Optimising Tropical Group Bali's Food Processing Business Process using a Web-Based Information System

I Gede Adhipramana Putra Sumesta[1]*, I Wayan Wahyu Gedas Adi Satyawan[2]

[1*,2] *Politeknik Negeri Bali, Denpasar, Indonesia*
[1*]*adhipramana@pnb.ac.id*, [2]*gedasadi@pnb.ac.id*

ARTICLE INFO	**ABSTRACT**

Keywords:
Business Process
Optimization;
Food Ordering;
Information System.

The food ordering information system serves as a viable solution for managing the food ordering procedure within the firm. The company faces challenges in its food ordering process, which is currently conducted manually using paper notes. This manual approach leads to errors, particularly during busy periods at the restaurant. These errors include the accumulation of notes, unsorted orders, and incorrect deliveries. As a result, employees are required to exert more effort and concentration to address these issues. The system design commences with the initial step of scrutinizing the accumulated data. Moreover, the design phase, also known as system design, employs a systematic approach that begins with the creation of an Event List, Use Case Diagram, and User Interface. Subsequently, the system is designed and tested using the black box testing method.

1. Introduction

A restaurant is a business that serves places and dishes to consumers, and sets certain rates for food and service. Apart from seeking profits, restaurants are also required to be able to provide good quality service to consumers(Hair Jr et al., 2019). One of the things that supports the quality of restaurant service is the ordering process. The ordering process that is very common and widely used by restaurants is the conventional (manual) ordering system.(Chai & Yat, 2019). In this system, the service must record the food and drink menus ordered by visitors and submit these notes to the kitchen and cashier.

Tropical Group is a hotel-based holding company in Bali, where this company operates a collection of branded restaurants, spas and villas. This company is located at Jalan Siligita BI No.6 Nusa Dua, Bali. Especially in restaurants, to improve service to customers, a system is needed that can improve good cooperation among all employees. However, on the other hand, restaurants in the Tropical Group still use a manual paper ordering system for customers and do not use a web-based food and drink ordering information system that can be accessed using a cellphone or tablet. This method can be detrimental to the income of each restaurant branch, for example: in a situation where the restaurant is busy, waiters are required to work quickly to serve customer orders and deliver orders. This sometimes causes the waiter to lose concentration so that the manual ordering system can cause errors, such as delivering the wrong customer's order due to the menu being mixed up. Another problem with manual ordering in the ordering system is the misordering of orders from

customers due to a backlog of order notes which often occurs when there are lots of customers. This is certainly less effective and efficient in terms of cost, time and energy.

From this problem the author wants to provide a solution for each restaurant branch to design a web system that can be used to improve employee performance and manage time so as to minimize losses that usually occur in restaurants.(He et al., 2019). There are research objectives and implications, namely designing a web-based food and beverage ordering information system for the Tropical Group so that it can facilitate and improve employee performance in serving food and beverage orders and minimize errors in accepting orders in each restaurant branch.

2. Literature Review

Related research focuses on how the adoption of web-based food ordering systems has influenced consumer habits and customer satisfaction levels in the culinary industry. Other research by(Herikson & Kurniati, 2019)The results of this research are to increase effectiveness and make it easier for customers to order food and admins can provide maximum service to customers via the web. Other research(Asyilah & Suendri, 2023)implementing a cake ordering information system for MSMEs so that it can help sellers overcome problems in processing orders when customers pre-order and there are too many orders coming in, making it difficult for the Tambang Cake Shop to determine which orders will be served first. Other research(Caiazza & Bigliardi, 2020)evaluate the challenges and opportunities in implementing a web-based food ordering system by covering technical, operational and managerial aspects(Li et al., 2020). As for other research(Brewer & Sebby, 2021; Kayikci et al., 2022)web-based food ordering systems used in the hotel and restaurant sector, and analyzing their advantages and disadvantages. There are also studies that implement web-based food ordering systems.

3. Research Methods

In designing the food ordering information system at Tropical Group Bali, the waterfall method is used, which is a model in Software Engineering(Gurung et al., 2020; Zaka & Yunanto, 2021). This model takes a systematic and sequential approach starting from the system requirements level and then moving on to the analysis, design, coding, testing/verification and maintenance stages. It is called a waterfall because the stages you go through must wait for the completion of the previous stage and proceed sequentially(Andrei et al., 2019). The following is an explanation of the stages carried out in the model(Rachmad et al., 2023; Sudipa et al., 2023):
1)Software Requirements Analysis

The process of gathering requirements is carried out specifically to specify software requirements so that the software itself can understand what the user needs. For example, analyzing data that has been collected either through interviews with sources or based on direct observations at the company, then carrying out analysis based on this data to find the needs for the software to be built and proceed to the next stage of the process, namely design.
2) Design

Software design is a step that focuses on the design or creation of software programs including data structures, software architecture, interface representation and coding processes. This stage functions to describe software requirements from the requirements analysis stage to the design representation so that it can be implemented into a program(Senarath, 2021). For example, based on previous data analysis, a design is created starting from the document flow stage to describe the system that is running, after that a system flow is created to describe the process flow of the system to be built, then enters the process, Use Case Diagram (DFD), Conceptual Data Model (CDM), and Physical Data Model (PDM), and the last one is the process of creating a user interface to describe the interface of the system to be built.
3) Coding

The design must be implemented into a software program. The result of the implementation is a computer program in accordance with the design that has been created. This coding process functions

to create a system that was designed in the previous stage. For example, the system that will be built in this research is website-based, so the program was created using Laravel, with a MySQL database.
4) Testing

Testing is a stage that focuses on the software from a logical or functional perspective and ensures that all parts have been tested. This stage functions to minimize errors and ensure that the output produced is as desired. For example, testing uses black box testing so that we can find out whether the functions in the system are working or whether there are problems(Fagarasan et al., 2021).
5) Support or Maintenance (Maintenance)

A software can undergo changes when it is sent to its users. Changes can occur because errors appear that were not detected in testing or the software must adapt to a new environment. The support or maintenance phase can repeat the development process starting from specification analysis to changes to existing software, but not to creating new software(Wibowo & Manan, 2022). This stage functions to repair if there are errors in the system and can also update the software that has been built. For example, after the system is used by the company, suddenly there is a function error in the system, so maintenance is carried out to resolve the problem.

4. Results and Discussions

From this problem, the author wants to provide a solution for each restaurant branch to design a web system that can be used to improve employee performance and manage time so as to minimize losses that usually occur in restaurants.

This research uses a usecase diagram design approach in explaining the role of actors and processes that can be performed on system features.

Use Case Diagram Design
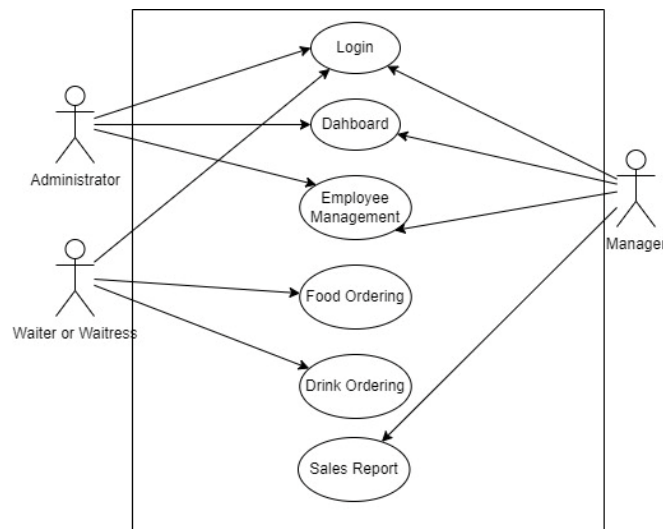
Fig. 1. Use Case Diagram

Based on Figure 1, it can be explained that there is an administrator actor who can carry out the login process, access the dashboard and manage employee data. Furthermore, there is a waiter or waitress actor who can log in, manage food orders and manage drink orders. Actor manager can perform the login process, access the dashboard, manage employee data and view sales reports.

The following is the user interface for designing a food and drink ordering information system at Tropical Group Bali. Interface design has been adjusted to the analysis of user needs for system features that can help and facilitate operations in restaurants.
1.   **Login Page**

The login page is a page used by admins, waiters/waitresses and managers to access the food and drink ordering information system page in accordance with their access rights. Figure 1 is a login page as follows:
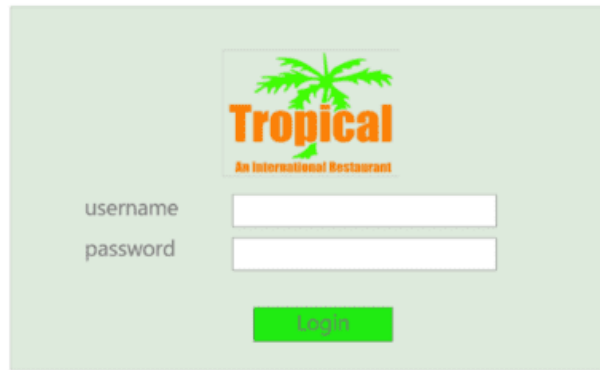
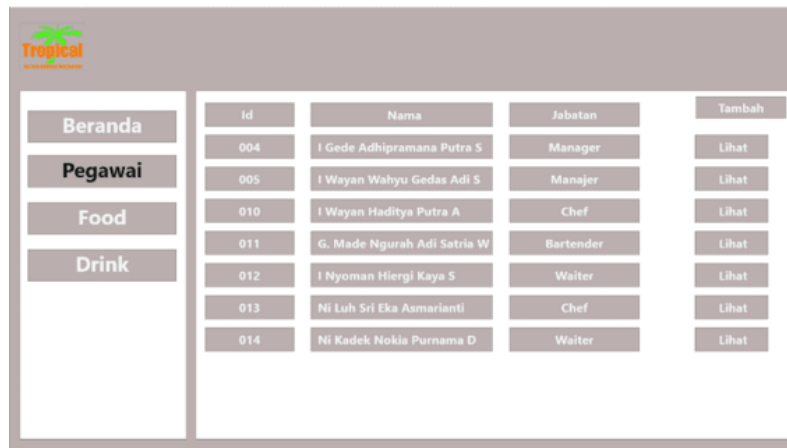**Fig. 2.**Login Page

2.   Admin Home Page

The admin dashboard page is the page that will appear after the admin logs in. On this page the admin can see information about employees, food menus and drink menus. Figure 3 is the admin dashboard page as follows:

Fig. 3. Admin Home Page

3.   Admin Page Managing Employee Data

The employee page for the admin user is a page that displays a list of employees. On this page the admin can see information about employees. Admin here can add, change, delete the employee list. Figure 4 is the admin page for managing employees as follows:

Fig. 4. Admin Page Managing Employee Data

4.   Add Employee Page
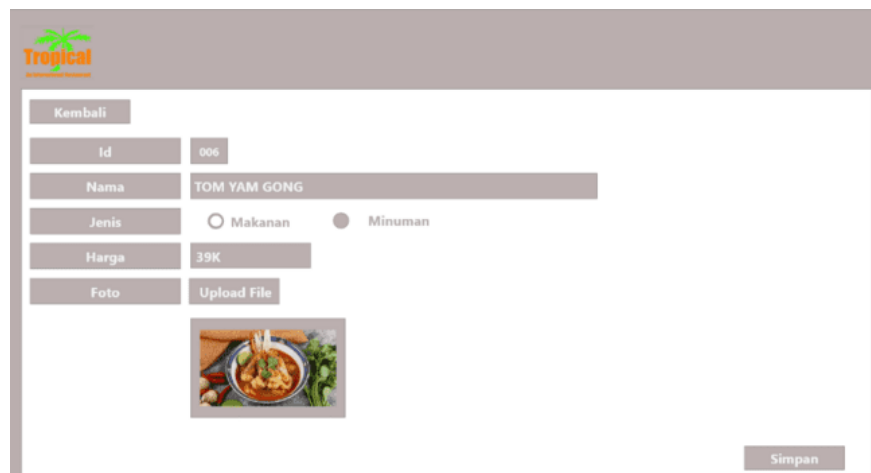
The add employee page for the admin user is a page that can add employees. Admin here can add employees. Figure 5 is the admin page for input employees as follows:

Fig. 5. Admin Page Input Employees

5.   Add Food Page

The add food page for the admin user is a page that can add food. Admin here can add food. Figure 6 is the admin page for input food as follows:

Fig. 6. Input Foods Page

6.   Add Beverage Page

The add drink page for the admin user is a page that can add drinks. Admin here can add drinks. Figure 7 is the admin page for input drinks as follows:

Fig. 7. Input Drinks Page

7.   Waiter/Waitress Home Page

This page appears after the waiter/waitress has completed the username and password login process in the initial login form. Figure 8 is the home page for the waiter/wairess as follows:

Fig. 8. Waiter/Waitress Home Page

8.   Add Food Order Page

This page appears if the customer wants to order the food they want. Customers just have to sit at the table, and the waiter/waitress will look for the customer. Figure 9 is a customer order page as follows:
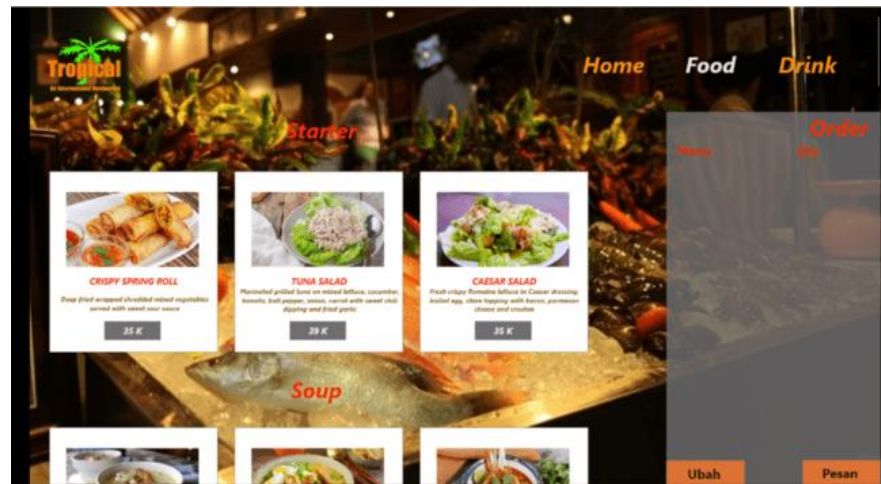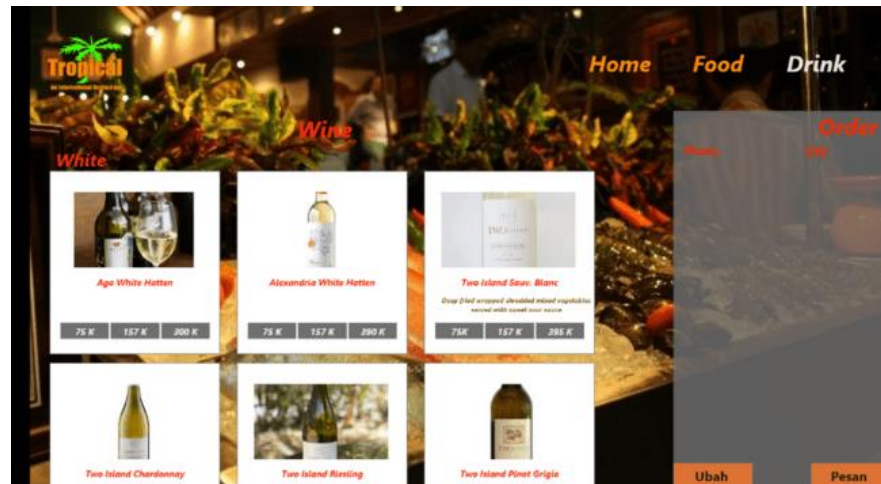
Fig. 9. Food order menu page

9.   Add Drink Order Page

This page appears if the customer wants to order the drink they want. Customers just have to sit at the table, and the waiter/waitress will look for the customer. Figure 10 is a customer order page as follows:

Fig. 10. Drink order menu page

10.   Add Order Menu page

On this page, customers can add menu orders for both food and drinks, orders will appear in the gray table to the right of the menu. Figure 11 is the add menu page as follows
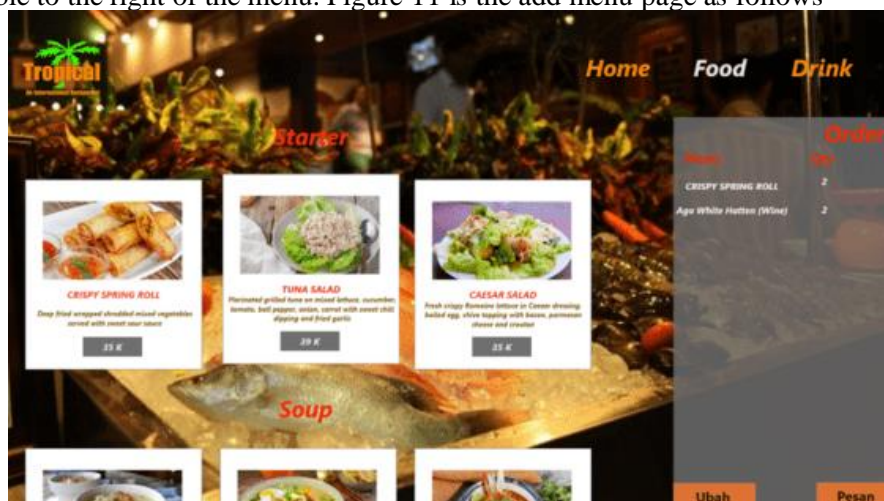
Fig. 11. Add Order Menu page

11.   Table Number Confirmation Page

This table confirmation page appears after the waiter/waitress clicks the order button that has been ordered by the customer. Figure 12 is a table number confirmation page as follows:
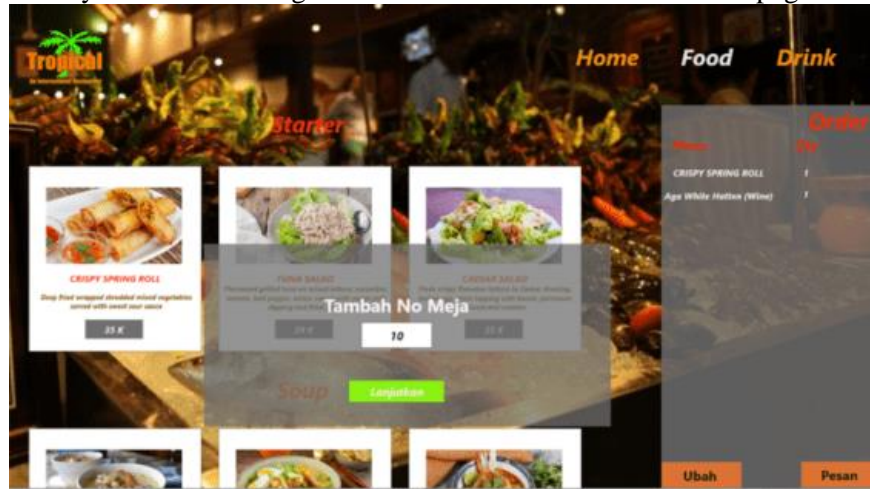
Fig. 12. Table Number Confirmation Page

12.   Wait for Order Confirmation Page

The order waiting confirmation page appears after determining the customer's table number. Figure 13 is a confirmation page waiting for an order as follows:
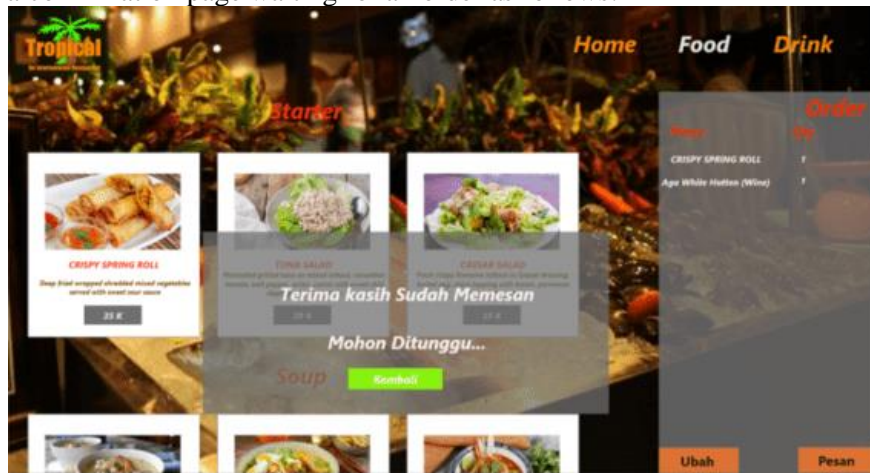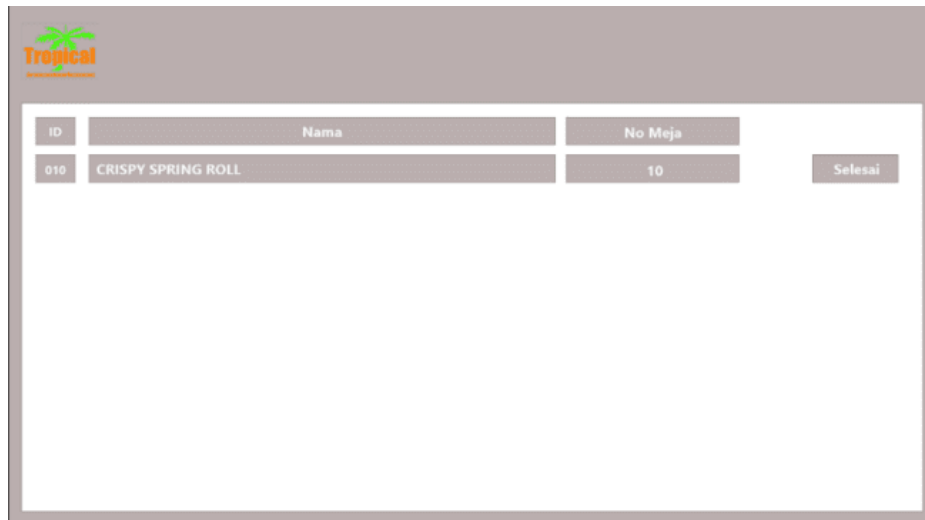

Fig. 13. Awaiting Order Confirmation Page

13.   Add Kitchen Order page

On this page the kitchen can add orders ordered by customers. After placing an order for a customer, the kitchen will click the finish button to confirm that the order is complete. Figure 14 is a page for input kitchen orders as follows:
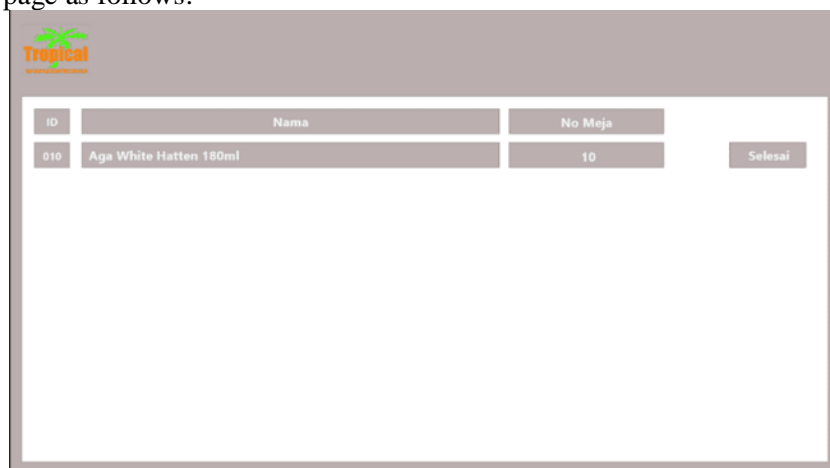
Fig. 14. Add kitchen order page

14.   Add Bar Order Page

On this page the bar can add orders ordered by customers. After placing an order for a customer, the bar will click the finish button to confirm that the order is complete. Figure 15 is the add bar order page as follows:
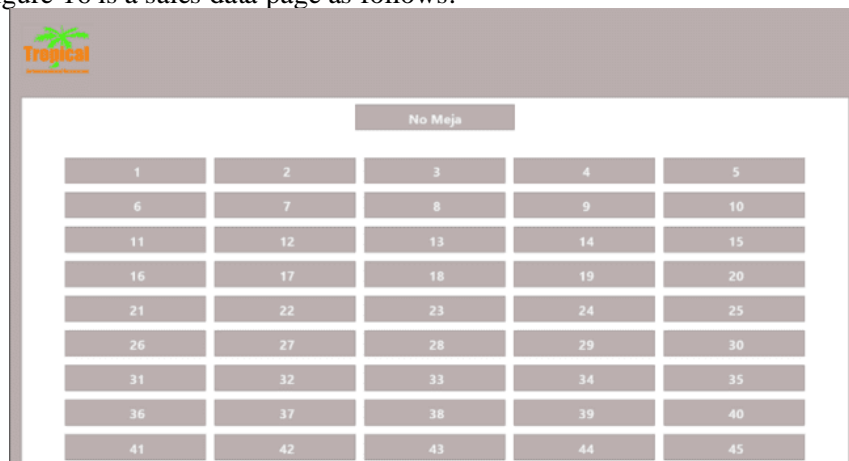

Fig. 15. Add Bar Order Page

15.   Sales Data Page

This page shows the table number at the cashier which will show details if the number button is clicked. Figure 16 is a sales data page as follows:
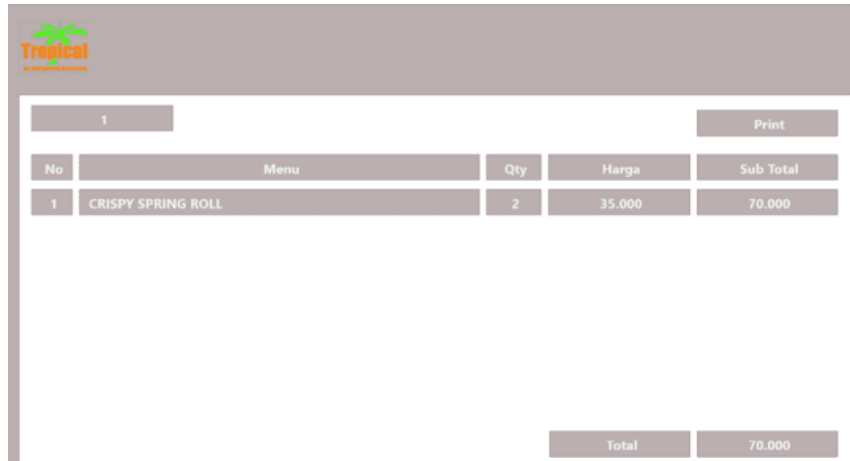

Fig. 16. Sales Data Page

16.   Sales Detail Data Page

On this page the sales details are available at the cashier. After clicking the number button on the initial sales data, a page like the one below will appear. Figure 17 is a sales detail page as follows:
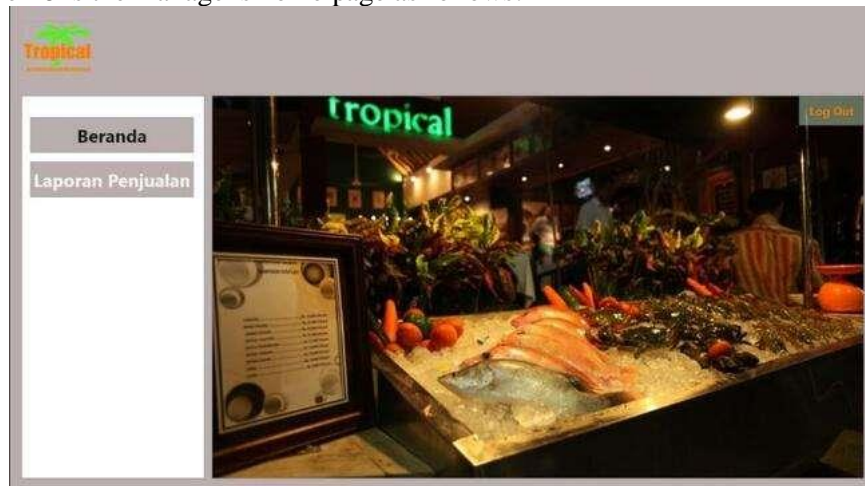

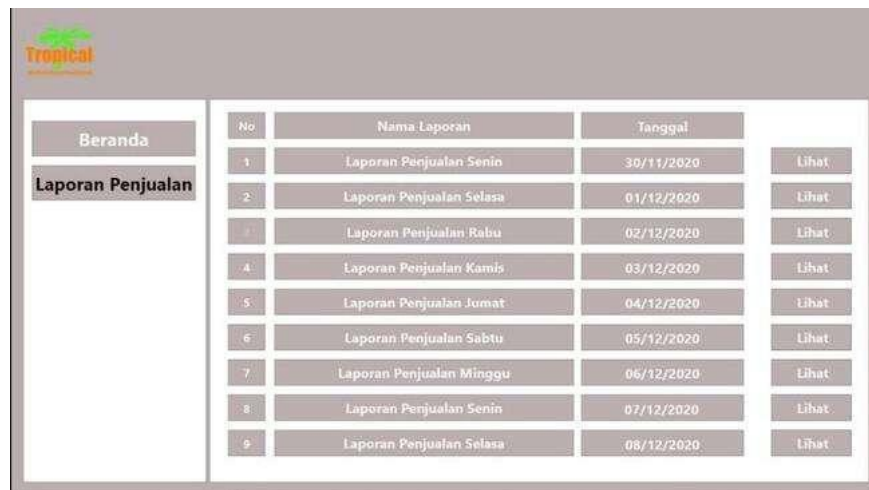**Fig. 17.**Sales Detail Data Page

17.   User Manager Home Page

On this page, managers can access daily sales reports which will be included in the sales report. Figure 18 is the manager's home page as follows:

Fig. 18. Manager home page

18.   Sales Report Information Page

On this page, managers can see sales report data entered into the sales report form. Figure 19 is a sales report page as follows:
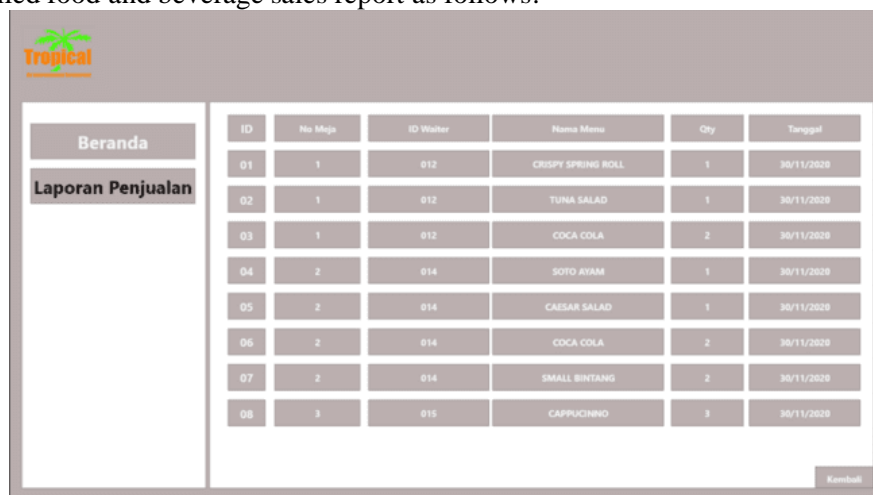
Fig. 19. Sales Report Page

19.   Sales Details Report Page

This page appears when the manager clicks the view button on the sales report page. Figure 20 is a detailed food and beverage sales report as follows:

Fig. 20. Detail Report Page

5. Conclusion

In the report on the design of a web-based food and drink ordering information system at Tropical Group Bali, it can be concluded that in this practical work report the author carried out data collection up to the system design stage so that conclusions can be drawn, namely by designing a web-based food and drink ordering information system at Tropical Group Bali , can help with managing food ordering data and structured reports.

References

Andrei, B.-A., Casu-Pop, A.-C., Gheorghe, S.-C., & Boiangiu, C.-A. (2019). A study on using waterfall and agile methods in software project management. *Journal of Information Systems & Operations Management*, 125–135.

Asyilah, N., & Suendri, S. (2023). Design of Ordering Information System for MSME Food Processed Products Using FIFO Method Based on Android. *Jurnal Teknologi Informasi Dan Pendidikan*, *16*(1), 27–37.

Brewer, P., & Sebby, A. G. (2021). The effect of online restaurant menus on consumers' purchase intentions during the COVID-19 pandemic. *International Journal of Hospitality Management*, *94*, 102777.

Caiazza, R., & Bigliardi, B. (2020). Web marketing in agri-food industry: Challenges and

opportunities. *Trends in Food Science & Technology*, *103*, 12–19.

Chai, L. T., & Yat, D. N. C. (2019). Online food delivery services: Making food delivery the new normal. *Journal of Marketing Advances and Practices*, *1*(1), 62–77.

Fagarasan, C., Popa, O., Pisla, A., & Cristea, C. (2021). Agile, waterfall and iterative approach in information technology projects. *IOP Conference Series: Materials Science and Engineering*, *1169*(1), 12025.

Gurung, G., Shah, R., & Jaiswal, D. P. (2020). Software Development Life Cycle Models-A Comparative Study. *International Journal of Scientific Research in Computer Science, Engineering and Information Technology, March*, 30–37.

Hair Jr, J., Page, M., & Brunsveld, N. (2019). *Essentials of business research methods*. Routledge.

He, Z., Han, G., Cheng, T. C. E., Fan, B., & Dong, J. (2019). Evolutionary food quality and location strategies for restaurants in competitive online-to-offline food ordering and delivery markets: An agent-based approach. *International Journal of Production Economics*, *215*, 61–72.

Herikson, R., & Kurniati, P. S. (2019). Web-Based Ordering Information System on Food Store. *IOP Conference Series: Materials Science and Engineering*, *662*(2), 22010.

Kayikci, Y., Subramanian, N., Dora, M., & Bhatia, M. S. (2022). Food supply chain in the era of Industry 4.0: Blockchain technology implementation opportunities and impediments from the perspective of people, process, performance, and technology. *Production Planning & Control*, *33*(2–3), 301–321.

Li, C., Mirosa, M., & Bremer, P. (2020). Review of online food delivery platforms and their impacts on sustainability. *Sustainability*, *12*(14), 5528.

Rachmad, Y. E., Tampubolon, L. P. D., Purbaratri, W., Sudipa, I. G. I., Ariana, A. A. G. B., Faried, M. I., Atmojo, D., & Kurniawan, H. (2023). *Rekayasa Perangkat Lunak*. PT. Sonpedia Publishing Indonesia.

Senarath, U. S. (2021). Waterfall methodology, prototyping and agile development. *Tech. Rep.*, 1–16.

Sudipa, I. G. I., Ariantini, M. S., Pomalingo, S., Ridwan, A., Primasari, D., Ariana, A. A. G. B., Ibrahim, R. N., Ilham, R., Arsana, I. N. A., & Irmawati, I. (2023). *Buku Ajar Rekayasa Perangkat Lunak*. PT. Sonpedia Publishing Indonesia.

Wibowo, G. W. N., & Manan, M. A. (2022). Penerapan Algoritma Naive Bayes Untuk Prediksi Heregistrasi Calon Mahasiswa Baru. *JTINFO: Jurnal Teknik Informatika*, *1*(1), 1–10.

Zaka, M., & Yunanto, R. (2021). Web-based Online Sales. *International Journal of Research and Applied Technology*, *1*(1), 120–126. https://doi.org/10.34010/injuratech.v1i1.5654