Application Wireless Location Base Service in Binus Square

Johan Muliadi Kerta, Hendra Arifin, Andreas, Sofian

***Abstract*—Purpose of the research is to help residents of the BINUS Square building know the position of the location, area information that is in the building, facilities - facilities available, and information on the position of friends who are using Wi-Fi networks quickly and accurately.**

Keywords Location-based servise, Wireless LAN, Wi-Fi, Map

1. INTRODUCTION

Today information technology developed so rapidly. Information technology provides many functions, such as providing or extending information. By using a computer network, the information that you want to be known can be delivered faster and more easily obtained.

By using a computer network, can be used to connect one computer to another computer or other hardware such as printers, scanners and the others in one room, between rooms or between buildings so that they can share information through the network. In the functions of a computer network, we can also apply by determining the position where the network user is located.

In general, in determining whether a location or target area, using GPS in mobile users, such as cell phones that take advantage provided by the provider network that is connected via the BTS (Base Transceiver Station) that is closest to the user to obtain location information.

Determination of the location in the building has grow significantly since the widespread deployment of wireless local area network (WLAN) and the demand for services within the context of the position of the building.

Manuscript received Maret 9, 2011.

Hendra Arifin is with the National Institute of Standards and Technology, Bina Nusantara University, Jakarta, CO 11480 IND (corresponding author to provide phone: 085880961008; e-mail: gyghazet@yahoo.com).

Andreas is with the National Institute of Standards and Technology , Bina Nusantara University, Jakarta, CO 11480 IND (corresponding author to provide phone: 081807747647; e-mail: andreascung89@gmail.com).

Sofian is with the National Institute of standards and Technology , Bina Nusantara University, Jakarta, CO 11480 IND (corresponding author to provide phone: 08195615238; e-mail:limsofian@ymail.com).

The wireless local area network (WLAN) technique is extremely popular. Therefore, this study adopts WLAN as a technique for detecting a location. TheWLAN reduces the cost and risk of hardware construction and utilizes existing network resources, which can be used to determine locations and does not affect original network transportation functions. Currently, nearly every notebook has been equipped with Wi-Fi, so in this study, an application designed to be implemented on the notebook that is connected to a wireless LAN network using a system of Location - Based Services (LBS).

In this study, we develop application systems that can identify the location of the Binus Square building using wireless components, components that can receive and send information to the user. In the other hand, can tell the difference using the search location in the building using the manual way through the plan and Wireless LAN location based services.

Organization of the study is as follows: In Section 2, we review the literature such as computer network , wireless LAN and Location – Based Service. We formulate the method in Section 3 and develop the approach in Section 4. Finally, use of what is discussed, and conclusions and directions for future work are given in Section 5.

2. LITERATUR REVIEW

2.1 Computer Network

A network is a set of devices (often reffered to as nodes) connected by media links. A node can be a computer, printer, or any other device capable of sending and/or receiving data generated by other nodes on the network. The links connecting the devices are often called communication channels (2).

We are generally referring to three primary categories : local area networks (LANs), metropolitan area networks (MANs), and wide area networks (WANs). The category a network falls into is determited by its size, its ownership, the distance it covers, and its physical architecture (2).

A local area network (LAN) is a computer network that connects a computer with another computer with a limited range and covers an area within a room, building, or several adjacent buildings. LAN typically uses a wired transmission

media. A metropolitan area network (MAN) has principle the same as a LAN, it's just a wider distance, 10-50 km. Such networks typically use a transmission medium with micro-waves or radio waves. However, there also are using leased lines (leased line). A wide area network (WAN) is network which includes inter-city, inter-provincial, inter-state and even between continents.

2.2 Wireless LAN

Wireless LAN communication is one of the fastest growning technologies. The demand for mobile devices has led to a need for wireless wide and local area networks. Wireless devices transmit using one of two types of signals : radio frequency waves or infrared waves. Radio frequency (RF) signals, having frequencies in the 1 to 20 GHz range, can be used transmit data between stations in a wireless LAN (2). The process of connecting to a wireless LAN consists of two sub - separate processes, namely authentication and association. For example, when we talk about a wireless PC card that connects to a wireless LAN, we say that the PC card has been proven authentic, with and been associated with a particular access point. Remember that when we talk about associations, we are stating layer 2 connectivitas and authentication directly alluded to the PC card radio.

Because wireless communication can easily be sent or received by unauthorized stations, a station must authenticate itself before it is permitted to send data. After a mobile station has been associated by the base station (i.e., accepted into its cell), the base station sends a special challenge frame to it to see if the mobile station knows the secret key (password) that been assigned to it. It proves its knowledge of the secret key by encrypting the challenge frame and sending it back to the base station. If the result is correct, the mobile is fully enrolled in the cell. In the initial standard, the base station does not prove its identity to the mobile station, but work to repair this defect in the standard is underway (3).

To associate itself with an AP, a station does the following :

- The station sends a probe request frame.
- All APs within reach respond with a probe response frame.
- The station selects one of the APs and sends an association request frame.
- The AP responds with an association response frame.

2.3 Location-based service

Location Based Services (Location - Based Service) is an information service which utilize the ability to use location information from mobile devices and can be accessed with mobile devices through a mobile telecommunications network.

3. METHOD

- Analysis

System analysis is carried out through four stages: 1. analysis of survey findings, 2. identification of information needs, 3. data collecting and 4. identification of system requirements.

- Design

Design method used in this paper is Structurized Design Method through 1. making use case diagram 2. making sequence diagram 3. designing the screen 4. making ERD (1)

A. Use Case

A use case diagram in Unified Modeling Language (UML) is a type of behavioral diagram defined by and created from an analysis of the case. The main purpose of a use case diagram is to show what the function of the actor system.

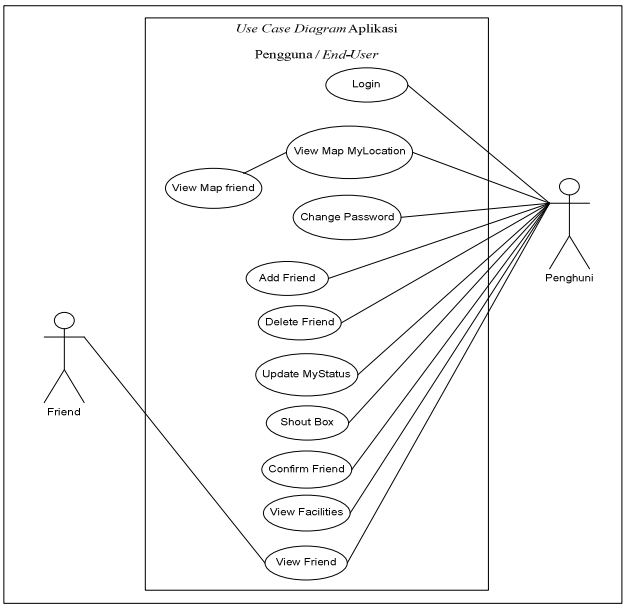

Fig 1. Use Case Diagram Aplikasi

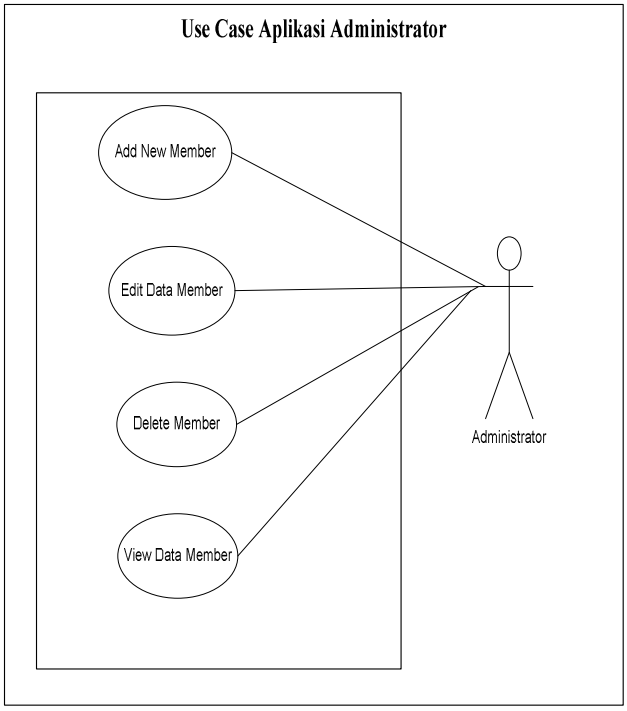

Fig 2. Use Case aplikasi administrator

B. Sequence diagram

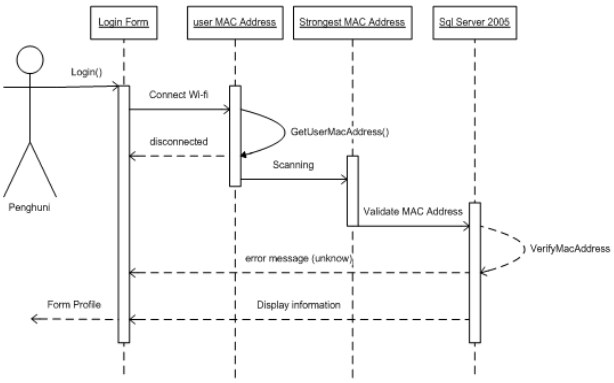

Fig 3. Sequence Diagram Login

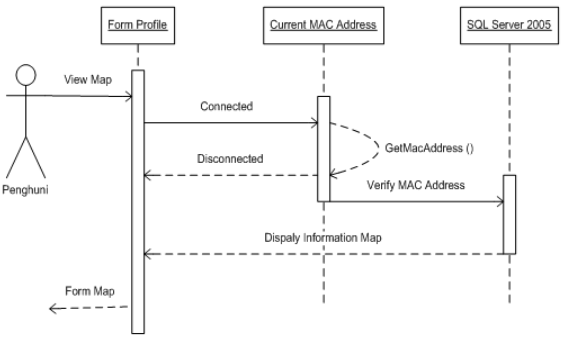

Fig 4. Sequence Diagram GetMAC

C. Designing the screen

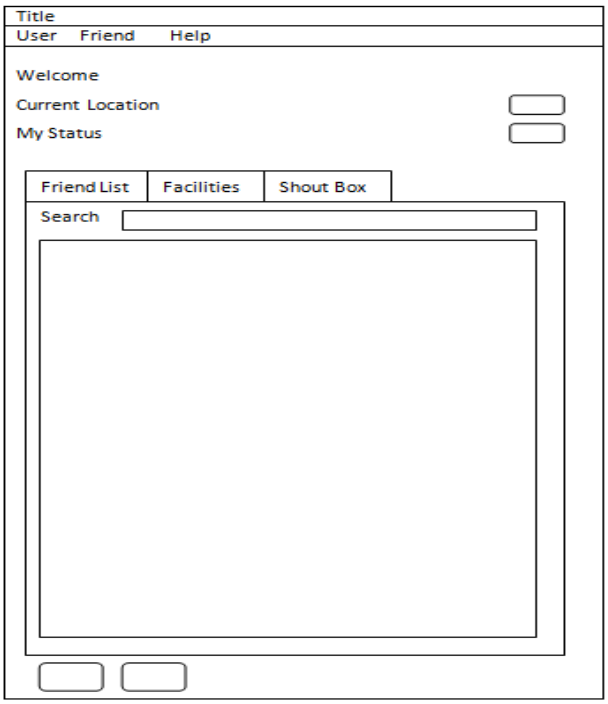

Fig 5. Screen Profile

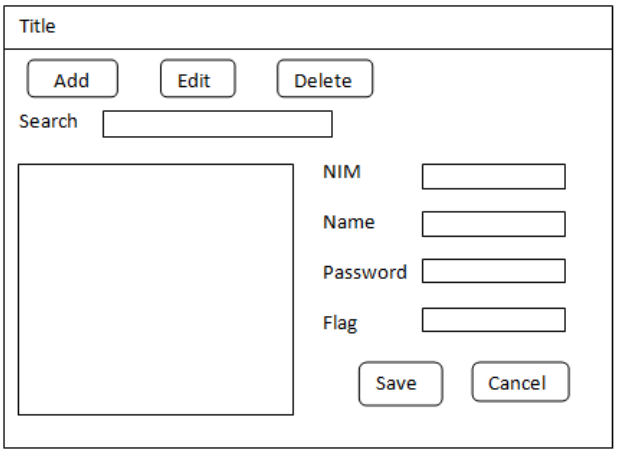

Fig 6. Screen Administrator

D. ERD

Entity Relationship Diagram (ERD) is a data model that uses some notation to describe the data in the context of the entities and relationships described by these data (1).

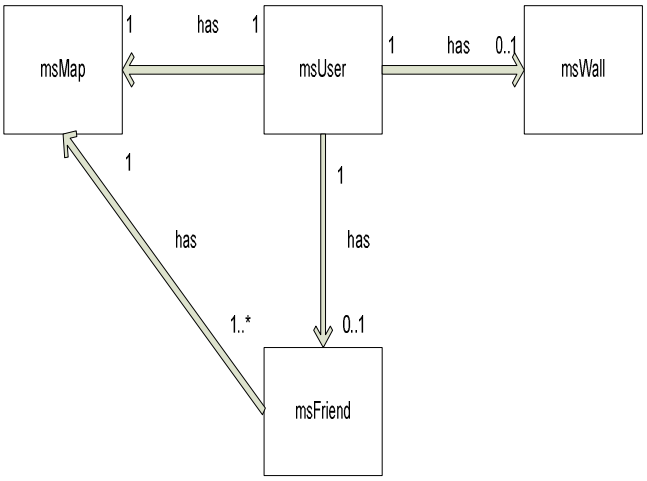

Fig 7. ERD

4. RESULT

Time Evaluation

In evaluating the proposed system, the evaluation is based on the speed of application can provide information on the user's location information, users can quickly find the location of the facilities available, users can quickly find the position where friends are located. The process of computation time, distributed into several processes, namely:

Left evaluation based on current Wi-Fi on the laptop is on, then the system will do the Search for the signal application and MAC Address Access Point, the nearest to be able to login.

When calculating the speed of access to the login process will begin after the occupants enter the NIM, password and pressing the "login" to appear the screen profile, and time counting applications using a stop watch on the phone. When the calculation speed access to an online friend in the friend list will begin after the current occupant logging on, the icon will change status to friends and the time count by using a stop watch on the phone.

When the calculation speed access to an offline friend in the friend list, will start on time residents to log out and application on his friends remain on, the icon will change the status of friends and time calculations using a stop watch on the phone.

The process of calculating the speed of access to Confirm Friend in addfriend will start after the occupant pressing the add friend, and enter the NIM friends. Time calculations in arithmetic when friends are online or after the login application pressing the 'Approve' on display confirm message.

When the calculation speed access to current location will begin to be calculated after the occupants to log in, then until a display profile.

When the calculation process for the shout box access speed (hosts interaction) will start after the occupants do input a word and press the 'shout' then the system will display a message on the screen.

Table 1. Application Performance Testing Results

Measurement	Average (seconds)	Maximum (seconds)	Minimum (seconds)
Process Login	3,136	4,09	2,46
Process Friend Online	3,143	5,25	2,37
Process Friend Offline	2,92	4,63	2,64
Process Confirm Friend	4,112	4,47	3,88
Process Current Location	12,774	60,11	1,12
Process Shout Box	2,174	3,06	2,52

5. Conclusions and Recommendations

Conclusions

1. Applications that are designed to determine and provide information to location information using Wireless LAN technology.
2. The application is designed to be able to interact with fellow users in social networking.
3. It is much more rapid, efficient, and beneficial to residents in Binus Square compared to using floor plans in terms of time and information.

Recommendations

1. Systems that have been made would be better if the added features that can be used to determine the distance the user with a distance of other friends who are 'online ' and route information.
2. Systems that have been made would be better if the added features that can be used to determine the distance the user with facilities along the route information area of destination.

3. The performance of the system will work better, if there are no restrictions on the right of access to a Wi - Fi network.
4. Systems that have been made would be better if the added features webcams that can be used for face to face, video call with other users and share files among users of Wi - Fi network.

6. Acknowledge

Thanks to IT Directorate staff of BINUS University for providing research tools used for this research.

7. References

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