

# Web-Based Geographic Information System Cash Transfers Assistance at Air Tenang Village Air Hangat Districts Kerinci Regency

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**Abstract:** This study aims to identify the functions needed to create a WebGIS system for cash assistance for Air Tenang village, which is then implemented in designing a WebGIS for cash assistance for Air Tenang village. This research is development research, known as Research & Development (R&D) using the waterfall model with stages, namely needs analysis, system design, implementation, system evaluation, operation, and maintenance. The results showed that the functions needed to create a WebGIS for the Air Tenang village assistance service were web-based information communication liaisons between the village and the community, data management included input, edit, and delete functions, submission of assistance, and visualization of the distribution of aid data in the form of interactive maps. WebGIS development for village cash transfer services in the WebGIS system with the domain address <http://gisbltdesa.my.id>. This WebGIS system has been tested on village communities, and the results show that most respondents consider the work of this system satisfactory and that it can be applied by the village as an alternative to the village cash transfer program.

**Keywords:** Cash transfers Assistance Village, Waterfall, WebGIS

## 1 Introduction

After the COVID-19 pandemic, the government to protect the poor expanded social safety by providing social assistance. Direct Village Cash Assistance is one of the forms of social assistance in the form of money in the amount of Rp. 300,000 that is given to poor families who live in villages to deal with the impact of the COVID-19 pandemic originating from village funds [1].

However, the implementation of social assistance programs often experiences problems related to data accuracy and updating, causing the aid to not be targeted properly. From the BPKP-RI Official Website 2020, Director of Pengawasan Keuangan dan Pembangunan Adil Hamongan said that the problem with the recipient database causes social jealousy in the community and that the target of public anger is the village operator [2].

A geographic information system that utilizes internet services as a medium for delivering information is known as WebGIS. WebGIS includes map layers and tools that agencies can use to analyze records across regions, identify geographic gaps in service delivery, and develop strategies [3]. Small organizations can use WebGIS to store, manage, and distribute housing and demographic data [4]. Puarungrojo (2019) developed a web-based GIS system for managing community-related data based on rural households in Thailand that assists

government agencies in implementing poverty alleviation projects. The use of WebGIS can be used to manage and monitor community-related data that is important to use to support community development [5].

Based on this, the author tries to propose solutions to problems related to the implementation of the village cash transfer program using a WebGIS-based system, which can help implement effective and efficient village assistance programs by managing and monitoring community data, which is often a problem in the accuracy of aid distribution.

## 2 Research Methods

The research method used is research and development (R&D) with the waterfall model. The waterfall model is a sequential software development model with the stages of requirement analysis and definition, system and software design, implementation and unit testing, integration and system testing, and operation and maintenance [6]. This research was conducted in Air Tenang Village, one of the villages implementing the cash transfer program in Kerinci Regency. Before developing the system, collecting system requirements was carried out by interviewing village officials, observing the running system, and sending online surveys to village communities. From the results of the system requirements specification, it is continued at the stage of system design and evaluation. For more details, see Figure 1 below.

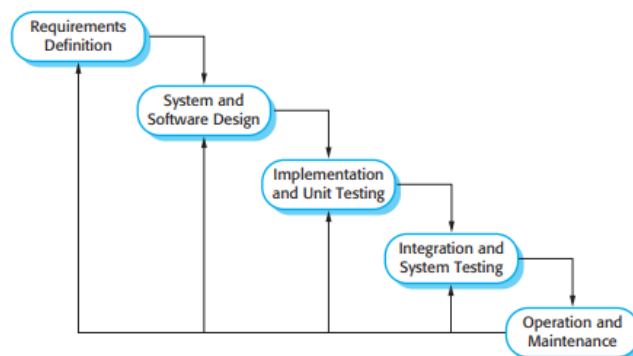


Fig. 1. Waterfall Development Model

## 3 Result and Discussion

### 3.1 Identification of System Requirements

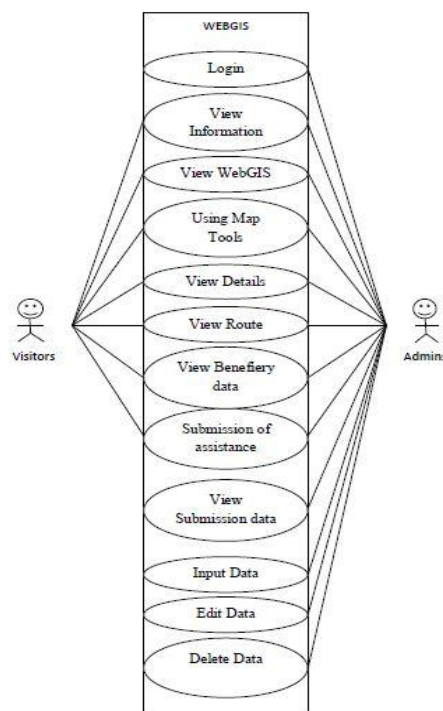
Every system development always begins with and is based on system specifications, namely functional and non-functional requirements. Based on the results of interviews, observations, and online surveys, it was found that the current state of the system is still manual in the delivery of information, management, and publication of data, so the information conveyed is uneven and less efficient in data management if data changes frequently. In addition, manual data storage has not utilized the spatial data that is useful for controlling the distribution of help data points. So that a web-based GIS system is proposed for the village cash transfer service, which has a function as a liaison between the village and the community in communicating data information with the function of submitting assistance

that can be accessed by the community online, data management functions by the help manager include input, editing, and deleting data. Data visualization functions from aid managers and the community are overlaid on an interactive map. Because this system is based online, users must use devices that have an internet connection and devices with location detection (GPS) support.

### 3.2 System Design

Based on the system analysis, it is known that the system will be two-way as a data communication link between the community and the village aid manager. So that there are two actors in the use of the WebGIS system, namely village officials as admins who can manage data and the community as visitors to the WebGIS system.

A use case diagram can be used to describe any function that is in a system and can also represent an actor's interaction with the system.



**Figure 2.** Use Case Diagrams

The use case diagram will be the basis of the sequence diagram, that there will be 5 menus, namely homepage, WebGIS, data management assistance, submission of assistance, and about. A sequence diagram will describe the sequence of events or activities to produce the desired output. The results of these 5 menus are designed to make the user interface easier for users to use the application.

### 3.3 System Implementation

At this stage, all designs are implemented. At this stage, there are 2 work processes, namely making SHP for the administrative boundaries of the research location, which will be included in the web, and making web programs.

Programming, or coding, is a core activity where each program code will be adapted to the design using codes that are understood by the computer and which are then translated into the form of a computer program. The coding process uses two applications, namely Visual Studio Code as a text editor in making the program, where the program code used is Codeigniter 3, and the XAMPP application to store program code so that it can be opened on localhost and in web database development.

The result of the web development is a WebGIS for the Air Tenang Village Cash Direct Aid service, which has five menus, namely the homepage, WebGIS, data management assistance, submission of assistance, and about. Which are described one by one as follows:

The homepage functions to display information or announcements to visitors added by the admin or village apparatus, more details are in Figure 3 below.

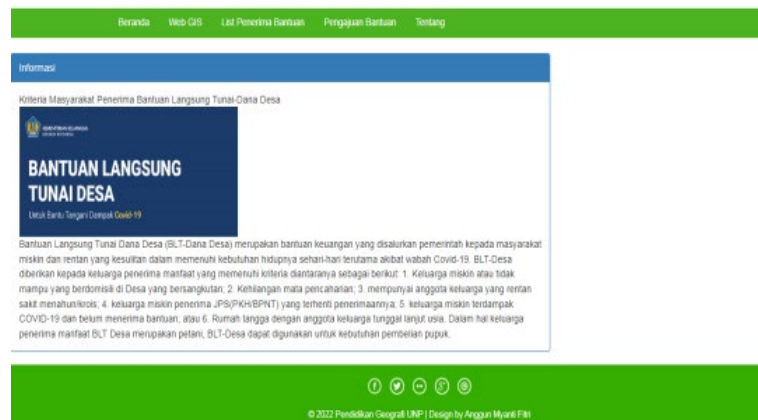


Fig. 3. Homepage

The WebGIS menu is a menu that contains the display of information on the database of recipients and donors of assistance, which is visualized in the form of a map (Figure 4). In this menu, there is a detail button that will appear by clicking on one of the markers and that serves to display detailed or complete information about the database (Figure 5), as well as a route button that functions to display the travel route.

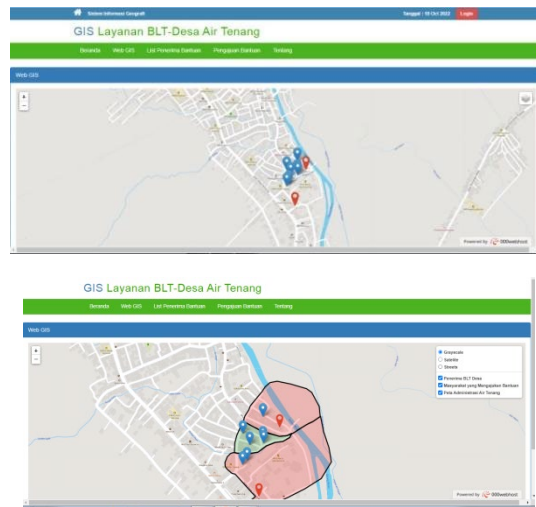


Fig. 4. WebGIS Menu

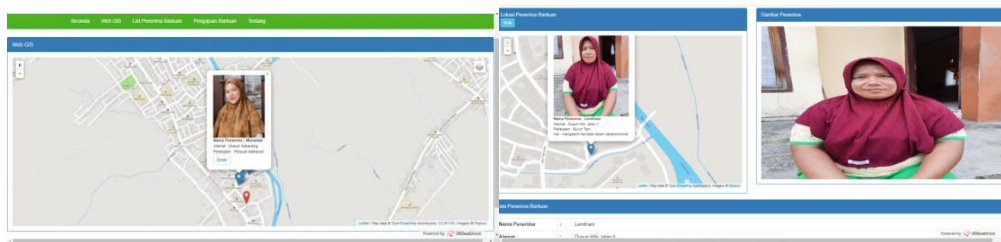


Fig. 5. Details function

The data management assistance menu (Figure 6) is a menu that functions to display database details in tabular form. And in this menu there is a function for managing recipient data assistance including input, edit and delete data functions by the admin (Figure 7). The data that has been added will appear on the WebGIS menu in the form of a map location distribution points. In this menu, the data displayed in tabular form is accompanied by a search feature to facilitate data retrieval.

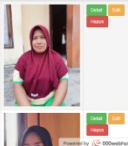




No	Identitas	Alamat	Pekerjaan	Keterangan	Gambar	Action
1	Lendram	Dusun Hilir Jalan 5	Buruh Tani	mengalami kendala dalam perekonomian		 
2	Tora Puji	Dusun Hilir Jalan 5	Ibu Rumah Tangga	masyarakat yang belum terdapat dalam Data Terpadu Kesejahteraan Sosial		 

Fig. 6. The data management assistance menu

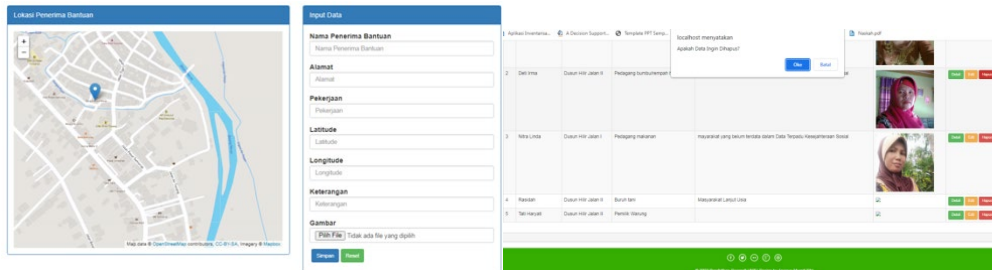


Fig. 7. Data management (input, edit, and delete) by Admin

The menu submitting assistance has an access function for the community to report themselves or other people who are residents of the Air Tenang village and who are considered to meet the criteria but have not received or have not been registered as recipients of direct village assistance. The public can access the submission menu to fill out a form, as shown in Figure 8.

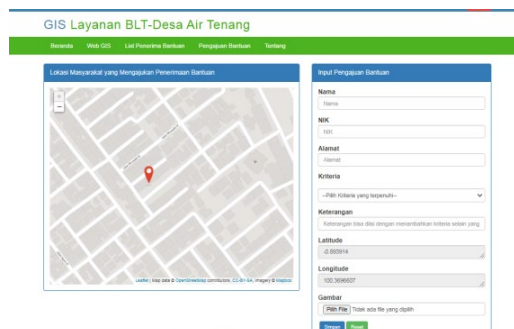


Fig. 8. Submitting assistance form

The menu contains information on instructions for using the web, which is displayed in the form of videos, and information on web management, along with a contact person. More details can be seen in Figure 9 below.

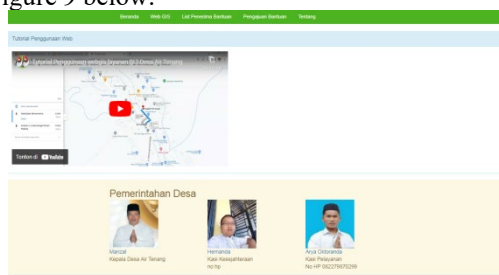


Fig. 9. About the Web

### 3.4 System Evaluation or Testing

The test was carried out by giving questionnaires to two village officials as administrators and 12 villager visitors as web visitors. The questionnaire used is a modification of the questionnaire used in Yulfa's (2019) research, which is adapted to the needs of testing. There

are three subtopics in the questionnaire: familiarity, functionality, and user satisfaction with the system. The questionnaire uses a Likert scale in the range of 1 to 5 which states that respondents strongly disagree to agree with the statement submitted. The average of the scale is calculated for the statement of tendency indicators proposed to the respondent [7].

On the topic of familiarity, it is associated with internet access applications and spatial data service applications. From the results of the respondents' assessments, the majority of administrators and visitors use the Google Chrome application to access the internet, with an average score of 4 for administrators and 3.9 for visitors. As for the application to access spatial data, the majority of respondents use the Google Maps application (the average score is 4 for admins and 3.1 for visitors). This result is in line with the results of a survey conducted by APJI Indonesia and released in June 2022, which found that the most frequently used browsing application is Google Chrome with a percentage of 76.95%.

Evaluation on the topic of functionality aims to find out how effective the system is in carrying out the scenarios that have been prepared. The results of the overall functionality questionnaire found that the average functionality according to respondents for admin was on a scale of 4.39 and for visitors on a scale of 4.56, both of which showed that respondents agreed about the functionality of the system. This shows that, in general, the system is effective in carrying out the scenarios that have been prepared.

Evaluation on the topic of satisfaction aims to measure the level of satisfaction of respondents with the system that has been made. The results of the overall satisfaction questionnaire found that the average respondent scored 4.35 on a scale of 4.35 for administrators and 4.41 for visitors. This indicates that respondents are satisfied with the system that has been made.

### **3.5 Operation and maintenance**

At this stage, the web application has been hosted and can be accessed by the public through the domain address <http://gisbltdesa.my.id/>. and repairs are made if there are system functions that experience errors.

## **4 Conclusion**

- a. The identification of the functions needed in the creation of a WebGIS-based system is a web-based system in information communication that becomes a liaison between the village and the community, spatial data management and dynamic beneficiary attributes (input, edit, and delete), services for requesting assistance from the community, and data visualization of villages and communities displayed in an interactive overlay map.
- b. WebGIS The Air Tenang village cash transfer service has been successfully built and has five main menus: the homepage menu, WebGIS, data management assistance, submission of assistance, and about.. WebGIS can be accessed via the domain address <http://gisbltdesa.my.id/>. WebGIS has been tested and the results are that all functions can run well and the community is satisfied with the work of the system so this WebGIS can be used as an alternative in village cash transfer services.

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