Designing Electronic Menu Applications for Restaurant Businesses

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Abstract. This study aims to facilitate and speed up the process of ordering menus in restaurants by customers and minimize the usual errors when ordering. In designing applications, we used descriptive method to see what processes must and can be done so customers can place orders easily and quickly. From this research, an application is produced which will make it easier for customers to make the order process, besides that the ordering process can be done quickly. This result is obtained because the application is designed to have an easy-to-understand flow for customers in order. The ordering process is faster because customers no longer need to ask and wait for the restaurant waiter to serve the order process. By facilitating and speeding up the ordering process, a restaurant will make visitors from restaurants feel comfortable and well served so that the restaurant business will run better.

1. Introduction

Along with the development of business era, people running a business from the traditional era which is completely manual to the era of business technology [1]. The development in the world of information at this time has started in various fields so that restaurants continue to improve their services. The use of data processing tools is one of the important developments to produce information [2]. Business in the restaurant sector is a very promising business, but also competitive because there are a lot of restaurants that have been established. Therefore, every restaurant must continue to make new breakthroughs to attract customers [3]. Electronic-based selection menus will be more significant than paper-based menus because restaurants should discuss the importance of improving restaurant menu ordering services [4].

The research conducted by Sheryl E. Kimes PhD stated that respondents had ordered food in restaurants using electronic channels, the convenience received by compiling using electronic devices is very important. Most users need personal interaction. However, there are also those who feel the need of technology to place their orders [5]. Research conducted by Arnelyn Torres in South Korea has developed the field of information and communication technology. The problem of communication between customers and servants can provide a solution because of the power of ICT. The food industry business can be purchased with menu options and ordering system applications for product offerings [6]. According to Rebeca A. Seguin electronic ordering equipment can also be used to assess food locations [7]. Filippova, Malin and also Sherstnyova introducing modern information technology is an important direction in the development of innovative restaurant businesses [8]. Dr Vinayak Ashok stated that the restaurant industry has developed with technology, innovative restaurant menus have been developed in the presence of modern service systems [9]. The results of research conducted by Liwei Hsu and Piyingwu show that the technology and information provided on electronic menus have a very positive influence on customer satisfaction [10].
The purpose of this study is to show a modern system of ordering in a restaurant. In addition, this study also aims to help restaurant businesses to see the design of an ordering application which will be explained by descriptive methods to see the basic process of making an application.

2. Method
In designing this application the method used is the descriptive method. Descriptive methods are used to see what processes must and can be done when a customer makes an order flow. Therefore data will be described as needed in designing this application. Data collection by analyzing the process of ordering menus in restaurants in general.

3. Results and Discussion
3.1 Data Analysis and Information Needs
To make this application, the data needed is a list of food and beverage menus available in the restaurant. In addition this application also requires data from restaurant employees to give access rights to the application so that the application can be used wisely [9]. The information needed is the order flow in the restaurant.

3.2 Use Case Diagrams and Actor Definitions
The following is a description of the flow of activities carried out by application users or actors on the system from the application (see figure 1).

![Use Case Diagram](image)

**Figure 1. Use Case Diagram**

a. Restaurant Visitor, the actor with this role has the authority to fill in the reservation data after which the actor can choose the menu and also order the menu.

b. Restaurant Cashier, actors with this role have the authority to log in and receive orders from restaurant visitors also receive payments.

c. Restaurant database, actor with this role as provider or container of information needed by the system.

3.3 Data analysis
The following are needed relations from the design of the electronic menu ordering application that will be created (see figure 2).
Designing data from applications to be made can be seen in the tables 1 - 6 below.

1. **Customers Table**
Customer table is needed to assist in inputting customer data when ordering food at a restaurant, thus helping customers to find out food orders, and helping restaurants in serving dishes to customers, consisting of customer IDs, customer names, customer table numbers, and customer cellphone numbers (See Table 1).

![Table 1. Customers Table](image1)

| Name Field   | Type    | Length | Explanation            |
|--------------|---------|--------|------------------------|
| customers_id | Varchar | 20     | Primary Key            |
| customers_name | Varchar | 50     |                        |
| diningtable_number | Varchar | 5     |                        |
| Phone_number | Varchar | 15     |                        |

2. **Menu Table**
Menu tables are needed to help restaurant managers in serving available food menus more effectively and efficiently using electronic menus, so that consumers can find out the availability of menus to be ordered anytime and anywhere without constraints on distance and time, as well as helping to reduce paper usage on provision of conventional menus (See Table 2).

![Table 2. Menu Table](image2)

| Name Field    | Type        | Length | Explanation |
|---------------|-------------|--------|-------------|
| menu_code     | Varchar     | 10     | Primary Key |
| menu_name     | Varchar     | 50     |             |
| menu_variety  | Enum        | "Drink", "Food" |
| menu_price    | Real        | 11     |             |
| menu_figure   | Varchar     | 20     |             |

3. **Orders Table**
Whereas the ordering table is needed in the class diagram to help customers place orders effectively and efficiently without any distance restrictions, consisting of the order code, customer id, time of
ordering, total order price, and additional notes by the customer which makes it easy for customers to provide additional information about orders placed (See Table 3).

| Name Field                   | Type   | Length | Explanation                                      |
|------------------------------|--------|--------|--------------------------------------------------|
| costumers_code               | Varchar| 10     | Primary Key                                      |
| costumers_id                 | Varchar| 20     | Foreign Key from table employees                 |
| time order                   | Datetime|        |                                                   |
| aotal_orderprice             | Real   | 11     |                                                   |
| additional notes             | Text   |        |                                                   |
| notes_costumers              | Text   |        |                                                   |

4. Order Details Table
Order table is a table that will help the process of making class diagrams in the order system, so that the restaurant has information about orders that are carried out in accordance with customer records (See Table 4).

| Name Field                   | Type   | Length | Explanation                                      |
|------------------------------|--------|--------|--------------------------------------------------|
| costumers_id                 | Varchar| 20     | Primary Key                                      |
| order_code                   | Varchar| 10     | Foreign Key from table Orders                    |
| menu_code                    | Varchar| 10     | Foreign Key from table Menu                      |
| total                        | Integer| 11     |                                                   |
| price_subtotal               | Real   | 11     |                                                   |

5. Payments Table
The payment table is a table that will help the restaurant in registering the total income earned, in addition to this, it also helps consumers to find detailed information about payments made for food that has been ordered including tax details and the price of each portion of food selected (See Table 5).

| Name Field                   | Type   | Length | Explanation                                      |
|------------------------------|--------|--------|--------------------------------------------------|
| payments_code               | Varchar| 15     | Primary Key                                      |
| order_code                   | Varchar| 10     | Foreign Key from table Orders                    |
| payments_total              | Real   | 11     |                                                   |
| payment_status               | Enum   |        | "Ya","Tidak"                                    |
| timeof_payments              | Datetime|       |                                                   |
| Employee_id                  | Varchar| 10     | Foreign Key from table Employees                 |

6. Employees Table
Employee tables are needed for employee data that work in restaurants and make it easier for managers to monitor and evaluate employee performance, as well as assist employees in carrying out digital service activities through the availability of personal employee accounts (See Table 6).

| Name Field                   | Type   | Length | Explanation                                      |
|------------------------------|--------|--------|--------------------------------------------------|
| employees_id                 | Varchar| 10     | Primary Key                                      |
| password                     | Varchar| 30     |                                                   |
| name                         | Varchar| 50     |                                                   |
| gender                       | Enum   |        | "L", "P"                                         |
| phone_number                 | Varchar| 15     |                                                   |
| position                     | Varchar| 10     |                                                   |
| level                        | Integer| 11     |                                                   |
3.5 Interface Design

After designing the data, the following figure is the display design of the electronic menu ordering application. First, visitors will choose the "allow order" button to start ordering while the employee will choose the logo to log in the system application (see figure 3).

![Figure 3. Initial display](image)

Before visitors enter the application to order, visitors must fill in the reservation data so that the ordered menu can be sent to the right person. The visitor ID number will automatically be generated with a string in the query request database by using the CONCAT_WS() function to combine names, telephone numbers, table numbers, and also the time of compilation of visitors entering the system (see figure 4).

![Figure 4. Reservation form](image)

After the visitor enters the system, visitors will see the display as shown below. There is a food and beverage menu that is made separately because of the design of the previous data, the menu has a type attribute that is divided into two namely food and drink. Visitors will order by selecting the message...
button below the menu, then later a manageable number will appear, to set the number of orders from the menu (see figure 5).

![Figure 5. Main Page](image1)

After the visitor selects the menu, the selected menu will be displayed on the right side of the screen as a menu list to be ordered. The menu that is ready to be purchased can also be cancelled by selecting the delete option by selecting the trash icon on the far right of the table. Then the visitor can send the order sent directly with the lower right corner button which has an icon like a paper aeroplane. In addition, before visitors send an order, visitors can also type the order description that they want to send to the recipient of the order (see figure 6).

![Figure 6. Menu list that will be ordered](image2)
In designing this application features are also provided for visitors to be able to find the desired menu and also sort menus from the cheapest or sort by other categories (see figure 7).

![Search and filtering menus](image)

**Figure 7.** Search and filtering menus

The following is a display of menu results by displaying food and drinks on the same page. Visitors can return to the food page and also drinks by selecting the food or beverage page next to the search page. Visitors can also delete pages from search results by selecting the cross icon (see figure 8).

![Sample Search Results](image)

**Figure 8.** Sample Search Results

The use of the website as a medium in providing digital menus, helping restaurant services become more effective and efficient, and helping customers make reservations without having to go to restaurants, this can also increase restaurant revenue and as a media promotion of restaurants through social media, caused by consumers who can order without distance and time savings. It also helps in managing a business continuity by using the availability of information system resources in monitoring and evaluating the condition of the company through the accuracy of the data available on the system [11].
4. Conclusion
Designing an electronic menu application must pay attention to the details that fit the customer's needs. The design of the ordering application will encourage business development in the restaurant sector because it can accelerate business processes and reduce errors. Therefore, designing an electronic menu application is needed to help restaurant businesses grow their businesses.

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