Geographic Information System of Health Service Place in Palembang

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Abstract. Health service place in Palembang consists of puskesmas, hospitals, health clinics, and pharmacies. People in Palembang get information about health service place through information about the surrounding community, health service institutions and websites that are displayed separately. Geographic Information System (GIS) is used to provide complete information about health service place in Palembang. GIS technology can display spatial data such as a digital map of health service location consisting of puskesmas, hospitals, pharmacies, and health clinics. GIS produces web based system that can be accessed online and quickly. GIS applies google map API technology with prototype method as a system development technique.

1. Introduction

Health service is an effort to improve health, prevent and cure disease. The increasing demand for health services, the more places that provide health service, especially in Palembang City. Health service place in Palembang consists of puskesmas, hospitals, health clinics, and pharmacies. People in Palembang get information about health service place through information about the surrounding community, health service institutions and websites that are displayed separately. Then a geographic information system is needed to provide information on where health services in Palembang are based on websites. GIS produces web based system that can be accessed online and quickly. GIS applies google map API technology with prototype method as a system development technique.

Some researches about geographic information systems and prototypes method are research conducted by Fazeli, Said, Amerudin and Rahman [1], built Volunteered Geographic Information (VGI), becomes the first point of response during any natural disaster. Research conducted by Hasti, Mulyani, Wahyuni, Gustiana and Hastini [2] built an information system for areas of business and wedding organizer. System approach method using object oriented approach and prototype method as system development technique.

Research conducted by Anurogo, Lubis, Khoirunnisa, Pamungkas, Hanafi, Rizki, Surya, Situmorang, Timbang, Sihombing, Lukitasari and Dewanti [3], this research produces 2 - dimensional high resolution image data on the research area. Utilization of third party software (Agisoft PhotoScan) making it easier to acquire and process aerial photogrammetric data.

Research conducted by Ismanto dan Mustofa [4] this research carried out the study concerned with the utilization of geographic information system (GIS) for irrigation system management in Merauke Regency. System approach method uses structural programming. Research conducted by Shaikh and Ali [5] built a geographic information system for spatial distribution and accessibility to public sector
tertiary care teaching hospitals in Karachi. Research conducted by Pitt, Monks, Crowe and Vasilakis [6] built systems modeling and simulation in health service design, delivery and decision making. Research conducted by Hamilton, Nedza, Doody, Bates, Bauer, Voyadgis and Fox-Lent [7], this research built web based geospatial multiple criteria decision analysis using open software and standards. This concept of application could be virtually accessible to many levels of decision makers from individuals to entire organizations. Research conducted by Barik, Dubey, Samaddar, Gupta, and Ray [8] Cloud Geographic Information Systems (GIS) has emerged as a tool for analysis, processing and transmission of geospatial data. This paper use FogGIS for mining analytics from geospatial data. Results showed that Fog Computing could analysis of geospatial data. Several open source compression techniques have been used for reducing the transmission to the cloud.

Research conducted by Gong, Geng and Chen [9], this research to show the proposed method in the data management environment, the Sensor Web Service Platform implemented that supports real-time realization GIS data model. Two cases of environmental data management in Wuhan city, China. One is real-time air quality monitoring, and the other is real-time monitoring of soil moisture. Research conducted by Wang, Miller, Brown, and Jiang [10] built a GIS 3D and virtual reality for public participation to support wind energy development. Research conducted by Jurgenhake and Dumitrescu [11], built a system to develop a systematic that assists in determining the ideal manufacturing process for a prototype at any stage of the product development process. Applicable MID-specific functions and solution elements have been analysed, and the appropriate processes have been assigned. The developed prototype classes and the supplement branch-specific characteristics help to determine the correct procedure at each step of the product development process.

Research conducted by Amirebrahimia, Rajabifarda, Mendisb and Ngobprocess [12], this research built a framework for a microscale flood damage assessment and visualization for a building using BIM–geographic information system integration. Research conducted by Susanto Tamsekar and Thorat [13], Planning Support System (PSS) is an architecture that, using computer science, supplies decision support information in the field of planning. PSS use for rationalizing planning process by providing necessary support to systematically structure and formulate problems, develop alternative plans or policy scenarios, assess and evaluate their impacts and to choose the proper decision, policy or plan. In this research will help to planners for the efficient planning process.

Research conducted by Menold, Jablokow, and Simpson [14] built a holistic framework for structuring prototyping methods to support engineering design. Research conducted by Prayughi, Hermadi and Sukoco [15] use object-oriented analysis and design of research seminar online registration in higher education.

2. Research Methodology
The technique of system development use prototype method, according to Afrina and Ibrahim [16], prototyping method is a development method that uses an approach to make a program quickly and gradually so that it can immediately be evaluated by the user. Following are the stages in the prototyping method as shown in the picture:

![Figure 1. Prototype Method](image)

1. Identification of User Need
   This stage is the initial stage of identifying user need. At this stage, there will be communication between the developer and the user to identify the needs needed to build the system.

2. Building Prototyping
   After obtaining data from various sources, the next step is to build the initial prototyping, as the system image will be built.

3. Test Prototyping
After building prototyping, the system description that will be built is evaluated with the aim of getting advice and input from the user. If there is still a revision at this stage, repairs must be made.

4. System coding
   In this stage, the agreed prototyping is then translated into the appropriate programming language, PHP and database using MySQL.

5. System testing
   After it is completed, it is built with programming, then the system testing process is carried out. But the researchers only applied the prototype method from step 1 to step 4.

3. Result and Discussion

Results and discussions are based on the following stages:

3.1. Identify of user needs
This stage is the beginning to identify user need. At this stage, communication will be carried out to identify the need to build the system. Need based on a system that will be built such as:

| User (People)                     | Administrator                                       |
|-----------------------------------|------------------------------------------------------|
| View Home                         | Process data of home (update data)                   |
| View Profile                      | Process data of profile (update data)                |
| View News                         | Process data of news (insert, delete and update)     |
| View of Health Services Place     | Process data of health services place (insert, delete and update) |

3.2. Building Prototyping
The stages of building prototyping are the initial stages of building a system image. The following is the use case diagram display:

![Figure 2. Use case diagram](image-url)
Figure 2 explains that there are 2 actors in system design. First is the user actor (people) who can see the home view, profile, news and health service place. Second is the administrator actor, who can process homepage, profile, news and process data of health services place.

3.3. Test Prototyping
After building prototyping, the admin, program expert and database expert meet to evaluate the prototype that was designed. And Figure 2 is the result of the prototype designed.

3.4. System Coding
System coding is the stage that is translated using the PHP programming language and database using MySQL. Here are the results of the system coding stage.

1. Homepage

![Figure 3. Display of home page](image)

The homepage is the main page that appears when the website is first opened by the user or community. Various navigation is displayed on this page such as home page, profile, news and location of health services.

2. Profile Page

![Figure 4. Display of profile page](image)

The page about us display general information about health services place. This page also displays information on the place of health services that can be displayed and searched by the user or community.
3. News page

![Figure 5. Display of news page](image)

News pages display information about health. People who want to get information such as the benefits of fruits, health articles and tips can be seen on this page.

4. The page of health services place

![Figure 6. Display of health services place](image)

The page of health services place displays information about health services place which consists of puskesmas, hospitals, health clinics and pharmacies in Palembang. The health clinic also features several specialist clinics such as beauty clinics, obstetric clinics, dental care clinics, and child clinics.

5. The page of Administrator

![Figure 7. Display of Administrator page](image)
Before entering the administrator page, the admin must log in by entering a username and password. If the username and password combination is correct, the system will display the administrator page. The administrator page is used to process the entire page, such as the health service page, the homepage, about us and the news.

4. Conclusion and Suggestion

The conclusion is geographic information system of health services place help many peoples to get complete location and information about health service place in Palembang. The suggestion is this research only use 4 steps method of the prototype, the next research is expected to be able to apply the next stages of the prototype method.

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