

A Geographical Information System of a Web-Based Food Delivery Services

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Abstract—Food delivery services become more popular in Indonesia, which is proven by the number of restaurants that provide delivery services such as KFC, Mc Donald, and others. They are still using the phone to serve the customers. For customers, ordering by phone is less interactive since they cannot see the display of available menus with the prices and other details. For the cashiers, ordering by phone is also less effective since they have to write the menus, prices and addresses manually, whereas nowadays we need automation and the speed becomes a very important factor. This system is using Mobile Web technology and Geographical Information System (GIS), which with this technology the customers can order anywhere, and the order pages will be more interactive. For the cashiers, with this GIS, they do not need to record the data order manually. For food deliver, with the technology of GIS, food delivery processes will become easier due to the visualization of the location of customers, and they also can use the existing tracking features in GIS. The system implements the concept of client-server where the server website is used by restaurants, and mobile websites as client are used by customers for ordering food. The Web server has a notification ordering feature, administrator management, menus management, order management, suggestion management, restaurant management, and financial reports. Client's website has a food order feature, geolocation, and send suggestions features to the restaurant.

Keywords-*Information systems; food delivery service; Geographical InformationSystem*

I. INTRODUCTION

Food is a basic requirement of every human being [1]. Because food is a source of energy in carrying out various kinds of daily activities. The food we eat must contain enough carbohydrates, fats, proteins, vitamins, minerals, and water for our bodies. According to the theory, humans need to eat 3 times a day to fulfill their nutritional needs, if nutritional needs are not met, it will have a bad effect on humans, such as slow physical growth, difficulty thinking, etc.

Today people are increasingly busy with their work. Business that is faced often makes people, in general, cannot leave work to meet food needs [2]. To let busy people can still enjoy various menus in restaurants, the restaurant is demanded to provide additional facilities for messaging services between foods.

Food delivery services are now increasingly popular in Indonesia, as evidenced by the many restaurants that provide messaging services such as KFC, Mc Donald, and others. The message service between food at this time in serving customers still uses telephone media [3], namely the customer calls to the number provided by the restaurant and orders the desired menu and gives the address where the food will be sent.

Competition in the restaurant business is getting tougher [4]. Restaurants are required to be able to improve quality not only on the food menu but also in terms of service. To be able to win the competition, the restaurant is demanded to apply information technology in its business processes, one of which is by utilizing Mobile Web technology and GIS.

By utilizing Mobile Web and GIS technology, buyers can place an order anywhere and the order page will be more interactive than using only telephone technology. By using with this GIS system, the cashier does not need to manually record the order data. The existence of GIS technology, the food delivery process will become easier due to the visualization of the location of food ordering, and also can utilize the tracking feature in GIS.

II. SYSTEM DEVELOPMENT METHODOLOGY

The system development methodology used in this study refers to the stages in the SDLC standard (System Development Life Cycle) using the waterfall model or Linear Sequential Model, as can be seen in Figure 1 [5]. This waterfall model approaches systematically and sequentially starting from the level of system requirements and then goes to the stage of analysis, design, coding, testing/verification, and maintenance.

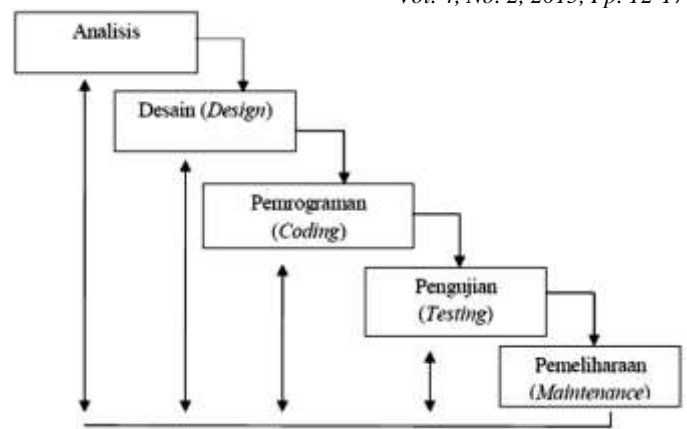


Figure 1. Waterfall Model

The explanation of the stages of the system development methodology is:

A. Analysis

This stage is intended to obtain an overview of the workings of the messaging service system between foods that still use telephone media and what features will later need to be added. What method is appropriate to be applied in the process of making a message service system between foods. Also, it is to analyze the conditions that might arise that can affect system performance in the order process as well as the action model or ordering security system provided by the system adapted to technological developments

B. Design

The message service system between foods is built with a functional approach. Furthermore, for system design using a flow chart that shows how the steps - steps of each process that occurs in this system. In addition to system design, it is also designed for interfaces.

C. Coding

Programming is the implementation of the results of system design and interface design. Implementation is done using the PHP programming language, AJAX.

D. Testing

This method is used to find out whether the software is functioning correctly. At this stage, testing uses black box testing which is a test of the fundamental aspects of the system without regard to the internal logic structure of the software. Black box testing is a method of designing test data based on software specifications. Test data is generated, executed on software and then the output of the software is checked whether it is as expected.

III. SYSTEM REQUIREMENTS ANALYSIS

The system analysis phase is one attempt to identify the needs and specifications of the system that will be created. In it will be described what are the entities involved, the process carried out, and the output produced.



Based on the results of the problem analysis described earlier, the solution offered is the creation of a geographic information system messaging service between foods with the following system specifications:

- a) The system consists of a server and a client. Servers and clients work on a website.
- b) The system on the server can manage registered administrator and operator data, food menu data, ordering data, suggestion data, financial reporting and can turn on and turn off food ordering services.
- c) The system on the client can order food, fill out the suggestion form and can display its position on a Google Map map.
- d) The client system works with internet and GPS service facilities.

IV. SYSTEM DESIGN

System design which is a functional requirements analysis will include system block diagrams, UML, table design, interface design.

A. System Block Diagram

The following is a system block diagram that describes an outline of geographic information systems for food delivery services. Figure 2 shows the process of data flow in the geographic information system application message service between foods.

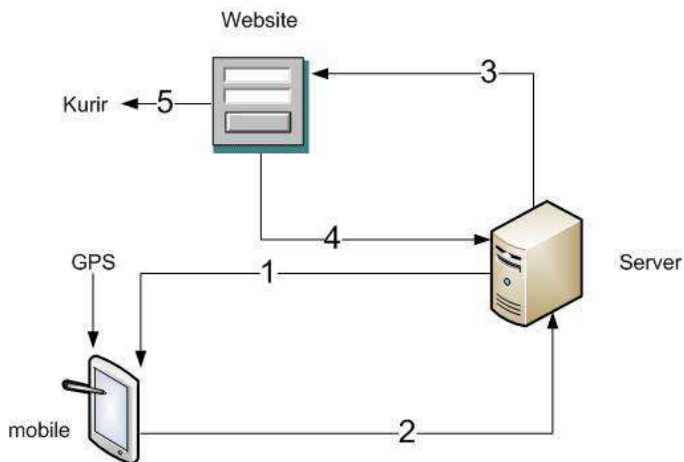


Figure 2. System Block Diagram

Description of Block Diagram of Geographic Information System for Delivery Service:

- 1) Process 1 is the process of getting data from the server and longitude data and latitude from the GPS feature. Data obtained from the server is in the form of mobile website files and system databases. GPS is used to determine the location of the buyer, which will then display location data on the Google Map.

- 2) Process 2 is the process of sending data in the form of ordered menu data, ordering data, suggestion data and criticism into the database server.
- 3) Process 3 is the process of getting data from servers and maps from Google Maps. The data obtained from the server is in the form of website server files and system databases. Google Map is used for visualizing the address of the buyer.
- 4) Process 4 is the process of sending data changes to the database if we do add, change, and delete data.
- 5) Process 5 is the process of submitting hardcopy order data to the courier to deliver the order.

B. Use Case Diagram

From the results of the analysis that has been done before, then modeling is made from the user's point of view using a use case diagram. Use case diagram is a diagram created using the user's point of view. In the use case diagram, the user is as involved in the system analysis and design stage. Use case diagram is a construction that helps system analysts determine the state of the system. Use case diagram will describe the system based on what the user will do to the system. The use case diagram describes the geographic information system functionality of the message service between these foods. The use case diagram can be seen in Figure 3.

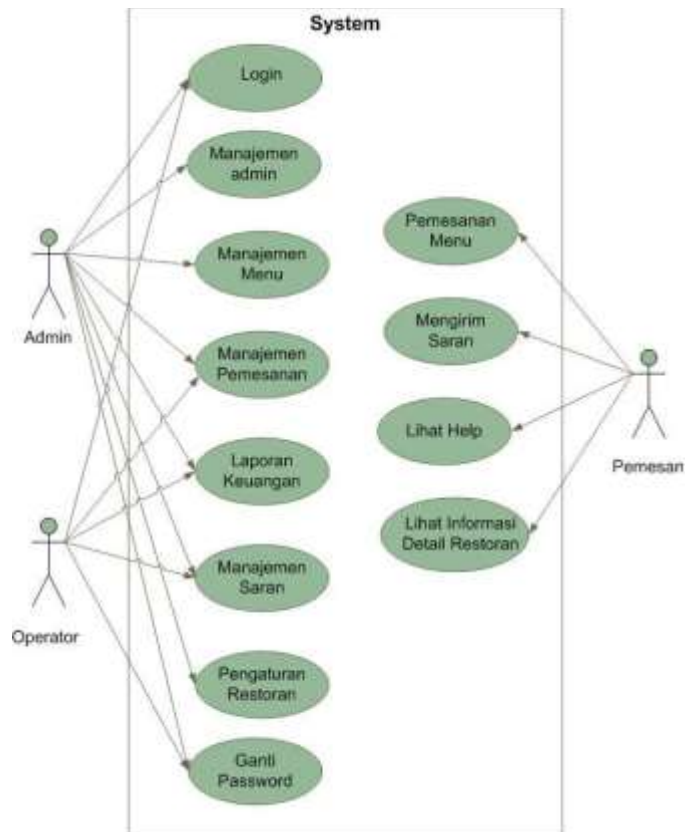


Figure 3. Use Case Diagram



C. Class Diagram

Class diagrams describe the structure of the system in terms of defining the classes that will be made to build the system. Classes have what are called attributes and methods or operations. Attributes are variables owned by a class, while operations or methods are functions that belong to a class. Figure 4 is a Class diagram of a food delivery services information system.

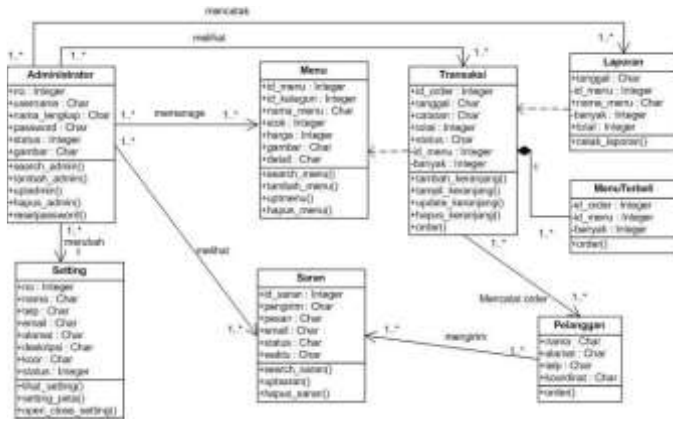


Figure 4. Class Diagram

V. INTERFACE DESIGN

The interface is the display of applications and websites that come in direct contact with users in carrying out functions needed by users.

A. Server System Interface Design

1) Login Interface Design

The login page interface is the page that first appears when the system is accessed. The menus on this system can be accessed by the admin and operator. On the login page there is a column to fill in your username and password. The design of the login page can be seen in Figure 5.



Figure 5. Login Page Interface Design

2) Dashboard Interface Design

The dashboard page interface will contain sales statistics, the number, and detail of the menu offered. In the header section, there is a notification if there are bookings and suggestions that come in, a logout button and a button to turn on and turn off the booking website on the mobile. The dashboard page design can be seen in Figure 6.



Figure 6. Dashboard Page Interface Design

3) Interface Design List of Administrators

The interface of the administrator list page will contain a list of administrators and operators. At the top, there is an add button to add administrators and operators and search fields. The bottom is the administrator list table and the pagination button. The design of the administrator list page can be seen in Figure 7.



Figure 7. Design interface List Administrator Page

4) Interface Design List Menu

The interface of the menu list page will contain a list of menus offered, which later this menu list will appear on the mobile web ordering. The page list menu design can be seen in Figure 8.



B. Client System Interface Design

1) Main Menu Interface Design

The design of the client system's main menu interface contains images and main menus which consist of Ordering, Suggestions, About us, Help. The main menu page design can be seen in Figure 11.



Figure 8. Design The Menu List Interface Page

5) View Order Interface Design

The page interface sees the order will contain the order data form, the menu table ordered and the print button, save, return. Page design see orders can be seen in Figure 9.

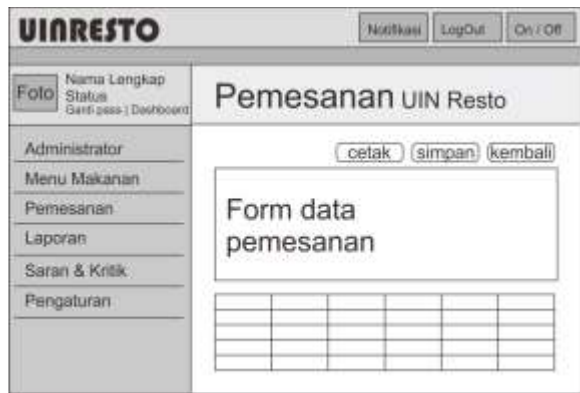


Figure 9. Design page interface see ordering

6) Order Print Interface Design

The order print page interface will contain the order data form, the menu table ordered, and the map of the ordering location. The order print page design can be seen in Figure 10.

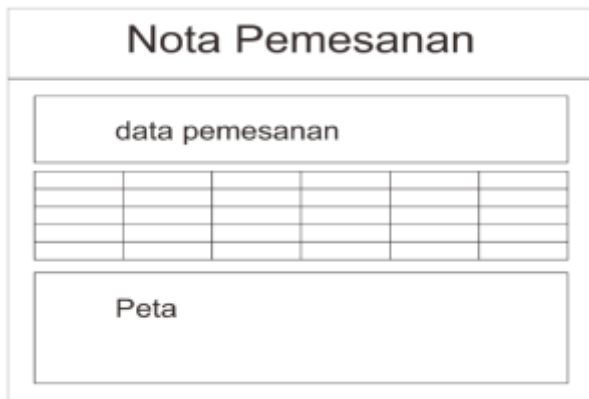


Figure 10. Order print page interface design



Figure 11. Design The Main Menu Page Interface

2) Ordering Interface Design

The ordering interface design consists of a list of menus offered, basket ordering and advanced buttons and returns to the main page. The order page design can be seen in Figure 12.



Figure 12. The Design of The Ordering Page Interface

3) Detail Menu Interface Design

The interface design detail menu consists of menu images and descriptions from the menu. The order page design can be seen in Figure 13.

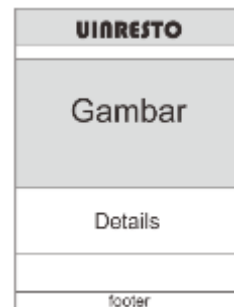


Figure 13. Interface Design Menu Detail Page

4) Order Menu Interface Design



VI. CONCLUSION

The order menu design interface consists of the order form, the customer's location map, the back button, and the order button. The page order menu design can be seen in Figure 14.



Figure 14. Interface Design of Order Menu Page

5) Help Interface Design

The help interface design consists of information about how to order menus and buttons back to the main menu. The help page design can be seen in Figure 15.



Figure 15. Help Interface Design

Based on the activities that have been carried out during the development of geographic information systems, the message service between foods, then conclusions can be taken as follows:

- 1) Has succeeded in creating an interactive mobile website, and a website administrator that has a realtime notification feature. The booking notification feature is very useful for restaurants to immediately serve restaurant reservations.
- 2) Successfully created a mobile web that can detect the geographical location of bookings.
- 3) The route tracking feature is also very useful for facilitating couriers in delivering food.

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