DavOr: DISASTER MONITORING AND REPORTING SYSTEM

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APPROVAL SHEET

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ABSTRACT

Roniel P. Moreno, Jeffymore M. Bantayan, Jadeboy B. Macabidang, and Henth P. Faustino. "DavOr: DISASTER MONITORING AND REPORTING SYSTEM." (BSIT Capstone Project). Davao Oriental State University, December 2021.

Adviser: **Jhon O. Inoco**

In Davao Oriental, many disasters were listed, such as floods, landslides, earthquakes, fires, and typhoons in different provinces. This capstone project aims to develop a monitoring and reporting system that monitors and reports a disaster incident in Davao Oriental. The Davao Oriental Disaster Monitoring and Reporting System is a web-based system that monitors disaster events in the area. In detail, the project aims to (1) design and develop a system that monitors and reports a disaster incident on Davao Oriental premises, (2) provide information and emergency hotlines in every area where a community can communicate during a disaster, (3) provide a web push notification to notify users to receive the latest updates, (4) provide a preparedness plan before, during, and after a disaster. The AGILE approach was used to implement the project. The web-based application was able to function correctly during the user testing process. The selected users agree that the web-based application is functional, reliable, usable, maintainable, and portable. The functionality has an average of 4.5; reliability has 4.7, usability has 4.7, efficiency has 4.7, maintainability has 4.8, and portability has 5.0, with an overall rating of 4.7, and complies with the ISO 9126-1... This project has been carried out to minimize potential losses from hazards, provide timely and appropriate assistance to disaster victims, and reassure a faster and more efficient response. Although the Davao Oriental: Disaster Monitoring and Reporting System can operate correctly in accordance with the design specifications, the web-based program still needs more modifications and optimizations to reach its full potential.

Keywords: Disaster, monitoring, reporting, disaster classification, web-push notification

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CHAPTER I
INTRODUCTION

1.1 Rationale

When disaster strikes, many of us will panic, and also, some businesses immediately risk never restarting especially if there is no action plan in place. A catastrophe is an unexpected, significant occurrence that substantially impairs the ability of a community or society to operate and results in losses to people, property, or the environment that are more than what the community or society is able to recover from utilizing its resources. Disasters can have human causes, even though they are frequently caused by nature. (IFRC, n.d.). An effective disaster management system will help the community. Disaster management is critical for survival in a natural or artificial disaster. It is defined as the organization and management of resources and responsibilities for dealing with all humanitarian aspects of emergencies, specifically preparedness, response, and recovery, to lessen the impact of a sudden disaster.

Natural calamities often strike the Philippines." listed some of the significant catastrophic disasters in the country. These are typhoons, earthquakes, tropical cyclones, volcanic eruptions, and other natural disasters that the country hit in the past decade, where deaths and damage, and loss of resources were devastated (Deutsche, 2013). In Davao Oriental, many disasters were listed, such as floods, landslides, earthquakes, and typhoons in different provinces.

1.2 Purpose and Project Description

This project was conducted to prevent or avoid possible losses from hazards, provide fast and appropriate support to disaster victims, and ensure a quicker and more

efficient response. The Davor: Disaster Monitoring and Reporting system aims to limit disaster impact, respond during and quickly after a disaster, and take actions to recover after a disaster. The project aims to alert the people of Davao Oriental through Web Push Notifications and web publications. The Davao Oriental Disaster Monitoring and Reporting System (DMRS) is a sustainable arrangement for systematically gathering, reporting, and analyzing disaster-related losses.

1.3 Objectives of the Study

The objective of this project is to design and develop a system that shares information, preparedness and publishes information content where disasters hit some areas or the municipalities of Davao Oriental that will also reduce and avoid the potential losses from various disasters; this project aims to:

1. design and develop a system that monitors and reports a disaster incident on Davao Oriental premises
2. provide information and emergency hotlines in every area where a community can communicate during a disaster.
3. provide a Web Push Notification to notify users to receive the latest updates.
4. provide a preparedness plan before, during, and after a disaster.

1.4 Significance of the Study

This study has a significant impact on people in the Province. Many sites provide such content, while this is for the specific areas or localized covered by the Province. Benefiting the study are the various sectors as follows:

The Constituents & Coordinator. Residents and coordinators should also be observed, as people who have stayed and coordinators who have worked at this institution are specific that they would be safe and informed of what has occurred in their environment.

1.5 Scope and Limitation

The study includes detailed information on the disaster-hit in Davao Oriental, which will help the residents who worked in the institution know and be aware of the Disaster within the area. The implementation of the system is bounded to the following scopes:

- The specifications will be identified into four: types of Disaster, place of incident, date, and time.
- After publishing information, the system has Web Push Notifications to notify its user when using the internet.
- The system is intended to provide information about the disaster incident in a specific area and give a list of organizations to contact. Alerting the community if the Disaster occurs and posting an available place to evacuate.

On the other hand, the limitations of the study are:

- Only the user can receive Web Push Notification when subscribed.
- If the signal is poor, most remote areas will not access the Website.

1.6 Conceptual Framework

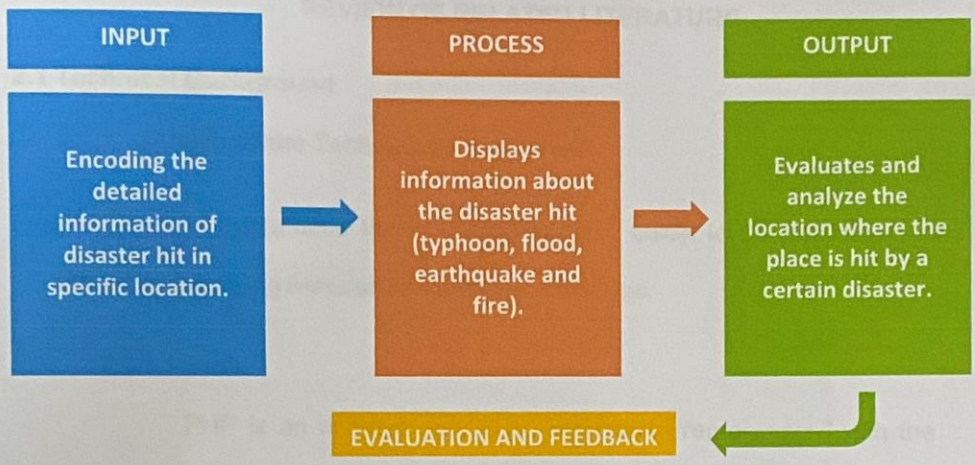

Figure 1.1 Conceptual Framework

Figure 1.1 shows the operation of the web-based system. It should put detailed information about the Disaster hit inside and outside near the campus and put the specific location, then evaluate and analyze the site to display the data where the Disaster struck in the area.

1.7 Definition of Terms

Admin -	the one in charge of publishing disaster information to the system
User	is a person who has subscribed to the system.
Web-Push Notification	a notification that a user might get upon publication of disaster information via desktop and mobile web.
Disaster	is a serious hindrance to a community's ability to function that exceeds its capacity to cope using its own resources.
Catastrophe	an occurrence resulting in severe and frequently rapid destruction or suffering; a disaster.

CHAPTER II

REVIEW OF RELATED LITERATURE

2.1 Technical Background

2.1.1 Details of the Technology to be used

The developers used the technological tools below to develop the system and formulate satisfying features to match the objectives.

2.1.1.1 PHP

PHP is an acronym for "PHP: Hypertext Preprocessor," with the original meaning of the term "Personal Home Page" within it. Since its introduction in 1994, the acronym has altered to better appropriately represent the essence of the phrase as the language has evolved. Due to the numerous advantages, it provides consumers and developers, PHP has maintained its popularity as a programming language for over three decades. (Code Institute Global, 2022).

2.1.1.2 WordPress

A website that makes use of the content management system (CMS). An open-source content management system is WordPress (CMS). It's a well-liked tool for those who wish to create websites and blogs but have no coding skills. (Price, 2022)

2.1.1.3 SQL

The most popular language for extracting the data and organizing data from relational databases is SQL. A table with rows and columns is what a database is. The language of databases is SQL. (Gupta,2021)

2.2 Related Literature

2.2.1 Disaster

A disaster or catastrophe is a sudden, catastrophic event that causes significant damage to a community or civilization and causes losses to people, property, the economy, or the environment that surpass the community's or society's ability to deal with its resources. Disasters can have human causes, even if they are often caused by nature (IFRC, 2021). Hazardous occurrences interact with exposure, vulnerability, and capacity conditions, resulting in one or more of the following: harm to people or property; financial loss; harm to the environment; and consequences (UNDRR, 2020). When the needs of the affected community exceed the resources that are available due to an unexpected tragedy, a disaster arises. Nearly every day, a calamity strikes somewhere else, yet these occurrences' scope, scale, and context vary greatly. Large-scale disasters that result in many casualties are uncommon (Furin, 2018). A catastrophic disaster is not always the result of a hazardous event. Much may be done to limit population exposure and susceptibility in locations where natural hazards occur frequently or infrequently. We can decrease existing risk, avoid future danger, and strengthen resilience and societies in the face of danger that cannot be successfully controlled (UNDRR, 2017).

2.2.2 Disaster Monitoring and Evaluation

Natural catastrophes have become more numerous in recent years, resulting in enormous loss of human life and the devastation of physical capital. Natural disasters are predicted to cause more upset and destruction due to climate change and our modern society's greater disaster exposure and vulnerability (Panwar & Sen, 2018).

For all hazards, economic damages from disasters such as earthquakes, tsunamis, cyclones, and flooding are currently averaging US$250 billion to US$300 billion per year. Future losses (anticipated annual losses) from earthquakes, tsunamis, hurricanes, and flooding in the built Environment are presently estimated to be around US$314 billion. The yearly amount that countries should set aside to offset disaster losses in the future (PreventionWeb, 2015).

Recent advances have centered on empirical research and modeling expansions and changes to meet catastrophic scenarios. This tendency is attributable to greater data availability on catastrophe damages and losses and expanded multidisciplinary disaster research efforts, including sociology, economics, and psychology. Nevertheless, the uniqueness of each hazard and its harms and consequences offer significant problems for catastrophe economic modeling; many topics, such as the handling of time, geography, and counteractions, remain unresolved. This special issue gathers new approaches in financial modeling for disaster effect assessments, some of which expand and supplement the present state-of-the-art socioeconomic catastrophe modeling (Okuyama, 2007).

In recent decades, input-output (I/O) economic models have played an increasingly important role in catastrophe effect analysis and resilience assessment.

They catemphasizee the distinction between direct financial losses and ripple effects created within a multi-industry system due to disturbances and are based on general equilibrium theory and economic production theory. Thus, empowering the I/O analysis approach and overcoming its inherent constraints is critical for effectively new catastrophe assessment issues such as multi-regional loss quantification and shock response study in global supply chains (Galbusera & Giannopoulos, 2018).

Many studies have used input-output analysis to quantify and analyze the economic consequences of catastrophes, owing to its capacity to represent regional economies' structure accurately. While they provide valuable information about economic impacts and products, as well as resource allocation strategies to minimize losses and effects, many of these studies have failed to investigate the dynamic nature of impact path space and time, owing to the difficulty in obtaining such data, as well as the static nature of the input-output Framework (Okuyama, 2004).

Direct damage produced by earthquakes, such as collapsed buildings, may interfere with routine company operations and interrupt the industrial chain's performance. The input-output analysis can be used to assess such economic consequences. The Hsinchu Hsincheng and Yilan Nan-ao earthquakes in northern Taiwan are replicated with a return time of 475 years. According to the findings, the economic effect of the Hsincheng earthquake is more significant than that of the Nan-ao earthquake, which should be the primary scenario considered for the disaster reduction plan. Manufacturing, culinary services, entertainment, storage, retail commerce, and public and construction industries are the most impacted. The Nan-ao earthquake causes excessive damage to the foodservice and entertainment industries. The loss to the industrial sector and its effects are massive. As a result, the government should prioritize the manufacturing industry to undertake earthquake mitigation measures, such as seismic retrofitting, or offer a seismic evaluation that allows businesses to engage in mitigation freely (Lin et al., 2011).

For a long time, macroeconomic models such as the input-output model, the social accounting matrix, and the computable general equilibrium model have been used to assess the effect of catastrophic events. Such models, in particular, may be

used to immediately give an approximate assessment of the system-wide impact on recovery planning and financing and evaluate catastrophe countermeasures in the pre-event period (O & Sen, 2018).

The Inoperability Input-Output Model, which provides a comprehensive database and modeling framework to assist the study of interdependent regional economies, is central to the problem's preparation. It provides a fast, low-cost, all-encompassing technique for evaluating economic consequences and sector interdependencies. It may be a part of a more comprehensive multi-objective decision model to examine the decentralized strategic preparation process. It develops a generic ability to quantify system trade-offs between preparedness decision objectives by embedding it in a multi-objective risk management model for strategic preparation (Crowther, 2008).

For the first time, the entropy technique was used to improve the complete disaster index effect model and apply it to tropical storm catastrophe assessment. The three catastrophe indicators were used to quantify economic losses: the area of impacted crops, the number of fallen structures, and direct financial losses (Chou et al., 2020).

2.3 Related System

The following are the related system of the proposed project. The system provides managing the records and provides information.

2.3.1 DesInventar Disaster Information Management System

The main features of this system are that it facilitates the systematic gathering, documentation, and analysis of disaster-related data. The information includes mapping and temporal data, events and causes, and direct and indirect impacts (United Nations Office for Disaster Risk Reduction, n.d).

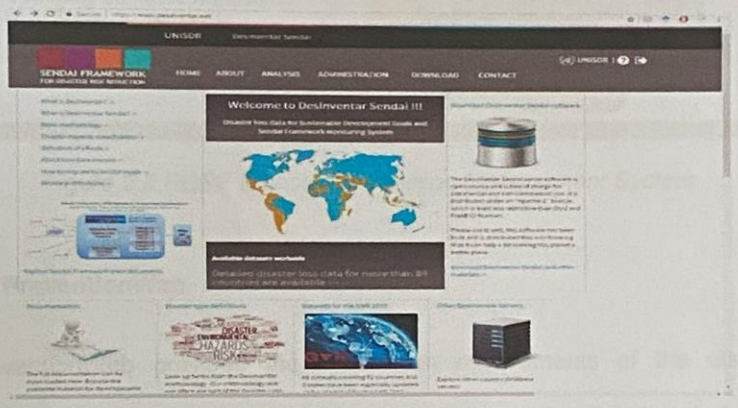

Figure 2.1 DesInventar Disaster Information Management System

2.3.2 PDRF Disaster Information System

The main features of this system are integrating all disaster management information that is reliable, accurate, and timely. The DIM System uses ESRI's HANDA (Hazard and Disaster Analysis for Business Resilience) modified ArcGIS Online platform. PDRF-HANDA is an integrated platform that eliminates waiting time and focuses efforts on assisting member companies in assessing and reducing their risk before disasters occur. These businesses can also use the platform to arrange relief and rehabilitation initiatives for their business continuity strategies and programs (Philippine Disaster Resilience Foundation, 2021).

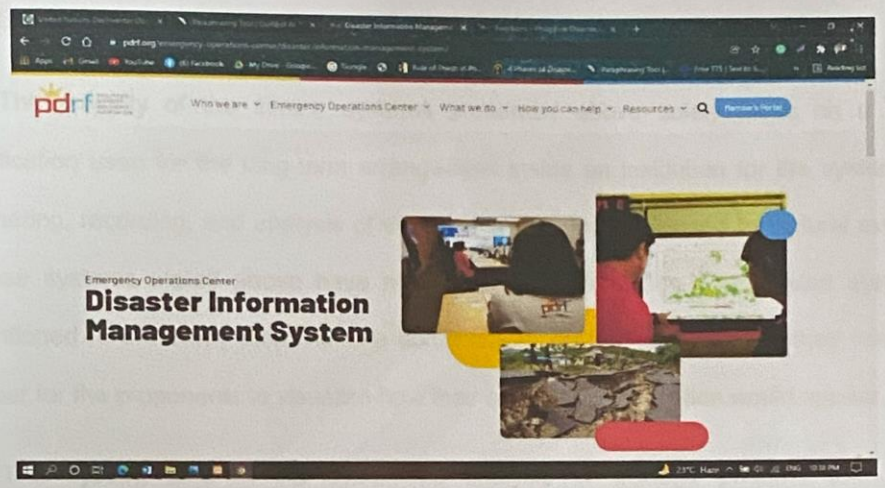

Figure 2.2 PDRF Disaster Information Management System

2.3.3 PreventionWeb

PreventionWeb provides the information requirements of the disaster risk reduction community, including the establishment of collaborative information-sharing platforms. PreventionWeb is the primary information management site for disaster reduction (UNDRR, 2022).

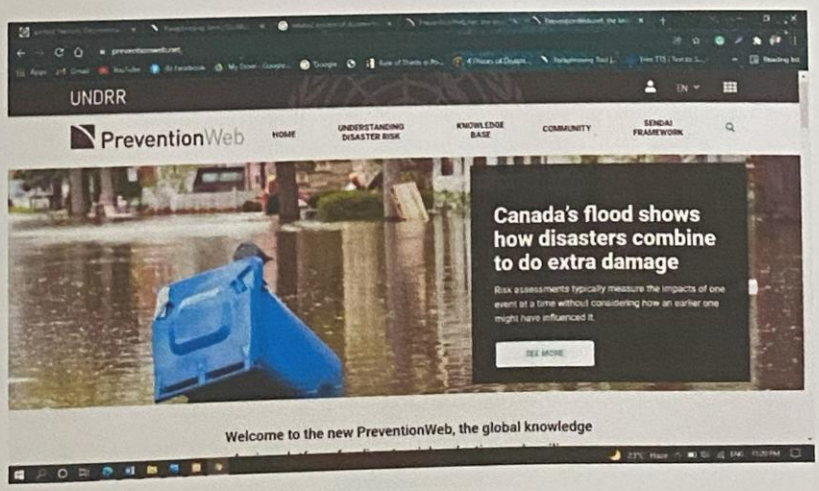

Figure 2.3 PreventionWeb

2.4 Synthesis

The majority of the similar systems presented above solely focus on a Web application used for the long-term arrangement inside an institution for the systematic gathering, recording, and analysis of data concerning losses caused by natural events. Those systems stated above have nearly identical processes. The related systems mentioned in the study also made a considerable contribution because they made it easier for the proponents to visualize how their suggested application would appear.

The system aids in the systematic analysis of disaster patterns and their consequences. More excellent prevention, mitigation, and preparedness strategies may be developed to lessen the impact of disasters on communities with a better understanding of catastrophic trends and their consequences. Our approach differs from the other systems because we have an alert notification

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CHAPTER III

METHODOLOGY

3.1 Software Methodology

3.1.1 Agile Development Life Cycle

The suggested system's overall structure will be based on software development methodology. The researchers will use it as a roadmap to follow the entire software engineering process.

The proponents use the new software development methodology known as agile methodology, as shown in Figure 3.1. This attempts to develop the system incrementally by building a series of prototypes and constantly adjusting them to user requirements. It emphasizes continuous feedback, and each incremental step is affected by what was learned in the initial stages of development. The phases of this model include requirements plan, design, development, test, relevant se, and feedback.

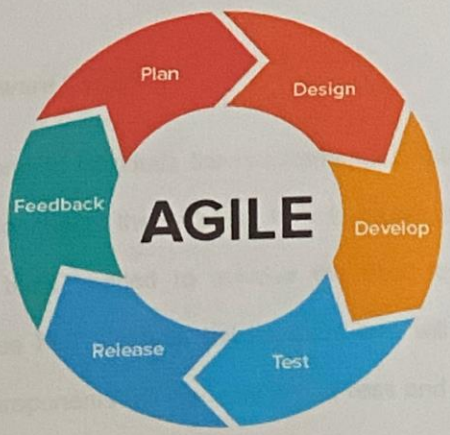

Figure 3.1 Agile Development Life Cycle

The Agile software development methodology is one of the simple yet effective ways to deliver a great product on the market. And yet, somewhere along the way, people started to complicate it. Properly implemented Agile is fast, flexible, error-proof, and a better way to manage software development teams.

3.1.1.1 Phase 1: Plan Phase

In this phase, proponents will gather initial requirements and can start designing the proposed system. The proponents create the initial documentation to list all initial requirements needed in developing the proposed method. The proponents will gather sufficient information about the Disaster in Davao Oriental and browse the Internet for data gathering.

3.1.1.2 Phase 2. Design Phase

This phase shows the system's design based on the gathered data and studies the information in the analysis phase. A database design and data structure design are required. Proponents will start to develop strategies for their proposed system.

3.1.1.2.1 Software Design

The proponents introduce the requirements created during the previous stage. The proponents then discuss how to tackle these requirements and propose the tools needed to achieve the best results. The proponents decided to use PHP for web development and will use Visual Studio for coding. The proponents will also use WordPress and JavaScript frameworks and libraries. The proponents will use MySQL for Database Server.

3.1.1.2.2 UI/UX Design

This phase is about writing code and converting design documentation into the existing software within the web development process. The proponents used Visual Studio and XAMPP to develop the disaster reporting monitoring system. The researchers used PHP, CSS, HTML, and JavaScript for the languages. They also use Frameworks like Bootstrap.

3.1.1.3 Phase 3. Develop Phase

This phase is about writing code and converting design documentation into the existing software within the web development process. The proponents used Visual Studio and XAMPP to develop the disaster monitoring and reporting system. The researchers used PHP, CSS, HTML, and JavaScript for the languages. They also use Frameworks like Bootstrap.

3.1.1.4 Phase 4. Test Phase

This phase ensures that the proposed system is bug-free and compatible with everything else that the proponents have written before. During the further iterations of this SDLC stage, the testing becomes more involved. It accounts not only for functional testing but also for systems integration, interoperability, user acceptance testing, etc.

3.1.1.5 Phase 5. Release Phase

The researchers will release the proposed system and provide it to the client for the demo or the actual use. Further iterations update the already installed system, introducing new features and resolving bugs.

3.1.1.6 Phase 6. Feedback Phase

Once all previous development phases are complete, the Client gathers the researchers again and reviews the progress made towards completing the requirements. The researchers will try to get the feedback after software testing. They will introduce their ideas for resolving the problems that arose during the previous phases, and the Client or Product Owner considers their proposition.

3.2 Requirements Analysis

In this study, all requirements must be thoroughly analyzed to complete the system and compel the needs required for its development with a detailed analysis to accomplish the intended output.

3.2.1 Documentation of the Current System

This phase discusses the procedures and ways of the current system used by the assigned administrator and another author to publish disaster information. The Davao Oriental Monitoring and Reporting System provides a good quality service in delivering disaster information through websites and Web Push notifications. The current publishing process is that if there is a disaster incident, an assigned administrator and other assigned author will publish the report of the said incident. In publishing, the in-charge admin of the particular municipality needs to log in to access and create and publish content related to the Disaster on the Website. The system also has the board's information, where all the contact information and hotlines can be contacted if ever the visitor or user needs to.

3.2.2 System Architecture

The developers provide a user validation feature, the Website's login system, to ensure that only specific users can access and publish information. If the login is successful, the user will access the data in their field.

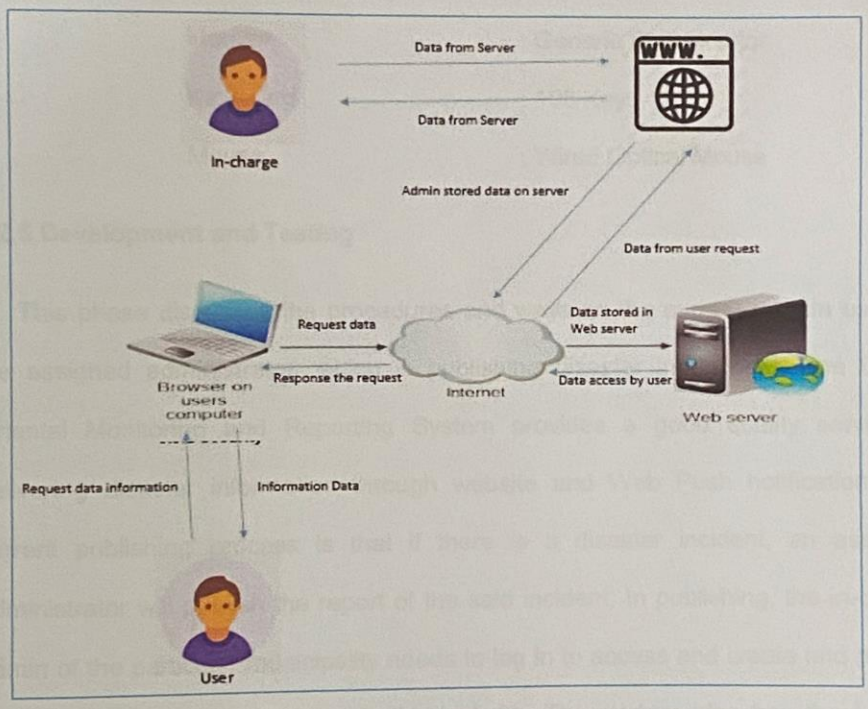

Figure 3.2 – System Architecture of DMRS

3.2.3 Software Specification

The system requires the following application to function correctly.

Operating System	: Windows 10
Programming Language	: PHP
Code Editing Tool	: Wordpress, Xampp
Database	: MySQL

3.2.4 Hardware Specification

The system requires the following to function correctly.

Processor	: Intel (R) Core(TM)i3-7020U
Hard Disk Drive	: 500
Memory	: 2048 MB RAM
Monitor	: Generic PhP Monitor
Keyboard	: 108 Keys
Mouse	: Wired Optical Mouse

3.2.5 Development and Testing

This phase discusses the procedures and ways on the current system used by the assigned administrator, which is publishing disaster information. The Davao Oriental Monitoring and Reporting System provides a good quality service in delivering disaster information through website and Web Push notification. The current publishing process is that if there is a disaster incident, an assigned administrator will publish the report of the said incident. In publishing, the in-charge admin of the particular municipality needs to log in to access and create and publish content related to the Disaster in the website. The system also has the board's information, where all the information and contact details and even hotlines can be contacted if ever the visitor or user needs to.

3.2.5.1 User Testing

The user also tests the website application for some crashes and bug detections. A browser, internet access, and any machine are required for testing the online application. The developers give a questionnaire for rating and feedback when testing the system.

3.3 Requirements Specification

Developing the system implies in-depth review and identifying the requirements for its development requiring complete study to attain the intended result.

3.3.1 Product Perspective

The developers developed the system for the wide dissemination of disaster information in Davao Oriental. The developers developed a "Web-Based Davao Oriental Monitoring and Reporting System" that helps the residents of Davao Oriental to prepare and be alert for the incoming Disaster. This system is somewhat similar to other disaster projects because it has a Web Push notification, making it easier to receive information. This online reservation process is very effective and efficient in our Province because it can easily view in any browser. It will help the community to be prepared for any disaster.

3.3.2 Product Features

The website application is one of the developers' services for end-users to interact with while using the system. This feature is used to prevent or mitigate potential losses from hazards, give prompt and appropriate assistance to catastrophe victims, and ensure faster and more efficient responses from each municipalities residents. In this feature, the processing and generation of reports take place. The built Website allows the user to interact with it. The Website's graphical programming interface aids data users in understanding and providing simplicity of use. Because it is designed to be user-friendly, the Website is built for interaction. The Disaster Monitoring System's Website serves as the principal interface to limit disaster impact, respond rapidly during and after a disaster, and take steps to

recover after a disaster. The project's goal is to notify the inhabitants of Davao Oriental via Web Push notification and web publication.

3.3.3 User Classes and Characteristics

The primary users of this project are the assigned administrators of each municipality and residents of Davao Oriental. This project aims to design and develop a system that publishes information content when disasters strike certain areas or municipalities, or cities in Davao Oriental, which will help in reducing and avoiding potential losses from various disasters.

3.3.4 The Constituents and Coordinator

Residents and coordinators should be observant, as those who have stayed or worked in this institution have the assurance that they will be safe and informed about what is going on in their surroundings.

3.3.5 Operating Environment

The developer uses multiple tools, software, platforms, concepts, and knowledge to develop the system.

3.3.5.1 Web Platform

The developers use various tools and technologies to create the project's website feature. WordPress, PHP, and MySQL are examples of software used by the researcher to support the Website. The developers also used the XAMPP Control Panel to see if Apache and MySQL were up and running and start and stop them. Apache and MySQL must be operational before you can use your

development environment. As long as the Website is up and running, it can be accessed with various browsers.

3.3.6 Design and Implementation Constraints

Every software program has its own set of limitations and constraints that prevent the system from processing the request.

3.3.6.1 Website Constraints

The Website was created to keep track of disasters in each municipality and respond to them. The Website is not adjustable and cannot be used for any other purpose; it only follows and executes the developer's guidelines and restrictions.

3.3.7 User Documentation

The researchers will also create a user manual to understand how to utilize the system. The user handbook is located inside the equipment. The manual is a step-by-step procedure that is very useful while using the system. In addition to the user handbook, the researchers will provide hands-on training on utilizing the system.

3.3.8 Other Non-functional Requirements

The researchers included several guidelines to ensure that the system was safe and effective.

3.3.8.1 Safety Requirements

When creating the system, the developers ensure that it is free of any hazardous aspects that could harm users' data or information.

3.3.8.2 Security Requirement

Administrators can only access the system to prevent data loss. The developers include a user validation tool in the Website's login mechanism. If the login is successful, the user will access the data in their field.

3.3.9 Software Quality Attributes

3.3.9.1 Reliability

The developers ensure that the system is dependable in monitoring and responding to a disaster incident on the premises of each municipality because it has been thoroughly tested to ensure its consistency during implementation.

3.3.9.2 Efficiency

The system is effective web via the Internet. The user must meet all requirements to execute correctly.

3.4 Design

3.4.1 Use Case Diagram

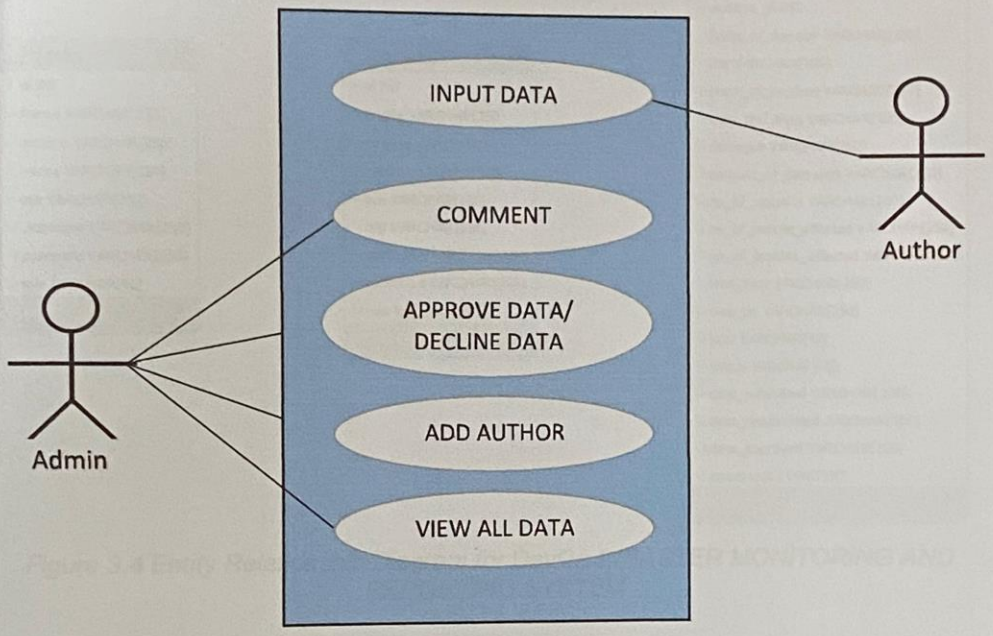

Figure 3.3 - Use Case diagram of Davor: DISASTER MONITORING AND REPORTING SYSTEM

Figure 3.3 above shows the use case diagram of DavOr: DISASTER MONITORING AND REPORTING SYSTEM with Web Push notification. It indicates the scope of the system provided to the user. The system includes login features, Posts, and Links.

3.4.2 Database

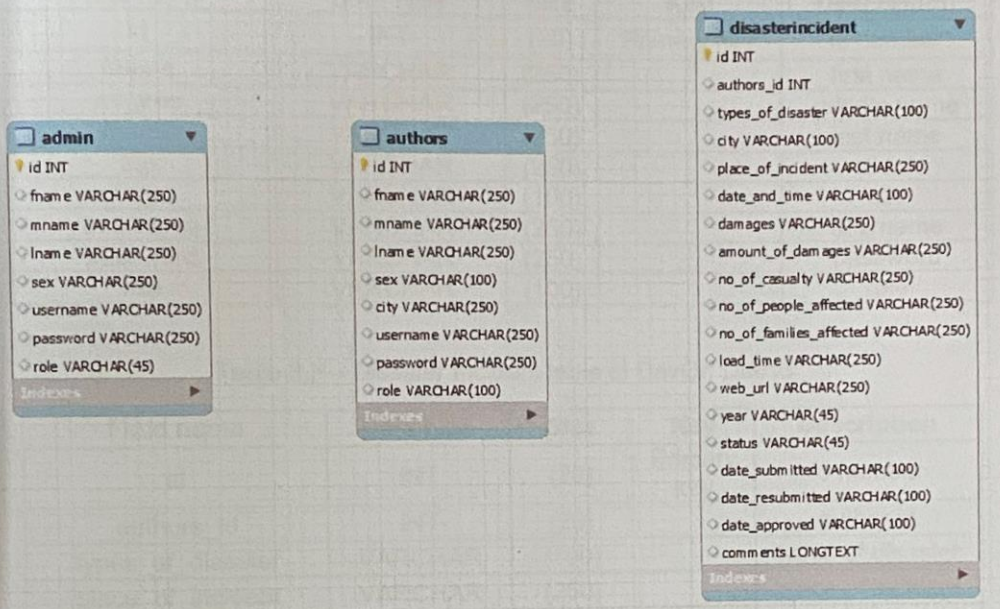

Figure 3.4 Entity Relationship Diagram for DavOr: DISASTER MONITORING AND REPORTING SYSTEM

3.4.3 Data Dictionary

This phase shows the structure and attributes of the data used. It describes each field name's table and details such as data type, size, and critical description.

Table 3.1 – Author table of Davor: DMRS

Field name	Data type	Size	Key	Description
id	INT	(20)	Primary key	id number
fname	VARCHAR	(250)		first name
mname	VARCHAR	(250)		middle name
lname	VARCHAR	(250)		last name
sex	VARCHAR	(250)		sex
username	VARCHAR	(250)		username
password	VARCHAR	(250)		password
role	VARCHAR	(45)		role

Table 3.2 - Admin table of DavOr: DMRS

Field name	Data type	Size	Key	Description
id	INT	(20)	Primary key	id number
fname	VARCHAR	(250)		first name
mname	VARCHAR	(250)		middle name
lname	VARCHAR	(250)		last name
sex	VARCHAR	(250)		Sex
city	VARCHAR	(100)		city
username	VARCHAR	(250)		username
password	VARCHAR	(250)		password
role	VARCHAR	(100)		role

Table 3.3 – Disaster Incident table of DavOr: DMRS

Field name	Data type	Size	Key	Description
id	INT	(20)	Primary key	id number
authors_id	INT	(20)		author id
types_of_disaster	VARCHAR	(100)		types of disaster
place_of_incident	VARCHAR	(250)		place of incident
date_and_time	VARCHAR	(100)		date and time
damages	VARCHAR	(250)		Damages
amount_of_damages	VARCHAR	(250)		amount of damges
no_of_casualty	VARCHAR	(250)		number of casualty
no_of_people_affected	VARCHAR	(250)		number of people affected
no_of_families_affected	VARCHAR	(250)		number of families affected
load_time	VARCHAR	(250)		Load time
web_url	VARCHAR	(250)		Web url
year	VARCHAR	(45)		link RSS
status	VARCHAR	(45)		Status
date_submmited	VARCHAR	(100)		Date submmited
date_resubmmited	VARCHAR	(100)		Date resubmmited
date_approved	VARCHAR	(100)		Date approved
comments	LONGTEXT			Comments

CHAPTER IV

RESULTS AND DISCUSSION

4.1 Achievement per Objective

For the system to work, it needs the data gathered from the representative in each municipality. Thus, the processing and storing of data is the work of the proponents. It shows the objective that the proponents have solved, including the photo documentation on how the proponents solved those particular objectives.

4.1.1 Website Objectives

The objective is to design and develop a website capable of sending Web push notifications to the user and displaying disaster information and all Disaster and recent news happening in Davao Oriental.

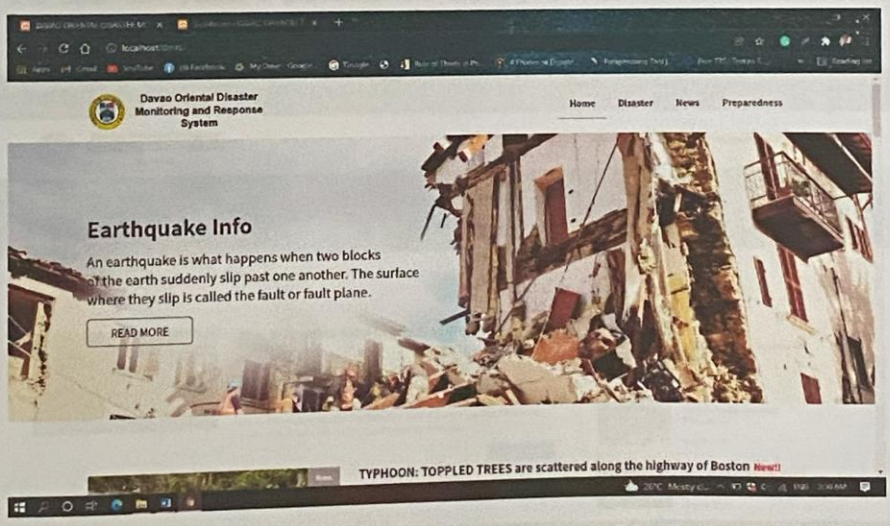

Figure 4.1 - Davao Oriental Monitoring and Reporting System Home Page

Figure 4.1 Shows the Home Page where recent and published content was displayed.

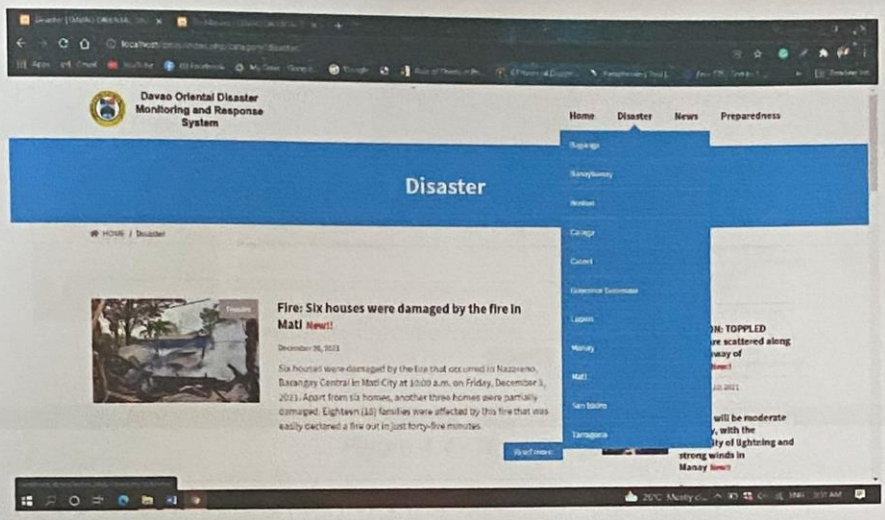

Figure 4.2 - Disaster Page and Municipality

Figure 4.2 shows that Disaster Page also has drop-down features, where the user can select a particular municipality to view data information about a disaster.

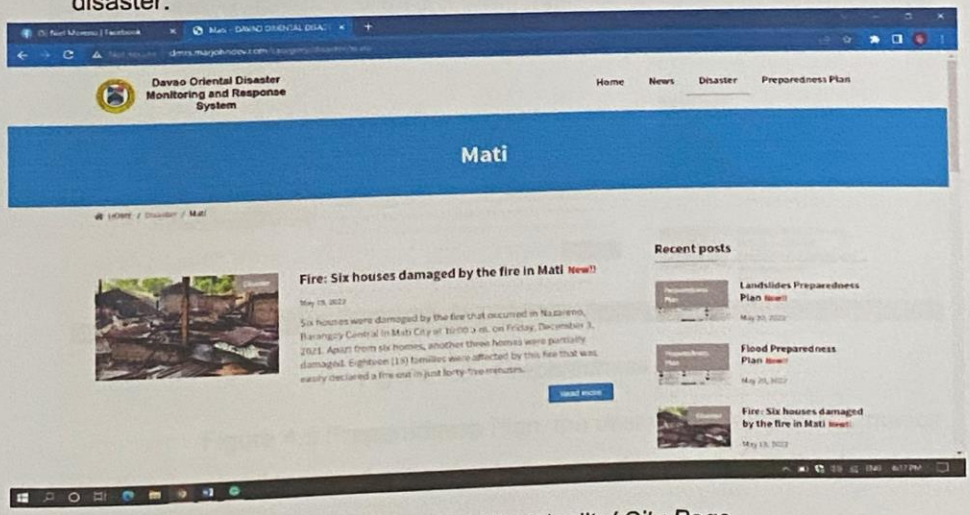

Figure 4.3 - Municipality/ City Page

Figure 4.3 shows data disaster information that happened in a particular Municipality or City.

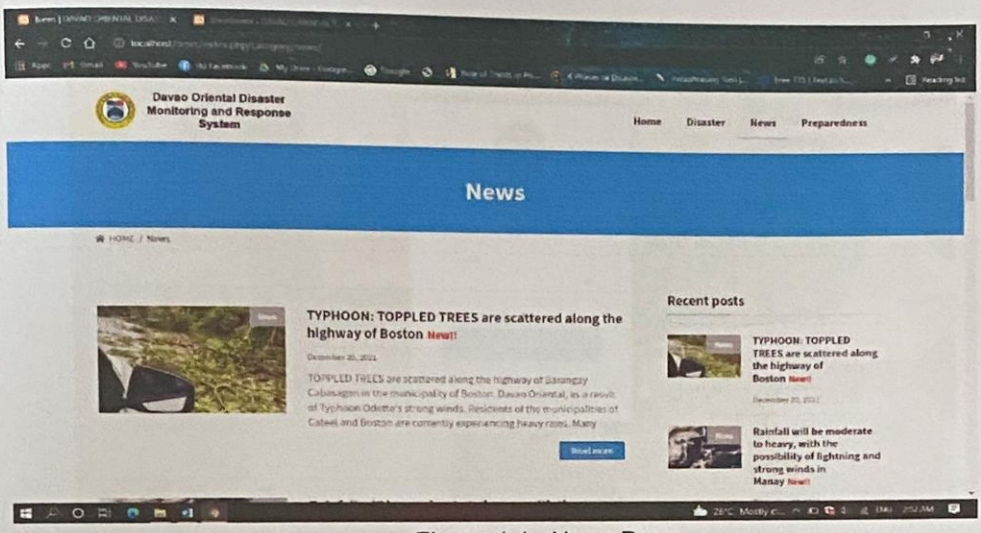

Figure 4.4 - News Page

Figure 4.4 shows the recent news and updates around the Province.

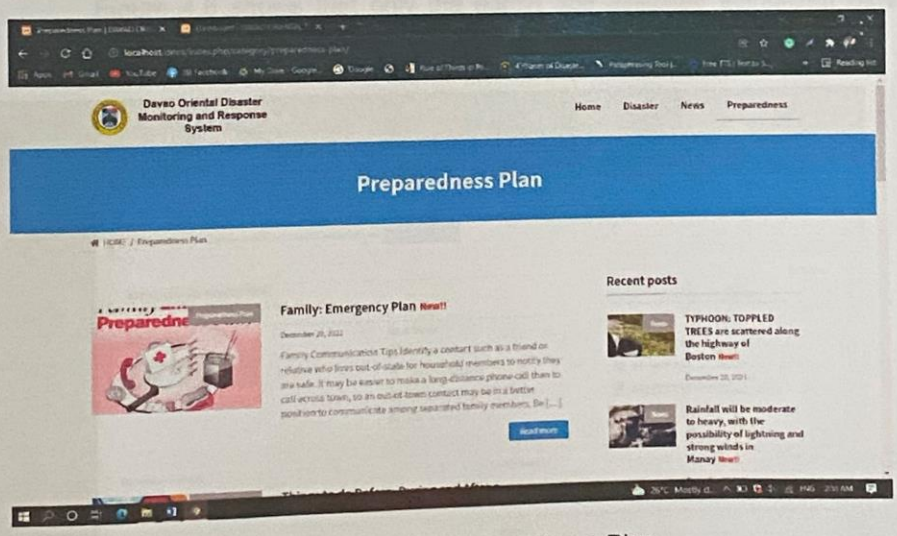

Figure 4.5 - Preparedness Plan

Figure 4.5 Preparedness Plan, the user will view some information regarding preparedness and mitigation to limit the damage before the disaster.

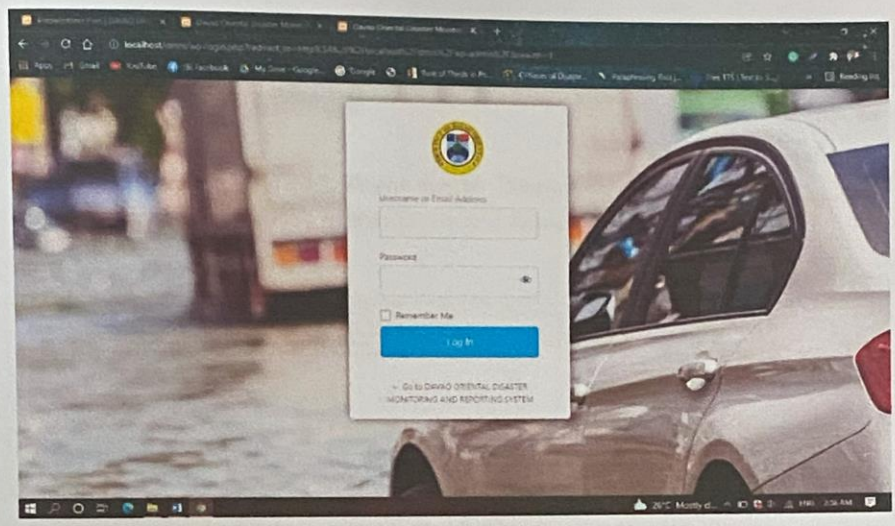

Figure 4.6 Davao Oriental Monitoring and Reporting System Admin Author Login Page

Figure 4.6 shows that only the admin and assigned authorized person can access the dashboard after signing in.

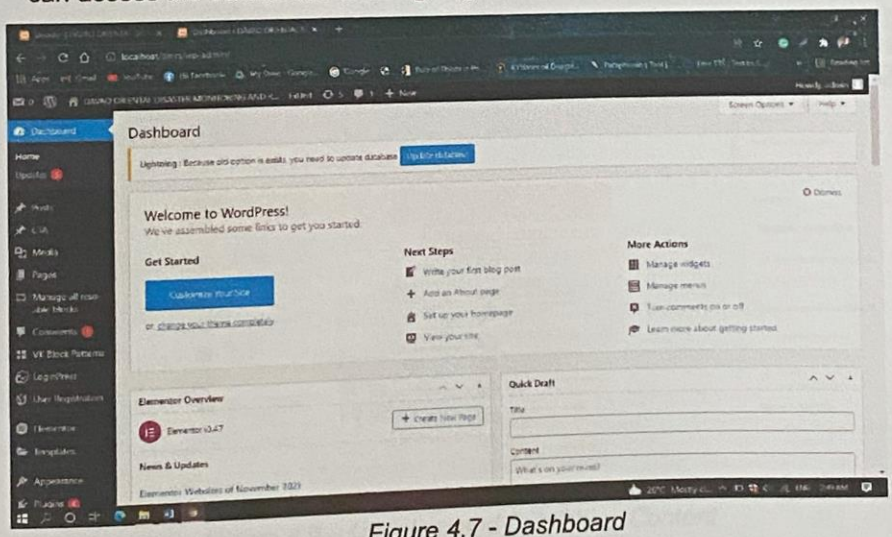

Figure 4.7 - Dashboard

Figure 4.7 shows the WordPress system dashboard that the admin can control everything where data information is created and published.

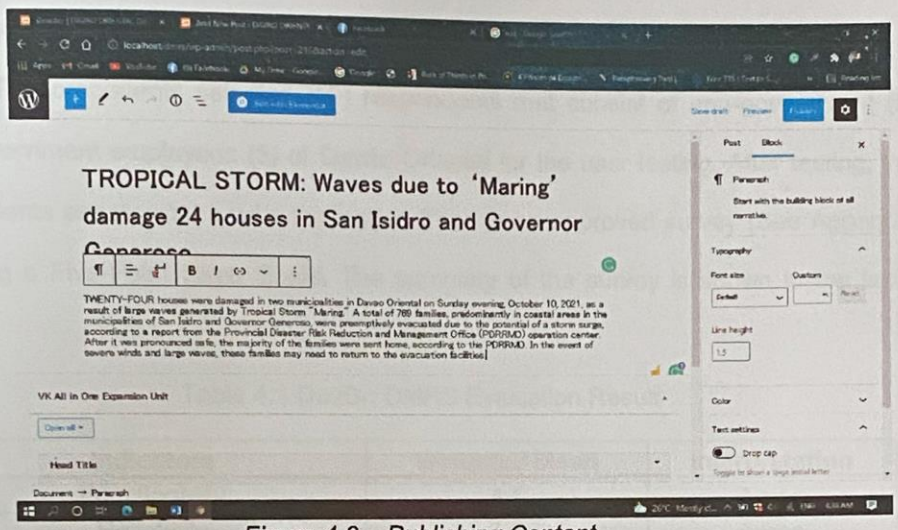

Figure 4.8 – Publishing Content

Figure 4.8 shows that the admin will publish content titles and information to be shared on the website page.

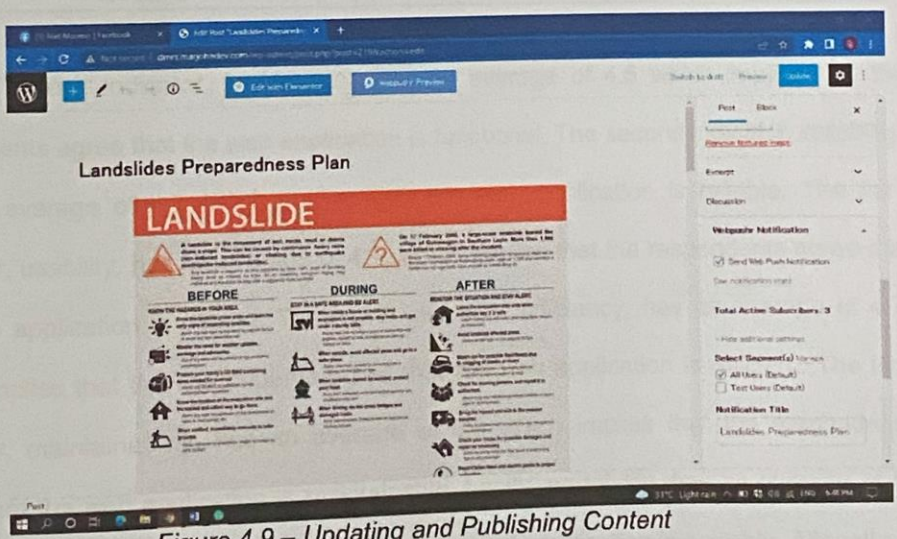

Figure 4.9 – Updating and Publishing Content

Figure 4.9 shows that the author will select to update or publishing content with Web Push Notification.

4.2 Software Testing and Evaluation

The proponents selected (10) respondents that consist of non-government (5) and government employees (5) of Davao Oriental for the user testing. After testing, the respondents assessed the web application through an approved survey (See Appendix D) using a Five-Point Likert Scale. The summary of the survey is shown in the table below.

Table 4.1 DavOr: DMRS Evaluation Result

Indicators	Weighted Mean	Interpretation
Functionality	4.5	Agree
Reliability	4.7	Agree
Usability	4.7	Agree
Efficiency	4.7	Agree
Maintainability	4.8	Agree
Portability	5	Strongly Agree
Overall	**4.7**	**Agree**

The first indicator, functionality, has an average of 4.5 which implies that the respondents agree that the web application is functional. The second indicator, reliability, has an average of 4.7 which implies that the web application is reliable. The third indicator, usability, has an average of 4.7, which implies that the respondents agree that the web application is usable. The fourth indicator, efficiency, has an average of 4.7, which implies that the respondents agree that the web application is efficient. The fifth indicator, maintainability, has an average of 4.8 which implies that the respondents agree that the web application is maintainable. Lastly, portability, has an average of 5, which implies that the respondents agree that the web application is portable. Altogether, the web application has an overall average of 4.7, indicating that it is compliant with ISO-9126-1 and is suitable for deployment

CHAPTER V
SUMMARY, CONCLUSION, AND RECOMMENDATION

5.1 Summary

The Web-Based Davao Oriental Disaster Monitoring and Reporting System for the Province of Davao Oriental is an information-sharing platform for all Disasters that struck Davao Oriental areas. The developers expect that the system will help the community receive some disaster information within the Province. This system is a big help to the community and the coordinators in charge of giving some disaster information; the data used by this system serves as the database or the storage of all critical disaster information in the Province.

The visitor can able to see the recent news and all disaster information in every municipality in Davao Oriental Province, and this system can provide information and updates on a specific disaster; the visitor can only view some data on Smartphone and the web as long as the visitor has an internet connection. This system is also essential to the in charge of the disaster office. It helps them share information with the public, which is very important to the community in terms of disaster in a particular municipality.

Every information content has its proof and image or any media that can show to the public what happened in a particular municipal area; it also gives information to the visitor whom they will contact during the Disaster; the system provides information through some preparedness plan and directory, where the visitor can get any of group or organization who assigned in giving rescue.

5.2 Conclusion

The system's goal is to create reports to monitor the disaster incident in Davao Oriental. The project's goal is to notify the residents of Davao Oriental via Web Push

notification and web publication. The developer decides that the system meets the objectives by using the established objectives to determine whether the system is successful enough to serve its purpose.

5.3 Recommendation

With the result of the study conducted and the conclusion made, the researcher highly recommended it is best to use the recent template in developing the website and make sure that the code is flexible on all hosting providers.

The Davao Oriental Disaster Management and Reporting System developer with Web Push Notification would like to recommend further improvements to the system functionalities. Since the system works as an information system that displays all the disasters on Davao Oriental premises, the developer would like to recommend that all information about the disaster happen and the list of data from any municipality that the user needs to know will be presented that this system can able to provide.

Hopefully, the system can provide not only the Disaster Information but also include some of the reported news and disaster content that happened in Davao Oriental. Most of the users can receive SMS Notification from the system since the system is intended for the disaster organization. The developer would also like to recommend further improvements to the system.

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- Video Editing
- Can speak both English and Filipino language

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