Analysis Of Geographic Information System Using SDLC (System Development Life Cycle)

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1. Introduction

1.1 Background

Information requirements in the present belongs to the essential needs, because an update is support in an activity. Knowing the information somewhere is important for each of them in order to support efficiency in terms of time and cost. Google Maps is a pointer system location or mapping information online the most popular today. Google Maps is not only available in the form of applications, but also web based. Nowadays more and more emerging applications apps are designed to facilitate employment or human activity, especially in the android application that uses Google maps. Thus many persons are racing to create a Geographic Information System application to determine a location and makes it easy somewhere that can also be used to promote an area that uses the application. With the strategy of information systems and information technology right in running GIS application development then the goal will be achieved with the desired appropriate.

2. Basic Theory

2.1 Review of Literature

a. "Government Area Distribution System Design Concepts With Web-Based Geographic Information System In Tangerang City Government" This journal is the result of the National Seminar on Information Technology and Multimedia written by Nanda Dian Prasetyo, Tatik YuniatiProg STMIK Information System Tangerang. This journal discusses the development and design of the distribution system locations with web-based Geographic Information System to produce a website which in this application we can find out the location and distribution of a thorough located in Tangerang city easily and quickly.

b. "Geographic Information System Design of Tourism in Lampung" Journal written by Ardi dwi saputra & Yulmaini of Informatics and Business Institute Darmajaya. This journal discusses the Geographical Information System Design for Building a geographic information system design Lampung Province tourism to help the Tourism Office of Lampung Province travel to the community to inform effectively and efficiently.

c. "Indian Tea Garden Information System- A webGIS Enable" journal Proceedings of the World Congress on written by Debasish Chakraborty, Arati Paul, Dibyendu Dutta, A. Jayaram1, TP Girish Kumar, Anju Bajpai, Khusboo Mirza, Vinay Soni and Dhiren Thirani. This journal discusses the use of Geographic Information System WebGIS to store, access, analyze and disseminate spatial and aspatial information to manage and monitor the tea gardens in India.

d. "Design the Geographical Information System for Supplier Selection in Batik Industry" written by Aries Susanty, Sri Hartini, Diana Puspitasri, Mandy Budiawan, Priliandi Hidayatullah on the Development of Geographic Information System aimed to identify the suppliers of raw materials nearby in certain areas, so that SMEs can get the minimum cost of shipping.

e. "Government Area Distribution System Design Concepts With Web-Based Geographic Information System In Tangerang City Government"National Seminar on Information Technology and Multimedia 2015 ISSN: 2302-3805. Author Nanda Dian Prasetyo, Tatik YuniatiProg STMIK Information System Tangerang.

3. Results Analysis And Discussion

3.1 Analysis of Results

Based on the analysis to realize that it is the city of Tangerang require access to information the locations where that facilitate the search quickly and precisely. And the results of research, has developed and produced a website which in this application, users can find out the distribution of a thorough locations that exist in the city of Tangerang easily and quickly, Assisting municipal governments Tangerang in providing services to the public and as a media promotion of the region to all communities ,

3.2 Discussion

The followingis a discussion of methods SDLC. System development method used in the design of this system is the *System Development Life Cycle* (SDLC), but there is one step that is not included in the development of this system namely the maintenance phase / treatment systems. The stages are carried out in the design of geographic information systems are:

1. The planning stage of the system, described herein is to define the issues involved, the problems faced by the City of Tangerang is a need for innovative system design information about bookmarks locations in the region of city government Tangerang. Given the growth of community activities that come in Tangerang very high, need to build a system that can help the public obtain precise location information and quick.

2. Phase Analysis. This stage is done on analyzing the behavior of the people of Tangerang or tourists who visit the city of Tangerang who often confusion in finding the address or location where you want to visit.

3. The design phase of the system, in a project making process modeling, data modeling, and design a display interface*(interface).*Using the model of Data Flow Diagrams (DFD) in which there are two entities, namely the admin as the manager of the system and the user as the user of the system.

4. Development Results. Here is a screen display of the development GISTA (Geographic Information System Tangerang) applied to a website where the application can determine the location and distribution of a thorough located in Tangerang City in accordance with the image below.

The image above shows the interface screen after selecting one of the methods that the search form will appear next screen image data eg tourism sites in Tangerang.

Page image display 3 above show the details of the location data further in accordance with the choice of location has been specified by the user, with description more detail of the data supporting, among others, address location, transportation used to get to that location and travel time to get to the location the.

From the explanation on the research, the authors conclude:

1. This website can help all people who visit or activities in Kota Tangerang can obtain location information easily, accurately, and quickly
2. Assist the government of Tangerang City in providing services to the public and as a media promotion of the region to all communities ,
3. This website provides an easy way to inform all existing activities in the area of Tangerang city administration.

Geographic Information System Design of Tourism in Lampung" Journal of Information,Vol. 12, No. 2, December 2012 author Ardi dwi saputra & Yulmaini of *Informatics and Business Institute Darmajaya.*

3.3 The Results Of Analysis

This research is to establish a Geographic Information System tourism in Lampung province to assist the public in selecting the existing attractions in Lampung increase the number of tourists coming to the tourist attraction in the province of Lampung, as a reference for readers who will conduct research more particularly with regard to issues of geographic information systems. Based on research that has been conducted, resulting Perencangan geographic information system Lampung Province tourism created with PHP, CSS, JavaScript and jQuery. Geographic information systems can be used as a guide to search for tourist attractions in the province of Lampung. Geographic information systems, the tourism Lampung province, to replace facilities that use the previous information quickly, based desktop, print media, brochures and pamphlets. Geographic information systems Lampung Province tourism can help the Tourism Office of Lampung Province travel to the community to inform effectively and efficiently.

3.4 Discussion

This study starts from the Planning phase, then Analysis and Design. In the DFD level 0, there are two external entities that visitor as a system user and admin as the manager of the system, the visitor there are several data flow is data Lampung province, travel the data, the data support facilities, event data and data guest book. On the admin also a data flow that is the login data, the data category a tour, facilities categorical data, the data is a tourist attraction, the data Lampung province, facility data, event data.

a. Display system: Based on the design of the interface has been made, the following will be explained about display geographic information system design Lampung Province tourism. Results website display is described in Form view websites that have been run (running).
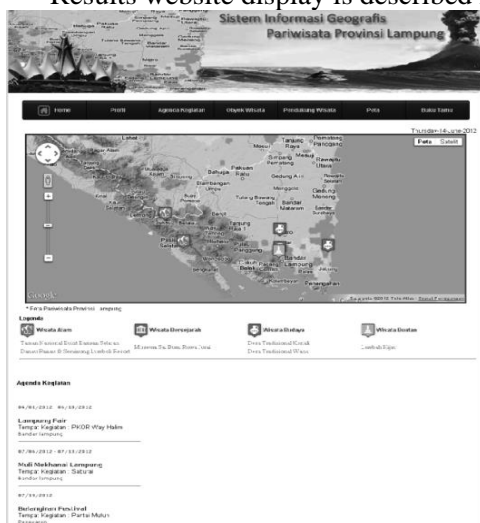
b. Maps main menu when the geographic information system tourism Lampung province is run for the first time, there are 7 pieces of menu on program shown namely: home, profile, agenda, tourism, tourist supporting , map and guest book.

c. page tourism has 4 sub menu is nature tourism, cultural tourism, historical tourism and artificial tourism.

d. For the more, the information pages of these attractions will appear when a visitor clicks on the link. The results of the analysis of the design of geographic information system tourism Lampung Province covering device software, operating systems, the internet and the hardware used to run this website, in accordance with the needs of the system. Users of geographic information systems can be entered into the system in two ways: as an administrator and as a visitor. Users of the system as an admin charge of input or update d ata geographic information systems. Through the admin page to enter the main menu for an admin need to login, and an end will see the information in the input or updated by an admin. Scheme geographic information system Lampung Province tourism created with PHP, CSS, JavaScript and jQuery. In its application on the Internet, accessing it requires a browser and an internet connection that is optimal.

3.5 *Study Locations*

West Bengal and Assam are the two countries that produce tea plant of the Indians in four districts (Darjeeling, Jalpaiguri, Coochbihar, Dinajpur North) from West Bengal is of 15 903 km^2 and 14 districts (Barpeta, Bongaigaon, Cachar, Darrang, Dibrugarh, Golaghat, Hailakandi, Jorhat, Karimganj, Marigaon, Nalbari, Sivasagar, Sonitpur, Tinsukia) of Assam is of about 75 201 km^2, to study and know the location of those areas.

3.6 *Use of Data*

GIS Portal Tea consists of an inventory of spatial and Data aspatial tea gardens. Spatial data includes georeferenced vector state boundary layer (viz., District boundaries, road network, drainage network, boundary, boundary section tea garden land use and density of trees in the tea gardens) and satellite images from Cartosat-1 and LISS-4. Non-spatial data includes the name of this vineyard, contacts, facilities, weather, infrastructure, agriculture, disease and production details.

3.7 *Methodology*

In this study, a prototype of the SDLC (Software Development Life Cycle) followed to develop applications. Progress applications continue to be improved to accommodate the new requirements. Flowchart of the development cycle shown in Fig

Indian Tea Garden Information System- A WebGIS Enabled Solution
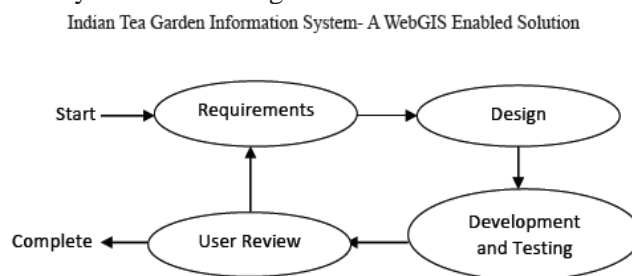
Prototype model selected for this application includes four stages. Needs analysis, designing, development & testing and user reviews. in the requirements analysis phase inputs are relevant to the project were collected from the user, the application is designed based on user requirements in the second stage and subsequently developed a prototype application in the third stage. Application development is shown to the user for feedback on the fourth stage. These steps are followed until the user is satisfied. Requirements analysis Requirements assessed based on multiple interactions and meetings, is the creation of a digital inventory (maps, satellite images and data aspatial) tea plantation and developing user-friendly interface to visualize the spatial extent of multi-scale gardens are. Section, gardens, county and state together with the demand, proximity / buffer analysis, surface in a web environment. User authentication is also essential for data security.

3.8 *Design*

Is done after a needs analysis in which the system components and their interfaces are described in detail appropriate for the commencement of development. Three broad aspects of the design is. Architecture design, interface design and database design followed to meet the needs of the application. The design was made flexible so that new requirements can be easily inserted. architecture design
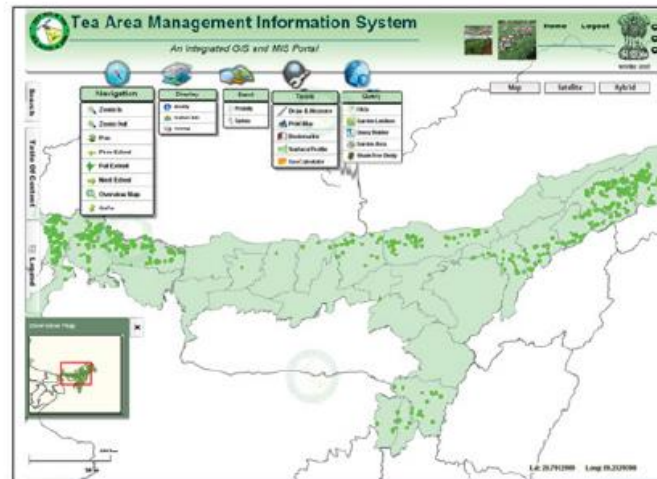
3.9 Navigation
The navigation menu provides functionality for map navigation and includes a tool to 'Zoom in', the 'Zoom', 'Pan' and go to 'as far as Previous', 'Next', 'Full So far' and the specified location.

3.10 Display
Display help menu to display and overlay raster and vector layers. Features of the location information in all visible layers can be viewed using the Identify tool available in the menu "Display".

3.11 Find
facilitate the search tool at locating the garden in the district or state. It is capable of searching, creating gardens that in turn can be displayed more recent satellite imagery to monitor the activities of the plantation. The facility was also available in the search menu to show the garden / plant / settlement near the selected location.

3.12 Tools
Menu 'Tools' includes a tool to measure distances / areas,surface profile and map display. BookmarkTools menu helps to keep the map current limit forfuture use and tool-Calculator converts geo Geocoordinates, the metric system, and temperatures.

3.13 Implementation and Testing
Portal TeaGIS in the local server after the completion of the construction. Black-box (input value) test to find the logic is lost, the white box (structural) testing to test the correctness of the code, performance testing to check whether the system meets the performance requirements and stress testing database subject to heavy loads carried. Testing mentioned above is done for all the modules of the application and described in the section. Search module is one of the important modules in applications that search for and display gardens. Based on the feedback that users, Name garden or district name or country name. This module also searching most for granted is different from the results found. Similarly, for all modules in the application were also tested as desired by size. The garden has a larger area of 10.86 Ha labeled as great if not labeled as a minor. Design*the Geographical Information System for Supplier Selection in Batik*Industry" *Proceedings of the World Congress on Engineering* 2015 Vol 1 London, UK Writer Aries Susanty, Sri Hartini, Diana Puspitasari, Mandy Budiawan, Priliandi Hidayatullah.

3.14 Analysis Results
The resulting based GIS development for suppliers of raw material selection in the batik industry, helps to identify the nearest suppliers of certain raw materials in certain geographical areas, so that

SMEs can obtain the minimum cost of shipping. The results of alpha testing with a black-box testing showed that all the functions contained in the GIS for supplier selection of raw materials in the batik industry has been going well in accordance with the design. GIS development has a good interface and easy to understand, the user can easily follow the instruction, which is logged into the system, collecting data in the system, it is able to produce the type of information required by the user, the raw materials provided by suppliers, as well as locations such as shown on the map.

3.15 Discussion

a. "Analyzing the batik industry requirements in a Geographic Information System". The main concern in any system supplier selection with SMEs in the batik industry is the availability of spatial information. Internet GIS facilitated by Google Maps can play a key role in this aspect by providing the shortest location of raw material suppliers. There is information about the number or databases required by GIS internet facilitated by Google Maps, which is information about each SME (name of SME, location, type of batik was produced, e-mail address, phone number), materials (fabric, dye, wax), information about each supplier (supplier name, location, e-mail address, phone number), shipping costs according to the type of transport to be used, as well as a certain amount of material to be transported. The procedure for supplier selection based on the most cost delivery of the minimum can be explained as follows: The user will see a map of Central Java and Yogyakarta, the user determines the location point as a destination for delivery of raw materials, points of interest can be selected via the menu if SMEs have been registered in the database, users choose the type of raw materials and filling amount of raw materials to be sent, the user will see the delivery of any supplier who sells ttese types of materials to be purchased, the system will display information about the shipping cost of each supplier based on the type of transport used to make the delivery.

b. Design and Coding System

Architecture System update the information system architecture depicted in a Use-Case Diagram, Context Diagram, and DFD. Use-Case Diagram illustrating the activity of the system and the people who carry out the activity on the system
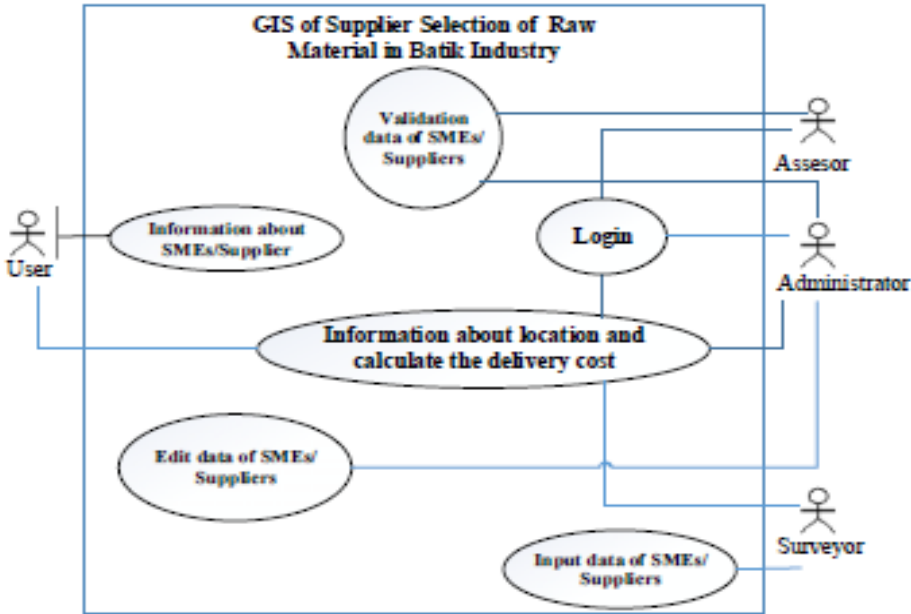

Table 1. DescriptionUse Case

Activity	Description	Actor

log Activity	log into the system (main page) by entering a username and password	Administrator, surveyors, appraisers
Information about SME / Supplier activities to identify the location of SMEs and suppliers administrator, data input from users of SME / supplier	of activities to add data about the location and other information about SMEs and suppliers of	system administrators, surveyors

Table 2. ExplanationUse Case

activity	Description	Actor
data Validation SME activities	validate supplier datahave been inputted by the	Administratorssupplier,the Valuer
Information on the location and calculate shipping costs	of activities comparing the distance between SMEs batik and location of suppliers and shipping costs will be charged to SMEs batik.	User
EditData SME suppliers	activity data changes that have been inputted by the supplier	administrator, surveyor

ERD database helps designers identify the data and rules that will be represented and used in the Database. Interface Design: The user interface is the aggregate of the means of people (users) interact with a particular machine, device, computer program or other complex tool. The user interface provides input, allowing the user to control the system; (And) Output, allowing the system to inform users
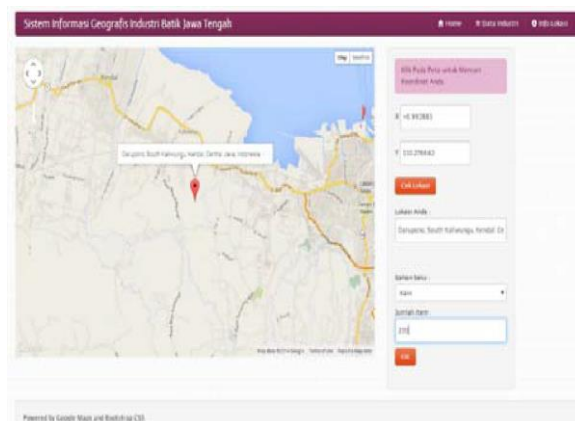
c. Software Testing: The proposed GIS information system for the selection of suppliers of raw materials in the batik industry will be tested by alpha and beta testing. The purpose of this testing is to uncover errors that can be found by users. Alpha test conducted at the site by the developer customers. The software used in a natural setting with the developer of the user and recording errors and usage problems. Alpha testing is done in the control environment. Beta testing is done at one or more locations by the end-user customer of the software. Unlike alpha testing, developers are generally present. Therefore, the beta test is a software application in an environment that can not be controlled by the developer. Note the customer all the problems encountered during beta testing and reporting this to the developer at regular intervals. As a result

of the reported problems during testing, software engineers make modifications and then prepare for the release of its software products to all customers.

d. Alpha testing will be done using black-box testing, black box testing is also called behavioral testing, focusing on the functional requirements of the software. That is, this test allows software engineers to get a set of input conditions that will fully implement all of the functional requirements for the program. Results of testing the alpha with black box testing showed that all of the functions contained in the GIS for the selection of suppliers of raw materials in the batik industry has been going well, according to the design. This means all successful GIS use and does not experience an error; if there is an error, this is caused by a user who does not give the right input. Functionally, GIS for supplier selection can produce output as expected by the user. After beta testing, the results of user evaluation of the system software performance is summarized as follows: GIS has a good interface and easy to understand, user can easily follow instructions, ie logged into the system, the search data in the system, the system is able to produce the information required by the user, the type of raw materials provided by suppliers, sertalokasi as shown on the map.

Table 3. Disadvantages and Advantages

No.	Journal of	Methods	Advantages	Disadvantages
1	Government Area Distribution System Design Concept Web-Based Geographic Information System in Tangerang City Government	SDLC (System Development Life Cycle)	By using SDLC generated website that can help all people who visit or activism in the town of Tangerang can obtain location information easily, accurately, and quickly.	Shortage that exists is not the inclusion of phase maintenance / care
2	Geographic Information System Design of Tourism in Lampung Province	SDLC (System Development Life Cycle)	Design of GIS with this SDLC method can help inform the public tours to effectively and efficiently.	Shortage that exists is not the inclusion of phase maintenance / care
3	Indian Tea Garden Information System a Web GIS Solution Enabled	SDLC (System Development Life Cycle)	Application generated will still perform well even under heavy load conditions even under conditions of stress.	Aspatial information about the still limited garden

Table 4. Disadvantages and Advantages

No	Journal	Method	Advantages	Disadvantages

4	Design the Geographical Information System for Supplier Selection in Batik Industry	SDLC (System Development Life Cycle)	The development of Internet-based GIS for the selection of suppliers of raw materials in the batik industry runs properly and in accordance with the design, and has a good interface and easy to understand	this study did not consider the road and traffic conditions

4. Conclusions And Recommendations

4.1 Conclusion

Based on all four journals have been analyzed, all journal discusses the design of Information Systems web-Based using the SDLC with the stages of the design that is inside. The results obtained in all four different journals, according to the issues discussed and the results of the analysis or design are made. The results are expected to assist the user in knowing every location there diruang scope of each system generated in the journal. From the results of all four journals above, it can be concluded that the design of Geographical Information Systems are made using SDLC method is very convenient in its application and to support the new system has been created to help facilitate the public. Use of the method SDLC on Geographic Information System design helps simplify the design by the stages that exist in the method. And with this study, the authors or peneliti can learn and study the results of the analysis and design of a Geographic Information System Web-based location.

4.2 Suggestion

author in this journal analysis is a Geographic Information System application can provide a positive impact for the community, for the future is expected to further research on the application of Geographical Information System so that the study was not limited to any analysis.

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