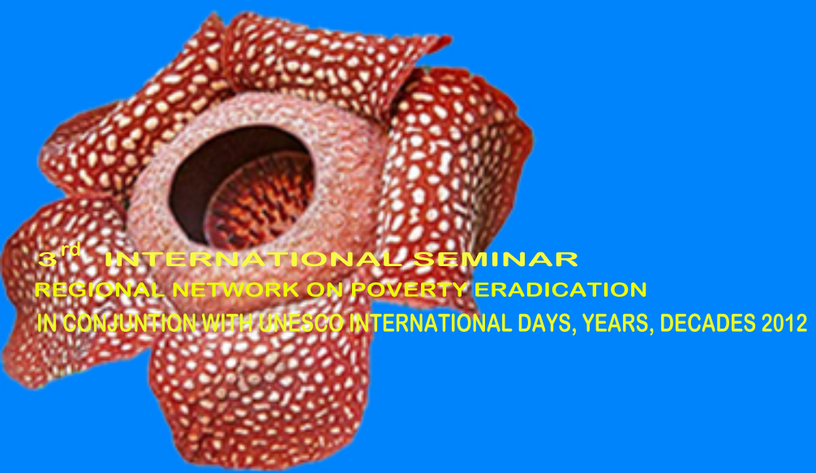
UNIVERSITAS BENGKULU

E-PAPER COLLATION
INTERNATIONAL SEMINAR

UNIVERSITAS BENGKULU

E-PAPER COLLATION
INTERNATIONAL SEMINAR



SCHEDULE OF
RENPER INTERNATIONAL SEMINAR
University of Bengkulu, Bengkulu, Indonesia, 15-17 October 2012

Day, Date, Time	Activity	Venue
Sunday, 14 October 2012		
08.30 – 19.00	Participants Arrival	Fatmawati Airport
Monday, 15 October 2012		
08.15 – 09.15	Opening Ceremony: - Prof. Ir. Zainal Muktamar, M.Sc., Ph.D. (Rector of UniB) - Prof. Dr. Ibrahim Che Umar (Chairman of Renper) - Performance: Traditional Dance - Photo Session	Raflessia Room (Ruang Rapat Utama)
09.15 – 09.30	Tea Break	Workshop Room Terrace
09.30 – 12.30	Plenary Session: - Dr. Ir. Sujana Rohiyat, Deputy of Coordinator Minister of Social Welfare Republic of Indonesia - Irman Lanti, UNDP Indonesia, Assistant Country Director, Democratic Governance and Poverty Reduction - Prof. Suahasil Nazara, Policy Working Group Coordinator, Secretariat of the National Team for the Acceleration of Poverty Reduction, Office of Vice President of Republic of Indonesia - Dr. Touch Visalsok, President of University of Battambang, Cambodia - Prof. Dr. Ibrahim Che Umar, Chairman of Renper, Universiti Malaysia Kelantan, Malaysia	Rafflessia Room (Ruang Rapat Utama)
12.30 – 13.30	Lunch break	UniB Lake
13.30 – 17.00	Council Meeting	Rector Office
13.30 – 15.00	Parallel Workshop	5 Workshop Rooms
15.00 – 15.30	Coffee break	Workshop Room Terrace
15.30 – 17.00	Parallel Workshop	5 Workshop Rooms
17.00 – 19.30	Free Time	Hotel
19.30 – 21.00	Dinner and performance	Rector Building Hall
Tuesday, 16 October 2012		
08.30 – 10.00	Parallel Workshop	5 Workshop Rooms
10.00 – 10.30	Tea Break	Workshop Room Terrace
10.30 – 12.00	Parallel Workshop	5 Workshop Room
12.00 – 13.00	Lunch Break	UniB Lake
13.00 – 14.00	Plenary: Workshop Discussions Wrap Up	Raflessia Room
14.00 – 14.30	Council Meeting Wrap Up and closing (Chairman of Renper)	Raflessia Room
14.30 – 15.30	Coffee break	Workshop Room Terrace

15.30 – 16.00	Way to Site Visit, Sri Katon Village	Desa Sri Katon
16.00 – 18.00	Close to the people and their work	Desa Sri Katon
18.00 – 20.00	Dinner, performance	Balai Desa Sri Katon
Wednesday, 17 October 2012		
09.00 – 12.30	Visit to UniB Agriculture Laboratory and UniB small business partner	UniB, Small Industry
12.30 – 13.30	Lunch Break	Jenggalu Resort
13.30 – 16.00	City Tour, free time	City of Bengkulu, Tourist Objects, Souvenir
Thursday, 18 October 2012		
08.30 – 17.00	Participant Departure	Fatmawati Airport

3rd RENPER INTERNATIONAL SEMINAR
SCHEDULE OF PARALLEL WORKSHOP
15-16 October 2012

15 October 2012: 13.30 – 17.00
Workshop theme 1: Making Poverty Issues Integral to Human Rights Agenda
Workshop Room 1 (Ruang Rapat 1)

Facilitator: Prof. Priyono Prawito
Supported by: Raja and Ichsan

No.	Name of participant	Country/ Institution	Paper Title
1	Frederikus Fios S.Fil., M.Th	Indonesia, Bina Nusantara University	Building Character, Alleviating Poverty
2	Dr. P.Amuthalakshmi	India, Madras School of Social Work, Tamil Nadu	Poverty Influence On Violation of Human Rights
3	Dalmeri, Munzir, and Achirudin Akiel	Indonesia, Universitas Indraprasta PGRI	Higher Education for the Poor People
4	Prof. Farok Zakaria	Malaysia, Universiti Malaysia Kelantan	Provide a Home: An Analysis on the Approach of Majlis Agama Islam Kelantan (MAIK) in Poverty Alleviation
5	Prof. A. Anwar Ismail, Mohd Badrul Hisyam Muhamad Alias, and Faiz Nur Hakim Azmi	Malaysia, Universiti Malaysia Kelantan	UMK-ECER: Agropolitan Project - Initiatives in alleviating poverty among the rural hardcore poor
6	Dr. K. Umachandran	India, Organizing Development NELCAST Ltd.	Exploitation of Human Rights in Indian Industrial Sector (Automobile Segment)

15 October 2012: 13.30 – 17.00
Workshop theme 2: Expanding Poverty Dimensions into Academic Curriculum
Workshop Room 2 (Ruang Rapat 2)

Facilitator: Dr. Teguh Adiprasetyo
Supported by: Perti and Mei

No.	Name of participant	Country/ Institution	Paper Title
1	Hajar G. Pramudyasmono, Ph.D	Indonesia, University of Bengkulu	Understanding Poverty on Fisher Families of Bengkulu
2	Dr.Viswanatha Subramaniam	India, FX Engineering College, Vannarpettai, Tirunelveli,	An Academic Analysis For Poverty Eradication
3	Mostafa A R Hossain, Md. Abdul Wahab, Nanna Roos and Shakuntala Haraksingh Thilsted	Bangladesh, Bangladesh Agricultural University	Impacts of carp-mola promotion research on fish availability and poverty alleviation at household level in Bangladesh
4	Prof. Rahana Abdul Rahman	Malaysia, Universiti Teknologi MARA	Students Perception Toward Academic Performance and the Relationship With Their Welfare
5	Shaban Mohammadi	Islamic Republic of Iran, Education System,	The study of the socio-economic factors of poverty in the rural areas of Chay Parah Payeen, Zanjan province, Iran
6	Prof. Rozinah Jamaludin Prof. Mohammad Iranmanesh	Malaysia, Universiti Sains Malaysia	A Comparison of E-Learning Readiness (ELR) between Vietnamese and Indonesian Higher Education Institutions Receivers/Students

15 October 2012: 13.30 – 17.00
Workshop theme 3: Engaging the Debate on Poverty and Globalisation
Workshop Room 4 (Ruang Vikon)

Facilitator: Adityo Ramadhan, MA
Supported by: Ediah and Ejo

No.	Name of participant	Country/ Institution	Paper Title
1	Prof Aiman Shaare, Prof. Rahana Abdul Rahman	Malaysia, Universiti Teknologi MARA	The Extent of Economic Growth Towards Relative Poverty Reduction
2	Mr. Boko Susilo, Albert Pratama, Rusdi Efendi, Yulian Fauzi	Indonesia, University of Bengkulu	Application of WebGIS-based Spatial Data Inventory
3	Manisha Shekhar,	India, Dept.of Electronic & Communication Dr. M.C. Saxena College of Engineering & Technology, UPTU, Lucknow	Harnessing Information And Technology For Disaster Response Decision-Making Units
4	Dr. Rostislav Netek, Ales Vavra, Jiri Panek, Vit Vozenilek,	The Czech Republic, Palacky University, Olomouc	Web Atlas Technology as a Tool of International Development Assistance of the Czech Republic to Empower the Poor in Selected Countries
5	Prof. Wee Yu Ghee	Malaysia, Universiti Malaysia Kelantan	Village Transformation and Poverty Eradication Through Social Enterprise for Economic Development (Seed) Program

15 October 2012: 13.30 – 17.00
Workshop theme 4: Building People Initiatives to Alleviate Poverty
Workshop Room 3 (Ruang Rapat 3)

Facilitator: Ade Sri W, Ph.D
Supported by: Putri and Agri

No.	Name of participant	Country/ Institution	Paper Title
1	Associate Prof. Sukree Kaeomanee	Thailand, Nakhon Pathom Rajabhat University	Measures to Elevate Quality of Life of Motorcycle-taxi Drivers: A Case Study in Nakhon Pathom
2	Dr. Muhamad Nadirin	Indonesia, Universitas Brawijaya	ZAKAT ORGANIZATION AND POVERTY ALLEVIATION (A Macro Social Work and Community Development Perspectives)
3	V. Nirmala, Kavika K. Yepthomi	India, Department of Economics, Pondicherry University	Self-Help Groups: A Strategy For Poverty Alleviation In Rural Nagaland, India
4	Dr. Dony Adriansyah Nazaruddin	Malaysia, Universiti Malaysia Kelantan	The Study on the Importance of ecotourism for Local Community Empowerment in the Kelantan Delta Area, Kelantan, Malaysia
5	Prof. Aweng, E.R. and Prof. A. Anwar Ismail	Malaysia, Universiti Malaysia Kelantan	Use of lemongrass as hedge plants in addition to providing extra income to poor farmers
6	Dr. Retno Agustina Ekaputri	Indonesia, University of Bengkulu	Understanding Microfinance Services for Poverty Reduction: Experience of Baitul Maal Wat Tamwil in Pondok Kelapa sub-District, Bengkulu Tengah

15 October 2012: 13.30 – 17.00
Workshop theme 5: Agricultural Research and Efforts to Eradicate Poverty
Workshop Room 5 (Ruang Rapat Senat)

Facilitator: Mucharromah, Ph.D
Supported by: Pipin and Danti

No.	Name of participant	Country/ Institution	Paper Title
1	Mochamad Lutfi F, Suramenda Ginting and Merina Rejayanti	Indonesia, University of Bengkulu	Potential usage of biopolymer from Indonesian marine resources
2	Dr. Lee Seong Wei	Malaysia, Universiti Malaysia Kelantan	Sustainable tilapia farming
3	Susri Adeni, MA & Apri Andani, MS	Indonesia, University of Bengkulu	Women Role on Poverty Reduction at The Coastal Areas in Bengkulu
4	Rustama Saepudin, Asnath Maria Fuah, and Luki Abdullah	Indonesia, University of Bengkulu	The Effect of Honeybee-Coffee Plantation Integration on Improving the Honey Productivity of *Apiscerana*
5	Dr. Ikhsan Hasibuan	Indonesia, Universitas Hazairin	Strategies to Reducing Herbicide use by Increasing Crop Competitiveness Ability Against Weed
6	Dr Zulhazman Hamzah	Malaysia, Universiti Malaysia Kelantan	Accessing and Mapping of Rafflesia Distribution Hotspot for Nature Conservation in Kelantan Malaysia
7	Phassakon Nuntapanich	Thailand, Ubonratchathani Rajabhat University	Small Organic Fertilizer Factory Promotion in Rural Community of Northeast Thailand: Poverty Reduction and Toward to Sustainable Agriculture

Tuesday, 16 October 2012: 08.30 – 12.00
Workshop theme 6: The Poor and Food Sovereignty
Workshop Room 1 (Ruang Rapat 1)

Facilitator: Yansen, Ph.D
Supported by: Ichsan and Raja

No.	Name of participant	Country/ Institution	Paper Title
1	Dr. Muhammad Nayim	India, Bundelkhand University Jhansi	Impact of food sovereignty on poverty
2	MD. Kamrujjaman	Indonesia, Universitas Padjadjaran	Flood creating poverty: An empirical Analysis
3	Dr. Agustin Zarkani	Indonesia, University of Bengkulu	Black Soldier Fly Hermetia illucens (Diptera: Stratiomyidae): From Waste to Wealth and Prosperity
4	M. Hasanuzzaman, V. K. Sharma, A. Sharma and A. Parmar	Bangladesh, Chittagong Veterinary and Animal Sciences University	Use of Seabuckthorn (Hippophae rhamnoides) Cake for Quality Egg Production in Poultry to reduce Poverty
5	Hery Suhartoyo, Ph.D and Dr. Sumarsono	Indonesia, University of Bengkulu	Improving household's economy through social forestry program (HKm): Case at Bukit Daun Protected Forest, Bengkulu
6	Prof. Yuwana, Ph.D	Indonesia, University of Bengkulu	Green House Effect Solar Dryer: An Appropriate Technology Pro the Poor

Tuesday, 16 October 2012: 08.30 – 12.00
Workshop theme 7: Using Technology to Empower the Poor
Workshop Room 2 (Ruang Rapat 2)

Facilitator: Hilda Puspita, MA
Supported by: Ejo and Ediah

No.	Name of participant	Country/ Institution	Paper Title
1	Arie Vatresia, S.T., M.T.I.	Indonesia, University of Bengkulu	Implementing Data Mining to Study Appropriation Of Citizen to Improve Effectivity Of Relief Fund In Bengkulu City
2	Dr. Banhi Chakraborty,	India, Department of Architecture & Regional Planning, Indian Institute of Technology, Kharagpur, West Bengal	Empowering Poor with Technological support: Towards Achieving Sustainability
3	Prof. Mariam Firdhaus Mad Nordin and Prof. Lee Seong Wei	Malaysia, Universiti Malaysia Kelantan	Hygiene, Cheap and effective of Processing Fish Pickled Through Microwave Oven
4	Prof. Seri Intan Mokhtar	Malaysia, Universiti Malaysia Kelantan	Product Development: Turning Ideas into Products for Developing Countries
5	L.Shekhar	India, Saxena Group of Engineering College, Lucknow, Uttar Pradesh	Management Information System and Trade Decision Making In An Association

Tuesday, 16 October 2012: 08.30 – 12.00
Workshop theme 8: Pro Poor Policies
Workshop Room 4 (Ruang Vikon)

Facilitator: Eric Syahrial, Ph.D
Supported by: Danti and Perty

No.	Name of participant	Country/ Institution	Paper Title
1	Dr.Mohd.Furqan and Dr. Mohd.Nayim	India, Bundelkhand University Jhansi	Poverty Alleviation In Rural India Through Centrally Sponsored Programmes
2	Zumilah Zainalaludin Ph.D, Laily Paim Ph.D, Jariah Masud Ph.D.	Malaysia. Bundelkhand University Jhansi	Capturing Level of Scaling up Micro Enterprise for Small Family Business in Rural Poverty Eradication
3	Dr. Naila Aaijaz, and Dr. Mohamed Dahlan Bin Ibrahim	Malaysia, Universiti Malaysia Kelantan	Key Problems faced by Poor communities and Care Providers in Developing Countries: Case based Study.
4	Prof. Lutfur Rahman	Bangladesh, Bangladesh Agricultural University	Planning for Poverty Reduction Through Agrotechnological Interventions at Local Levels: Bangladesh Perspectives
5	Dr. Ramle bin Abdullah and Suda Kazahiro	Malaysia and Japan, Universiti Sultan Zainal Abidin	Development Obstacles Among the Batek de Sub-Tribe in Kuala Koh, Kelantan, Malaysia

Tuesday, 16 October 2012: 08.30 – 12.00
Workshop theme 9: Models or Strategies for Combating Poverty
Workshop Room 3 (Ruang Rapat 3)

Facilitator: Syafrizal, MA
Supported by: Agri and Putri

No.	Name of participant	Country/ Institution	Paper Title
1	Prof. Nurul Hidayah Chamhuri	Malaysia, Universiti Teknologi MARA	Low Cost Housing and Urban Poor in the Developing Countries: Lessons Learned from Malaysia
2	Dwatmadji, Ph.D and Tatik Suteky	Indonesia, University of Bengkulu	Poverty Reduction in Bengkulu: Integrated Livestock Management in Oil Palm Plantation for Small Holder Farmer.
3	Muhamad Abduh, Ph.D	Indonesia, University of Bengkulu	An integrated networking strategy based on business incubator concept to accelerate the gowth of MSMEs and poverty alleviation
4	Bandi Hermawan Ph.D, Dr. Kanang S. Hindarto and Dr. Sukisno	Indonesia, University of Bengkulu	A Model of Post-Mined Land Reclamation for Poverty Alleviation: A Case Study in Coal Mining of South Sumatera
5	Causa Iman Karana and Retno Agustina Ekaputri, Ph.D	Indonesia, Bank of Indonesia, Bengkulu Branch	Communication among University, Private and Government on Poverty Reduction: Lesson from Experience of Bank Indonesia Social Responsibility program of "Desa Kita"
6	Prof. Suhaimi Othman and Ahmad Anwar Ismail	Malaysia, Universiti Malaysia Kelantan	Rice Farming In The Granary Areas Of Malaysia: Strategies For Poverty Eradication And Productivity Improvement

Application of WebGIS-based Spatial Data Inventory

Boko Susilo, Albert Pratama, Rusdi Efendi, Yulian Fauzi
Bengkulu University, Indonesia

The main purpose of this study was to establish an inventory application based on Web GIS spatial data that facilitates the user to manage spatial data in an integrated way. The method used in the development of the system is SDLC (System Development Life Cycle) model waterfall. Modeling systems analysis and design used to UML (Unified Modeling Language). The results of the analysis and design of the system is then implemented through language PHP (Hypertext Processor) and MySQL (My Structured Query Language). This software has the ability to extract digital data format GML (Geographic Markup Language), storing spatial data in a format WKT (Well-Known Text), and present spatial data in vector format that comes with legend and some facilities, such as: zoom in , zoom out, zoom to max extent, layer switcher, scale, scale line, mouse position, drawing tools, and a popup window. Based testing has been done, the system has been able to handle spatial data management include: storage and presentation of spatial data in vector format. With this software, users can store, edit, and present spatial data in a web environment without having to perform GIS web development.

Keywords: Inventory of Spatial Data, Web GIS (web-based GIS), UML (Unified Modeling Language).

APPLICATION OF WEBGIS-BASED SPATIAL DATA INVENTORY

BokoSusilo*,
AlbertPratama, RusdiEfendi, and YulianFauzi
*email: bksusilo@gmail.com
*mobile phone: 08127825843
*Informatics Engineering Study Program, Engineering Faculty, University of Bengkulu

Abstract

The main purpose of this study was to establish an inventory application based on Web GIS spatial data that facilitated the user to manage spatial data in an integrated way. The method used in the development of the system was waterfall model of SDLC (System Development Life Cycle). Modeling systems analysis and design used to UML (Unified Modeling Language). The results of the analysis and design of the system implemented through language PHP (Hypertext Processor) and MySQL (My Structured Query Language). This software had the ability to extract digital data in GML (Geographic Markup Language)format, store spatial data in a WKT (Well-Known Text) format, and present spatial data in vector format that completed by legend and some facilities, such as: zoom in , zoom out, zoom to max extent, layer switcher, scale, scale line, mouse position, drawing tools, and a popup window. Based testing had been done; the system could handle spatial data management which included: storage and presentation of spatial data in vector format.

Key words: Inventory of Spatial Data, Web GIS (web-based GIS), UML (Unified Modeling Language).

1. Introduction

Alongwith advances ininformationtechnology, GISapplication developmentleadstoa WebGISapplication. This is causedbythe development ofapplicationsin a network environment, especiallythe Internet. An example istheonlinemapof acitywhere the usercan easilyfindthe desired locationby going onlinevia theinternet. Figure 1.1andFigure 1.2are some of example ofthe imageonlinemapofGoogle Maps.

Figure 1.1 Road Network Map of city of Bengkulu on Satellite Imagery
(GoogleMaps, accessed on August 18, 2011)

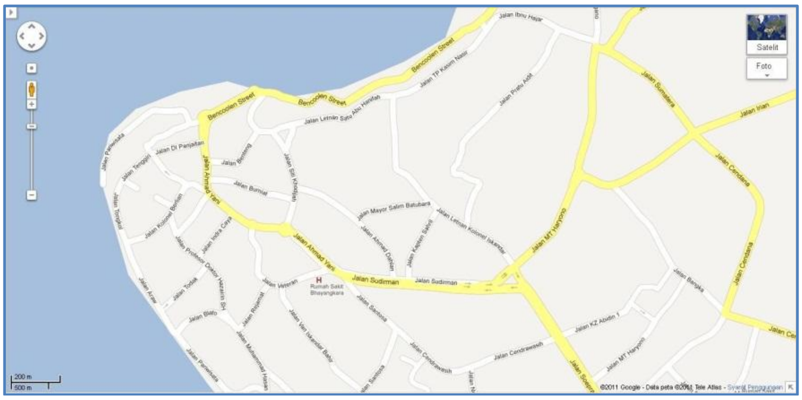


Figure 1.2Road NetworkMap ofcity of Bengkulu
(Google Maps, August 15, 2011)

In Indonesia, the use of GIS technology is increasing. Various studies have been done to meet the needs of geographic information. However, to date, the results of GIS studies that have been developed are still separated from one another. Obviously this makes the use of information from the research results to be not optimal. For example, in studies Irdam, D. (2011), limited to the developed GIS spatial data profile schools in the district of RatuSamban in the Bengkulu City (see Figure 1.3). While the research Satriawan, R(2010), GIS is developed only limited distribution of elementary school students in District of RatuSambanin the Bengkulu City (Fig. 1.4.).

Figure 1.3: WebGISin theSchoolof RatuSambanDistrictProfiles ofBengkuluCity(Irdam, D., 2011)

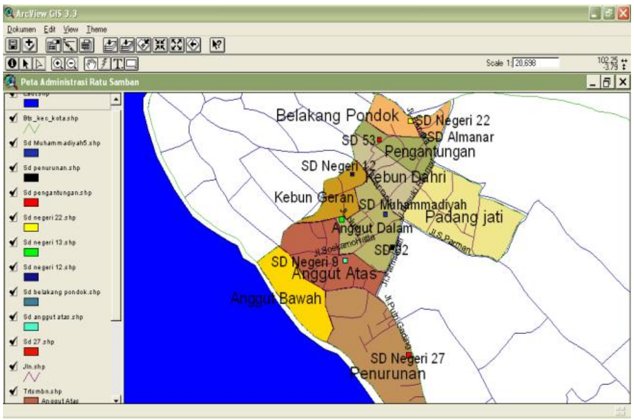


Figure 1.4: GIS application of Ratu Samban District in the Bengkulu City
(Satriawan, R., 2010)

Both the results of research on GIS at above have in common, namely the use of spatial data of existing schools in the District of Ratu Samban of Bengkulu City. However, both of them are on different systems. Systems have been developed still do not have facilities that allow users other than administrators to perform the addition and updating of spatial data once the system is completed, especially web-based GIS. This is due to system specially designed for the study of each case study. Accordingly, the authors look at a problem, namely the need for a web-based GIS system that facilitates management of spatial data in an integrated way. Thus, in this study, the authors will do the designing and building web-based information system that facilitates inventory GIS spatial data from GIS research has been done or will be done in the future.

2. Literature Review

2.1 Information Geographic.

Since the mid-1970s, have developed systems specifically designed to handle geographically referenced information in various ways and forms. These problems include:

1. Organizing data and information.
2. Putting information on a specific location.
3. Computing provides an illustration of connectedness to each other (connections), and their spatial analyzes (Prahasta,E., 2005).

The common naming for systems which is deal with matters on above is called the geographic information system (GIS). GIS is a computer system for collecting, checking, integrating and analyzing information related to the surface of the earth (Rhindin Hussein, 2006).

Geographic information is always changing from time to time, in line with changes in natural phenomena and social phenomena. Geographic information that is required must have the characteristics possessed other sciences (Romenah, 2011), namely:

1. The results of experience.
2. Systematically arranged that is one unit and arranged in sequential order.
3. Logically, that makes sense and shows cause and effect.
4. Objective, which is generally applicable and have clear targets and tested.

In addition to having the characteristics mentioned above, geographical information must also show characteristic spatial and regional (territorial). Because of geography is a scientific study of natural and social phenomenon from the viewpoint of spatial and regional (Romenah, 2011).

The geographic information consists of:

1. The symptoms of lithosphere. These symptoms include relief and topography, soils and rocks, rocks and coating systems.
2. Hydrosphere symptoms. These symptoms include events related to water areas, both inland waters and marine waters, which concern the shape, nature and other phenomena of the waters.
3. Atmospheric symptoms. This phenomenon is related to the information about weather and climate, including its elements and factors that influence it.
4. Symptoms of the Biosphere. Biosphere symptoms associated with plants, animals and humans, which is strongly influenced by elements of the lithosphere, hydrosphere and atmosphere.
5. Symptoms of Social and Cultural Rights. These symptoms are related to people live such as advances in science and technology is rapidly increasing.

According Rajabidfard and Williamson (in Gumelar, 2007), spatial data is one item of information, which is information on the Earth including the Earth's surface, below the surface of the earth, water, marine and lower atmosphere. There are two models in spatial data, the

raster data model and vector data models. The data model is representations of geographic objects are recorded so that it can be recognized and processed by a computer.

The following description of the raster data model and data model vector (Puntodewo, 2005):

1. Raster Data Model, also called a grid cell is the data generated from the system of Remote Sensing. In the raster data model, geographic object is represented as a grid cell structure called a pixel (picture element).
2. Vector Model, which represents the earth as a mosaic of the line (arc / line), the polygon (area bounded by a line that begins and ends at the same point), the point (a node that has the label), and the nodes (the point of intersection between two lines).

Web-based GIS (Web GIS) is a system that runs on the Internet and developed the concept of client-server web architecture. Geo Spatial object consists of information of spatial data and non-spatial Data. To receive data from the spatial and non-spatial DBMS requires a technique that is able to communicate between the client and the database on the server. Such techniques are already available in PHP, ASP, ASP.net, or JSP. The selection technique adapted to the web server being used (Charter, 2008).

2.2 Inventory and Unified Modeling Language/UML

Inventory is carrying out maintenance activities, coordination, arrangement, recording and registration of inventory items (Bogor Agricultural Institute, 2008). Inventory can be interpreted as something owned.

UML (Unified Modeling Language) is a language which has become the standard for specification, visualization, modification, construction, and documentation components in object-oriented development of a software system. There are three important types of UML modeling, namely:

1. Structural / static Modeling

   Structural modeling framework describing the system and the framework is a place where all the components are. Include the features modeling the static structure of a system consisting of: class diagrams, object diagrams, deployment diagrams, and component diagrams.
2. Behavior / Dynamic Modeling

   Behavior modeling of the system describes the interaction. This is an interaction between the structural diagrams. Modeling of the behavior demonstrated the dynamic nature of systems consisting of: use case diagram, sequence diagram, collaboration diagram, State chart diagram, and activity diagrams.
3. Architectural Modeling

   It is an overall framework of the system that contains structural and behavioral elements of the system. Architectural model can be defined as a blue print of the entire system. Package diagram is a modeling architecture. UML consists of grouping the diagrams according to aspects of the system or a particular viewpoint. Diagram is a picture of the problem or the solution of a model. In modeling the system with UML used 9 diagrams standard UML are follows:

   a. Class diagram; b. Object diagram; c. Use case diagram; d. Sequence diagram; e. Collaboration diagram; f. Activity diagram; g. State chart diagram; h. deployment diagram; i. Component diagram

2.3 Method of Software Testing

The software testing is a critical element of software quality assurance and represents the fundamental study of the specification, design, and coding. There are three methods commonly

used in software testing, which are Black Box Testing, White Box Testing and Grey Box Testing.

1. Black Box Testing.
   Black Box testing refers to testing an application or system without specific knowledge of the depth of the job application system, access to source code, and also no understanding of the architecture of the application.
2. White Box Testing.
   White Box Testing or often referred to as Clear Box Testing is testing a system in which the examiner to understand the whole system and have access to source code and system architecture.
3. Grey Box Testing
   Grey Box Testing refers to testing the application over which the examiner has limited access to and knowledge of system or application. The knowledge is usually limited to the documents of the design detail and architecture diagrams. Grey Box Testing is often referred to as a combination of the two previous methods and also a combination of advantages of both.

3. Method of Research

3.1 Method of System Development

The method was used in developing of system is SDLC (System Development Life Cycle), Waterfall Model. This model can be represented in Figure 3.1

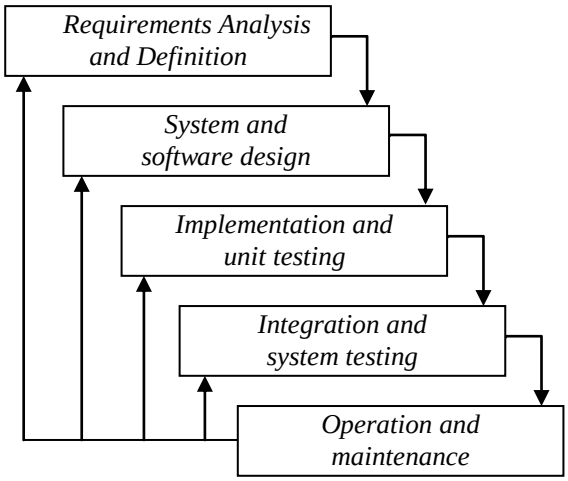


Figure 2.1 Waterfall Model

3.2 System Analysis and Design

Planning

Discuss the planning stages of the election plat form used in software development which include: the use of programming languages, databases used, and supporting devices that use spatial data processing. In building a Web GIS, it is important to choose the technology to be used. Based on the study of literature that has been the author, the author chose to use the programming language PHP with My SQL database, and Open Layers for presenting spatial data.

AnalysisSoftware

Application ofweb-based inventory of GIS spatial data is a web-based software developed to facilitate the management and utilization of spatial data in an integrated way. Service model developed in this system are:

1. Visualization: the presentation of spatial data services in the form of maps.
2. Inventory: Service to conduct an inventory of spatial data.
3. Administration: service to perform system maintenance functions.

Use case diagram serves to illustrate the functionality of object-oriented systems are designed. Use case diagram is the basis for system design. Figure 4.1 is a use case diagram of the overall system.

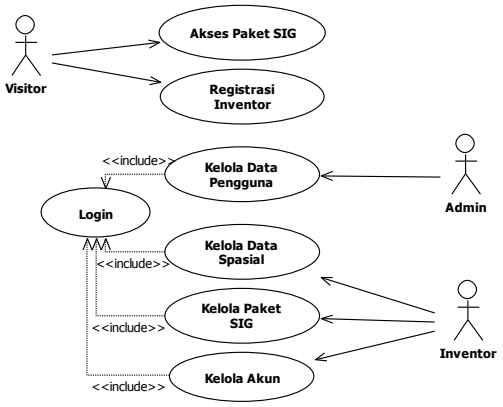


Fig. 4.1 Use Case Diagram

The Actor is an actor who runs the system functionality. Actor system is divided into two categories: unregistered user which only consists of the visitor, and registered users consisting of inventors, and the administrator(admin). Table 1 contains a list of actors and a description of the role of each actor.

Table 1: Definition of System Actor

No	Actor	Description
1	Visitor	User that play a role in the utilization of information systems.
2	Inventor	Users role is to conduct an inventory of spatial data.
3	Admin	Users role to manage the website and management of user data

The Table 2 below lists the main use case and a description of each system use case.

Table2: Description of system use case

Code	Use case	Description
UC-01	GIS Packet Access	Actor can access the GIS package
UC-02	Inventor Register	Actor scan register to become inventors
UC-03	Login	Actor to login
UC-04	Manage of User Data	Actor scan manage user data.
UC-05	Manage of Spatial Data	Actor scan perform spatial data management
UC-06	Manage of GIS Packages	Actor can perform GIS data management package
UC-07	Manage of Account	Actor can perform account management.

Analysis of System

Based on the use case that has been modeled, the classes that perform the functions to realize the use cases the system comprising: interface classes, control classes and entity classes. Figure 3shows the class diagram analysis of the whole system.

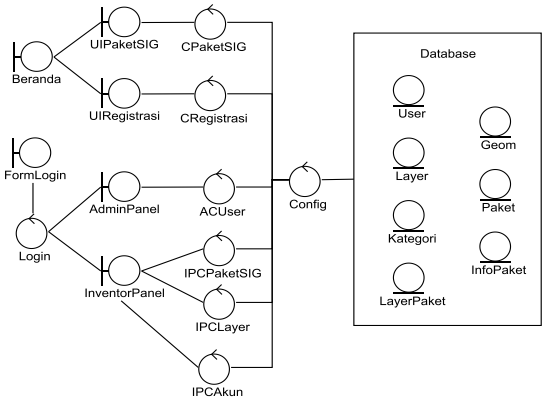


Figure 4.2 System analysis class diagram

A brief description of the responsibilities of each class in the realization of use cases described in Table 3.

Table 3: Responsibility of the class

No	Name of Class	Responsibility
1	Home	An interface class as the front page of the website
2	UI Paket SIG	An interface class that provides a GUI for presentation of Paket SIG
3	CP Paket SIG	A control class that handles and execute any requests Paket SIG.
4	UI Registrasi	a interface class that provides a GUI to register.
5	Cregistrasi	a control class that handles validation of the registration form.
6	Form Login	An interface class that provides GUI to login
7	Login	An interface class that handles a user login validation
8	Admikn Panel	An interface class that provides GUI for administrative function
9	AC User	Control class that handles and executes any process of managing user data
10	Inventor Panel	An control class that provides GUI to hold on inventory of spatial data
11	IPC Paket SIG	A control class that handles the process of Paket SIG management
12	IPC Layer	A control class that handles the process of spatial data management
13	IPC Akun	A control class that handles the process of account data management
14	Config	A control class that handles the connection to the database system
15	Database	The class that contains the entity clases as a repository of data used in the system.

Design System

The model aims to improve the design, and develop analytical models, and adapt according to the implementation environment. The design of the system consists of designing systems that use case is modeled through a sequence diagram, database design is modeled through the ERD (Entity Relationship Diagram), and interface design.

The design aims to use case modeling the sequence of interactions between the classes in each use case. The design is modeled through the use case sequence diagram. Figure 4.3 is a sequence diagram of use case design of the system.

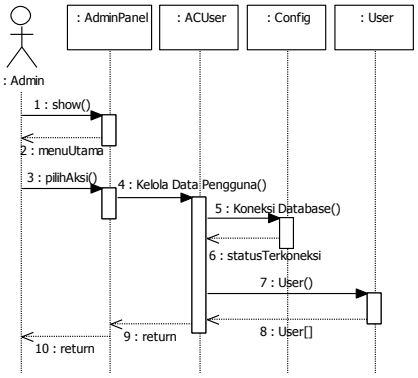


Figure 4.3 Sequence diagram of user data governance

The design aims to model the structural class of systems. The design of this class is modeled through a class diagram. Class diagram shows the classes in the structural design of the system. Class interface consists of: Class Home, Class UI Paket SIG, UI Registrasi Class, Class Form Login, Admin Panel Class, and Class Inventor Panel. Control class consists of: Class C Paket SIG, C Registrasi Class, Class Login, Class AC User, IPC Paket SIG Class, Class IPC Layer, IPC Akun Class, and Class Config. While the entity class consists of: User Class, Class Layer, Geom Class, Class room Style, Class Category, Class Pack, Layer Paket Class, and Class Info Paket. Figure 5 The following is a class diagram of the overall system.

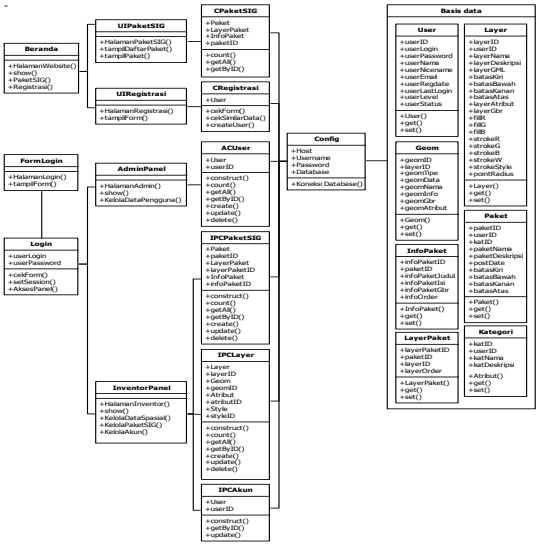


Figure 4.4 Class diagram design system

Design Database

To represent a model of entity classes in the design of spatial data inventory system required tables as follows:(i)User table serves to store user data; (ii) Layer table, serve to keep public information data layers; (iii) Table Geom, serves to store the geometry data of a layer.; (iv) Table Categories, serves to store geographic information category; (v) Table Package, serves to store general information GIS package; (vi) Table LayerPaket, serves to store the data layer used in a package; and (vii) Table InfoPaket, serves to store data Information Package.

The model of database design used a model of Entity Relationship Diagram (ERD). Relationships between entity classes in the database are as follows:

1. The relation between the user tables with a table of the layer is one to many, which means each user can manage multiple data layers.

2. The relation between the tables with table GEOM layer is one to many, which means that each data layer can have a lot of geometry data.
3. The relation between the user tables with the category table is one to many, which means each user can use a lot of categories.
4. The relation between the user tables with a table of the package is one to many, which means each user can manage multiple GIS packages.
5. The relation between category table to table package is one to many, which means that each category can be used by many GIS packages.
6. The relation between the tables with table packet layer packet is one to many, which means that any GIS package can consist of many layers Package.
7. The relation between the tables with table layer packet layer is one to one, which means that each layer represents a layer package.
8. The relation between the tables with table package info package is one to many, which means that each package can have a lot of GIS Information Package.

Figure 4.5 is an ERD (Entity Relationship Diagram) design of database systems.

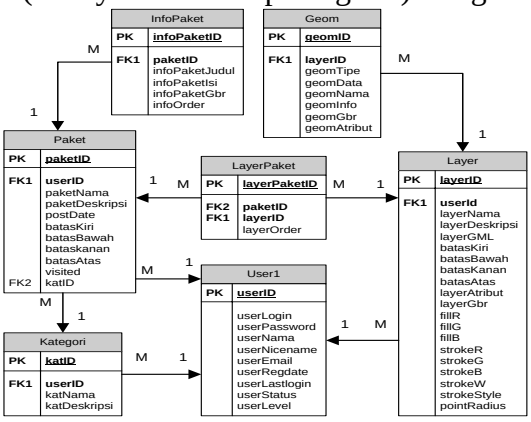


Fig 4.5 InterfaceDesign

Interfacedesignis a referencetothe implementation phaseof thedesign ofthesystem. The user interfaceisdesignedvisitorinterfaceas shownin Figure4.6, theinventorinterfaceas shown inFigure 4.7, andadministratorinterfaceas shownin Figure4.8.

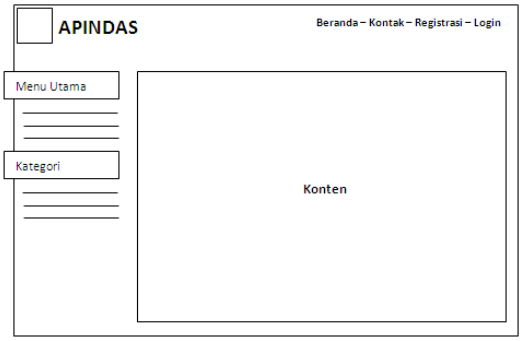


Figure 4.6.Visitorinterfacedesign

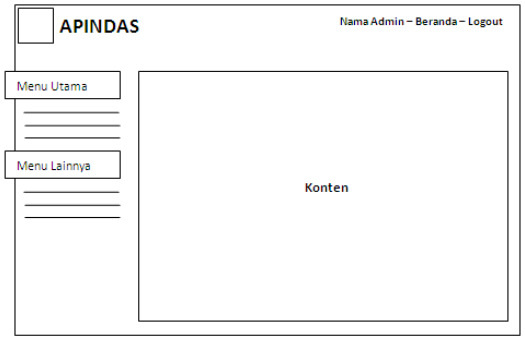


Fig 4.7.Inventorinterface

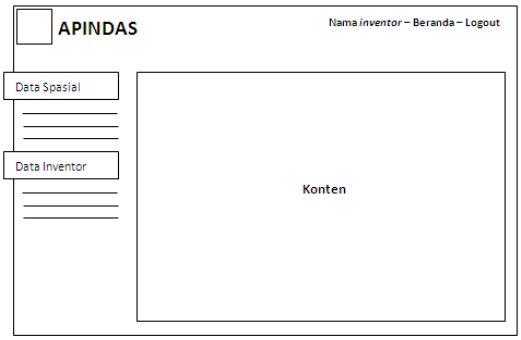


Fig 4.8.Administratorinterface

4. Result and Discussion

4.1 Implementation

The software is built on this research is able to handle the input digital data with GML(Geography Mark up Language) format(*.GML). GML is a grammar text data to XML (Extensible Mark up Language) developed by the OGC (Open Geospatial Consortium) to define the geographical features. Table 4 contain simplementation of research, treatment issues, and implementation of handling the problem.

Table4: Implementation issues

No	Issues	Handling	Implementation
1	How to integrate Open Layers with the database	To integrate Open Layers API to the tag PHP and SQL queries.	Write the Open Layers API in PHP tags to data from the database can be parsed in the Open Layers API script.

Each class in the system implemented in PHP language, where each classis implemented in a single file or more. List of classes that are implemented can be seen in Table5.

Table5: List of implementation Classes

No	Class Name	Physical File
1	Home	/ndex.php/boundary/visitor.php/ control/visitor /index.php
2	UI Paket SIG	/index.php/boundary/visitor.php/ control visitor /paket.php
3	C Paket SIG	/ control/visitor /paket.php
4	UI Registrasi	/index.php/boundaryvisitor.php/control/visitor/registrasi.php
5	Cregistrasi	/ control/visitor /registrasi.php
6	Form Login	/boundary/visitor.php/ control/login.php
7	Login	/ control/login.php
8	Admin Panel	/boundary/admin.php/ control/admin/index.php
9	ACUser	/control/admin/userAdd.php/control/admin/userAddExec.php /control/admin/userAkun.php/control/admin/userChange.php / control/admin/userDetail.php

		/control/admin/userDelete.php/control/admin/userUpdate.php/control/admin/users.php
10	Inventor Panel	/boundary/inventor.php/ control/inventor/index.php
11	IPC Paket SIG	/ control/inventor/paket.php
12	IPC Layer	/ control/inventor/layer.php
13	IPC Akun	/ control/inventor/userAkun.php
14	Config	/ control/config.php

Implementation ofthe interfaceis then performed;the resultsof theimplementation of visitor interfacecan be looked in Figure 10.

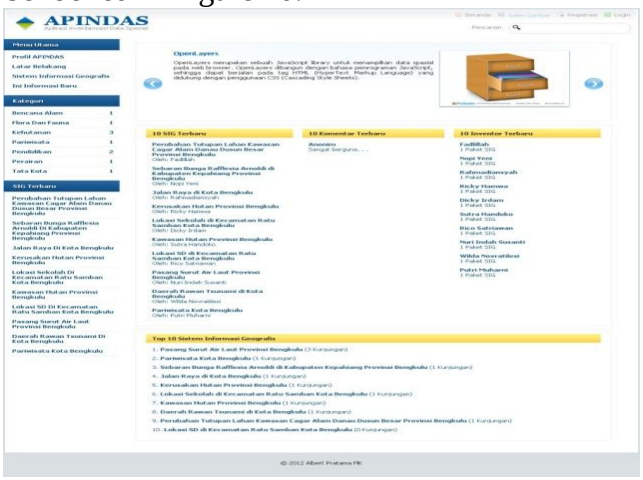


Figure 10:Visitorinterface implementation

4.2 Testing

Software testingisperformedby the method ofblack box,whichfocusesonfunctionaltestingsoftware. It aims to determinewhether the softwarehas beenrun in accordancewiththe test scenario, namelywithtestingbased onuse casethat has beendesigned.

Preparationisdone insoftwaretestingare asfollows:

1. Prepareone (1)unitlaptoporPC.
2. Setting up aGISwithGMLformat.
3. RunningGoogleChrome9.0.597.107.
4. Http://localhost/apindas/access.
5. Conducttesting in accordancewithtest scenariosthat have beendesignedinsection3.2
6. Record thetest results.

Basedtestinghas been done; the software has successfullyperform those functionsin accordancewith ause casethat has beendesigned.

5. Conclusion and Recommendation

5.1 Conclusion

This research has produced an inventory of software applications in the form of Web-Based GIS Spatial Data that can be used to manage spatial data in a web environment without having to perform GIS web development. Users can add spatial data by uploading the digital data to the format of (*. GML).Digital data with the (*.GML) format can be generated by converting the data to the format of (*.SHP) into the format of (*. GML) throughsoftware is Quantum GIS.

Based on testing done with this software, the system has been able to handle spatial data management include: storage and presentation of spatial data in vector format

5.2 Recommendation

Users need to update data from a variety of GIS research. For advanced implementations, can be done related to the development of spatial data processing facility is more user friendly, and better accessibility, as well as the development of the digital data format handling facility that is more diverse, such as KML, GeoJSON, ArcXML, Atom, GeoRS

REFERENCE

1. Charter, Denny. (2008). *Basic Concepts of Web GIS*. [Online] Available: http://ilmukomputer.com/charter-webgis.pdf [March 17, 2011]
2. Gumelar, Dhani. (2007). *Spatial Data*. [Online] Available: http://ilmukomputer.com/dhani-dataspasial.doc[February 8, 2011]
3. Husein, Rahmad. (2006). *Basic Concepts of Geographic Information Systems*. [Online] Available: http://www.ilmukomputer.com/rahmat-sig.pdf
4. Bogor Institute of Agriculture. (2008). Property Inventory and Reporting of IPB. Canberra: Directorate of Facilities and Property IPB
5. Irdam, Dicky. (2010). Spatial Database Management School Profile - Web-Based Education in the city of Bengkulu (Case Study: District Queen Samban). Faculty of Engineering UNIB: Thesis.
6. Prahasta, Eddy. (2005). *Basicconcepts ofGeographicInformationSystems.*New York:Information
7. Puntodewo, Atie, etal. (2003). *Geographic Information SystemsforNatural Resource Management.*New York:Centerfor InternationalForestry Research
8. Romenah, *Geographic InformationSystems*. [Online] Available: [11April2011]
9. Satriawan, Rico, 2010, *Application ofGeographic Information Systemsin the DistrictElementarySchool LocationSambanQueenCity ofBengkulu*. Faculty of EngineeringUNIB: Thesis.