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Web Service-Based Food and Beverage Ordering Application with Android Platform. Case Study: Rumah Makan Muslim Hajjah Zuleka

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Abstract

This research is intended to overcome the problems that exist in restaurants which require technology to solve these problems. The process of ordering food, recording and calculating incoming orders, as well as monthly transaction reports are still manual, this causes sluggishness in recording and serving food to customers, thereby losing some customers who are reluctant to wait, especially when the restaurant is busy. To improve service to customers, as well as make it easier for restaurants to manage transactions and reports, a platform was built that can help improve business, monitor data and restaurant management. This will bring customers, kitchens, cashiers, and managers together on a digital platform where customers can order food at the dining table. The kitchen can get orders right away and process them. Managers or cashiers can have all the data in one place to monitor and manage to be organized. Modeling the system using UML and the system will run on the apache server and in this system the web server and REST API are built using php, MySQL is used for database management. The android application for food and beverage ordering activities will be built with android studio using the Java programming language that communicates with the system server using the REST API. MySQL is used for database management. The android application for food and beverage ordering activities will be built with android studio using the Java programming language that communicates with the system server using the REST API. MySQL is used for database management. The android application for food and beverage ordering activities will be built with android studio using the Java programming language that communicates with the system server using the REST API.

Keywords
restaurant; androids; platforms; web; REST API

I. Introduction

Over time, technological developments increasingly play an important role in meeting the needs of human life. The digital era brings significant changes to the pace of economic growth. Changes or technological advances refer to inventions that can facilitate human work. More generally, technological change results in increased productivity of labor, capital, and other resources. So technological progress means increasing all factors of productivity. As a result of technological advances, it has become possible to produce more output with the same resources or the same amount of product with fewer resources.

Technology can be used in any field. Where data is available, technology can be used to perform specific tasks with that data to obtain accurate results. One example is that the use of technology in the culinary field can help to manage difficult, troublesome and time-

consuming financial reports and is accompanied by automatically collecting buying and selling data at restaurants. With the existence of computerized services, customer service, calculation results and recap reports, a restaurant business can be organized and efficient.

Research on food and beverage ordering applications has previously been carried out including by Ryan Suarantala, Fajar Aryo Nugroho and Koko Hermanto (2020) with the research title Designing an Android-Based Food Ordering Application at the Restaurant "Bengawan Tepi Sawah". The difference with what the author wanted to design is, the results of previous studies focused on customers and admins only. While the author wants to create a food ordering system where waiters and chefs use an android application to receive incoming orders. Meanwhile, the admin and owner can control the menu, prices, and various transaction reports in the web service.

This study is aimed at solving problems that occur in the case study site, namely the Hajjah Zuleka Muslim Restaurant located in the city of Parapat. The problems experienced are problems that can be solved with the help of technology. Where these problems include: 1. Ordering food is still manual where the waiter writes orders on paper so that they often experience incorrectly recording the price or amount of food or drink ordered; 2. Financial statements are still recorded in the report book. The problem that arises is when the restaurant is busy, it is very difficult to record each income obtained in 1 order, this affects the monthly recapitulation report; 3. Financial reports are often duplicated or missing records; 4. The absence of organized transaction data makes restaurants often have problems calculating their losses or profits. With the problems that arise, the author will create an application that can help Hajjah Zuleka Muslim Restaurant to manage orders in one android application, where the waiter does not need to manually record every order on paper but uses an android application. Each order will be connected to the web which can be processed into menu data, transactions and reports where the waiter does not need to manually record every order on paper but uses an android application. Each order will be connected to the web which can be processed into menu data, transactions and reports where the waiter does not need to manually record every order on paper but uses an android application. Each order will be connected to the web which can be processed into menu data, transactions and reports.

II. Research Method

2.1 Method of Collecting Data

In the preparation of this research data collection is carried out by qualitative research methods, which are held through the collection of required data related to research. Data collecting techniques carried out by researchers in this study are as follows:

a. Interview

Communication is the process of delivering messages by someone to other people to tell (Hasbullah, et al: 2018). Communication while collecting the required data with the resource persons is part of the data collection technique which can be in the form of dialogue (question & answer) orally, either directly or indirectly to obtain information related to research. The following is a list of questions in the interview:

1. What is the process of ordering food at Hajjah Zuleka Muslim Restaurant?
2. Are there any problems with the food ordering process?
3. How is the process of recording the results or income at the Hajjah Zuleka Muslim Restaurant?

4. Are there problems in managing the results or income in the Restaurant?
5. How is the transaction process that occurs at Hajjah Zuleka Restaurant?
6. Does the transaction process run smoothly when the restaurant is busy?
7. Are the restaurant's financial reports well organized?

b. Observation

Observations are observations made directly to the place to be studied. The author made observations at the Hajjah Zuleka Muslim Restaurant to see the performance of the ongoing manual service to strengthen the data for research.

c. Literature Review

Data collection techniques with literature study are carried out by studying problems related to the object of research, sourced from books, literature according to experts, journals, and the internet.

2.2 System Requirements Analysis

Identifying system requirements is the most important part needed to determine system requirements specifications. This specification also includes what elements or components are needed for the system to be built until the system is implemented. There are 2 analyzes needed, namely Functional Needs and Non-Functional Needs.

Analysis of functional requirements is a requirement that contains processes and what information will be carried out and generated by the system. While the analysis of non-functional requirements is a requirement that contains properties owned by the system including hardware and software requirements.

a. Functional Needs

In this functional requirement, the system built is expected to:

1. Record and store all incoming order data.
2. Manage menu lists, prices, and stock availability of food and beverages.
3. View and print order reports.
4. Print payment receipts.
5. Process admin and server data.
6. Displays menus and food prices in the android application.
7. Display order data in android application.

b. Non-Functional Needs

1. Hardware
   a) Monitor
   b) Processor Intel Atom D2600 1.6Ghz L2 cache 1MB
   c) Memory DDR3 2GB
   d) Hard disk 320GB
   e) Mouse
   f) Keyboard
   g) Printer
   h) Android Smartphone
2. Software
   a) *Operating System*(minimum windows 7)
   b) Apache 2.4.10
   c) PHP 5.6.3
   d) MySQL Databases 5.6.21
   e) Java ver. 6

f) Visual Studio Code v1.68.1
g) Android Studio v2021.2.1

2.3 Software Development Method

This is done by using the Rapid Application Development (RAD) method. This system development method is used because the processing time is short and the stages of work do not depend on previous process problems because they are interrelated. The stages carried out in the development of the system built are as follows:

Figure 1. *Stages of Rapid Application Development*

a. Requirements Planning
   Identify the goals of the system and information needs to achieve the goals in this study. the involvement of both parties is the most important stage.
   At this stage, the author analyzes the needs of the user. In the system built, there are 2 users, namely the server and the admin.
   1. Servant Needs
      a) Can add menus to the order cart and process orders through the android application.
      b) Make it easier for waiters to record all customer orders without having to write them down.
   2. Admin Needs
      a) Can add, change, delete food and beverage menus that will be displayed on the android application.
      b) Can add, change, remove server access for android apps.
      c) Can view, confirm, change and delete order data.
      d) Can view and print payment receipts to be given to customers.
      e) Can view and print daily and monthly transaction reports.
b. System Design Process (System Design)
   The determination for the design and development stages of the application is at this stage. What is determined at this stage includes determining images, layouts, and colors for the pages contained in the application. This stage produces an output in the form of software specifications in which there is a data structure, system organization in general and others.
c. Implementation
   The design development of the project occurs in this stage. The design is turned into coding to finally be translated into an executable program. The program needs to be tested before being applied to the object of research (case studies) so that it can be traced first if there are errors. Through the implementation phase, the program is tested directly on the user and the user can provide feedback. In reducing the risk of system defects, testing is carried out thoroughly with testing techniques that focus on the functional specifications of the software or commonly referred to as Black Box Testing.

III. Results and Discussion

3.1 System planning

In designing the system using system modeling to describe the system to be built. The modeling system used is Unified Modeling Language (UML) and the diagrams used are Use Case Diagrams and Activity Diagrams to describe the interaction between the user of a system and the system itself. Here there are differences in access rights based on the scope of work restrictions by the running system.

a. *Use Case* Food and Beverage Ordering Diagram

The usability of the system to be built needs to be identified in such a way that users of this system can understand well the benefits and functions of each feature in the planned system. To make this happen, it is necessary to create a framework outlining the functionality known as Use Case Diagrams.

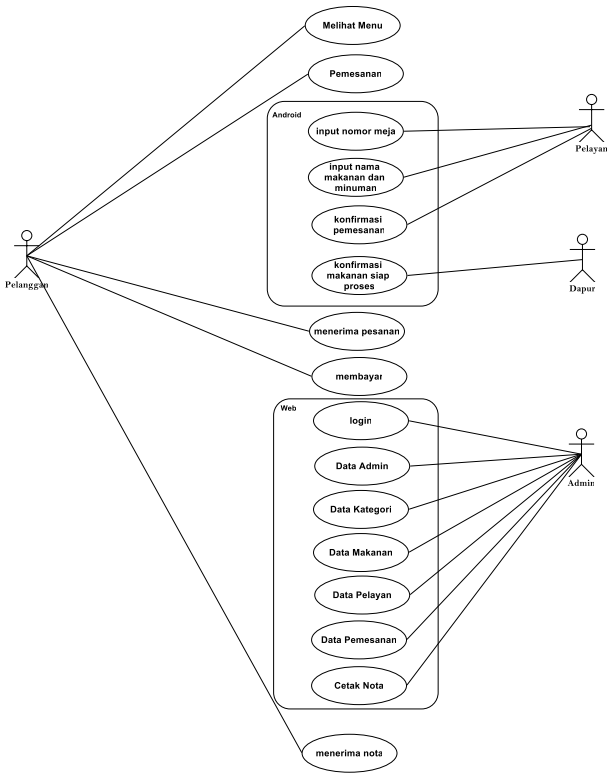

Figure 2.*Use Case Diagram*

b. *Activity*'Diagram

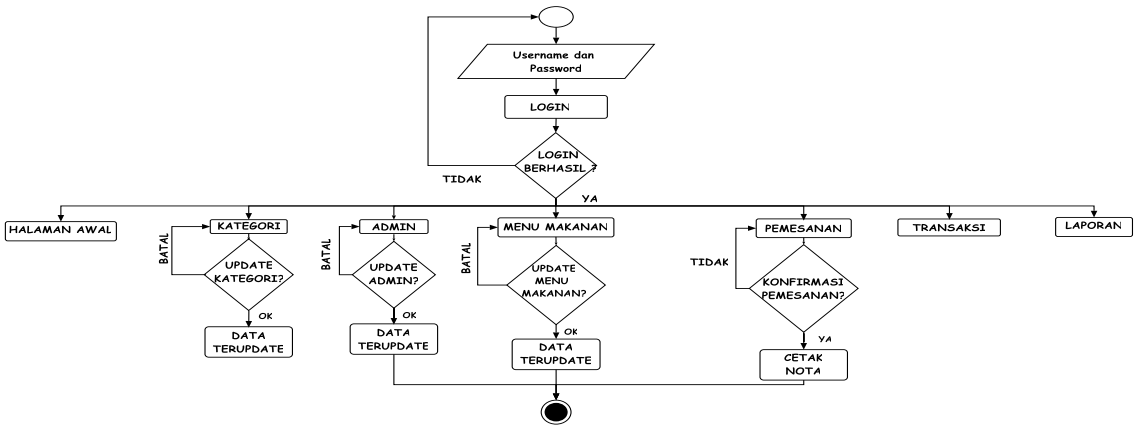

Figure 3. *Activity Admin Diagram*

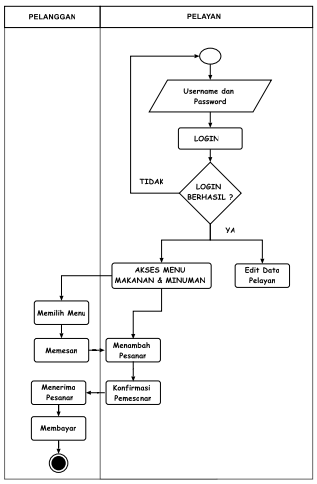

Figure 4. *Activity Waiter and Customer Diagram*

Activity diagrams Also known as an activity diagram, is a diagram that depicts the different developments of an activity within the framework that is being planned and summarizes the activity from the flow it begins to how it ends. This system is divided into two, namely for admin and for waiters & customers. This chart shows the flow of admin activity on the web from start to finish. For Waiters and Customers, this diagram illustrates the activities starting from the waiter successfully accessing the application, accessing the food and beverage menu, adding orders for customers until the customer pays.

3.2 Implementation

a. Web View

Figure 5 display the initial page where when you first access the web, the login page for the admin is the first page that appears. Admin can use the provided username and password to login.

Figure 5. *Home Page View*

Figure 6 display the main page is a page that can be accessed after a successful login. On the left there are menus that can be accessed by admins, including: Home, Admin, Categories, Food Menu, Waiters, Orders, Transactions, and Reports. The report as Master Data contains Admin Data, Transaction Data, Category Data, Food Menu Data, Waiter Data, Order Data, Best-selling Food Menu Data.

Figure 6. *Main Page View*

Figure 7 display of food menu data is a page that is accessed by the admin to view the food menu. Admin can change food menu data such as name, price, photo to be displayed later in the android application which will be accessed by the waiter. Figure 8 view of the add food menu page that can be accessed to add new entries to the food menu to be displayed in the application.

Figure 7. *Food Menu Data Display*

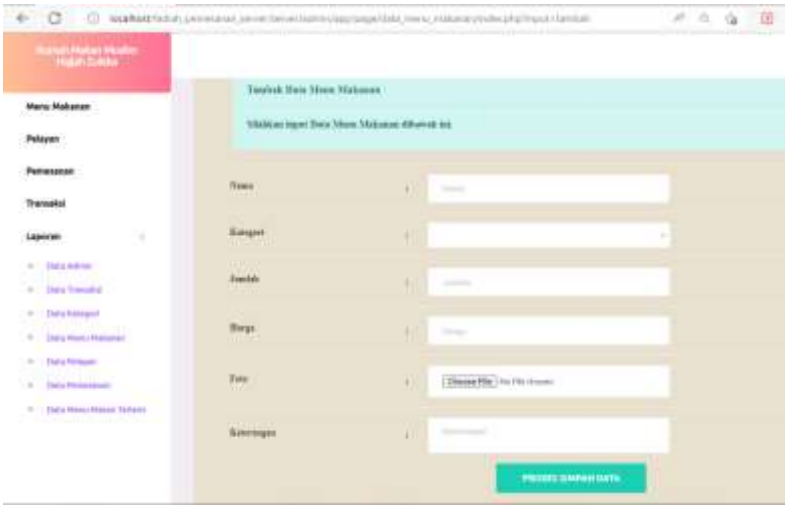

Figure 8. *Data Display Add Food Menu*

Figure 8 display of order data is a page that is accessed by the admin to view and confirm orders that have been paid. When the admin clicks confirmation, it will go to the order data edit page which can be seen in Figure 9.

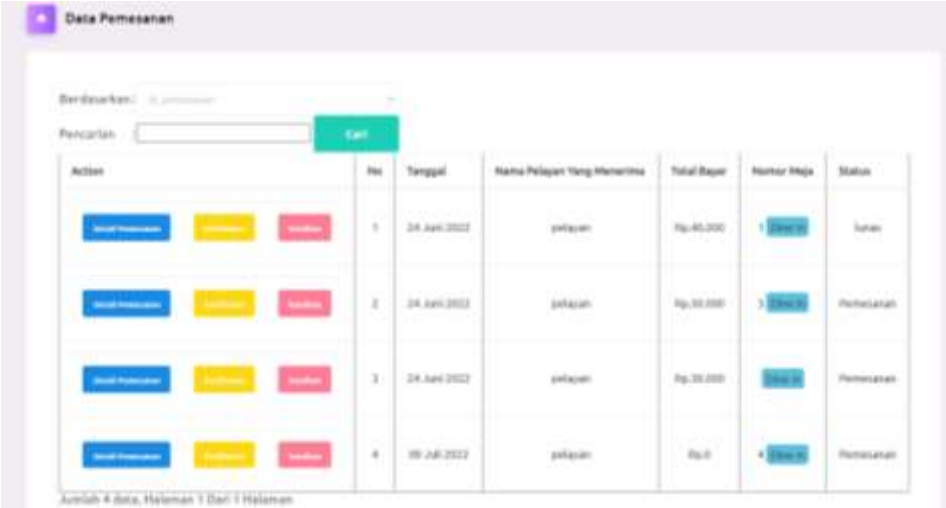

Figure 9. *Order Data Display*

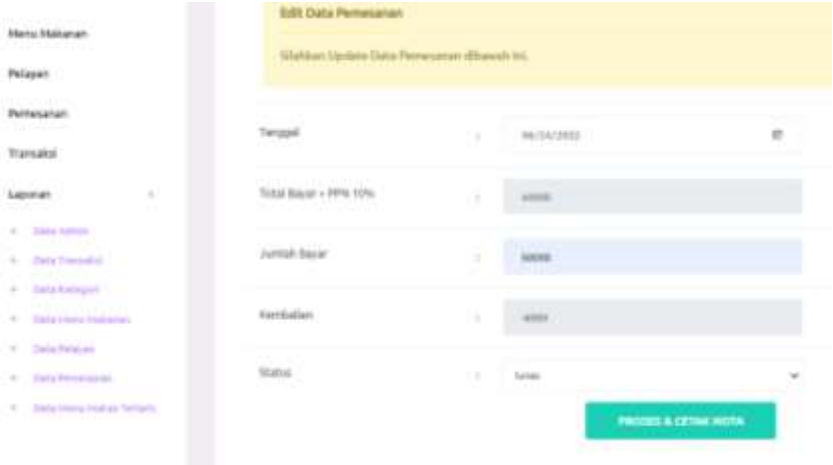

Figure 10. *Order Data Edit View*

Figure 10 display of the payment note is the payment note page which is accessed after the admin processes and prints the note on the previous page. And Figure 11 display of transaction data is the page of all entry transactions that are recorded and stored in the system.

Figure 11. *Payment Note Display*

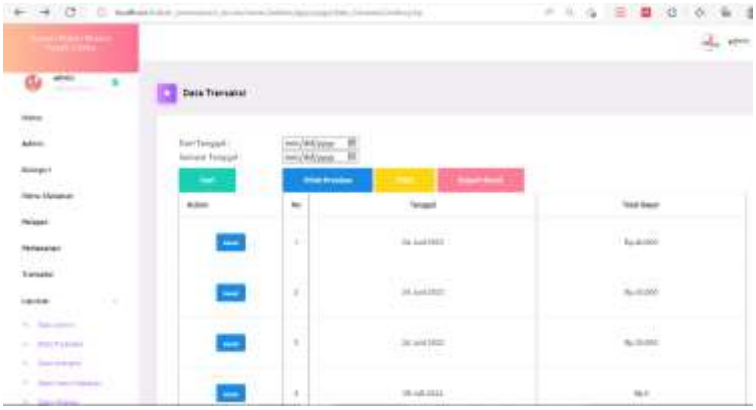

Figure 12. *Transaction Data Display*

b. Application View

The waiter will see the main menu after logging in using the provided username and password as shown in Figure 12. To input customer orders, the waiter must select Menu Message. Figure 13 display select the food menu where on this page the waiter can choose the food menu ordered by the customer and enter the amount. The next process can be seen in Figure 14 adding order data to enter the table number and process the customer's order. Waiters can also view order details as shown in Figure 15. Order Detail Information.

Figure 13. *Main Menu Display*

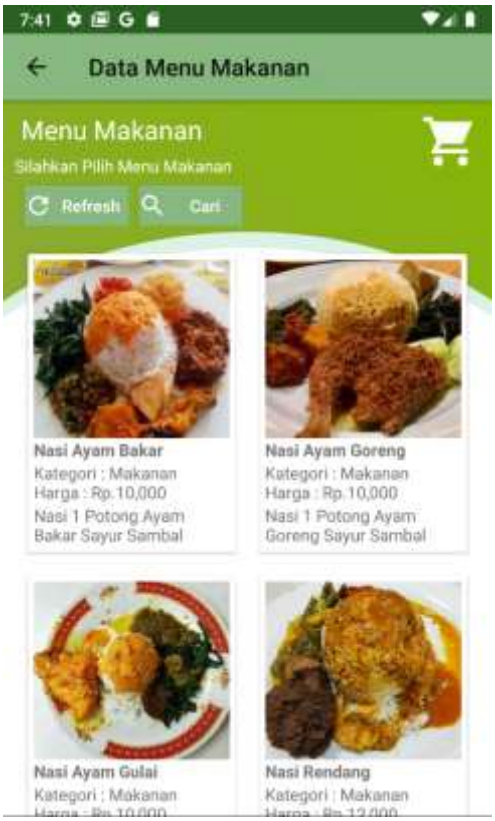

Figure 14*. Display Select Food Menu*

The next process can be seen in Figure 15 adding order data to enter the table number and process the customer's order. Waiters can also view order details as shown in Figure 16. Order Detail Information.

Figure 15. *Display Add Order Data*

Figure 16. *Order Detail View*

IV. Conclusion

From this research it can be concluded that:

1. To deal with the problem of incorrectly recording the price and the amount of food and drinks ordered, it can be overcome with a food and beverage ordering application where the waiter only needs to add the food ordered by the buyer and also the amount in the application.
2. The Transaction Data feature on the web service can solve problems that exist in restaurants, such as financial statement problems that are difficult to record in the report book when the restaurant is busy, can now be resolved with the transaction report menu. With this feature, all transaction data is automatically recorded, stored and can be printed. This feature can also solve other restaurant problems, namely financial statement records that have been duplicated or lost. Another problem is that the absence of organized transaction data makes restaurants often have problems when calculating the loss or profit they get has also been resolved with the Transaction Report feature.
3. The Order Data feature can solve problems that exist in restaurants, namely problems in reports on the results of existing food and beverage sales. With this feature, restaurants can see what menu data are most frequently ordered in order to prepare more stock.

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