Prototyping Disaster Preparedness Information System: A Case of Pandeglang District, Indonesia

51936701 Elmo Juanara

First Advisor: Prof. Yasunobu Maeda
Second Advisor: Prof. Takahiro Hasegawa

1. Introduction

This research's goal is to make an information system in disaster preparedness for the Pandeglang district government, Indonesia. Disaster preparedness is needed in order to deal with the lesson from the Pandeglang tsunami at the end of 2018 so that the Pandeglang district government can prepare better itself with technology when disasters occur.

2. Method

The method in this research consists of two, literature review and prototyping system.

2.1 Literature Review

In literature review, disaster management systems in Japan and records of the 2011 Great East Japan Earthquake which focus on aspects of preparedness were studies.

2.2 Prototyping System

This prototyping stage has six steps. Firstly, the objectives of the system is determined. Secondly, system requirements are obtained from local residents and the government by using written style interview. Thirdly, functional specifications are determined by using Soft Systems Methodology. Fourthly, the internal specifications are determined. Fifthly, the system is prototyped, and finally, verification and validation the system are done (Figure 1).

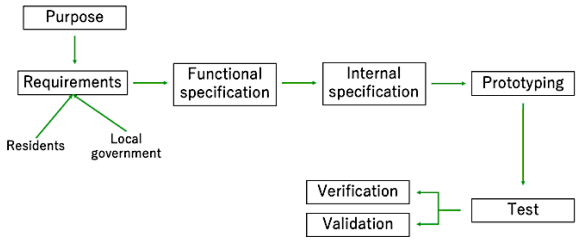

Figure 1 Steps of prototyping system

3. Results

The results of this research are shown below.

3.1 Requirements for System

Requirements for the system were obtained using written style interviews with the Disaster Agency, local government, neighborhood association, and schools, then Soft Systems Methodology[1] was used for finding the root definition and context. The requirements for the system are obtained as follows.

1. Requirements for the content
   - To have content related theories of disaster preparedness
   - To have disaster preparedness training regular schedule
   - To be able to increase public awareness and knowledge related to disaster preparedness
2. Requirements for the user interface of the system
   - It can be accessed by the public via PC or smartphone
   - To be interactive and user friendly

3.2 Functional Specification

To define functional specifications, a screen transition was created. The screen transition diagram is divided into two, Screen for Administrator and Screen for General Users. 'Administrator' screen describes the steps for administrators to manage website content, while 'general users' screen is for people visiting and using the website.

3.3 Internal Specification

To realize the functional specifications, an information system was made using the WordPress platform. The Web site uses free themes and plugins provided by WordPress. The Astra theme is used and several plugins are utilized to support functional specifications, such as Elementor. Elementor is suitable for building Web sites without coding. Other plugins used are Timetable and Event Schedule, Wise Chat, Google Maps, and AddToAny Share Buttons.

3.4 Prototype

Prototyping is an activity that usually used in software development. The prototyping process is very useful for developer to get valuable feedback from the users early in the project regarding errors and bugs of the system. Figure 2 shows the result of the prototyping system that has been made (www.belajarbencana.com).

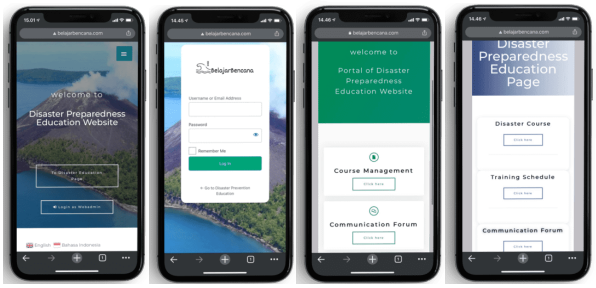

Figure 2 Prototype of smartphone mode

3.5 Verification

Verification is the process to confirm what is system like.

Verification process compares the system that has been created with the design on the screen transition before. Verification process involved Maeda laboratory members. From the verification process, some features were added to the system, namely downloadable manuals for webadmin and users, as well as connection of the system to Twitter.

3.6 Validation

Validation is a process to get feedback from users. For validation, the local stakeholders in Pandeglang, Banten asked for feedback. Stakeholders consist of Pandeglang Government, Regional Disaster Management Agency, School, and RT/RW (neighborhood association).

Basically, the feedback given by users is positive. They like the system and the content have met their expectations. Most of them also rate the website with high scores.

Table 1 summary of positive answers from users

Questions	Answers Summary
Is this system good for education preparedness?	Yes
Is this system easy to use?	It's easy and very informative
Is this system easy to understand?	Yes, easy
Are the Disaster Course contents easy to understand?	Yes, easy to understand
Are the Disaster Course contents enough?	Enough
What is a good point of this website?	Available in two languages, connect with media social, informative, the material is quite useful
Rate this website (for score 1 – 10)	9, 8, 7, 7

But on the other hand, there are also comments that suggest that the system still needs improvement in the future.

Table 2 summary of suggestion answers from users

Questions	Answers Summary
Are the Disaster Course contents enough?	Need to add animated pictures/videos
What kind of contents do you need in the Disaster course?	Still need to add animated pictures/videos, map of disaster-prone locations
In your opinion, are the features in this system good for disaster preparedness education?	- The features are good enough, for even more massive information to the public the platform is made more accessible, such as on Android, or other digital platforms that are easier -Use a language with local wisdom, an easily accessible language
Is this system easy to understand?	No
What is a weak point of this website?	-Interactive features need to be added -Please don't use Japanese
Do you have any suggestions for improvements to this system?	-Easy login access -Providing various learning materials
Rate this website (for score 1 – 10)	4, 3

4. Discussion

From the results of the feedback from users, several things were obtained:

For schools and RT/RW, in general, the content of the disaster education information system has met their expectations. They really appreciated the features inside the system such as connect with social media, languages translation, material, and etc.

As for feedback from the government and regional disaster management agency, in general it also gave a positive impression. They said, for example, disaster course contents are easy to understand, the disaster course contents are enough, and the features provided by this system are sufficient.

But on the other hand, some suggestions for improving this system were also given, such as adding more features, making disaster learning content more interactive with animation and images in the future, and making easier to access.

5. Conclusion

From the results of this study, several points can be concluded.

1. Based on experience in disaster preparedness that occurred and was carried out in Japan, it is realized that disaster education is the most important thing.

2. Creating a disaster education information system using WordPress platform is a good option. Because WordPress provides a variety of free plugins that can support our system functions.

3. From the results of second written style of interview (feedback), the overall system has been made quite well, then in the future it is necessary to make improvement on material (content) of disaster education that are more interactive.

Reference

[1] Checkland, Peter. (1975). *System Thinking, System Practice*. John Wiley & Sons Ltd