HELP FLOOD VICTIM: A REAL-TIME DATASET-DRIVEN WEB APPLICATION TO ASSIST FLOOD VICTIMS ON REAL-TIME INFORMATION

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FINAL YEAR PROJECT REPORT SUBMITTED TO MEET THE REQUIREMENTS TO OBTAIN A BECHALPR OF EDUCATION DEGREE (EDUCATION SOFTWARE ENGINEERING) WITH HONORS

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ABSTRACT

To assist flood-prone areas, especially in Malaysia's state of Kelantan. This research focuses on developing the web application HELP FLOOD VICTIM. Monsoon season flooding in this location is severe and results in major loss of life and property damage. The study aims to identify crucial flood information needed by victims, create a prototype of the HELP FLOOD VICTIM web application and evaluate its usability. By providing accurate flood data, the web application enhances early detection and prediction of flood events and improves overall preparedness among affected communities. The methodology employs evolutionary prototyping to ensure a clear and efficient development process. Usability evaluation, conducted using the System Usability Scale (SUS), yields a satisfactory score indicating the system's usefulness and user-friendliness. This research emphasizes the significance of technology in assisting with disasters as well as the need for feedback from users in improving the HELP FLOOD VICTIM system going forward.

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CHAPTER 1

INTRODUCTION

1.0 Introduction

Malaysia is a country with an equatorial climate that is hot and humid throughout the year. Every year starting from November until March, Malaysia will be facing the monsoon season. Among the states involved in disasters during this monsoon season are states on the east coast such as "Kelantan ", "Terengganu" and "Pahang". In 2014 the massive flood that hit Kelantan was the worst in the history of the state confirmed by the National Security Council. According to the council's report, the water level of Sungai Kelantan at Tambatan DiRaja, which has a danger level of 25 metres, reached 34.17 metres last month compared to 29.70 metres in 2004 and 33.61 metres in 1967. (Azlee, 2015). Floods are natural disasters that can cause loss of lives and damage to property, infrastructure and land. In developing countries like Pakistan, floods cause huge damage to agricultural resources along with the loss of lives of people and animals. This results in huge economic losses. (Suliman Munawar, 2020). Therefore, to reduce the rate of destruction of property and lives, a system needs to be developed to assist these victims in always getting information and preparing to face floods. Therefore, the researcher has researched to develop a web application called Help Flood Victim to distribute the most recent flood information to flood victims.

Figure 1.0: Logo of HELP FLOOD VICTIM

1.1 Background Research

Information about floods must be spread widely to alert the general public to the danger. Flood victims will find the information provided to be very helpful. So that the knowledge could help in their disaster preparedness. They can start preparing ahead of time to minimize the impact that they will experience. According to Alias (2020), the success of disseminating flood warnings to the general public depends heavily on the distribution medium that was used, with significant variations in how well the general public responds to warnings via various media.

Other than that, efficient flood management can assist in minimizing all the impacts that will be faced. Throughout the four stages of disaster management- risk reduction, preparedness, response, and recovery information systems assist people in capturing, exchanging, and processing disaster-related information. (Sakurai & Murayama, 2019)

1.2 Problem Statement

Floods have the worst effect on a person's life, according to the research, which also discovered several other issues. Floods are an unpredictable disaster. In addition, the impact of floods is also difficult to predict by any other system. Floods continue to impact people and have destructive effects on life, properties, and infrastructure (Ibrahim et al., 2021).

The second problem that researchers found is the slightness of knowledge about floods in several areas even though they experience flooding every year, some areas are not affected by flooding. However, there was a time when a flood unexpectedly hit the area they lived in. Due to their lack of prior flooding experience, some victims are left unsure of how to handle the risk of flooding. Based on the statement from Clar et al (2023) said that there are people still lacking in-depth knowledge about flood trends, challenges, abilities, and plans to manage flood risk. This proves that flood trends are difficult to predict.

The third problem that researchers found is a lack of management to decrease the flood impact. According to the statement, flood vulnerability assessment is critical to understanding how floods affect infrastructure and communities and what mitigation strategies and measures are appropriate to take place to minimize the negative impacts (Alabbad et al., 2023). This occurs as a result of poor drainage and drainage system management in a neglected area. When monsoon floods come, the floods get worse since the drainage and drainage system fails to be maintained. In addition to extremely heavy rains,

one of the reasons Terengganu experiences major floods is the state's poor drainage system. Prof. Dr Hafizan Juahir, director of the East Coast Environmental Research Institute (ESERI) at Sultan Zainal Abidin University (UniSZA), stated that the existing drainage system did not meet the requirements for usage in a residential area development (Kamaruddin, 2022).

Thus, there are many strategies to stop the problem from occurring. One of the solutions is to figure out what information the victims need, develop a system that can help the victims acquire flood information, and test the system's level of usability to the victims.

1.3 Research Objectives

The main intention is to meet the goals as follows:

- To identify the most required flood information needed from flood victims to prepare for the flood season.
- To develop a prototype of HELP FLOOD VICTIM that can assist victims receive the latest flood information.
- To evaluate the usability of the HELP FLOOD VICTIM to users.

1.4 Research Questions

During the study, the researchers aimed to identify flood information that is required. The research question is detailed below:

RQ 1: What is the most required flood information needed from flood victims to prepare for the flood season?

RQ 2: How to develop a prototype that can assist victims in receiving the latest flood information?

RQ 3: How to evaluate the usability of the system to the users?

1.5 Scope

HELP FLOOD VICTIM is a web application that displays flood information that can assist flood victims in being ready for the flood season. The main content of HELP FLOOD VICTIM is live radar satellite maps, weather forecasts, awareness, and flood information. Based on the content, the function in the HELP FLOOD VICTIM enables users to access the most recent flood information, awareness, help contact numbers, and weather forecasts. Not

only that, users are also able to get flood alerts. The target users for this web application are flood victims from the state of Kelantan

1.6 Significance of Study

The project carried out gives importance to flood victims in the state of Kelantan. This is because this project provides useful benefits, where it can convey more accurate information about flood information to victims. Accurate flood information allows the early detection and prediction of flood events. By having precise information, people can make informed decisions about their safety and actions to protect their property.

In addition, this project can help victims to find a temporary flood evacuation centre easily and quickly. Contact information can assist people to be aware of potential dangers and how to evacuate. This research will be carried out as a web application that helps all the flood victims to be more informed about flood information needed.

1.7 Operational Definition

1.7.1 Flood

A flood is a natural disaster that occurs when an overflow of water submerges land. The damage caused to a property is dependent on the flood characteristics, in terms of depth, velocity flow, contaminant content, and time duration (Proverbs & Soetanto, 2004).

1.7.2 Flood information

Flood information is information related to the risk driver information and associated uncertainty that can ensure that decision-makers are fully aware of their risks (Cooper et al., 2022).

1.7.3 Flood management system

Flood Management systems comprise human, man-made, and natural assets with associated procedures. They rely on some people (human assets) who design, construct, commission, operate, inspect, and maintain the man-made and natural assets water monitoring, water-retaining, and water-control assets (Ferrier & Jenkins, 2021).

1.7.4 Weather forecast

The Weather forecast is used to predict atmospheric conditions such as rain, wind, heat, pressure, humidity etc. It is very useful, especially in agriculture, air traffic, and military purposes (Mahmood et al., 2019).

1.8 Conclusion

In conclusion, flood information can assist flood victims to become more informed and alert about the flood situation. The beginning of the development of this project is gathering all the requirements from the flood victims. It is important to explore the important information that the victims need. From that, the HELP FLOOD VICTIM can be designed and developed.