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# PROCEEDING

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The 1st International Conference on Information Technology and Security

Malang, November 27, 2014

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Sekolah Tinggi Informatika dan Komputer Indonesia

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## The 1st International Conference on Information Technology and Security (IC-ITechs) November 27, 2014


**Editors & Reviewers:**

Tri Y. Evelina, SE, MM Daniel
Rudiaman, S.T, M.Kom Jozua
F. Palandi, M.Kom

**Layout Editor:**

Eka Widya Sari



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# GREETINGS

## Head of Committee IC-Itechs

For all delegation participants and invited guest, welcome to International Conference on Information Technology and Security (IC-Itechs) 2014 in Malang, Indonesia.

This conference is part of the framework of ICT development and security system that became one of the activities in STIKI and STTAR. this forum resulted in some references on the application of ICT. This activity is related to the movement of ICT development for Indonesia.

IC-Itechs aims to be a forum for communication between researchers, activists, system developers, industrial players and all communications ICT Indonesia and abroad.

The forum is expected to continue to be held continuously and periodically, so we hope this conference give real contribution and direct impact for ICT development.

Finally, we would like to say thanks for all participant and event organizer who involved in the held of the IC-Itechs 2014. We hope all participant and keynote speakers got benefit from this conference.

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on Information Technology and Security

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# Software Requirements Specification Of Database Roads And Bridges In East Java Province Based On Geographic Information System

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University of Kanjuruhan Malang
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***Abstract***

*Database of Road and Bridge-based Geographic Information System (DJJ-SIG) is resented in this paper is a system designed to manage data and information across the roads and bridges in East Java that is used by the government as the information society. In essence, DJJ-SIG allows users who have access rights to view, add, edit and delete data roads and bridges that can be managed online dynamic web based. DJJ-SIG to manage the data that consists of identifying track roads, general data, the data segment and the data bridge traversed every road. This paper presents a software requirement Specification which is based on the needs of users are involved in the system with a case study in Dinas Bina Marga East Java.*

***Keywords :*** *Database roads and bridges, SRS, Geographic Information Systems, UML, Sub description uses case*

## 1. Introduction

Roads and bridges are the means of land transportation that has a strategic role in the development of the region, the availability of an integrated road network, effectively and efficiently into the expectations of society. Department of Public Works Highways East Java province in charge of the realization of land transportation infrastructure in the field are required to maintain a steady road conditions, so as to serve the user community with a smooth, safe and comfortable. In helping to bring the activities of development, maintenance, and operation of the road can run well, it would require information about the road system, which contains the history of development, facility dimensions, condition, the data segment, the data will be required for the purpose bridge road management. The results of SRS-making web-based system or Online will later be used as information for the recommendation to establish a Geographic Information System implementation that can be accessed by relevant agencies and the public.

## 2. Material and method

### 2.1 Geographic Information System

Geographic Information System abbreviated GIS is a special information system to manage data that has spatial information (spatial reference). Or in a more narrow sense, is a computer system that has the ability to build, store, manage and display geographic berefrensi information, such as data identified according to location, in a database. The practitioners also include those who build and operate them and the data as part of this system. Geographic Information System technology can be used for scientific investigations, resource management, development planning, cartography and route planning. For example, GIS can help planners to

quickly calculate emergency response times during a natural disaster, or a GIS can be used to find wetlands (wetlands) that need protection from pollution.

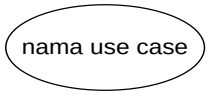
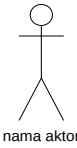
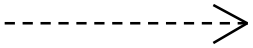
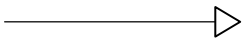
**2.2 Unified Modeling Language**

UML (Unified Modeling Language) is a language that is based on the graphics / images to visualize, specify, construct, and the documentation of a system based software development OO (Object-Oriented). UML itself also provides a standard writing a blue print system, which includes the concept of business processes, writing classes in a specific programming language, database schema, and the components required in a software system.

**2.3 Use Case**

Making use case aims to describe the behavior of the system to the functions that must be provided. The first step is to identify the actors who will be involved, the second is to define use cases for each actor and the last is the modeling scenarios of events for each use case.

Table 1. Symbol Use Case Diagram

| Simbol | Diskripsi |
|---|---|
| *Use Case*   | The functionality provided by the system as units exchanging messages between units or actor, usually expressed using the verb at the beginning of the phrase the name of the use case |
| *actor*   | People, processes, or other systems that interact with information systems that will be created outside the information system will be made itself, so even though the symbol of the actors are pictures of people, but not necessarily a person, usually expressed using the noun phrase at the beginning of the name of the actor |
| *Extended dan include*  | Extended functional relationship rare Include a functional relationship to the normal system flow |
| *Generalization*  | Relationship generation and specification (general-specific) between two use cases where the function is a function that is more general than the other |

| Use Case: Create Classroom Schedule |
|---|
| **ID:** UC7 |
| **Actor:**<br>University administrator |
| **Precondition:**<br>1. All semester information has been entered. |
| **Flow of events:**<br>1. The use case starts after all semester information has been entered.<br>2. The system prompts the user to choose which parameter(s) he or she wishes to schedule by.<br>3. The system schedules, as much as possible, the classes into classrooms.<br>4. The system notifies the user whether it has successfully scheduled all classes into classrooms.<br>5. The system saves the schedule even if it was not successful (in all cases, the portion that is successfully scheduled is saved). |
| **Secondary Scenarios:**<br>No Valid Schedule Solution Is Possible<br>Ran Out of Memory<br>User Cancels Schedule Creation |
| **Postconditions:**<br>1. A schedule file is created.<br>2. The user knows whether the schedule was created successfully or if changes to the information are needed. |

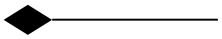
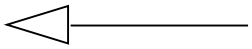
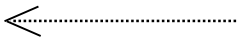
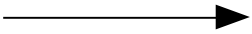
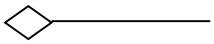
Figure 1. Description Use Case

### 2.4 Class Diagram

Class diagram describing the structure of the system in terms of the definition of classes that will be made to build the system, class diagrams have what is called a class name, attributes and methods or operations. The class name is used for the member name of the class and must be unique. Attributes are variables owned by a class. Operations or methods are functions that are owned by a class.

Tabel 2. Symbol Class Diagram

| Symbol | Description |
|---|---|
| **Class**<br>- attribute0:int<br>+operasition0():void<br>*Class* | Class are the building blocks in object-oriented programming. A class is described as a box which consists of 3 parts. The top is the name of the class. The middle section defines proprerty / class attribute. Attribute is information |

| | |
|---|---|
| *Asosiation*  | An association is a relationship between two classes of the most common and is represented by a line connecting between the two classes. This line could symbolize the types of relationships, |
| *Generalization*  | A generalization relationship commensurate with a relationship to the concept of object-oriented inheritance. A generalization is represented by an arrow with an arrow head that no solid leads that lead to the parent class |
| *dependency*  | Sometimes a class using another class. This is called a dependency. Generally, the use of dependency is used to indicate operation on a class that uses another class. A dependency is |
| *Composition*  | If a class can not stand alone and must be part of another class, the class that has the Composition of the class that relies place. |
| *Aggregation*  | Aggregiation indicative of the overall section and an aggregation relationship is described as a line with a parallelogram that is not filled. |
| *Implisity*   | Implicity indicates the relationship between two relations. A relation instance associated with the relation B with implicity 1. . . * (One to many) |

**3 . Result and Discussions**

**3.1 Users Involved in system**

The following table needs and permissions actors involved in the system that is used for setting permissions in the system

| User type | Information | Master Track | Master Data Umum UPT | Master Data Segmen UPT | Master Data Jembatan UPT | Master Data Semua UPT | View Web Umum |
|---|---|---|---|---|---|---|---|
| **Admin Pusat** | Admin center responsible for all data contained in the data SIG roads and bridges at the Department of Public Works Highways East Java Province | √ | √ | √ | √ | √ | √ |
| **Kepala Dinas** | responsible for all data contained in the data SIG roads and bridges at the Department of Public Works Highways East Java Province and kontroling web data. | √ | √ | √ | √ | √ | √ |
| **Kepala UPT** | Responsible UPT data respectively. | √ | √ | √ | √ | - | √ |
| **Admin UPT** | Responsibility on the data UPT respectively. | √ | √ | √ | √ | - | √ |
| **Pengguna Umu** | See all existing data in all UPT. | - | - | - | - | - | √ |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **m** | | | | | | | |
| **Admin Jalan Tol** | Responsibility on the data highway | √ | √ | √ | √ | - | √ |
| **Admin Jalan Lintas Selatan** | Responsibility on the data highway south | √ | √ | √ | √ | - | √ |

### 3.2 Use Case Diagram Main Geographic Information System Database roads and bridges in the province of East Java web based.

Usecase design represents a functional system of geographic data is roads and bridges in the province of East Java. This function must be provided in the system to be developed.

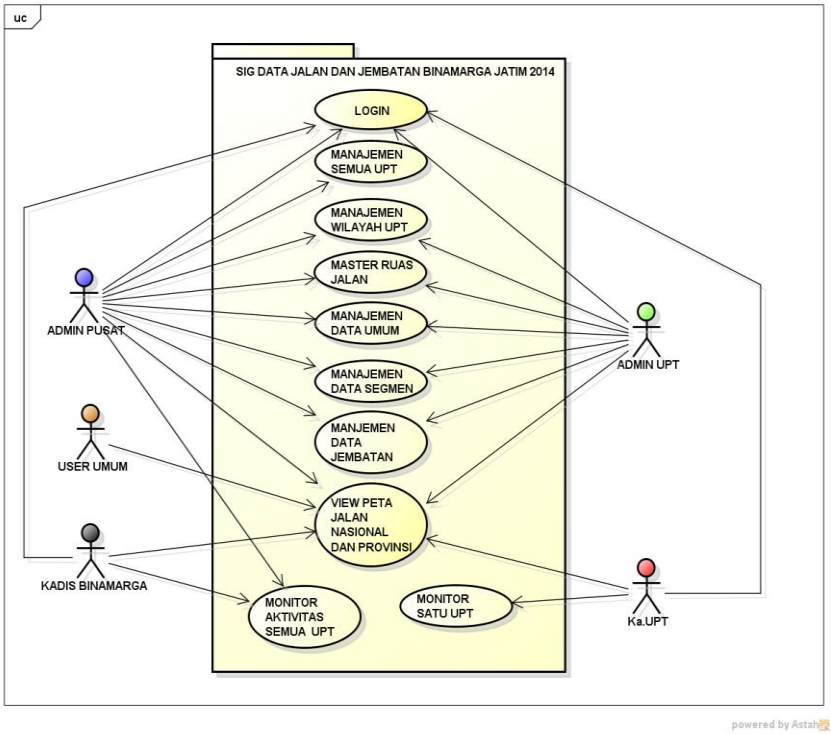



Figure 2. Main Use Case Diagram DJJ-SIG

Figure 2 is a diagram usecase major functional geographic information system data path and bridges across the province of East Java. Usecase represents actors involved in the system include: Head binamarga, Admin binamarga Center, Admin every 12 Technical Implementation Unit in East Java, Head of Unit of each region, Admin highway, south of the causeway Admin, Admin and User Center general user. Oval picture symbol represents a functional form that will be developed and arrows describe the access rights of each user type involved in the system. Detailed design will be presented at the time of the preparation of the final report after making the entire functional activity of the system will be done.

### 3.3 Description of Sub Use case

Due to space limitations we present the following are just two examples of the use cases and two sample scenarios sub use case description of figure 2.

| |
|---|
| **ID** : UC2 |
| **Use Case** : Manajemen Unit Pelaksana Teknis (UPT) |
| **Actor :**<br>Admin Pusat |
| **Precondition :**<br>All data throughout East Java Unit ready in place in the system |
| **Flow of event :**<br>1. The user selects a master menu UPT<br>2. Incorporating User Id Unit, Unit Name, City<br>3. The user presses the button to save the data saved to the database |
| **Secondary Scenarios:**<br>**1.** 1. Data Unit entered already exists<br>**2.** 2. Clear perform mastering Data Unit |
| **Post Conditions :**<br>1. Unit Master Data stored and displayed on the screen menu system<br>2. Master Data Unit ready for data generation and city roads |

Gambar 3. Deskripsi Sub Use Case untuk Master UPT

| |
|---|
| **ID** : UC4 |
| **Use Case** : Master Ruas Jalan |
| **Actor :**<br>Admin Pusat |
| **Precondition :**<br>Master Unit has been available in the menu system and there is a master menu roads |
| **Flow of event :**<br>1. The user selects a master UPT.<br>2. The user selects the City.<br>3. The user enters the number of roads.<br>4. User member name roads.<br>5. Users do track the way to choose the coordinates of the beginning to the |

| |
|---|
| end.<br>6. Users store data roads by pressing the save button to the database of roads. |
| **Secondary Scenarios:**<br>1. The ID number of existing roads<br>2. Clear the database to store the data segment |
| **Post Conditions :**<br>Data roads shaped track or path on the map has been stored and can be displayed by the system, the data is ready to be filled with common data, the data segment and the data bridge. |

Figure 4. Description Use Case Sub Master Roads.

### 3.4 Class Diagram DJJ-SIG

Design Class Diagram necessary in preparing the master data to be processed, the class diagram consists of three components, namely the class name, class attributes and methods or operations class. The class name is used to name the class identity created unique and should not be the same as the name of another class. Class attribute is used to create data fields required in the preparation and design class. Its content consists of the attribute name, data type and size fieldnya. While the method or operation procedure or function class is required in each class such as: add, edit, delete, select the data, view data and other. The following class diagram form required in the GIS system is represented as follows:

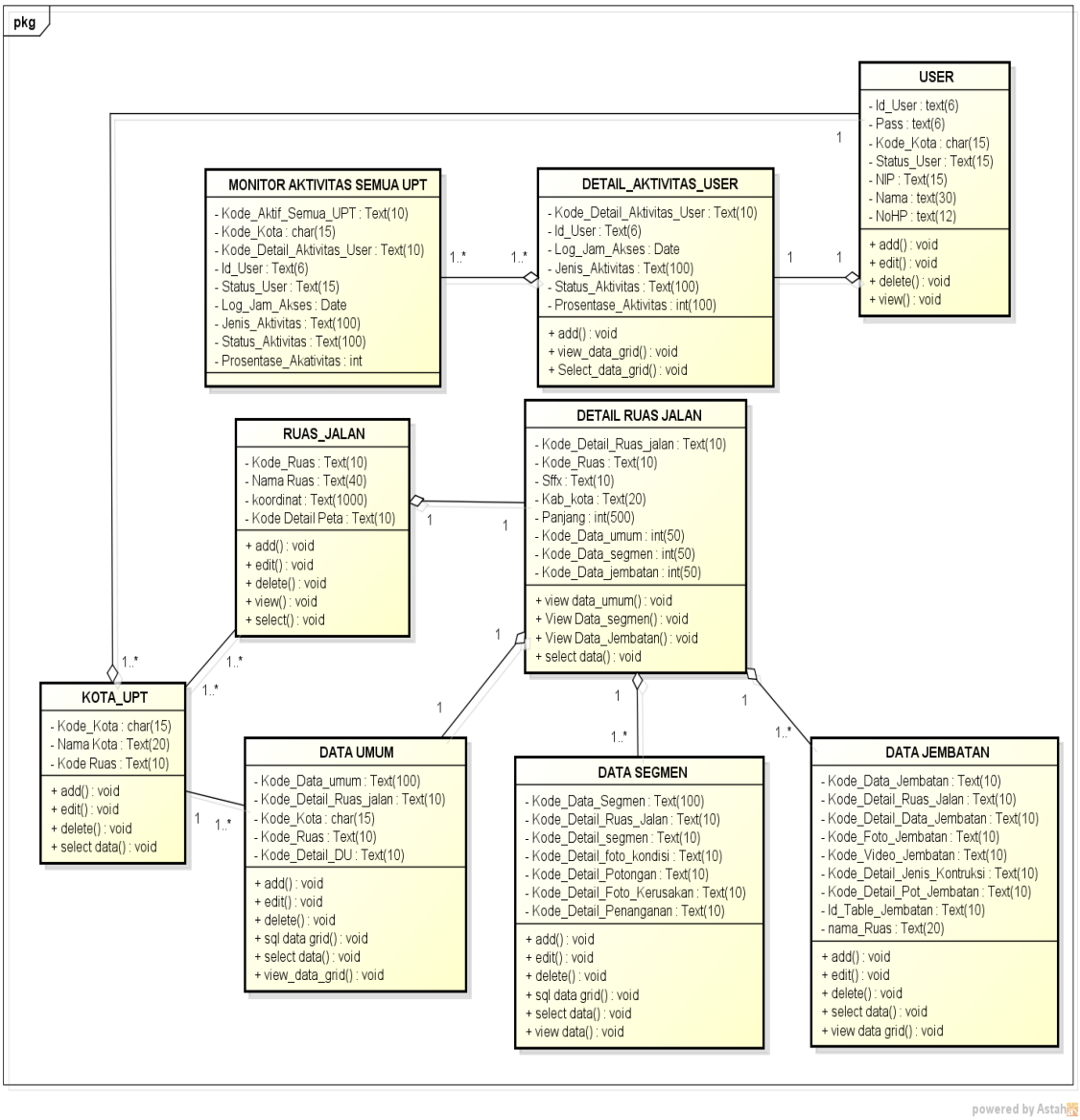



Figure 5 Class Diagram DJJ-SIG.

## 4. Conclusion

SRS whose specification has been presented in this paper provide documentation for the preparation of the implementation of the system will be developed, as well as recommendations on the binamarga East Java province to build a database of geographic information system applications roads and bridges in the province of East Java. With the SRS will make it easier for developers and system for manufacturing applications can be made for further research to develop a system that will be made functional.

## 5. References

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