create an account by inputting their email address and creating a password. If the email is registered, the admin is directed to the dashboard interface.

Within the dashboard, the admin is afforded the capability to update the status of reports and submit them to the database. This sequential process ensures that the admin can efficiently navigate through the system, addressing login issues and accessing the necessary functionalities for managing reports.

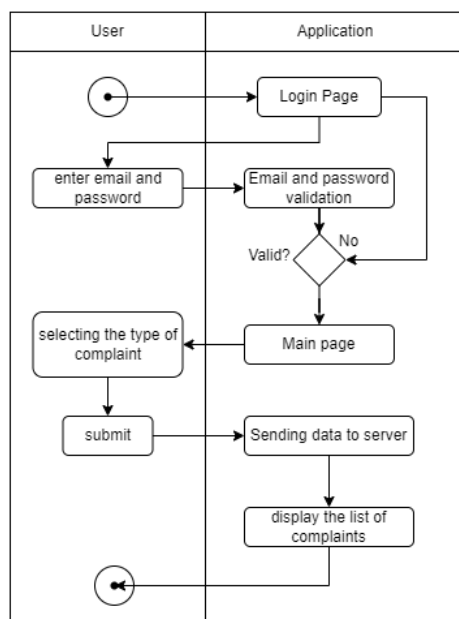


Figure 4. User Activity Diagram

In figure 4 the activity diagram outlining user interactions, the flow initiates with the user attempting to access the application. Upon accessing, the system prompts the user to log in. In the event of unsuccessful login, the system verifies whether the entered email is registered. If the email is not registered, the application prompts the user to create an account by providing their email and setting up a password, if the email is registered, the user gains access to the application's main interface.

Within the application interface, users can engage in various activities such as browsing content, submitting reports, and accessing features pertinent to their needs. Following report submission, the system processes the data and stores it within the database. This structured sequence ensures that users can seamlessly navigate the application, addressing

authentication challenges and utilizing the functionalities provided for their interaction and engagement.

3.2. Communication System

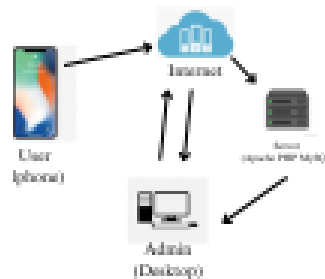


Figure 5. Communication system

The community complaint system is designed as a unified platform with an iOS application and a website, functioning through a client-server network. The community members are the clients, and the administrative team manages the server. As community members submit their complaints via the iOS app, the server securely stores the data and promptly responds with any requested information back to the clients. This two-way communication facilitates a smooth data exchange between the community and the administrative team, ensuring an effective complaint-resolution process.

3.3. User and Admin Display



Figure 6. (a) Home, (b) Register, (c) Login page

For example, in this application, figure (a) shows the main view when the application is opened. Users can select the "Login" button to access the registration or login view as shown in figure (b). If the user already has an account, they will be directed to figure (c) to perform the login process. The app is designed to provide a better user experience with clear and easy-to-use navigation.

3.4. User Display



Figure 7. (a) Report form, (b) and list of report

With a prominent "Lodge Complaint" button on the home page, this community complaint system has an intuitive user interface. When chosen, users are taken to (b) a detailed form where they can provide information, including the complaint type, the location, photo and video proof, and the timeline of the incident. Users can safely submit the information once they have finished the report. Users can then access and read all submitted complaints, including complaint reference numbers, types, and submission dates, by clicking the "Complaint List" button. The user experience and data security are prioritized in this application to guarantee the community a quick and private complaint-reporting process.

			name, email, password, and profile photo.	successful registration notification.	
3.	Home Menu	User Account	After Login Successfully	Displays user, profile photo and email.	Valid
4.	Report form menu	Report form menu	Click Report form	Displays the report form page.	Valid
		Location button	Click submit location according to the location point.	Displays google maps.	Valid
		Photo upload button	Click the upload photo button according to the evidence of the incident	Displays the photos in the file then enter one selected photo.	Valid
		Video upload button	Click the upload video button for evidence of the incident	Displays the videos in the file then select one selected video.	Valid
		Report Title button	Click the complaint title box, the contents according to the disaster or incident. Click the description box for the report's contents according to the disaster or incident.	Displays the keyboard and starts filling in the report title.	Valid
5.	Report List Menu	Report Description button	Click the submit report button	Displays the keyboard and starts filling in the report description.	Valid
		Submit Report button		Displays a text notification that your report was successfully sent	Valid
		Refresh button	Click the refresh button to review the report that has been submitted	Displays a list of complaints that have been sent	Valid
6.	Home Menu	Logout button	Click the Logout Button	Displaying the login page means successfully log out	Valid

The test results show that the main functionality intended for the users of the application works well. Users were able to perform tasks such as registration, search, and interaction with content without any issues.

Table 2. Admin Black Box Text Results

Number	Testing Department	Test Function	Input	Output	Status
1.	Log In Menu	Login menu to enter the system	Enter the email and password already stored in the database.	Displays the successful login and display the home page	Valid
2.	User Report List Menu	Menu button lists user reports	Click the user report list menu	Displays a list of user reports	Valid
		Check Button	Click the tick button	Respond to or complete reports	Valid
		Cross Button	Click the cross button	Deleting Reports	Valid
		GPS button	Click the GPS button	Displays the location point of the reporter	Valid
		Video button	Click the Videos button	Showing the video sent by the reporter	Valid
		play button	Click the play button	Plays the video sent by the reporter	Valid
		Photo button	Click button Photo	Displays a photo of the reporter. Displays home.	Valid
3.	List User Menu	User List button	Click the list users button	Displays data from the user	Valid
4.	Home Menu	Logout button	Click the Log out button	Displays the Login page	Valid



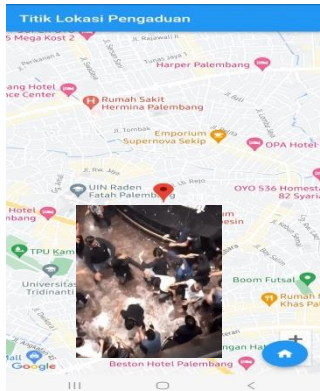
The test results from table above show that the core functionality of the admin section has been fulfilled. Admins can perform tasks such as user management, content management, and application settings smoothly, Testing also revealed that data security mechanisms such as logins function properly. Access to sensitive information is restricted according to the access rights assigned to each user.

Table 3. Appication Test Results

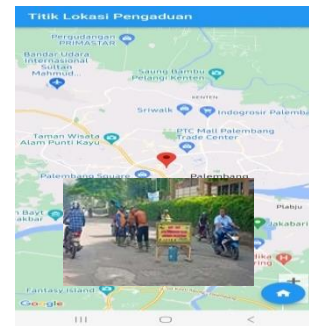
Number	Device	Fitur	Response Time (Second)		
			Test 1	Test 2	Test 3
1.	IPHONE XR	Splash Screen	1,2	1,4	1,4
		Login	1,2	1,2	1
		Register	1,1	1,1	1,1
		Home	1	1	1
		Report List	1,1	1,1	1,2
		Report form	1,1	1	1
		Video player	1,2	1,1	1,1
		Google maps	1,2	1,3	1,1
		Log out	1	1	1
		Splash Screen	1,1	1,2	1,3
2.	IPHONE 10	Login	1	1	1
		Register	1	1,1	1
		Home	1	1	1
		Report List	1,1	1,1	1
		Report form	1	1	1
		Video player	1,1	1,1	1,1
		Google maps	1,2	1,1	1
		Log out	1	1	1
		Splash Screen	1,6	1,5	1,5
		Login	1	1	1
3.	IPHONE 12	Register	1	1	1
		Home	1	1	1
		Report List	1	1,1	1
		Report form	1	1	1,1
		Video player	1,1	1,2	1,1
		Google maps	1,4	1,4	1,3
		Log out	1	1	1

Several variables can influence the variations in the delay response time test table above. These include changing network capacity, various server performance, and the accessibility of infrastructure resources that have an immediate impact on system response. If the server or infrastructure is overworked or underutilized, the response time could be slower. The use of databases also plays a key role in influencing reaction time delays. Database performance factors such as complicated architecture, index utilization, and queries can considerably impact response time. Delays in providing data to users due to slow database access times are another possibility. The setup of the server and application should also be taken into account. Response times may be delayed due to servers not configured correctly and by using subpar application settings. By effectively managing performance, it can help improve overall response and performance. Keep in mind that various other factors can affect application response time delays, and all of these factors should be carefully considered to achieve optimal results.

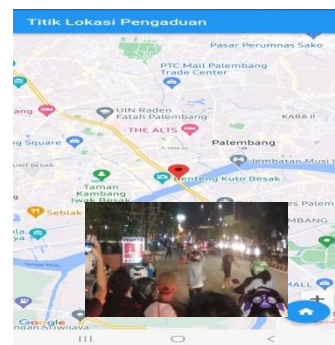
Table 4. Application database

Number	Report title	Latitude	Longitude	Report photo
1.	fire	-2.9813042	104.824321	
2.	flood	-2.944247	104.743764	
3.	Riot	-3.023957	104.7102831	

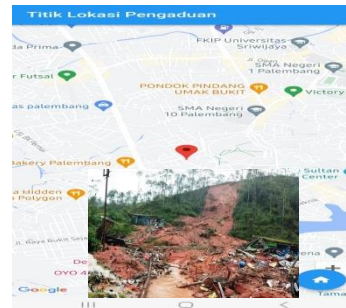
4. Road repair -2.943580 104.813457



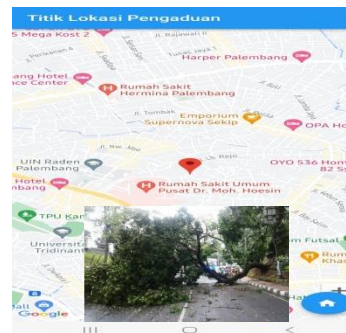
5. fight -2.982294 104.743772


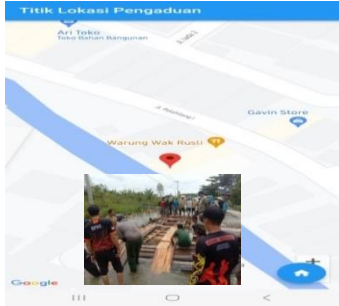
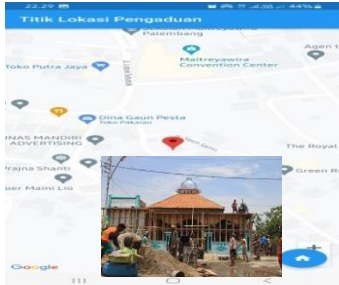


6. landslide -2.964278 104.752241



7. fallen tree -2.843155 104.752241



8.	fight	-2.989355	104.762233	
9.	bridge construction	-2.928339	104.780767	
10.	mosque construction	-2.952232	104.779957	

Based on the table above, it can be observed that the results of the report, in the form of photos depicting locations and their corresponding types, have been successfully stored in the application database for processing by the Babinsa officers. This data storage process facilitates efficient and rapid access to information for the officers, enabling them to respond to field situations more accurately and effectively. the stored data can also be utilized for further analysis and long-term monitoring of the developments in various reported locations.

3.7. User Acceptance Testing

Usability testing (UAT) is conducted to evaluate the application by end users to ensure that all features work as expected, the interface is easy to use, and all aspects meet the needs and expectations of users before the official launch.

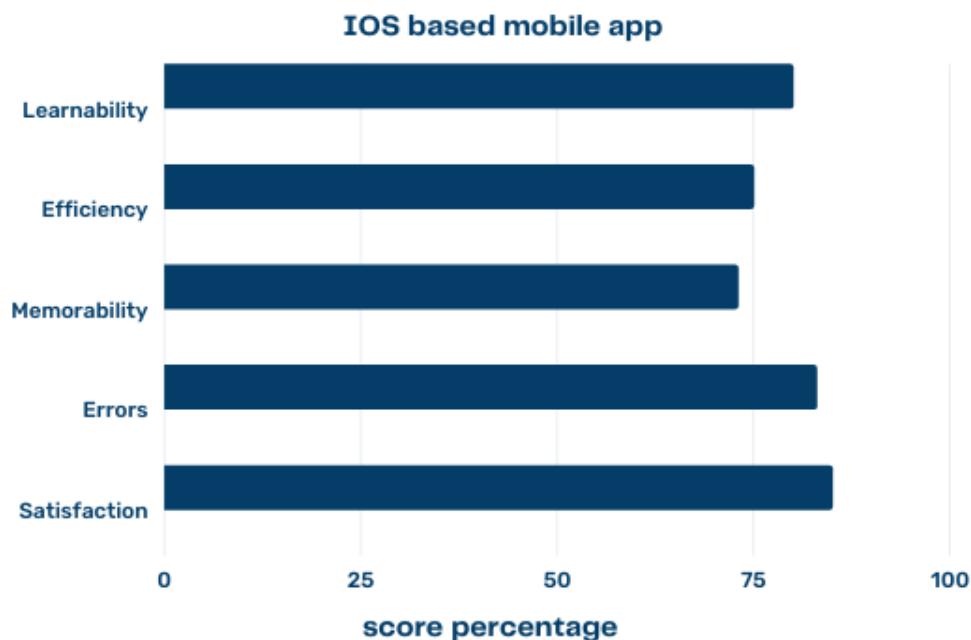


Figure 9. User Acceptance Testing Results

You can see at figure 9 User Acceptance Testing (UAT) results, the system or application tested has received a satisfactory score. Learnability reached 80, indicating that users can learn and use the system easily. User satisfaction is also high. Getting a score of 85 indicates a good level of satisfaction with using the system. Tested errors resulted in a score of 83, indicating that the error rate in using the system is relatively low. Although Memorability reached 73, indicating that the user's ability to remember how to use the system after a certain period is less than optimal, Efficiency reached 75, indicating that the system can handle tasks quite efficiently. Thus, based on these UAT results, the system or application has sufficient quality and is ready to officially launch to users.

4. CONCLUSION

Based on the conducted research, this application has been found to facilitate both the community and babinsa officers in efficiently monitoring the outcomes of community reports and providing appropriate responses. Upon receiving reports in the form of photos

and locations from the community, the application promptly stores them in the database for long term monitoring, thereby enhancing the efficiency and effectiveness of disaster reporting. Moreover, the results of the User Acceptance Test (UAT) demonstrate that the application exhibits an 80 percent level of learnability. Furthermore, during testing across various iOS devices, only minor delay time difference were observed, yet the application remained effective despite these minor difference.

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