FRONT-END WEB-BASED VOLUNTEER MANAGEMENT SYSTEM AT BPBD LAMPUNG USING REACT JS

(A Script)

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BANDAR LAMPUNG
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In

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ABSTRACT

FRONT-END WEB-BASED VOLUNTEER MANAGEMENT SYSTEM AT BPBD LAMPUNG USING REACT JS

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Krisna Benedicta Prima

BPBD Lampung Province has a crucial role in disaster management, which needs volunteers to do their job. However, the Volunteer management at BPBD Lampung is still running conventionally, which inefficient in managing data, monitoring activity, and communication between volunteers. This research's goals is to develop the front-end web based Volunteer Management System (VMS) to support BPBD Lampung in disaster management so the process would be more effective and efficient. The system used ReactJS as framework and Rapid Application Development (RAD) method, RAD Method consist 4 phases that is, Requirements Planning, User Design, Construction, and Cutover. Data were collected through observation, interviews, and literature studies to identify system requirements and user needs. The system has several main features including volunteer activity management, task monitoring, reporting, agenda scheduling, budget tracking, and team coordination. The system tested with Functional Testing, System Usability Scale (SUS), and User Experience Questionnaire (UEQ) to test functionality, usability, and user experience. The front-end web based VMS is expected to improve effectivity and efficiency in volunteer management at BPBD Lampung Province and support disaster management.

Keywords: Volunteer Management System, Front-End Development, ReactJS, Rapid Application Development, BPBD Lampung

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hereby declare that my thesis entitled "Front-End Web-Based Volunteer Management System at BPBD Lampung Using React JS" is my own original work and not the work of others. All writings contained in this thesis have complied with the academic writing guidelines of the University of Lampung.

Should it be proven in the future that this scientific work is the result of plagiarism of another person's work, I am willing to accept sanctions in the form of revocation of the academic degree that I have obtained.

Bandar Lampung, 21 April 2026

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BIOGRAPHY

Born on Thursday, December 14, 2000, the author is the second child of Supriadi and Sukini. The author completed elementary education at MI Ismaria Al-Quranniyah in 2012. Subsequently, secondary education was completed at MTsN 2 Bandar Lampung in 2015, followed by senior high school education at MAN 1 Bandar Lampung, from which the author graduated in 2018.

In 2019, the author was officially enrolled as a student in the Department of Computer Science, University of Lampung, through the SBMPTN admission pathway. During the period of study, the author actively participated in several academic and organizational activities, including serving as a Member of the Cadre Development Division of the Computer Science Student Association for the 2020/2021 period, and as a Coordinator of the National Computer Science Student Association for the 2021/2022 period.

In addition, the author participated in the Merdeka Campus internship program at Gojek from January to June 2022. The author also completed the Community Service Program (Kuliah Kerja Nyata) in 2022 (Period 2) at Wai Sidomukti Subdistrict, Ketapang District, South Lampung Regency.

MOTTO

“"The best of people are those that are most beneficial to others"”

(Ath-Thabari VI/58)

“Life must grow and be meaningful. We live to win, but winning does not mean never falling. Winning means making sure we always rise again. You can be dented, you can be damaged, but you can’t be beaten.”

(A father once said to his son)

DEDICATION

All praise and gratitude are due to Allah Subhanahu Wa Ta'ala for His grace and blessings, which have enabled the author to complete this thesis to the best possible extent. Peace and blessings be upon Prophet Muhammad Shalallaahu 'Alaihi Wassalaam, who has guided humanity from the age of ignorance to an era enlightened by knowledge and truth.

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Bandar Lampung, 21 April 2026

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CHAPTER I
INTRODUCTION

1.1. Background of the Problem

BPBD Lampung Province is a Regional apparatus formed in order to carry out the duties and functions for disaster management and all the consequences that arise (UNILA, 2023). Main tasks of BPBD Lampung is to make and organize post-disaster recovery plans, including the handling of natural disasters such as floods, landslides, and earthquakes. BPBD Lampung collaborate with some stakeholder including volunteers.

Volunteering means any activity in which time is given freely to benefit another person, group, or organization. This definition does not preclude volunteers from benefiting from their work (Wilson, 2000). Volunteering in disaster management is very important, volunteer itself providing direct assistance to victim of the disaster. Therefore, BPBD Lampung often usually recruiting volunteer during a disaster to help accelerating post-disaster recovery. In managing this volunteering activity, BPBD Lampung still uses conventional methods that are still limited in terms of managing volunteer data, reporting activities, and monitoring volunteer attendance.

According to research conducted by (Fernandez, 2007), Emergency managers need a VMS that will capitalize on the available volunteer resources, while ensuring safety and the responders' ability to effectively perform tasks. Volunteers need a system that will enable them to contribute skills and resources to the response and recovery from the disaster that has affected their lives. A systemic approach to this problem is needed to establish the requirements and manage the associated risks in building an effective and efficient model. In the context of BPBD or Regional Disaster Management Agency, a volunteer management system is essential to

organize and optimize the role of volunteers in post-disaster recovery. BPBD Lampung can use a web based volunteer management system to help the management and coordination of the volunteers in emergency situations.

By using a web based volunteer management system, BPBD Lampung can provide an online platform that allows volunteers to register, fill in personal information and their skills. This will make it easier for BPBD to collect volunteers data, optimized their skills, and plot the right volunteers at right departement in disaster situations.

In addition, the volunteer management system can also make BPBD Lampung assign volunteers efficiently. By considering volunteers' skills, the admin can assign the most suitable assignment to the volunteer. This will optimize the utilization of volunteers' potential and minimize errors or shortcomings in plotting the volunteers.

In terms of monitoring and evaluating volunteer performance, the volunteer management system can provide a reporting feature that allows the coordinator or manager of BPBD Lampung to track volunteer attendance, contributions, and work results. With well documented data, BPBD can recognize and reward volunteers who have performed well and identify areas that still need further support.

In addition, the volunteer management system can also be an effective communication channel between BPBD Lampung and volunteers. Through the notification or messaging feature in the system, BPBD can provide volunteers with the latest information on disaster situations, task directions, or schedule changes quickly and efficiently.

In this research, the author will focus on creating the front-end of a web-based volunteering management system for BPBD Lampung Province using Codeigniter framework while the back-end of the will be created by other student. The focus on the front-end aims to ensure that the user interface built is in accordance with the needs and can facilitate users in accessing information and managing volunteering activities.

Front-end development in a web-based volunteer management system at BPBD Lampung using ReactJS as a framework can provide advantages in developing responsive and interactive user interfaces. ReactJS provides a structured organizational structure, built-in features that are useful in asset management and security, and easy integration with front-end frameworks such as Bootstrap to build an attractive and appropriate appearance.

1.2. Statement of the Problem

Based on the background previously described, the problem formulations of this research are:

1. Designing and developing an effective and efficient front-end system for the Volunteer Management System (VMS) for BPBD Lampung Province using the CodeIgniter framework.
2. Integrating necessary features into the VMS front-end system, such as volunteer management, volunteer assignment, volunteer performance monitoring, and activity reporting.
3. Testing and evaluating the VMS front-end system developed for BPBD Lampung Province using CodeIgniter.

With the formulation of these problems, it is hoped that this research can provide answers and appropriate solutions for BPBD Lampung Province in managing volunteers in post-disaster recovery.

1.3. Limitation of the Problem

Some of the problem limitations taken in this study include:

1. This system is only used for BPBD Lampung Province and cannot be used by other BPBDs.
2. This system only focuses on volunteer management at BPBD Lampung Province and does not discuss other resource management at BPBD.
3. This system only focuses on the front-end aspect and does not discuss the

back end aspect of the VMS at BPBD Lampung Province.

4. This system is only used for activities in disaster management and does not discuss volunteer management in other activities outside of disasters.

With these problem limitations, it is hoped that this research can provide relevant results and focus on the problems faced by BPBD Lampung Province in volunteer management.

1.4. Objective of the Research

The purpose of making a VMS front end system for BPBD Lampung Province using CodeIgniter is to facilitate the management of volunteers registered with BPBD Lampung Province in an activity or disaster management. The specific objectives are to create a system that is easy to use, improve the efficiency and effectiveness of volunteer management at BPBD Lampung Province.

1.5. Benefits of the Research

A The use of the VMS front end system for BPBD Lampung Province using CodeIgniter provides several benefits, namely:

1. Facilitate volunteer management

This system makes it easier for BPBD Lampung Province to manage volunteers efficiently and effectively. BPBD can register volunteers, monitor volunteer attendance, assign volunteers appropriately, and report activities quickly and accurately.

2. Improve the efficiency and effectivity of volunteer management

With this system, BPBD Lampung Province can improve the efficiency and effectivity of volunteer management, so as to accelerate disaster response and minimize disaster damage.

3. Improving the quality of volunteer data

This system can assist BPBD Lampung Province in collecting, storing, and processing volunteer data centrally and accurately, so as to improve the quality of volunteer data owned.

4. Reducing administrative errors

This system can reduce administrative errors because all volunteer data is stored centrally and done automatically by the system, so as to reduce human error in data entry.

5. Provides fast and accurate information

This system can provide fast and accurate information related to volunteer data and activities carried out by volunteers, so that it can facilitate BPBD Lampung Province in making the right decisions.

With these benefits, it is hoped that the VMS front end system for BPBD Lampung Province using CodeIgniter can be a solution for BPBD Lampung Province in managing volunteers better and more effectively.

CHAPTER II
LITERATURE REVIEW

2.1 Previous Research

The purpose of including previous research is to compare between research that has been done before and research that will be done next. In addition, previous research can be a useful reference in conducting literature reviews related to the research being conducted. Some previous studies that are relevant to the current research topic are listed in Table 1. Previous Research.

Table 1. Previous Research

Num	Author	Title	Method
1	(Fernandez, 2007)	Volunteer management system design and analysis for disaster response and recovery	Literature Study
2	(Volunteer Logistics, 2023)	Vicnet Online Volunteer Portal	Case Study

According to research conducted by (Fernandez, 2007), Emergency managers need a VMS that will capitalize on the available volunteer resources, while ensuring safety and the responders' ability to effectively perform tasks. Volunteers need a system that will enable them to contribute skills and resources to the response and

recovery from the disaster that has affected their lives. A systemic approach to this problem is needed to establish the requirements and manage the associated risks in building an effective and efficient model.Research conducted by (Volunteer Logistics, 2023), is an example of research on the development of a web-based Volunteer Management System called VicNet. The purpose of the development is to design a system that can help volunteers and stakeholders. VicNet is the optional module that gives volunteers online access through the web. With VicNet, volunteers can check their schedules, sign-up for schedule openings, update their profile information, post their services, and receive messages from others. Volgistics states that In today's non-profit environments, online access for volunteer managers and their volunteers is critical. For efficiency purposes, allowing the coordinators to manage volunteers online is a must. Many volunteer organizations have a large number of volunteers, and each coordinator may be responsible for managing a considerable group at any given time. With the right online volunteer management system, coordinators can know at a moment's notice which volunteers they have access to and where they are located.This research used an information system design approach and involved collecting and analyzing data regarding the weaknesses of the existing information system, and the design and implementation of a new, more efficient, web-based system. The results of the development of VicNet that has been commercialized have proven to be helpful for coordinators and volunteers in carrying out activities to be more effective and efficient and right on target.

2.2 Badan Penanggulangan Bencana Daerah (BPBD)

Badan Penanggulangan Bencana Daerah (BPBD) according to Law No. 24 of 2007 concerning Disaster Management is a ministerial-level non-departmental government agency responsible for disaster management in Indonesia, especially in the regions. In article 12, it is explained that BPBD has the task of providing guidance and direction for disaster management efforts which include disaster

prevention, emergency response handling, rehabilitation, and reconstruction in a fair and equal manner, in its application BPBD can be assisted by volunteers.

BPBDs have an important role in coordinating disaster management efforts and managing volunteers involved in these activities. BPBDs are responsible for planning, implementing and supervising disaster management activities, including organizing and utilizing volunteers. The BPBD acts as a coordinator between local governments, related agencies and volunteers in disaster management efforts.

BPBD Lampung is one of the BPBD units operating in Lampung Province. Lampung Province is an area that is often affected by natural disasters such as tsunamis, earthquakes, and landslides. Therefore, BPBD Lampung needs to have an effective and efficient volunteer management system to deal with disasters and maximize volunteer participation in disaster management. The volunteer management system in BPBD Lampung is expected to be able to integrate information about registered volunteers, assign volunteers to disaster sites, and monitor volunteer performance in order to support disaster management activities.

2.3 Volunteer Management System (VMS)

Information and communications technology (ICT) is a major enabler of volunteering processes. Volunteer Management System. According to the (UN Volunteers, 2015), is a system that bring together potential volunteers with volunteering opportunities, allowing the scheduling, allocation and execution of tasks, providing communication and coordination mechanisms for collaboration and cooperation and finally, facilitating assessment and motivation strategies

From this understanding, there have been several innovations for volunteer empowerment. In 2007, an initiative called Team Österreich was established in Austria. This form of coordinating and mobilizing volunteers has several positive effects, those people willing to become a member of the team have to undergo an extensive online registration process - having an e-mail address and a cell phone is compulsory. After creating an initial profile they have to fill in their personal data,

their knowledge and skills and must state what kind of contributions they wish to make (e.g. physical work, administrative help, and contributions only in case of disaster).

2.4 Front-End

Data needs to be processed in order to become information. Users certainly want to see information that is concise and easy even though they have a lot of data. From this problem, the front-end can help users to manage data and turn it into an attractive application or website display. Front-End is a part of the website that presents the display to the user (Putri, 2019).An efficient and effective display is a front-end priority that must be met.

Indicators of attractive appearance are very subjective. This is because each person has their own taste and way of enjoying something, to be able to produce a good application or website display, the front-end needs to hold discussions with the User Interface / User Experience (UI / UX) in order to define what kind of appearance is desired and what needs are needed from primary to tertiary. The front-end is responsible for realizing the design that has been made by the UI/UX designer (Nashiruddin, 2020).

2.5 Web-based Application

A web-based application is a type of application that can be run with a web browser. Unlike a traditional website, web applications provide interactive functionality and allow users to perform tasks and interact with dynamic content.Web applications are usually designed to mimic the functionality of desktop or mobile applications while utilizing the advantages of the web platform.Web-based applications have the capability to accept user input, perform complex operations, and store and retrieve data from servers (Amanatidis & Chatzigeorgiou, 2016).

Programming technologies such as HTML, CSS, and JavaScript as well as server-side programming languages such as PHP, Python, and Ruby are used to build web-based applications.In addition, there are technologies and frameworks such as Laravel, CodeIgniter, and Ruby on Rails that can be used to facilitate the development of web-based applications.

2.5.1 HTML

HTML, short for Hypertext Markup Language, is a standard markup language used to create and organize web pages and applications.Typically, HTML is used to organize elements such as headings, paragraphs, tables, and links in web pages.Today, this markup language has become the official standard for the web and is maintained by the World Wide Web Consortium (W3C), which is responsible for releasing regular updates to HTML (Astari S., 2022).

2.5.2 CSS

CSS is short for Cascading Style Sheets.CSS is a style sheet language used to organize the appearance of elements written in a markup language, such as HTML.The main purpose of CSS is to separate the content from the visual appearance of the website. CSS was created and developed by the W3C (World Wide Web Consortium) in 1996 with a simple purpose. At first, HTML had no tags that could be used to format pages (Ariata, 2023).

2.5.3 PHP

PHP, also known as Hypertext Preprocessor, is an open-source programming language popular in web development. Typically, PHP is used in server-side interactions, and it is now compatible with almost all systems (Ayunindia, 2021).

2.5.4 JavaScript

JavaScript is a programming language used by developers to create a more dynamic interaction on a web page, application, server, or game. Web developers generally

use JavaScript followed by HTML and CSS because all three can work together in composing a web (Alexandrea, 2022).

2.5.5 AJAX

AJAX stands for Asynchronous JavaScript and XML. It is a set of web development for building more responsive websites and applications. AJAX allows web pages to update their content without the user having to reload the page (Gudeliauskas, 2023).

2.5.6 jQuery

jQuery is a JavaScript library that simplifies the interaction between HTML/CSS documents, or rather the DOM (Document Object Model), and JavaScript. Its goal is to ease the use of JavaScript in web programming by taking common tasks that require many lines of JavaScript code to accomplish, and wrapping them in methods that can be called with just one line of code. jQuery also simplifies many of the complexities of JavaScript, such as AJAX calls and DOM manipulation (Wesley, 2015).

2.5.7 Framework ReactJS

ReactJS is an open-source library that is utilized for building up the UIs explicitly for single-page applications. ReactJS empowers software engineers to make immense web-application that can use data and can change after some time without reloading the page. Along these lines React has a savvy diffing calculation that it uses to just recover in its DOM hub what should be recovered while it keeps all that else with no guarantees. The utilization of reusable parts gives a simple method of building our application. The brilliant thought of React moreover makes arranging UI reliable and takes a huge weight off from programmers so they could focus on more huge limits and business reasoning. Respond likewise doesn't force a particular method to play out a specific undertaking. It gives a rich arrangement of libraries from which clients can choose to play out a specific undertaking (Rawat & Mahajan, 2020).

React.js is used as a supporting web framework. This is in line according to Fathoni (2018) React.js is one of the most popular web frameworks in the Node.js world, its complete documentation and fairly easy use, can make us develop various products such as web applications or RESTful APIs and can be used as a foothold for building more complex web frameworks. React was developed by Facebook to facilitate developers in creating UI components that are more interactive, stateful, & reusable (Kumar & Singh, 2016). In the MVC (Model, View, Control) rules, React only represents the View part and this is the best part in simplifying the UI components.

2.6 System Development Method Rapid Application Development (RAD)

The definition of Rapid Application Development (RAD) is a linear sequential software development process that emphasizes the development cycle in a short time (S. Aswati, 2016).

Meanwhile, according to Kendall (2010), RAD is an object-oriented approach to system development that includes a development method and software tools. RAD aims to shorten the time usually required in the traditional system development life cycle between the design and implementation of an information system. Ultimately, RAD equally seeks to meet rapidly changing business requirements.

A more specific presentation of the concept is explained by Pressman. RAD is an incremental software process model that emphasizes short development cycles. The RAD model is a "high-speed" adaptation of the waterfall model, where rapid development is achieved using a component-based construction approach. If each project's requirements and scope constraints are well known, the RAD process allows the development team to create a "fully functional system" in a very short timeframe. system" in a very short timeframe (Pressman, 2012).

According to Kendall (2010), there are three phases in RAD as shown in Figure 1 that involve the analyzer and users in the assessment, design, and deployment stages. The following are the application development stages of each application

development phase :

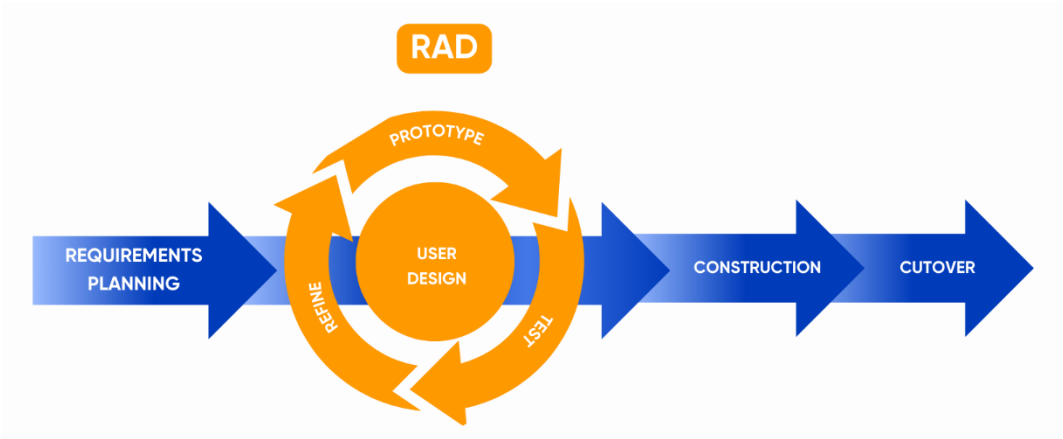


Figure 1. RAD Phases

A. Requirements Planning

During this phase, users and analysts identify the goals of the application or system and to identify the information requirements arising from these goals. The orientation is to solve the company's problems. Although information technology and systems may drive some of the proposed system, the focus will always remain on achieving the company's objectives. remains on achieving company goals .

B. Workshop Design

This phase is a design and refinement phase that can be described as a workshop. Analyzers and programmers can work on building and showing visual representations of designs and work patterns to users. patterns to the user. This design workshop can take days depending on the size of the application to be developed.

During the RAD design workshop, users respond to the prototype and the analyzer refines the designed modules based on the prototype and the analyzer refines the designed modules based on the user responses. If the developer is an experienced developer or user, Kendall argues that this creative endeavor can drive development to an accelerated state (Kendall, 2010).

C. Implementation

In this implementation phase, the analyzer works with the users intensely during workshops and designs the business and nontechnical aspects of the company. As soon as these aspects are approved and systems are built and screened, new systems or parts of systems are tested and then introduced to the organization (Kendall, 2010).

2.7 Testing

At this stage, testing of the new system is carried out and can be used without encountering any constraints. Testing will be carried out using Functional Testing, System Usability Scale and User Experience Questionnaire.

2.5.2 Functional Testing

Functional testing is a software testing method that aims to verify the conformity of the software application or system being tested against the functional requirements specified in the software design. This procedure involves testing a software application or system based on functional specifications to ensure that the application operates as expected (Rafiq et al., 2020). Functional testing can be done manually or automatically.

Automated functional testing is a variant of software testing that uses software tools to automate the execution of functional tests. In automated functional testing, a pre-prepared set of test actions is executed by a software tool. The actions are recorded and predefined, and the results are compared with the expected behavior. The success or failure of the test is reported (Rafiq et al., 2020).

2.5.3 System Usability Scale

System Usability Scale is a measuring tool that assesses usability of a product. There are several characteristics of SUS that make it interesting and different from other questionnaires. First, SUS consists of ten questions, making it relatively quick and easy for respondents to complete. Second, SUS uses technology agnostic,

which means it can be used widely and evaluate almost all types of interfaces, including websites, smartphones, interactive voice response (IVR), systems (touch-tone and speech), TV, etc. Third, the questionnaire results are single value, ranging from a score of 0 to 100, and are relatively easy to understand by various disciplines,both individuals and groups (Brooke, 1996).

2.5.4 User Experience Questionnaire

The User Experience Questionnaire is a UX questionnaire with a fixed number of six scales intended to measure a broad range of UX aspects. The User Experience Questionnaire (UEQ) (Laugwitz et al., 2008) is an established and frequently used questionnaire for the evaluation of the UX of interactive products. The questionnaire consists of 26 items and requires 3-5 minutes to fill it out.

The user experience questionnaire UEQ in its current form appears to be an easy to apply, reliable and valid measure for user experience that can be used to complement data from other evaluation methods with subjective quality ratings.

CHAPTER III
RESEARCH METHODOLOGY

3.1 Time and Place of Research

The research will take place in September-October at BPBD Lampung which is located at Jl. Gatot Subroto No.44, Pahoman, Engal, Bandar Lampung City, Lampung 35123.

3.2 Research Tools

This research will use two types of tools, namely software and hardware. The following are the specifications of the tools that will be used during the research.

3.2.1 Software

In this research the software used is:

a. Operating System : Windows 10 Home Single Language 64-bit
b. Application:

1. Visual Studio Code Version 1.77.0
2. Microsoft Edge Versi 111.0.1661.62
3. Figma
4. Postman

3.2.2 Hardware

In this research, the hardware used is a laptop with specifications:

a. Prosesor AMD Ryzen 5 3500U (8 CPUs), ~2.1GHz.

b. Grafis AMD Radeon(TM) Vega 8 Graphics.

c. Memori 8GB RAM.

d. Penyimpanan SSD 512GB.

3.3 Research Stages

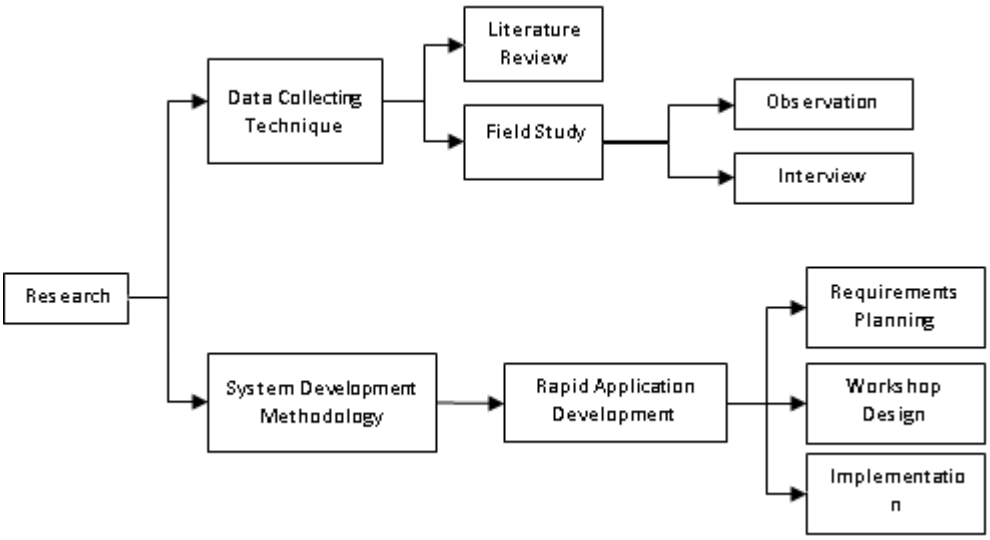


Figure 2. Research Stages

In this research, there are five stages listed in Figure 2, namely Data Collection, Problem Identification, Literature Study, Application of Rapid Application Development Method, and Testing.

3.3.1 Data Collection

Data collection in this study can be grouped into primary data and secondary data.

3.3.1.1 Observation

Observation is carried out to obtain data on activities carried out by BPBD Lampung Province in managing and managing volunteers. Observation is carried out directly when the activity occurs, so that researchers can see and record relevant information.

3.3.1.2 Interview

Interviews were conducted with several related parties, such as BPBD Lampung Province officers, volunteers, and also several organizations related to volunteer management. Interviews were conducted to obtain more detailed information about the problems faced and the expected solutions.

3.3.1.3 Literature Study

Literature study was conducted to obtain information about the theories, methods, and technologies used in the development of volunteer management systems.

3.3.2 System Development Method

The Rapid Application Development (RAD) method is one of the most popular software development methods. This method aims to speed up system development time by reducing the time required for planning and analysis. The following are the steps in system development using the RAD method are .

3.3.2.1 Requirements Planning

At this stage the developer combines reports on the results of field study methods in the form of policies used into a structured specification by using modeling that serves to determine user needs, errors in the old system such as a system that is still manual so the data becomes irregular. From the analysis of the system can set design objectives, and submission of acceptable proposals.

The Requirements Plan for this research is as follows:

Table 2. Requirements Plan

Number	Title	Description
1.	Login Page	Implement a login feature where access rights are restricted.
2.	Dashboard	The dashboard will display some important summary information about volunteer activities
3.	Feature Page	Page The main features of the system include. Volunteer Activities List, Daily Report, Activity Detail, Cash Report, Agenda, Budget Plan and Team Members.

In the Requirements Plan Table 2 obtained from the results of the analysis of website development needs carried out by the developer. The system design is then illustrated using a Activity Diagram with reference to the Requirements Plan which can be seen in Figure 3.2.

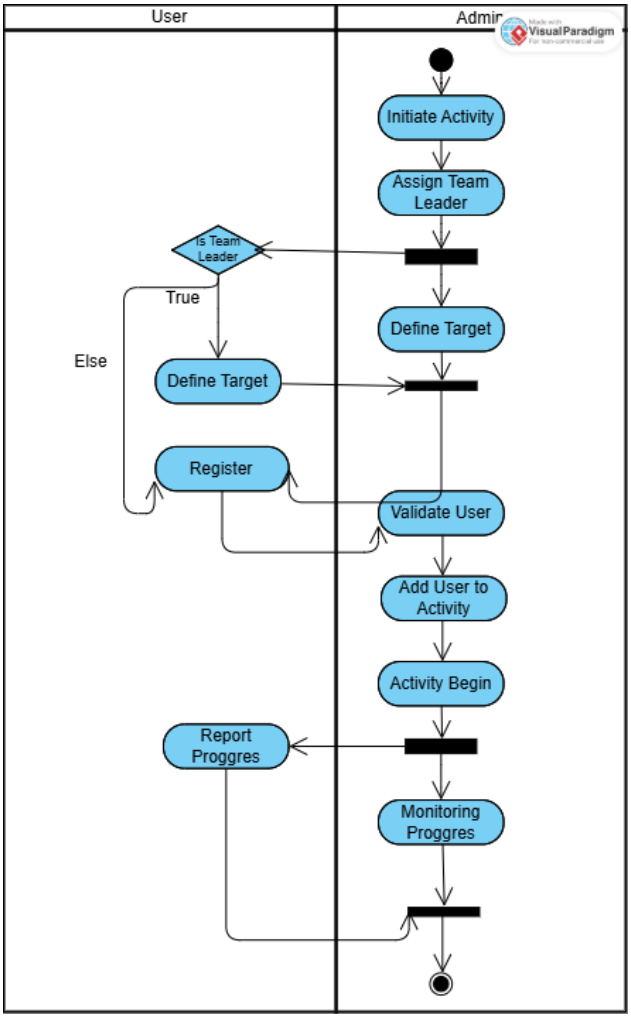


Figure 3. Activity Diagram

Activity Diagram in Figure 3 will be a reference in developing the system in this study.

3.3.2.2 Workshop Design

At this stage the developer designs the interface of the proposed system so that it can run better and is expected to overcome the existing problems.

User interface design is carried out using Figma based on the developer's initial suggestions regarding solutions to existing problems to be discussed again later

User interface design for this system includes :

a. Login Page

Figure 4. Login Page

Figure 4 is a login interface design used for landing page.

b. Dashboard Page

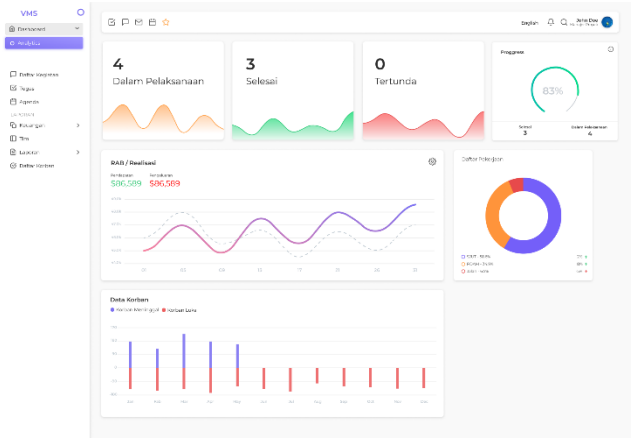


Figure 5. Dashboard Page

Figure 5 is a dashboard interface design that contains information related to volunteer activities.

c. Volunteer Activities List Page

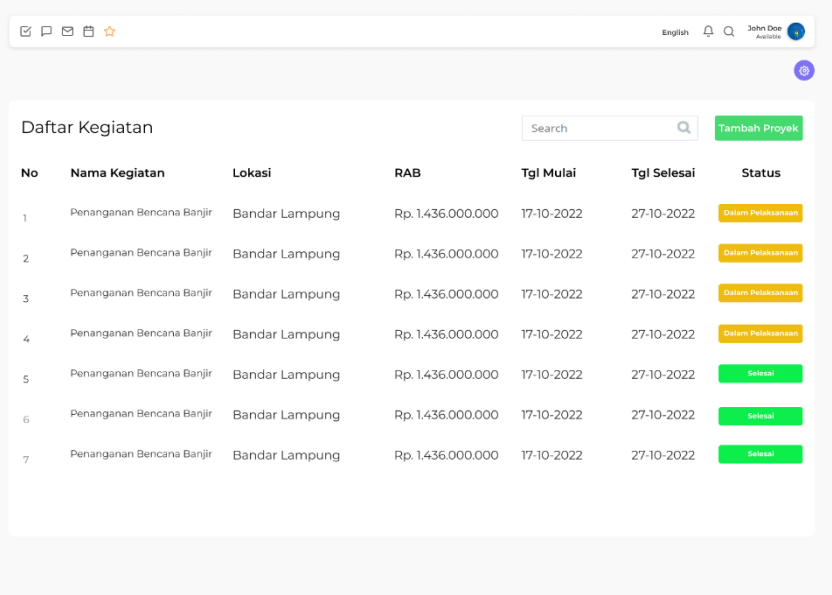


Figure 6. Volunteer Activities List Page

Figure 6 is a list of activities during the volunteer activity, including the start- end date and also the status of the activity.

d. Daily Report Page

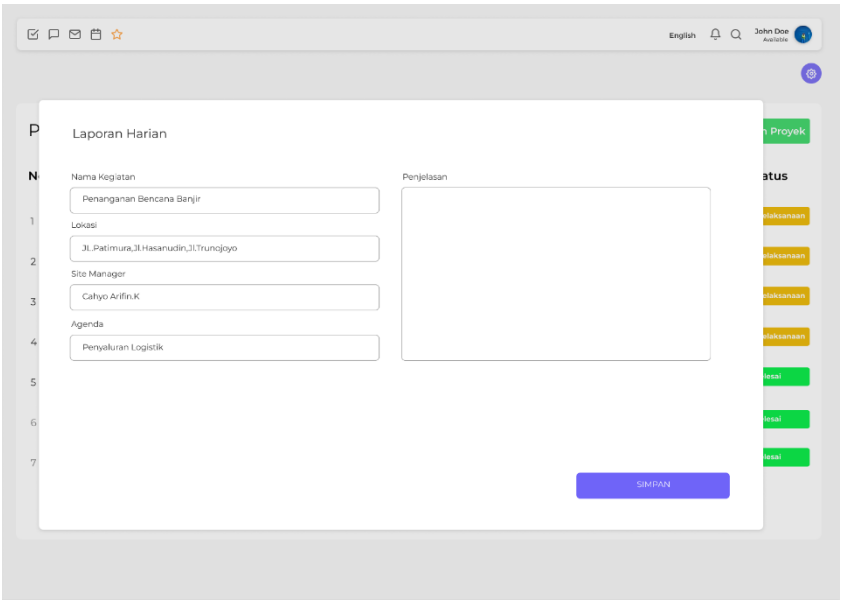


Figure 7. Daily Report Page

Figure 7 is page serves for volunteers to submit daily reports during activities so that they can be monitored.

e. Activity Detail Feature

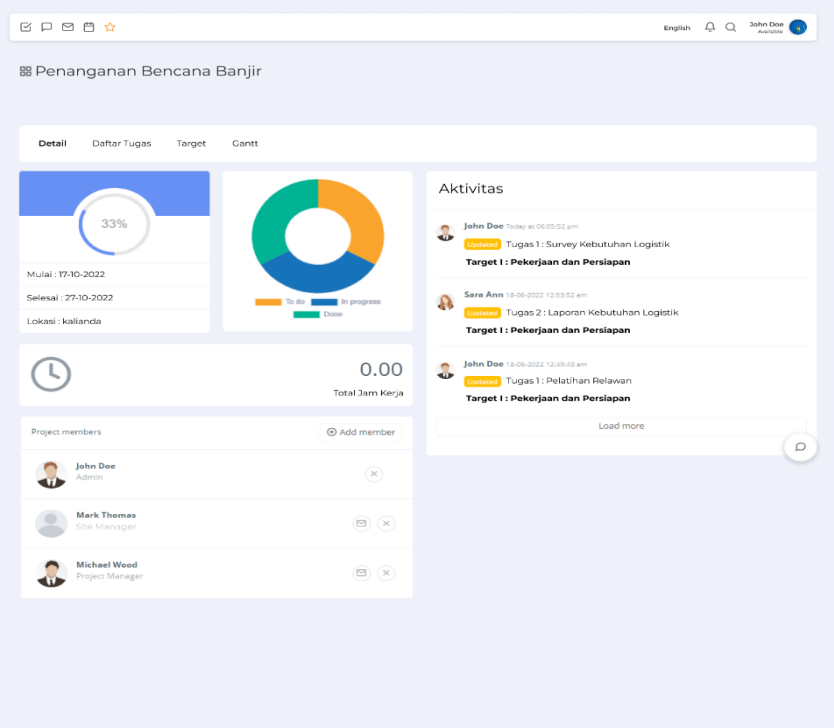


Figure 8. Activity Detail Page

Figure 8 contains a collection of information related to activity details etc., including activity progress

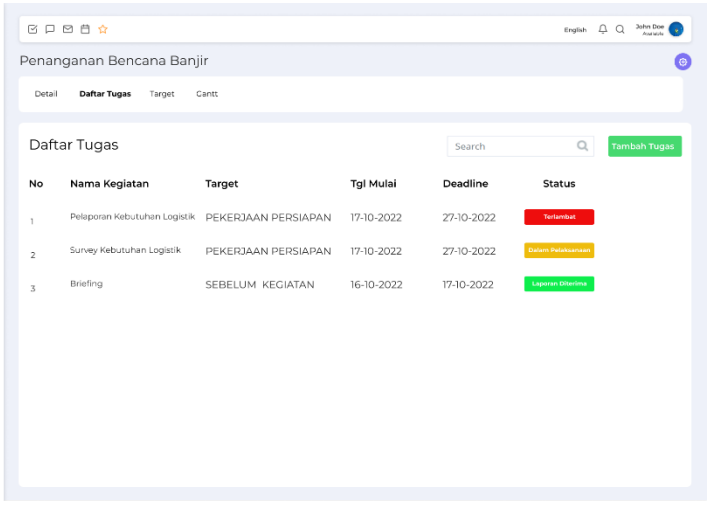


Figure 9. Task List Page

Figure 9 contains a table listing the tasks that the volunteer must perform, the start and end dates and the status of the task execution.

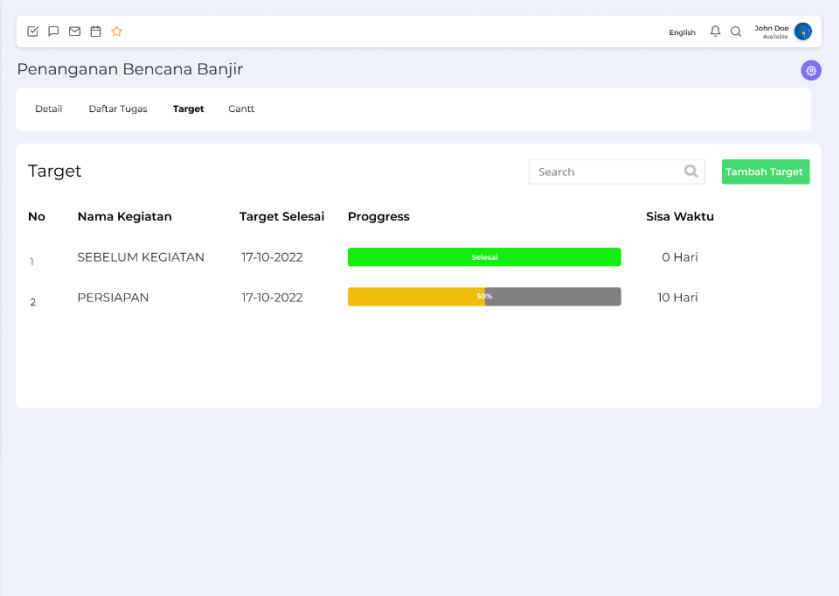


Figure 10. Checkpoint Page

Figure 10 contains activity completion targets, progress and remaining time so that activities can be completed on time.

f. Cash Report Page

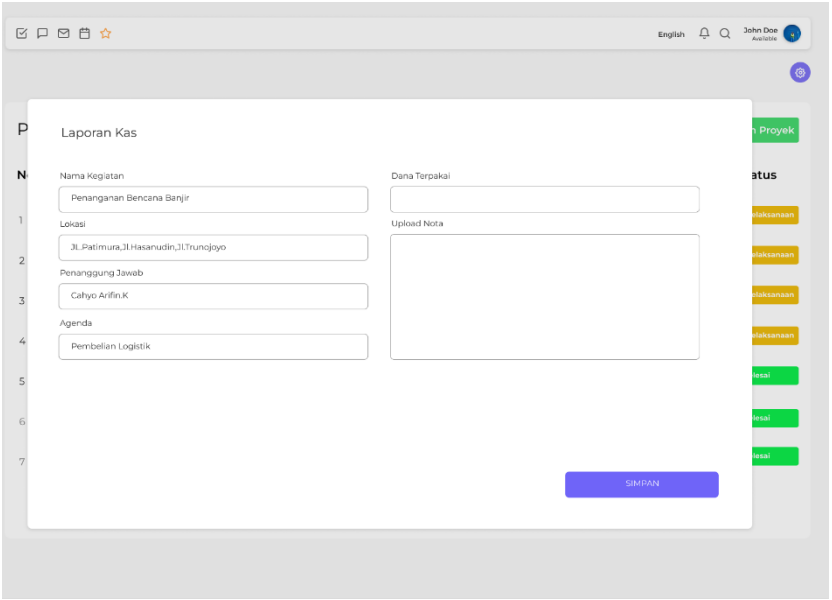


Figure 11. Cash Report Page

Figure 11 contains a form to report the use of cash in volunteer activities

g. Agenda Page

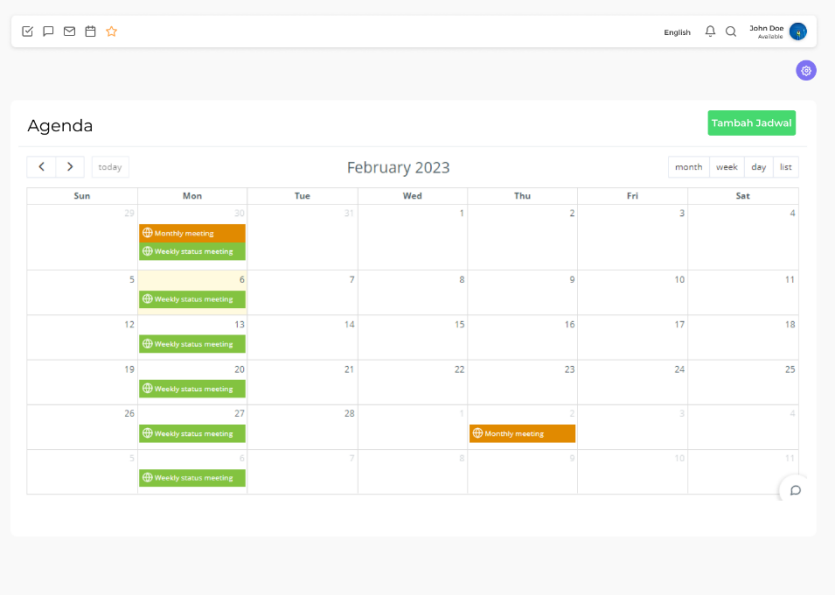


Figure 12. Agenda Page

Figure 12 contains a calendar with activities on each date in the calendar.

h. Budget Plan vs. Realization Feature

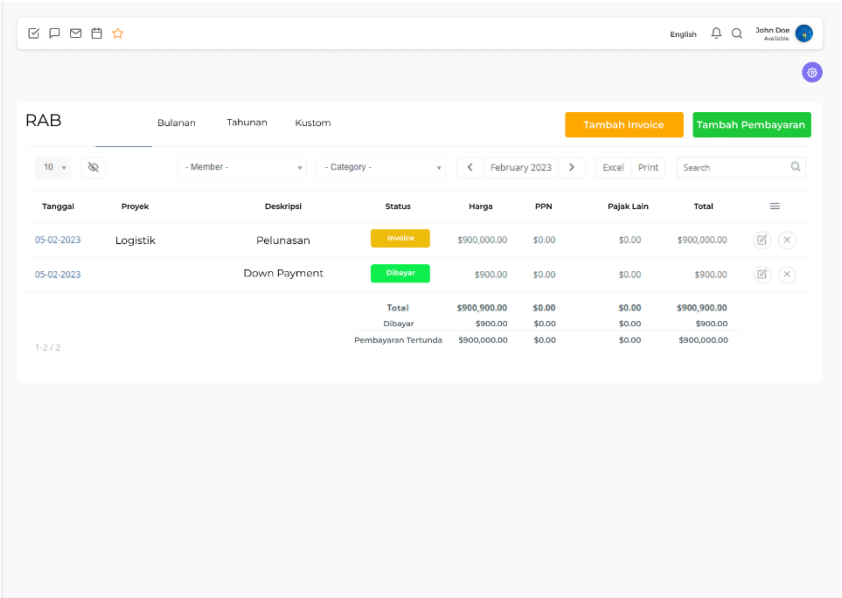


Figure 13. Budget Page

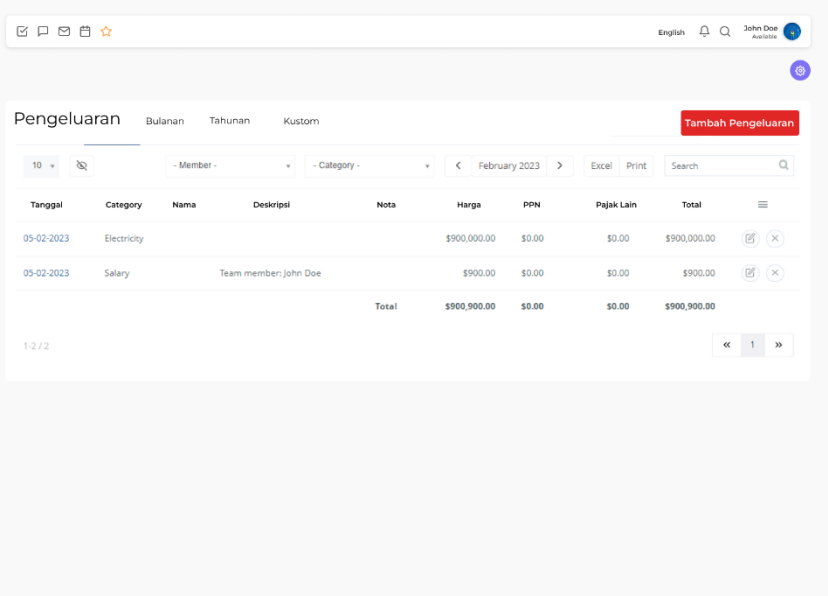


Figure 14. Cash Expenditure Page

Figure 13 and Figure 14 contains a budgeted cost plan and a list of expenses during volunteer activities.

i. Team Members

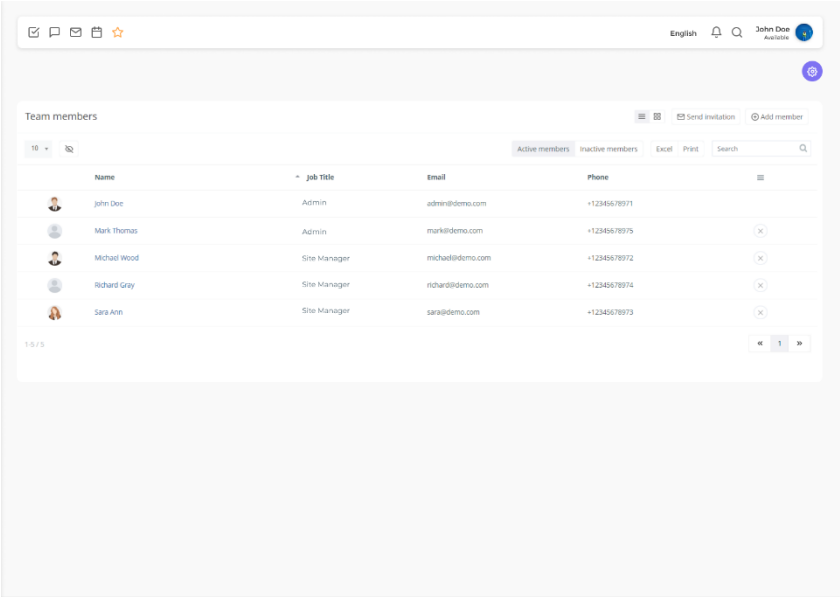


Figure 15. Members Page

Figure 15 contains all team members along with their respective duties and functions.

C. Implementation

After conducting system analysis and system design in detail, the next stage is implementation.

3.3.3 Testing

At this stage, testing of the new system is carried out and can be used without encountering any constraints. Testing will be carried out using Functional Testing, System Usability Scale and User Experience Questionnaire.

3.3.3.1 Functional Testing

Functional testing is done using the React Testing Library. React Testing Library is a set of helpers that let you test React components without relying on their implementation details. This approach makes refactoring a breeze and also nudges you towards best practices for accessibility. Although it doesn't provide a way to "shallowly" render a component without its children, a test runner like Jest lets you do this by mocking. This test aims to ensure that the inner functionality is working properly.

3.3.3.2 System Usability Scale

The System Usability Scale (SUS) provides a “quick and dirty”, reliable tool for measuring the usability. It consists of a 10 item questionnaire with five response options for respondents; from Strongly agree to Strongly disagree. Originally created by John Brooke in 1986, it allows you to evaluate a wide variety of products and services, including hardware, software, mobile devices, websites and applications.

	The System Usability Scale Standard Version		Strongly Disagree				Strongly Agree
			1	2	3	4	5
1	I think that I would like to use this system frequently.		o	o	o	o	o
2	I found the system unnecessarily complex.		o	o	o	o	o
3	I thought the system was easy to use.		o	o	o	o	o
4	I think that I would need the support of a technical person to be able to use this system.		o	o	o	o	o
5	I found the various functions in this system were well integrated.		o	o	o	o	o
6	I thought there was too much inconsistency in this system.		o	o	o	o	o
7	I would imagine that most people would learn to use this system very quickly.		o	o	o	o	o
8	I found the system very awkward to use.		o	o	o	o	o
9	I felt very confident using the system.		o	o	o	o	o
10	I needed to learn a lot of things before I could get going with this system.		o	o	o	o	o

Figure 16. System Usability Scale Table

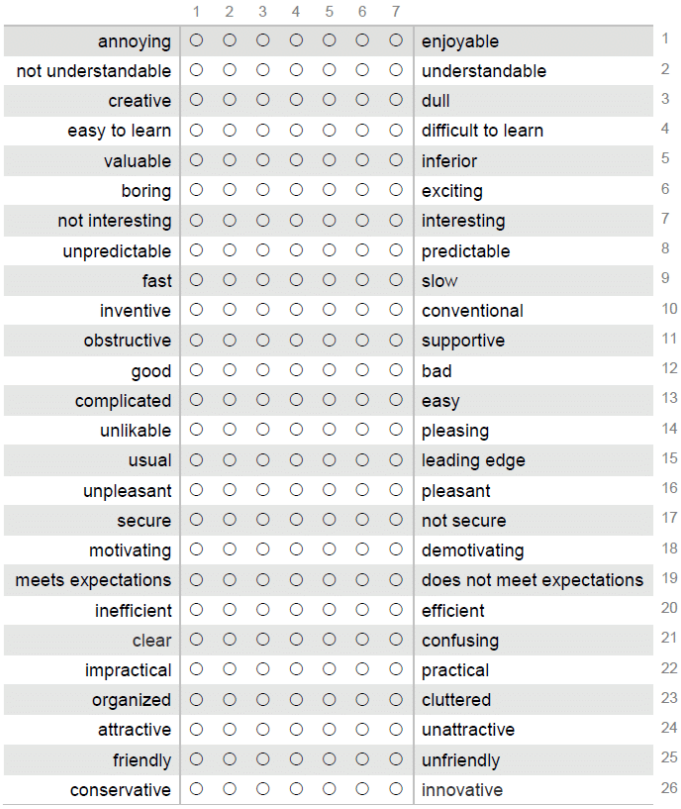
Interpreting scoring can be complex. The participant's scores for each question are converted to a new number, added together and then multiplied by 2.5 to convert the original scores of 0-40 to 0-100. Though the scores are 0-100, these are not percentages and should be considered only in terms of their percentile ranking.

Based on research, a SUS score above a 68 would be considered above average and anything below 68 is below average, however the best way to interpret your results involves "normalizing" the scores to produce a percentile ranking.

3.3.3.3 User Experience Questionnaire

UEQ (User Experience Questionnaire) is an easy and efficient tool or questionnaire to measure User Experience (UX). This UEQ makes it easy to measure UX in an application design.

UEQ itself has 26 questions and 7 answers. These are the list of UEQ:



	1	2	3	4	5	6	7		
annoying	○	○	○	○	○	○	○	enjoyable	1
not understandable	○	○	○	○	○	○	○	understandable	2
creative	○	○	○	○	○	○	○	dull	3
easy to learn	○	○	○	○	○	○	○	difficult to learn	4
valuable	○	○	○	○	○	○	○	inferior	5
boring	○	○	○	○	○	○	○	exciting	6
not interesting	○	○	○	○	○	○	○	interesting	7
unpredictable	○	○	○	○	○	○	○	predictable	8
fast	○	○	○	○	○	○	○	slow	9
inventive	○	○	○	○	○	○	○	conventional	10
obstructive	○	○	○	○	○	○	○	supportive	11
good	○	○	○	○	○	○	○	bad	12
complicated	○	○	○	○	○	○	○	easy	13
unlikable	○	○	○	○	○	○	○	pleasing	14
usual	○	○	○	○	○	○	○	leading edge	15
unpleasant	○	○	○	○	○	○	○	pleasant	16
secure	○	○	○	○	○	○	○	not secure	17
motivating	○	○	○	○	○	○	○	demotivating	18
meets expectations	○	○	○	○	○	○	○	does not meet expectations	19
inefficient	○	○	○	○	○	○	○	efficient	20
clear	○	○	○	○	○	○	○	confusing	21
impractical	○	○	○	○	○	○	○	practical	22
organized	○	○	○	○	○	○	○	cluttered	23
attractive	○	○	○	○	○	○	○	unattractive	24
friendly	○	○	○	○	○	○	○	unfriendly	25
conservative	○	○	○	○	○	○	○	innovative	26

Figure 17. User Experience Questionnaire Question

Unlike SUS, UEQ already has Data Analysis Tools. We only need to collect data from users and then enter it into the Data Analysis Tools that have been prepared. The Data Analysis Tools is available on the official UEQ website.

CHAPTER V
CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The research conducted can be summarized as follows:

1. A Front-End Volunteer Management System has been developed as a website using the ReactJS framework.
2. Users of this system are divided into four roles: admin, volunteer, team leader, and skill coordinator. The admin role can manage skills, activity lists, and users. Volunteers can select activities and manage income and expenses. The team leader and skill coordinator roles have similar access to that of volunteers, but the skill coordinator can fill out daily reports, which are then validated by the team leader. The team leader role can manage targets and validate weekly reports.
3. The system development was carried out using the RAD (Rapid Application Development) method.
4. The Disaster Volunteer Management System was tested using Functional Testing, System Usability Scale (SUS), and User Experience Questionnaire (UEQ), achieving favorable results and evaluations.

5.2 Recommendations

Based on the series of processes carried out, several recommendations for future research have been identified. These recommendations are as follows:

1. Develop additional modules for users and admins.
2. Implement preview and PDF document download features.
3. Expand the system to an Android-based platform to facilitate greater ease of use for users.
4. Develop features for volunteer distribution management.

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