A Web-Based Boarding House Information System in Yogyakarta

Andry Rachmadi
Department of Informatics
UIN Sunan Kalijaga
Yogyakarta, Indonesia
doriasta09@gmail.com

Naufal Asyhab
Department of Informatics
UIN Sunan Kalijaga
Yogyakarta, Indonesia
naufalasyhab@gmail.com

Muhammad Dzulfikar Fauzi
Department of Informatics
Faculty of Science and Technology
UIN Sunan Kalijaga
Yogyakarta, Indonesia
agus.mulyanto@uin-suka.ac.id

Agus Mulyanto
Department of Informatics
Faculty of Science and Technology
UIN Sunan Kalijaga
Yogyakarta, Indonesia
dzulfikar1234567@gmail.com

Abstract— **Daerah Istimewa (Special Region of) Yogyakarta has 3,186 km^2 wide area with 3,020,837 populations. Yogyakarta is well-known as an education city and a new student destination. Until 2005, it was reached number of 229,761 students (DIY Education Department, 2006). Finding boarding houses which are as needed and desired by students and learners is not easy. The obstacle that is often faced is do not know the area, or do not have friends who can give suggestion of appropriate boarding houses for students and learners. Therefore, it is necessary to create boarding house information system to facilitate students when looking for a place to stay. This information system is expected to help students finding a boarding house and also help boarding house owners to publish an empty boarding house room. System development method in this study is SDLC (System Development Life Cycle) using a waterfall model. The waterfall model is a systematic approach and sequential starting of the level of system requirements, then to the analyzing data, designing, coding, and testing / verification. The boarding house information system is capable of informing the boarding line with the criteria sought by searchers. This information system is also capable of displaying the boarding house location utilizing Google Maps API to ease the boarding house location searching.**

Keywords--Information System; Boarding House; Google Maps API.

I. INTRODUCTION

Technological developments have an important role in human life, one of which is the development of information technology. The internet is a physical network connection from millions of computers using protocol the same for sharing / transmitting information in addition to information sharing/transmitting, the internet is also used to connect two or more people online [1].

Nowadays the internet has become an important and effective means of communication throughout the world and many fields that use it. applications Web that can be used in all fields, such as in the field of business and in the field of society have been widely implemented and proven to provide benefits to the community. The field of business has now glanced at this internet potential. Nowadays, the internet is a means of learning and exchange information that is useful for community service(providers) and boarding/tenant (service users' consumer) who aim to make it easier for someone to get practical and efficient information about boarding in an area.

Boarding is one place for providers of lodging services or temporary residence consisting of several rooms and each room has several facilities offered or provided and also has a price determined by the owner of the boarding house while the length of time the rental is determined by the tenant.

The Special Region of Yogyakarta has an area of 3,186 km2 with a population of 3,020,837 people, an area in Indonesia known as the "Student City". This can be seen from the growth of the number of active students in Yogyakarta until 2005 reaching 229,761 people (DIY education office, 2006), where 70% of them came from outside the province of Yogyakarta and it is estimated that there were also thousands of high school students from outside Yogyakarta, all of them are pupils and students live on boarding/ rented houses as mentioned by Aroma in [2]. Pupils and students who are looking for boarding houses get information from friends or immediately search, this is less effective and inefficient. In addition, the budget, facilities, and also the location of boarding are considered. On the other hand, boarding owners have difficulty publishing an empty boarding house, so this application also helps boarding owners to publish their boarding house to the fullest.

With this background, to analyze the extent to which the web-based boarding information system in processing boarding information, whether in the form of boarding pictures, complete equipment in boarding, as well as a price list per boarding contract, it is proposed to build a-based boarding house information system web so students and students can find out boarding information in certain areas. To build this system will use the PHP programming language and MySQL database and utilize the Google Maps API to display a map of boarding locations.

II. RESEARCH PURPOSES

The objectives to be achieved in this study are:

1. Create a boarding information system that is able to provide information about boarding according to the criteria sought by the user.
2. Creating a system that can be used as a media boarding house promotion for boarding owners.
3. Creating a system that is able to provide location maps using the API.

III. RESEARCH METHOD

The research method used in this research is system development, namely, a web-based boarding house information system in Yogyakarta. The steps used are library studies, identification of system requirements, data collection, system equipment requirements, and system development methods.

A. Library Studies

Library studies can be interpreted as a step to obtain information from previous research that must be done, regardless of whether a study uses primary data or secondary data. In this case, try to gather information that is relevant to the topic and problem to be studied. This step is carried out to study theories related to and support research topics so that they get an overview of system design and more accurate analysis. Based on our studies, several research related to boarding house have done, such as in [1,3,4,5]. Our research is a combination of ideas implemented in those research.

B. System Identification

Identification of system requirements in this research is carried out by identifying the system requirements to implement the algorithm of the system itself and knowing what is needed in making this information system. With this system, users are expected to be more helpful in finding the desired boarding house.

C. System Development Methods

System Development Methods used in this study is referring to the stages in the SDLC standard using the model waterfall or Linear Sequential method [6]. The model waterfall in the figure below and approaches systematically and sequentially starting from the level of system requirements, then towards analysis, design, coding, and testing/verification.

1. Analysis, the process of determining system architecture in total and determining data size and amount of data. Determination of the definition of the system needed, explanation and purpose of the system can be obtained through consultation with system users. The process of gathering needs is intensified and focused, especially on software.
2. Design, determine the basis for the formation and selection of data structures, program structures, program architecture, algorithm selection, and interaction with users. The design process will translate the requirements for a software design that can be estimated before made coding is. This process focuses on: data structures, software architectures, interface representations, and procedural details.

3. Programming, transforming designs into program lines, language selection. Programming or Coding is translation design in a language that can be recognized by computers. This stage is a real step in working on a system. In that sense, the use of computers will be maximized in this stage. After the coding is complete, will be carried out testing of the system that was made earlier. The purpose of testing is to find errors in the system and then be corrected.
4. Testing, testing the correctness of the program, debugging error. The testing process is done on internal logic to make sure all statements have been tested. Functional external testing to find errors and ensure that inputs will provide actual results as needed.

IV. ANALYSIS AND SYSTEM DESIGN

A. *Requirement Analysis*

Based on the identification of these problems, it needs to be described in more detail what needs are needed for system development. These needs are divided into three types, namely information needs, functional requirements, and non-functional requirements.

1. Information Needs

   To be able to perform tasks and activities of each entity, the web-based boarding house information system must be able to provide the required information including:

   - Boarding Data:

     This information contains data from boarding profiles. Starting from the boarding name, boarding photos to the coordinates of boarding points in the map.

   - Class Data Information:

     This information contains data - class data from a boarding house that includes price sizes and so on.

   - General Facilities Data:

     This information contains ownership data of public facilities in a boarding house in the list of public facilities.

   - Room Facilities Data Information:

     This information contains ownership data of facilities in a boarding room in the list of room facilities.

   - Data List Public Facilities Information:

     This information contains data on a list of common facilities that are usually in boarding.

   - Data List Room Facilities Information:

     This information contains ownership data of facilities in a boarding room in the list of room facilities.

   - Room Size Data:

     This information contains data on the size of rooms that are common in a boarding.

   - Admin Data Information:

     This information contains data admin that is able to process boarding data. Admin is divided into two levels, namely Super Admin and Admin Standard.

2. Functional Requirements

   Functional requirements are needs that generally must be owned by the system to run a business processing and managing data. These needs include:

   1. Login Process: is the process of entering the system using *username* and *password* the admin. The information involved in this process is admin data information.
   2. Data View Process: is a process to display data from the *database* to the screen. All data information is involved in this process.
   3. Data Addition Process: is a process for entering new data from the system interface display into the *database*. All information is involved in this process.
   4. Data Search Process: is a process for searching data based on certain parameters. All information is involved in this process.
   5. Data Change Process: is a process for updating existing data with new data. All information involved in this process.
   6. Data Removal Process: is a process to delete or delete data. All information is involved in this process.
   7. Logout Process: is the process of leaving the system.

3. Non-functional Requirements

   Non-functional requirements are needs that are beyond functional requirements such as Access Rights. Access Rights is the distribution of rights to access the system based on the level. With the sharing of access rights, only users who are given access rights can access certain information in the system. There are three entities that are directly related and can use the information system. The three entities include Admin, Boarding Owner, and User.

4. System Design

   To understand and implement the results of the analysis obtained, we need a system design for processes, databases and interfaces.

   - Context Diagram

     At this level, the system is described as a whole the process that occurs in the system and describes the relationship of the system with external unity contained in the system. In this system, there are three related entities, namely Admin, Boarding Owners (Pemilik Kost), and Users.

   - Data Flow Diagram Level 1

     To clarify the data flow diagram, the next context diagram is further translated into DFD level 1. At this level four

main processes are described, including the process of registration, login, data processing, and data search. It is shown in Fig. 1.

The Registration Process (Process 1.0) describes the data flow from the Boarding Owner's entity. In this process only use the admin table. The entity sends registration data and receives the registration information flow.

Process Login (Process 2.0) describes the data flow only from two entities, namely Admin and Boarding Owner. Both entities send data login in the form of a username and password to then be checked by the system against the Admin table.

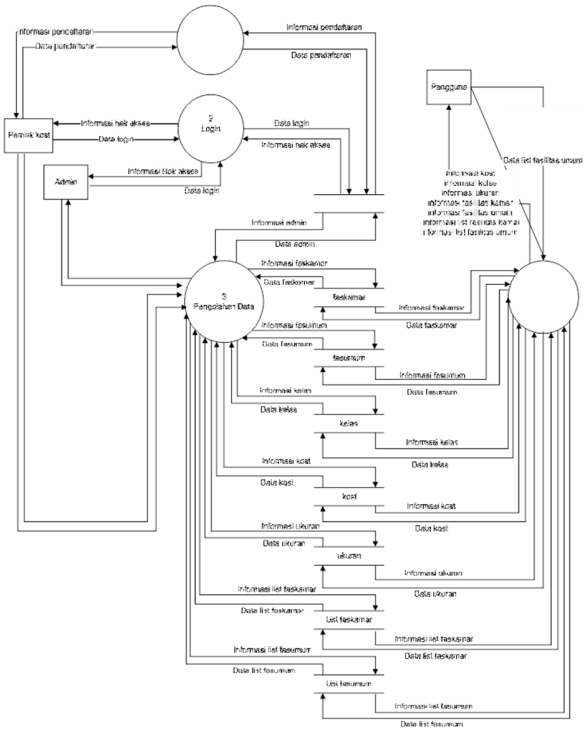

Figure 1. Data Flow Diagram Level 1

Data Processing Process (Process 3.0) describes the data flow of two entities, namely Admin and Boarding Owner. This process will affect all tables in the system. Both entities can process the boarding data, process class data, process public data, process room data and measure data. For the process of processing admin data can only be done by the Admin entity.

Data Search Process (Process 4.0) describes the data flow from the user entity. In this process use almost all tables except the Admin table.

- Data Flow Diagram Level 2

DFD Level 2 Data Processing is a translation of DFD level 1 in process 3.0. At this level the process is described in more detail into the six data processing processes which described in Fig. 2.

In the picture it appears that the entity can then take the data processing boarding, class data, data list public facilities, data list room facility the data size and data admin. While boarding/ rented owners can perform data processing boarding, class data, data list public facilities, data list room facility and the data size. The following is an explanation of these processes.

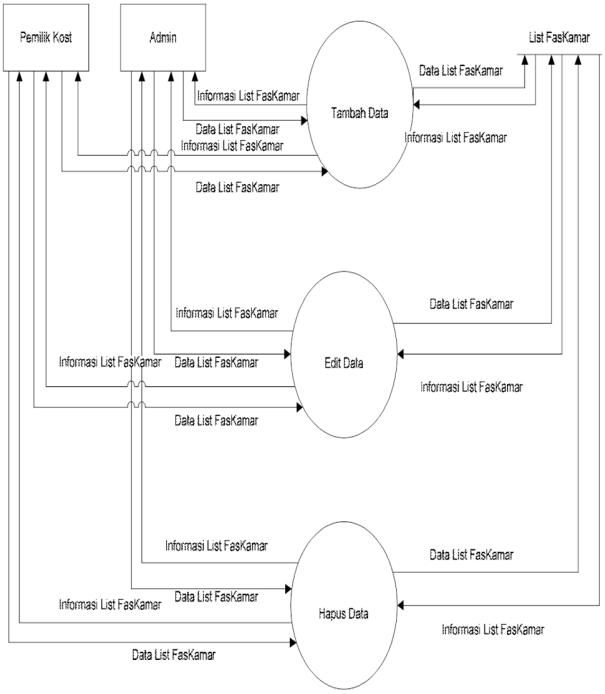

Figure 2. Data Flow Diagram Level 2 Data Tabulation Process

1. Process 3.1, this process describes the admin data processing flow
2. Process 3.2, this process describes the boarding data processing flow
3. Process 3.3, this process describes the data processing flow list of room facilities
4. Process 3.4, this process illustrates the flow of data processing list facility common
5. Process 3.5, this process describes the flow of data processing size
6. Process 3.6, this process describes the flow of data processing class

- Entity Relationship Diagram

The ERD design describes the system database design. ERD explains the relationship between each data with another data. From this ERD, what table will be needed for the system to be built will be seen. Figure 3 shows the ERD of this system.

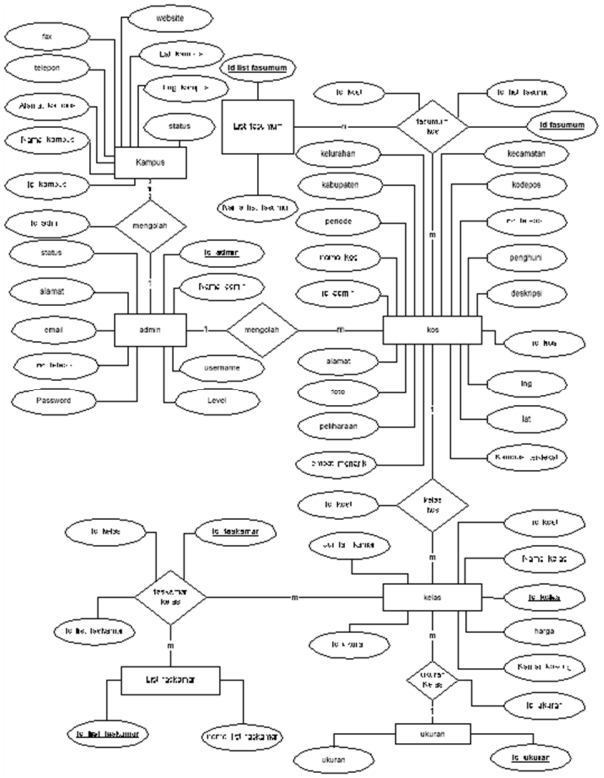

Figure 3. Entity Relationship Diagram

- Table Relationships Design

Relationships between tables are a representation for relations between each tables in a system database, which is shown in Fig. 4.

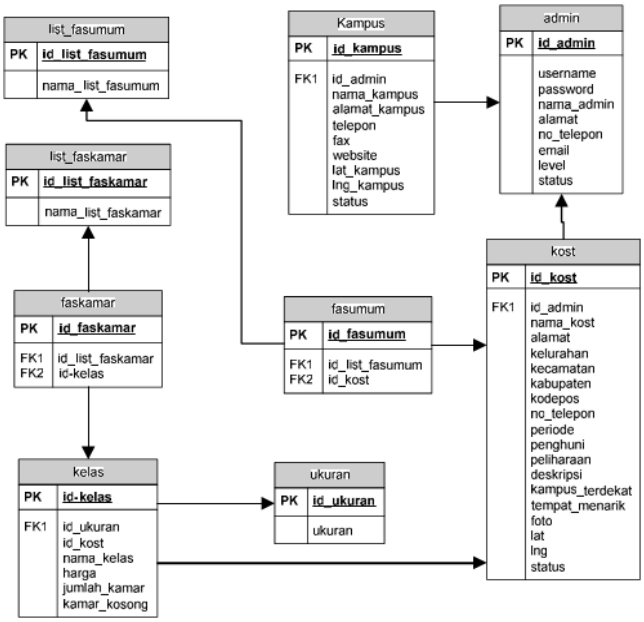

Figure 4. A Table of Relationships Design

- Menu Structures Design

Menu structure design describes the results of grouping based on the processes contained in the Web-Based Boarding Information System. From the structure chart it can be seen that the Web-Based Boarding Information System is designed to be used by 3 parties, namely Users, Admin and Boarding Owners. Figure 5 shows it.

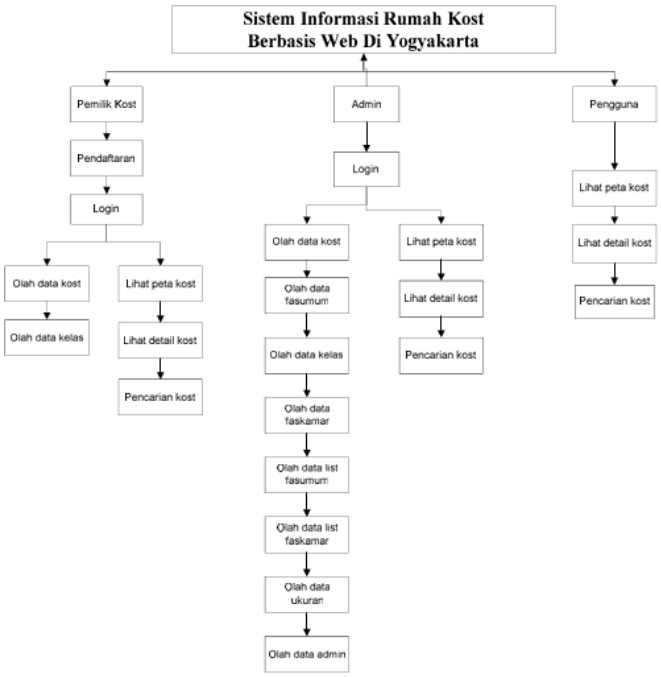

Figure 5. Menu Structures Design

- Databases Design

Databases design is the result of implementation of the ERD description that has been made. The tables are shown in Table 1-9.

1. Admin Table

Table 1. Admin Table

Attribute	Data Type	Size	Constraint
id_admin	Integer	11	Primary Key
username	Varchar	20	
password	Varchar	20	
nama_admin	Varchar	50	
alamat	Text		
no_telepon	Varchar	15	
email	Varchar	25	
status	Tinyint	4	

level	Tinyint	4	

2. Boarding House Table

Table 2. Boarding House Table

Attribute	Data Type	Size	Constraint
id_kost	Integer	11	Primary Key
nama_kost	Varchar	20	
alamat	Varchar		
kelurahan	Varchar	35	
kecamatan	Text	35	
kabupaten	Varchar	Kota Yogyakarta, Sleman, Bantul, Kulon Progo, Gunung Kidul	
kodepos	Varchar	5	
no_telepon	Tinyint	15	
periode	Enum	Bulan, 3 Bulan, 6 Bulan Tahun	
penghuni	Enum	Pria, Wanita, Umum	
peliharaan	Enum	Boleh, Tidak Boleh	
deskripsi	Text		
kampus_terdekat	Text		
tempat_menarik	Text		
foto	Varchar	75	
lat	Double		
lng	Double		
id_admin	Varchar	20	Foreign Key
status	enum	Y, N	

3. Class Table

Table 3. Class Table

Attribute	Data Type	Size	Constraint
id_kelas	Integer	11	Primary Key
nama_kelas	Varchar	35	
id_ukuran	Integer	11	Foreign Key
harga	Decimal	10,0	
jumlah_kamar	Integer	11	
kamar_kosong	Integer	11	
id_kost	Integer	11	Foreign Key

4. Room Facility Table

Table 4. Room Facility Table

Attribute	Data Type	Size	Constraint
id_faskamar	Integer	11	Primary Key
id_kelas	Integer	11	Foreign Key
id_list_faskamar	Integer	11	Foreign Key

5. Common Facility Table

Table 5. Common Facility Table

Attribute	Data Type	Size	Constraint
id_fasumum	Integer	11	Primary Key
id_kost	Integer	11	Foreign Key
id_list_fasumum	Integer	11	Foreign Key

6. Room Facility List Table

Table 6. Room Facility List Table

Attribute	Data Type	Size	Constraint
id_list_faskamar	Integer	11	Primary Key
nama_list_faskamar	Varchar	35	

7. Common Facility List Table

Table 7. Common Facility List Table

Attribute	Data Type	Size	Constraint
id_list_fasumum	Integer	11	Primary Key
nama_list_fasumum	Varchar	35	

8. Room Size Table

Table 8. Room Size Table

Attribute	Data Type	Size	Constraint
id_ukuran	Integer	11	Primary Key
ukuran	Varchar	35	

9. Campus Table

Table 9. Campus Table

Attribute	Data Type	Size	Constraint
id_kampus	Integer	11	Primary Key
nama_kampus	varchar	100	

alamat_kampus	varchar	100	
telepon	varchar	25	
fax	varchar	25	
website	varchar	25	
lat_kampus	varchar	25	
lng_kampus	varchar	25	
status	enum	Y/N	

V. IMPLEMENTATION AND TESTING

A. *System Implementations*

An implementation is the stage of translating design results into program lines. A web-based boarding house information system is an information system that is implemented using programming language and MySQL as its database.

1. Implementation of Database Connection
   So that applications can access data in the database, a connection is needed that will connect the application to the database.
2. Implementation of Login Page
   On the login page, there is a form where registered admin can enter a username and password to enter the system admin page according to their respective authorities. It is shown in Fig. 6.

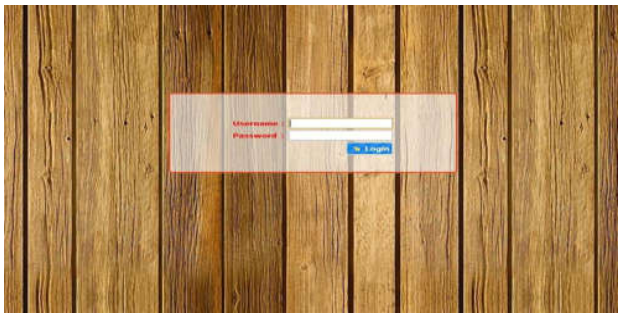

Figure 6. Login Page

3. Implementation of Main Admin Page
   Admin page that can be accessed after logging in. On this page, there are several menus for managing data in the system. Menus on this page include Boarding, list of public facilities, list of room, size and admin facilities. It is shown in Fig. 7.

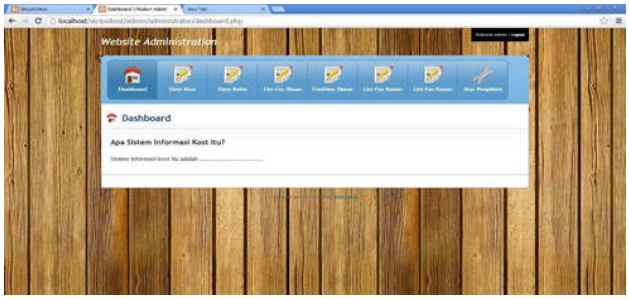

Figure 7. Admin Page

4. Implementation of View Data Page
   Admin can see all boarding lists stored on the page see boarding data. On the boarding page, there is a *tool* to edit and delete existing data. It is shown in Fig. 8.

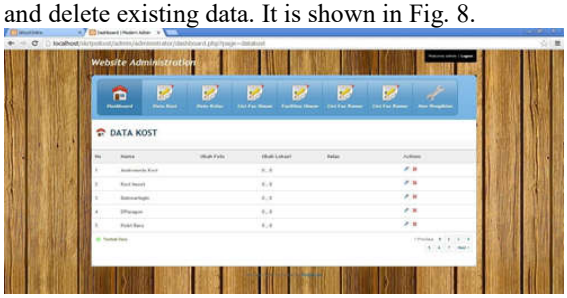

Figure 8. View Data Page

5. Implementation of Boarding House Edit Data Page
   Menu is used by admin to update boarding data that has been previously inputted. The implementation of the boarding data edit page can be seen in the picture. It is shown in Fig. 9.

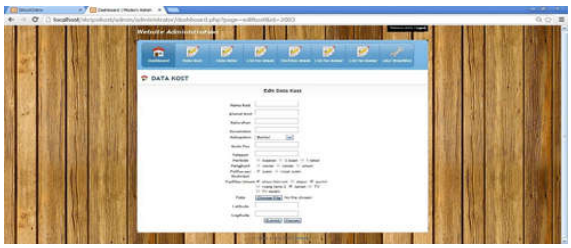

Figure 9. Boarding House Edit Data Page

6. Implementation of Home Page
   Page This page is the first page to be opened when the user accesses it. On the front page, there is a welcome greeting, the latest boarding house, boarding page, and boarding search page. On this page there is also a search column in the sidebar, this search column is used to search by address. It is shown in Fig. 10.

Figure 10. Home Page

7. Boarding Houses Map
   Boarding page is a page that displays boarding location information in the form of a marker on a map that has been stored in the database. This page serves to search boarding based on location. Figure 11 shows this service.

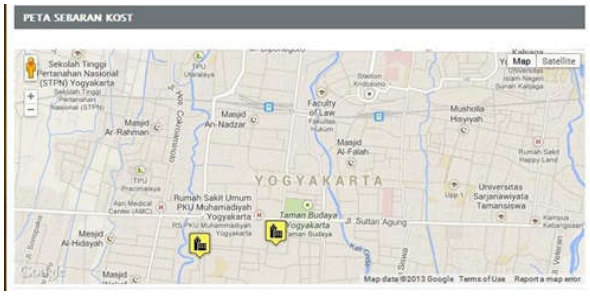

Figure 11. Boarding Houses Map

8. Implementation of Search Page
   The search page is a page for users to search by feature criteria or boarding specifications. Users can set the desired search criteria. Starting from the address, rent, size, occupants, and facilities. It is shown in Fig. 12.

Figure 12. Search Boarding House Page

9. Implementation of Boarding Owner Registration Page
   his page will be visible after the Boarding House Owner who wants to register his board clicks on the banner in the sidebar. Then the terms and conditions page will appear which if approved will enter the registration form. It is shown in Fig. 13.

Figure 13. Boarding Owner Registration Page

10. Implementation of Boarding House Menu
    Menu page is the page used to manage boarding data that will and has been stored in the database. On this page there are features to add, change, delete boarding data and class data, change locations and change boarding photos. Figure 14 shows it.

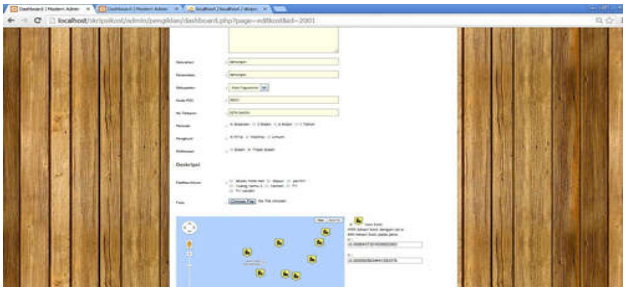

Figure 14. Boarding House Menu Page

B. *Testing*

System testing is the last stage in this study, which is carried out using a system test that tests the overall capabilities provided by this system. At this stage, testing the system will use the method black box. Black box is a testing method by focusing on the functional system that has been built and pays attention to the results of the system whether it has been running as expected. System testing scenarios carried out by several respondents who use this system, then the results of the test will be written on the questionnaire that has been given. The test scenario can be seen in Table 10.

Table 10. System Testing Scenario Table

No.	Test Classification	Testing Technique	Test Category
1.	Authentication	Black Box	System can processing Login for admin. Turn off login session so admin has to use admin menu if he/she want to login again.
2.	Input data processing	Black Box	System can display inputted data
3.	Data processing by Admin	Black Box	System can manipulate data which is include input, edit and delete data process by administrator.

4.	Geographical information processing	Black Box	System can display boarding house location on map

Tests are carried out on the functional systems, interfaces and accesses, and testing system content for admins and users. Alpha test result can be seen in Table 11 and beta test result can be seen in Table 12.

Table 11. Alpha Testing Result Table

No.	Statements	Measurement	
		Yes	*No*
1.	If the username and password are incorrect or the username is not registered, then it cannot log in to the system.	20	0
2.	The system can display the page in the main menu.	20	0
3.	System can display boarding data, public data processing, class data processing, room data facilities, data list public facilities, data list room facilities, data size, boarding data and boarding details clearly.	19	1
4.	System can input boarding data, public facilities data, class data, room facilities data, public facilities data list, room facility data list, size data, boarding maps, boarding details, and other input.	19	1
5.	The system is able to provide menu information clearly, according to the contents of the system.	19	1
6.	The system can search boarding data, public facilities data, class data, room facilities data, public facilities data list, data list room facilities, data size, boarding maps, boarding and other input details well	18	2
7.	The system can proceed to the next process if the user enters data correctly	20	0
8.	The system can display maps used in the system	17	3
9.	The system can display all data display properly	18	2
10.	After user logout, he/she can't enter the system again without login again	20	0
Total		190	10

Table 12. Beta Testing Result Table

No.	Statements	Measurement				
		SS	*S*	*N*	*TS*	*STS*
1.	System has navigation that easy to operate	6	14	0	0	0
2.	Loading time relatively fast	1	10	9	0	0
3.	System has good display content	3	12	5	0	0
4.	System displays a successful message if the user enters the correct data	5	13	2	0	0
5.	System displays an alert message if the user enters the wrong data	6	13	1	0	0
Total		21	62	17	0	0

Based on the results of system testing, it can be concluded that this web-based boarding house information system that has been made is feasible to use. However, further system development is needed to get optimal results.

VI. CONCLUSIONS

The Web-based Boarding House Information System in Yogyakarta is a software that is built to help users, especially boarding seekers and boarding house owners, to determine the boarding house in accordance with the criteria needed. This system helps in boarding searches that have certain facility facilities and is strategically located according to the boarding house wanted with the help of google maps. With the creation of this system, it is expected to provide convenience for boarding house owners to publish their vacant boarding houses optimally.

Based on the results of the analysis and implementation of boarding house information systems carried out by the author, then some conclusions can be drawn, namely:

1. Successfully creating a boarding information system that is able to provide information about boarding according to the criteria sought by the user.
2. Successfully create a system that can be used as a media for home promotion boarding house for boarding house owner.
3. Successfully created a system capable of providing location maps utilizing Google's Map API to find out information about the boarding house.

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