

# Implementation of Web-Based Geographical Information System Mapping Recipients of Social Assistance in Giri Purno Village

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## Abstract

*Giri Purno Village is a village located in Rimbo Ilir District, Kab. Tebo. This village is one of the villages that receives social assistance from the government where the assistance will be passed on to people in need. The distribution of the location of the houses that receive assistance is still not available, so the coordinates of the houses receiving social assistance are needed. Therefore, we need a geographic information system in which the system contains information and the distribution of the location of houses that receive social assistance. This information system uses the Laravel framework, Laravel is a PHP framework for building a web-based system framework and uses the leafletjs library as a tool for displaying maps and Open Street Map as the base map used. The research method used is the waterfall method. The waterfall method is the earliest SDLC approach used for software development. This research resulted in a Geographic Information System that is capable of managing social assistance beneficiary data, RT data, social assistance beneficiary criteria and can visualize social assistance beneficiary location points on maps spread across Giri Purno Village. In addition, there are also details of recipients of social assistance as well as the route to the recipient's house.*

## I. INTRODUCTION

Information technology has been ranked as a basic human need for centuries. Information technology gets a new form, namely an information system that can be accessed without space and time limits. Information technology is developing very rapidly giving rise to geographic information system technology that facilitates regional mapping. Geographic information system is a computer information system that is used to manage data related to geography. This system provides information in graphical form and usually uses a map as the interface [ 1 ] .

Social assistance is the provision of assistance in the form of money/goods from the regional government to individuals, families, groups and/or communities which are not continuous and selective in nature which aims to protect against possible social risks[2].

Of course, social assistance from the government can be obtained throughout Indonesia. One of them is in Jambi Province, Tebo Regency, Rimbo Ilir District, Giri Purno Village. The village is one of the villages in the Rimbo Ilir sub-district that receives social assistance from the government to be passed on to people who need this assistance. The assistance distributed was divided into several categories including the Family Hope Program (PKH), Direct Cash Assistance (BLT), basic food packages, Non-Cash Food Assistance (BPNT). Communities who receive social assistance from the government must of course meet certain requirements where the recipient must be registered in the Integrated Social Welfare Data (DTKS)[3].

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There is still no distribution of the locations of the houses that receive assistance, so several coordinate points for the houses of the social assistance recipients are needed. Therefore, a web-based geographic information system is needed in which the system contains information and the distribution of houses of beneficiaries and can provide information to relevant agencies who need data on the distribution of houses of social assistance recipients in Giri Purno Village.

## II. METHODS

### A. System

The system is a collection of elements that are interrelated and work together to process input. The system is also a collection of elements that are interrelated and work together to process the input addressed to the system and process the input to produce the desired output[4].

### B. Information

Information is the result of data processing in a form that is more useful and more meaningful to the recipient which describes a real event (fact) that is used for decision making[5].

### C. Information System

Information system is a collection of hardware and software as well as human devices that will process data using the hardware and software. In addition, data also plays an important role in information systems[6].

### D. Geographic Information System

Geographic information system is a system in which there is a component that can be used to manage data that has spatial information (spatial)[7].

There are 2 types of geographic information systems[8], namely:

#### a. Spatial Data

This data has a certain coordinate system as its reference basis and has two important parts that are different from other data, namely local information (spatial) and descriptive information (attributes). In GIS, spatial data can be represented in 2 (two) formats, namely vector data and raster data.

#### b. Non-spatial Data

Non-spatial data is used as a basis for representing spatial data, based on these non-spatial data spatial data can be formed. Such as population data for each region can be used to map the population distribution.

### E. Social Assistance

Ministry of Social Affairs Regulation No. 1 of 2019 concerning Distribution of Social Assistance Expenditures within the Ministry of Social Affairs. According to article 1, social assistance is assistance in the form of money, goods or services to a person, family, group or community that is poor, unable and/or vulnerable to social risks[9].

### F. Database

A database is a computerized system whose primary purpose is to maintain processed data or information and make the information available when needed. In essence, the database is a medium for storing data so that data can be accessed easily and quickly[10].

### G. PHP (Hypertext Preprocessor)

PHP is a complementary language to HTML that allows the creation of dynamic applications that enable data processing and data processing. All syntax given will be fully executed on the server while only the results are sent to the browser[11].

### H. UML (Unified Modeling Language)

UML is a standardized language for building software that is built using object-oriented programming techniques, UML arises because of the need to specify, describe, build and document software systems[12].

### I. Framework Laravel

Laravel is a PHP framework released under the MIT license, built on the MVC (model view controller) concept[13]. Laravel is an MVC-based web developer written in PHP designed to improve software quality by reducing initial development and maintenance costs, and to enhance the experience of working with applications by providing expressive, clear and time-saving syntax[14].

### J. Leafletjs

Leafletjs is the leading open source JavaScript library for mobile-friendly interactive maps, which weighs around 42KB of JS and has the mapping features developers really need. Leafletjs was designed with simplicity, performance and usability in mind. Leafletjs works across all major desktop and mobile platforms, is extensible with tons of plugins, has a beautiful, easy-to-use and well-documented Application Programming Interface (API) and source code that is easy to read and a joy to contribute[15]

### K. XAMPP

XAMPP stands for X (any four operating systems), Apache, Mysql, PHP and Perl. XAMPP is a tool that provides software packages in one package. The package includes Apache (web server), Mysql (database), PHP (server side scripting), Perl, FTP server, PhpMyAdmin and various other help libraries[16].

### L. MySQL

Mysql is one of the most popular types of database servers. Its popularity is due to MySQL using SQL as the basic language to access its database. MySQL is free with the GNU General Public License (GPL). With this situation, you can use this software freely without having to be afraid of the existing license[17].

### M. Bootstrap

Bootstrap is an intuitive and powerful front-end framework for faster and easier web application development. Bootstrap uses HTML, CSS and Javascript[18].

### N. Waterfall Method

The waterfall method is the earliest SDLC approach used for software development[19]. The waterfall method has the following stages[20]:

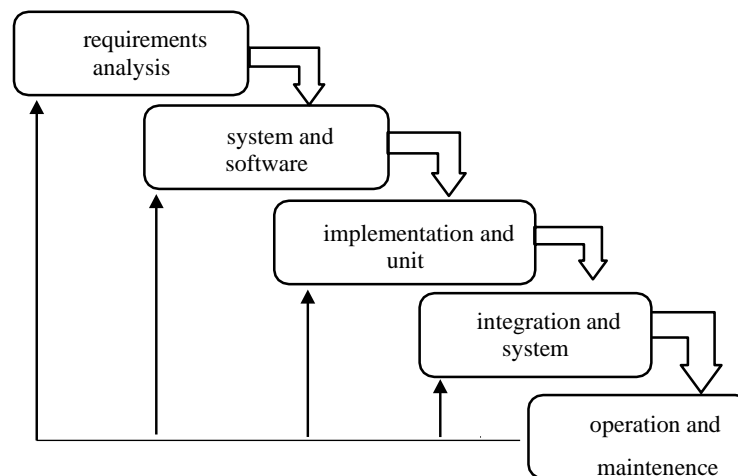


Fig. 1 Waterfall Method

The waterfall method is used to design the system design you want to make. Where the author makes a draft first and then consults with related parties. If there is a change, the author will re-identify according to the order of the waterfall method.

### III. RESULTS

#### A. UML (Unified Modelling Language)

##### 1. Use Case Diagrams

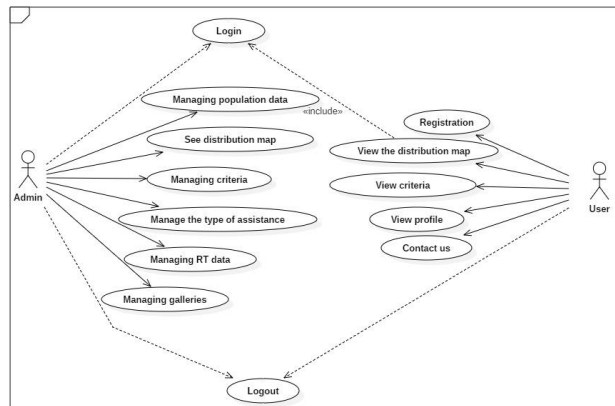


Fig. 2 Use Case Diagrams

##### 2. Activity Diagrams

###### a. Login Activity Diagrams

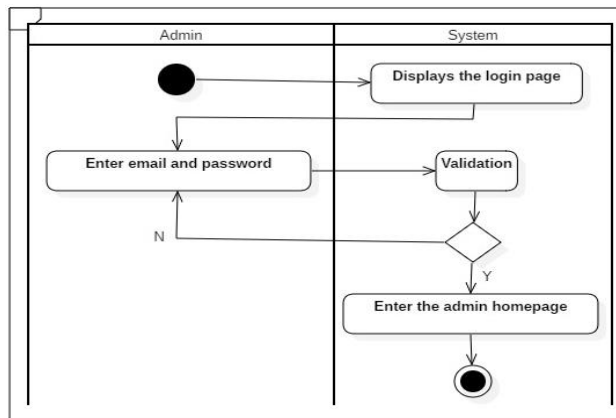


Fig. 3 Login Activity Diagrams

###### b. Activity Diagram looking at the map spread

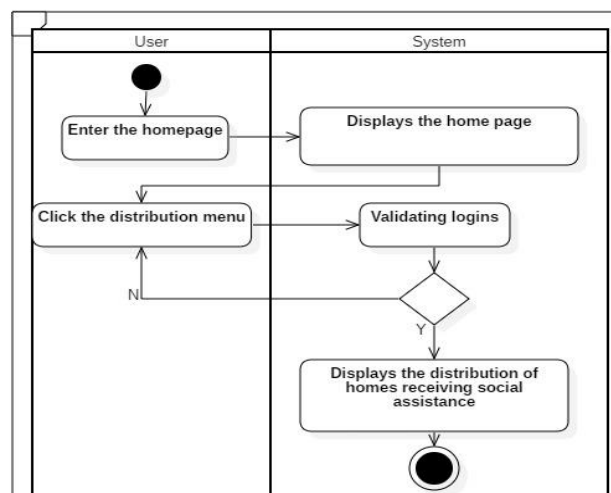


Fig. 4 Activity Diagram looking at the map spread

3. Sequence Diagram  
a. Login Sequences

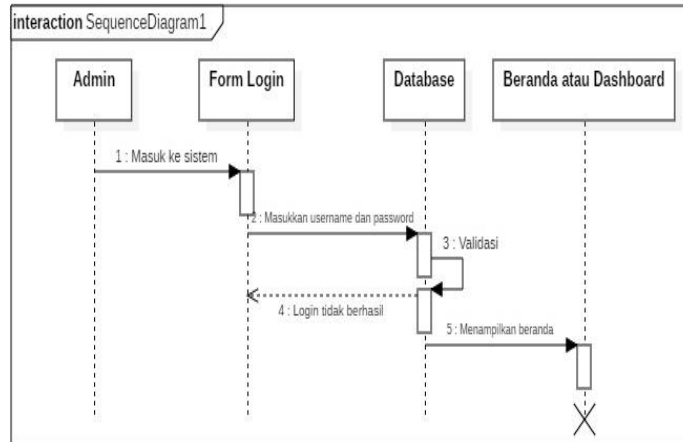


Fig. 5 Login Sequences

c. Sequence Diagram to see the spread of the map

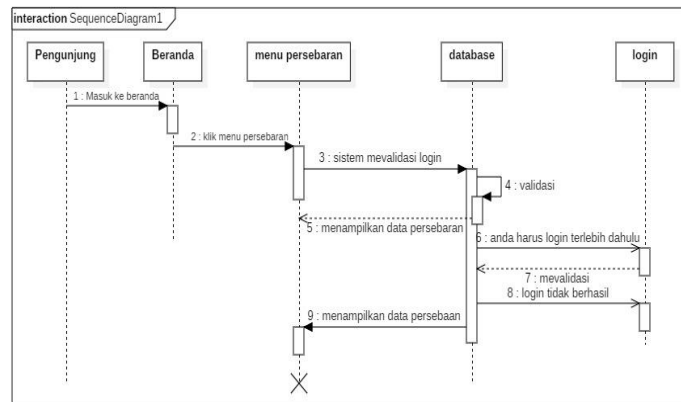


Fig. 6 Sequence Diagram to see the spread of the map

B. Product Results

a. Home Page Display

The home menu is the initial page of the system which displays news about the Giri Purno Village Office.

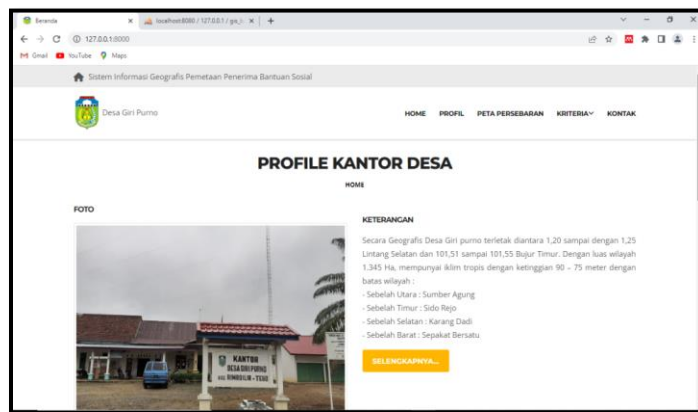


Fig. 7 Home Page

b. Display Of Distribution Map Page

This menu displays a map of the distribution of recipients of PKH and BLT social assistance in Giri Purno Village, where visitors can see the distribution of houses in the population that receive social assistance.

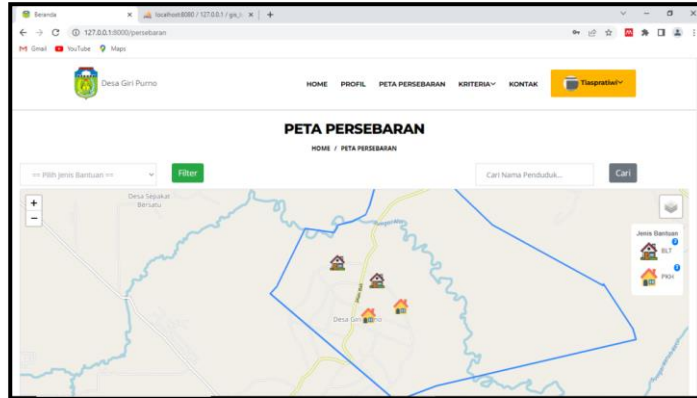


Fig. 8 Distribution Map Page

c. Display Of Social Assistance Recipient Details Page

The beneficiary details menu is a display for visitors to be able to see details of the beneficiary of social assistance, be it a photo of the beneficiary's house, the recipient's name, address, and RT as well as a route to the beneficiary's house.

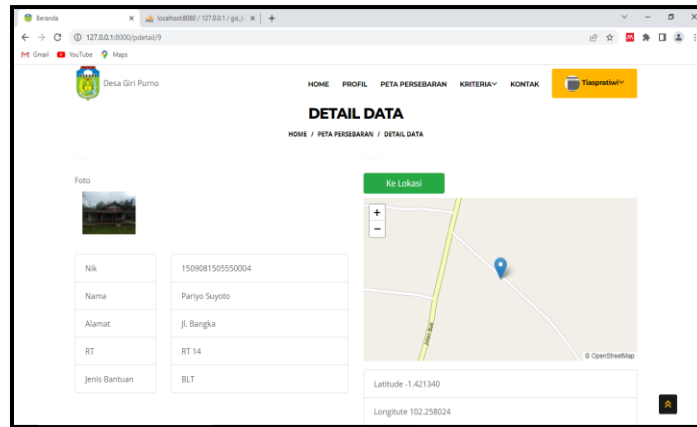


Fig. 9 Details Page

d. Route Page Display

The road route menu is a display for visitors if they want to visit the homes of social assistance recipients.

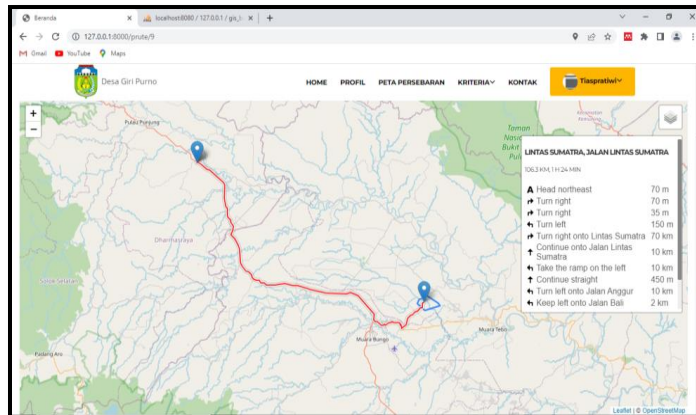


Fig. 10 Route Page

#### IV. CONCLUSIONS

Based on the results of the analysis of the geographical information system mapping recipients of social assistance in the village of Giri Purno, it can be concluded that a product is produced that can facilitate the Giri Purno Village office in processing population data on recipients of social assistance, especially PKH and BLT assistance, RT data and house location data. Recipients of social assistance are obtained from geographic data in a more accurate and complete manner by displaying data and maps in a visual form using the Leafletjs library as a tool for displaying maps and the Open Street Map as the basis for the map used. In addition, it also makes it easier for related parties to obtain information about recipients of social assistance in the village of Giri Purno.

#### REFERENCES

- [1] R. A. Wulandari, "Sistem Informasi Geografis Pemetaan Rumah Penduduk Penerima Bantuan Sosial (Bansos) Pkh Dnegan Menggunakan Framework ...," *J. Mhs. Inform.*, pp. 1–7, 2022, [Online]. Available: <http://eprints.univbinainsan.ac.id/201/%0Ahttp://eprints.univbinainsan.ac.id/201/1/Rati Ayu WulandariJurnal SIG Rati Ayu 018010001.docx>.
- [2] S. S. Anggriani, W. A. Triyanto, and D. L. Fithri, "Sistem Informasi Pemberian Bantuan Sosial Di Dinas Sosial, Pemberdayaan Perempuan, Perlindungan Anak, Pengendalian Penduduk Dan Keluarga Berencana (P3Ap2Kb) Kabupaten Kudus Berbasis Web Menggunakan Notifikasi Sms," *Indones. J. Technol. Informatics Sci.*, vol. 2, no. 1, pp. 22–26, 2020, doi: 10.24176/ijtis.v2i1.5645.
- [3] A. C. Murti and A. P. R. Pinem, "Perancangan Sistem Pemetaan Bantuan Sosial Berbasis Web Responsive," *Indones. J. Technol. Informatics Sci.*, vol. 1, no. 2, pp. 49–54, 2020, doi: 10.24176/ijtis.v1i2.4932.
- [4] A. Kristanto, *Perancangan Sistem Informasi dan Aplikasinya*, Revisi 2. Yogyakarta: Gava Media, 2022.
- [5] D. Prehanto, *buku ajar konsep sistem informasi*. Surabaya: SCOPINDO MEDIA PUSTAKA, 2020.
- [6] M. S. Dr. Priyanto Hidayatullah, S.T., *Pemrograman Web (Edisi 3)*. Informatika Bandung, 2021.
- [7] S. H. Sumantri, M. Supriyatno, S. Sutisna, and I. D. K. K. Widana, *Sistem Informasi Geografis (Geographic Information System) Kerentanan Bencana*, Edisi 1. Jakarta: CV. Makmur Cahaya Ilmu, 2019.
- [8] A. P. Hadi, *Buku Ajar Sistem Informasi Geografis dan Aplikasinya*, Cetakan Ke. Yogyakarta: CV Budi Utama, 2021.
- [9] I. P. Hendrajaya, I. G. J. Ek. Putra, and I. G. P. K. Julihartha, "Sistem Informasi Geografis Pemetaan Masyarakat Penerima Bantuan Sosial Tepat Sasaran Pada Desa Sulangai Berbasis Web," *J. Teknol. dan Inf. Komput.*, vol. 6, no. 3, pp. 278–287, 2020.
- [10] R. Abdulloh, *Pemrograman Web*, Pertama. Jakarta: PT Elex Media Komputindo, 2018.
- [11] S. Utomo and M. A. Hamdani, "Sistem Informasi Geografis (SIG) Pariwisata Kota Bandung menggunakan Google Maps API dan PHP," *J. Teknol. Inf. dan Komun.*, vol. XI, no. 1, pp. 1–9, 2021.
- [12] Rosa A. S. M. Shalahuddin, *Rekayasa Perangkat Lunak*. Bandung: Informatika, 2018.
- [13] A. I. U. Dewi, I. K. A. N. A. Jaya, and I. D. K. L. Digita, "Sistem Informasi Geografis (Sig) Sebaran Lpd Di Kota Denpasar Berbasis Web Menggunakan Framework Laravel," *Kumpul. Artik. Mhs. Pendidik. Tek. Inform.*, vol. 2, no. 3, pp. 224–232, 2022.
- [14] C. Chairuddin, N. Suryana, and ..., "Dukungan Sistem Informasi Geografis untuk Pendataan Bantuan Sosial Berbasis Masyarakat," ... *Nas. Inov. dan ...*, no. September 2021, pp. 147–158, 2021, [Online]. Available: <https://e-journal.rosma.ac.id/index.php/inotek/article/view/115>.
- [15] O. Arifin and A. R. Supriyatna, "Sistem Informasi Geografis Untuk Pemetaan Lahan Kakao Menggunakan Leaflet Js Dan Geojson," *J. Teknoinfo*, vol. 17, no. 1, p. 364, 2023, doi: 10.33365/jti.v17i1.2397.
- [16] A. R. Ananda, G. F. Nama, and M. Mardiana, "Pengembangan Sistem Informasi Geografis Pemerintahan Kota Metro Dengan Metode SSADM (Structured System Analysis and Design Method)," *J. Inform. dan Tek. Elektro Terap.*, vol. 10, no. 1, pp. 24–33, 2022, doi: 10.23960/jitet.v10i1.2261.
- [17] M. Danny, "Sistem Informasi Geografi Pariwisata Kabupaten Karanganyar Berbasis Android," *J. SIGMA*, vol. 8, no. 1, pp. 33–42, 2018.
- [18] M. I. Sarangnga and G. Gafrun, "Sistem Informasi Geografis Pelayanan Kesehatan Rumah Sakit Di Kota Kendari Berbasis Web," *Simtek J. Sist. Inf. dan Tek. Komput.*, vol. 5, no. 2, pp. 70–77, 2020, doi: 10.51876/simtek.v5i2.78.
- [19] Renaldy and A. Rustam, "Perancangan Sistem Informasi Inventory Berbasis Web Pada Gudang Di Pt. Spin Warriors," *J. Homepage*, vol. 4, no. 1, pp. 27–32, 2020, [Online]. Available: <http://jti.aisyahuniversity.ac.id/index.php/AJIEE>.
- [20] T. Triana, M. Yusman, and B. Hermanto, "Sistem Informasi Manajemen Data Klien Pada Pt. Hulu Balang Mandiri Menggunakan Framework Laravel," *J. Pepadun*, vol. 2, no. 1, pp. 40–48, 2021, doi: 10.23960/pepadun.v2i1.33.