

Web-Based Food Menu Order Processing Information System at Urban Cafes Using User Centered Design Method

Onky Fatur Rahman^{1*}, Muhamad Alda²

^{1,2} Sistem Informasi, Sains Dan Teknologi, Universitas Islam Negeri Sumatera Utara

* Corresponding Author:

Email: onkyuinsu@gmail.com

Abstract.

The development of information technology encourages the culinary sector to adapt through digital systems. This study aims to develop a Web-Based Food Menu Order Processing Information System at Urban Cafe using the User Centered Design (UCD) method. This system is designed to improve ordering and service efficiency by directly involving users in the design process. The research method used is descriptive qualitative with data collection techniques through observation, interviews, and literature studies. The results show that the application of the User Centered Design method is able to produce a system that suits user needs, has an easy-to-use interface, and increases customer comfort in the ordering process. The developed system supports real-time transactions, order status monitoring, and more systematic sales reporting. Thus, this system is expected to improve the service quality and competitiveness of Urban Cafe.

Keywords: Sistem Informasi; Pemesanan Makanan; Web; User Centered Design and Cafe Urban.

I. INTRODUCTION

The very rapid progress of information and telecommunications technology in the digital era has had a major impact on various fields, including the culinary sector.[1] In this context, the use of digital technology is crucial for businesses to achieve operational efficiency, accelerate service processes, and improve the quality of the customer experience. One concrete example of this technology is the use of web-based information systems, which support a faster and more efficient food ordering process while minimizing errors. In addition to making it easier for customers to access menus and place orders, these systems also help business managers manage orders and transactions in an integrated manner, thereby continuously improving productivity and service quality.[2] Under current conditions, Cafe Urban still processes orders manually. Customers place orders directly with the waiter, who then records them on a receipt to be forwarded to the kitchen and cashier. This process creates various challenges, such as service delays, recording errors, and lack of coordination between departments. As a result, customer wait times increase and transaction management becomes inefficient.

Furthermore, management experiences difficulty in summarizing sales data and monitoring overall transaction activity. Therefore, a digital-based information system is needed that can integrate the entire ordering process to improve operational accuracy and effectiveness.[3] To address these issues, a Web-Based Food Menu Order Processing Information System is needed, designed to integrate the ordering process, menu data management, and transaction recording into a single, interconnected system. This system was developed using the User-Centered Design (UCD) method, an approach that focuses on user involvement at every stage of the design to ensure the system is tailored to their needs and characteristics. Through this method, the system is expected to have an easy-to-use, informative interface, and enhance user experience when placing orders [4]. With this system, customers can easily order independently through a digital menu, monitor order status in real time, and complete payments without having to wait long. Meanwhile, cafe managers can manage menu information, order data, and transaction reports more efficiently, systematically, and accurately. In addition to improving service quality, this system can also be used as an evaluation tool and a basis for business decision-making based on the automatically stored data[5].

II. METHODS

This study uses a descriptive qualitative approach because it aims to explore user needs in depth and describe in detail the design process of a Web-Based Food Menu Ordering Processing Information System at

an Urban Cafe. This approach allows researchers to identify user needs, interaction patterns, and preferences in a real context so that the developed system can adapt to real needs in the field. The User Centered Design (UCD) method is used as a system development framework by placing users at the center of the entire design process. Each development stage is carried out by directly involving users to ensure that the resulting system not only fulfills technical functions, but also provides comfort, convenience, and satisfaction for users.[6]

2.1 Method Of Collecting Data

The data collection process in this study was carried out through three main stages :

a) Observation

Observations were conducted directly at Cafe Urban with the aim of observing the manual menu ordering process, mapping the workflow, and identifying obstacles encountered in operations.

b) Interview

Interviews were conducted with Cafe Urban customers and administrators to obtain firsthand information regarding their needs, expectations, and any challenges encountered during the ordering process. Interview questions were designed to explore user perceptions and experiences, providing a clear picture of the features needed, the desired level of convenience, and any issues that needed to be addressed.

c) Literature Review

Literature studies are conducted by reviewing books, journals, scientific articles, and relevant previous research as a theoretical basis and as a comparative reference.

2.2 User Centered Design Method

User Centered Design (UCD) is a systems design approach that places the user at the center of every stage of development. The fundamental principle of UCD is to ensure that the resulting product truly meets the needs, preferences, and characteristics of the end user.[7]

Explanation of flowchart image:

1. Start : The process starts from the initial stage of designing a UCD-based system.
2. User Identification and Needs : Customers: order menu items, monitor order status, and make payments.
3. Define the Context of Use : Determine the conditions and situations in which the system will be used. Customers use smartphones to order menu items. Admins use computers to manage orders. The system supports real-time and online access, ensuring fast and efficient transactions.
4. Design Solution Design : Based on the needs and usage context, the interface and system flow were designed. Implementation System : Translating plans into a usable system. PHP programming language. MySQL database.
5. Evaluation & Trial : The system is tested by users (customers and administrators). Functional and usability tests are conducted. User feedback is collected. Bugs or deficiencies are noted for improvement.
6. Improvements & Requirements Fulfillment : Conduct system revisions based on the evaluation results of bug fixes found.
7. The process is complete and the system is ready to use.

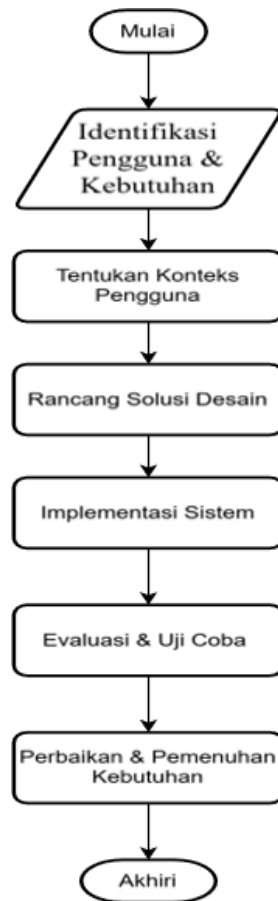


Fig 1. Concept Flowchart of *User Centered Design Method*

2.3 System Development Methods

The System Development Life Cycle (SDLC) method was used in designing this system. SDLC is a series of processes used to build and modify systems, complete with procedures and techniques that support their development [8]. This method serves as a framework consisting of several sequential stages: planning, analysis, design, implementation, testing, and maintenance. The selected development model is the Waterfall Model.[9]

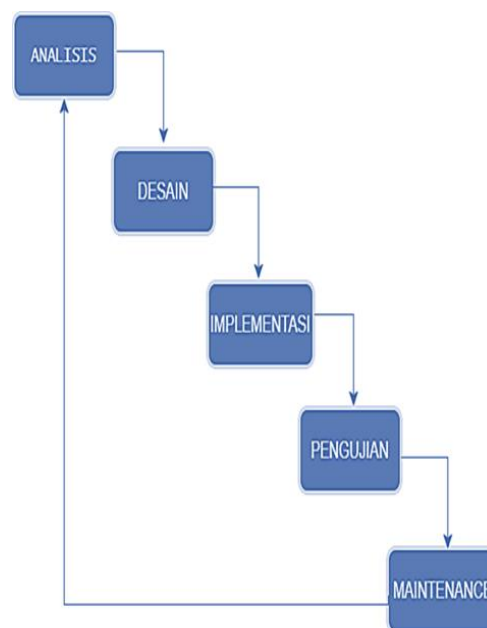


Fig 2. Waterfall Method

III. RESULT AND DISCUSSION

3.1 Design Plan

The Unified Modeling Language, or UML, is a standard language used to visualize, design, and document software systems in a structured manner. UML helps developers describe how system components interact, both in terms of data structure and system behavior. Simply put, UML serves as a communication tool between developers, systems analysts, and stakeholders to achieve a shared understanding of the system design.[10]



Fig 3. Use Case Diagram

The image is a Use Case Diagram that illustrates the interaction between actors and the system in the Food Menu Order Processing Information System at an Urban Cafe Using the User-Centered Design Method. In this diagram, there are two main actors the customer and the admin:

Customer Use Case:

1. Register and login.
2. View the available menu.
3. Add items to the order cart.
4. Place an order, starting with the customer's name, table number, and the choice of takeaway/dine-in.
5. Make QRIS/Cash/E-wallet payments.
6. Print payment receipts.
7. Log out after completing the order.

Admin Use Case:

1. Login as an admin.
2. Manage menus.
3. View and manage menu category data.
4. Manage customer data.
5. Manage admin data.
6. View the status of incoming customer orders.
7. Manage customer payment data.
8. Manage admin accounts.
9. View sales reports.
10. Admins can log out after completing their tasks.

An activity diagram is a type of behavioral diagram in the Unified Modeling Language (UML) used to model the dynamic behavior of a system. This diagram represents the flow of activities, whether in the form of business processes, algorithms, or interaction systems, depicting the sequence of activities and logistical decisions within a scenario.[11] This activity diagram explains the main system flow involving the

Customer, System, and Admin. The process begins when a Customer logs in or registers, then the system displays the menu. Customers can select food or drinks, specify the order type (takeout or dine-in), and payment method, such as QRIS, cash, or e-wallet. Once the payment is processed, the system confirms the transaction and displays a receipt. Meanwhile, the Admin can log in to the system to manage menus, categories, order status, and generate sales reports as part of Cafe Urban's management.

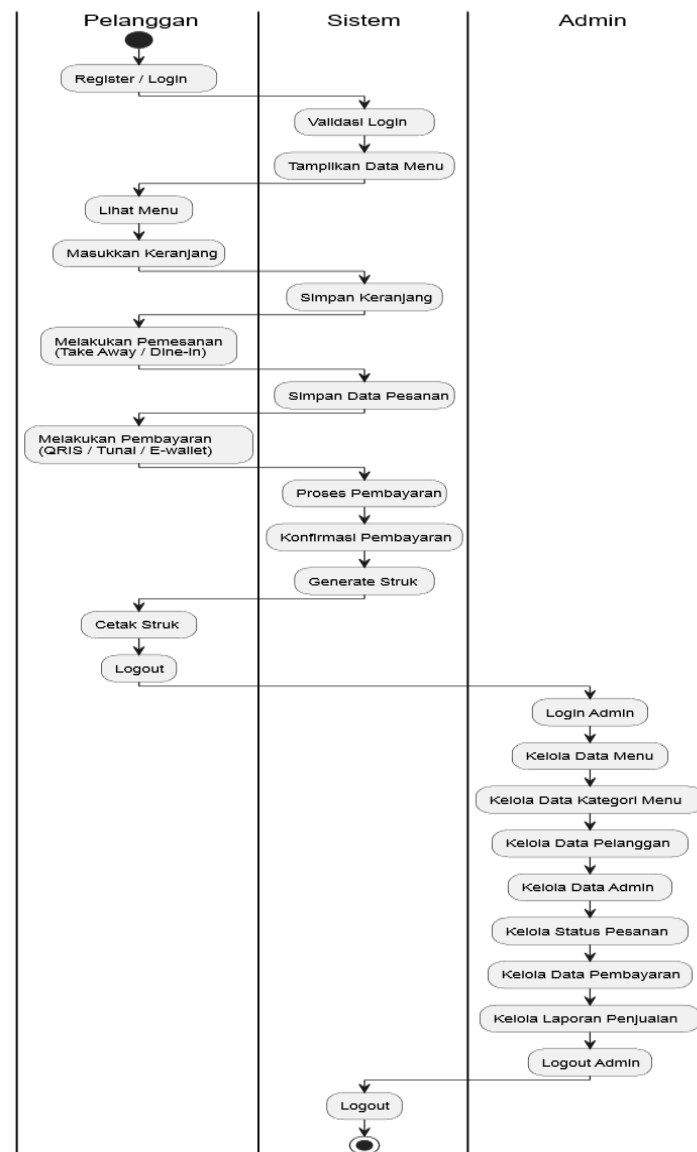


Fig 4. Activity Diagram

A sequence diagram is a visual representation in system modeling used to depict the communication flow between entities (objects or actors) in a system sequentially based on time. This diagram shows how messages are sent and received between components in a process scenario, from the first event to the last, thereby coherently demonstrating the dynamics of system interactions [12]. This diagram illustrates the interactions between customers, admins, the system, and the database in supporting core business processes. Customers register and log in, which is verified by the system, and then can view the menu displayed in the database. Next, customers place orders, select the type of service (dine-in or takeout), and complete payments using various methods. All transaction and payment data is automatically stored in the database, and the system displays a receipt as proof of the transaction. Meanwhile, the admin logs into the system to manage menu, category, customer, and payment data, as well as update order statuses and generate sales reports. Thus, this diagram shows the overall communication flow between actors and the system in carrying out ordering, payment, and data management functions at Cafe Urban.

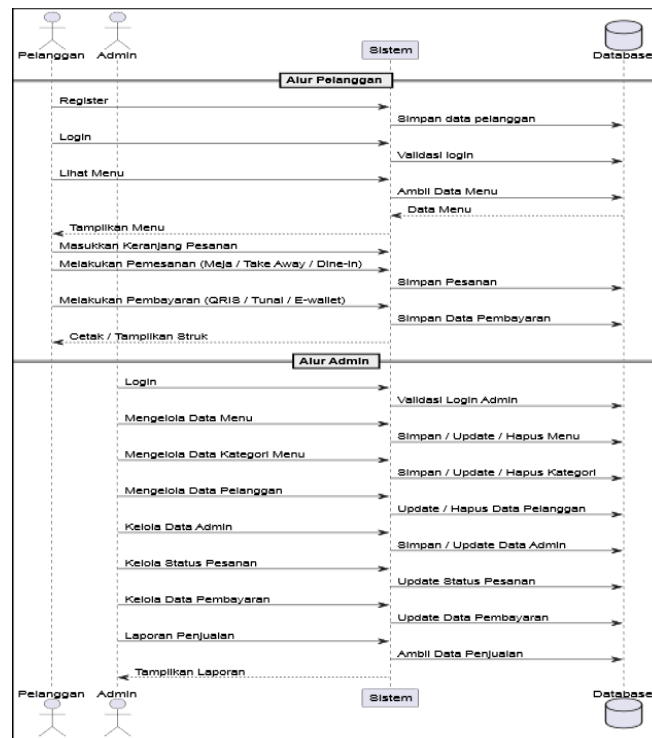


Fig .5. Sequence Diagram

A class diagram is a visualization tool in the Unified Modeling Language (UML) used to represent the static structure of object-based systems. This diagram displays a collection of classes in a system, complete with their attributes and the functions or methods performed by each class. Furthermore, a class diagram also illustrates relationships between classes, such as association, inheritance, aggregation, and composition, showing how interrelations and dependencies between entities are formed within the system[13].

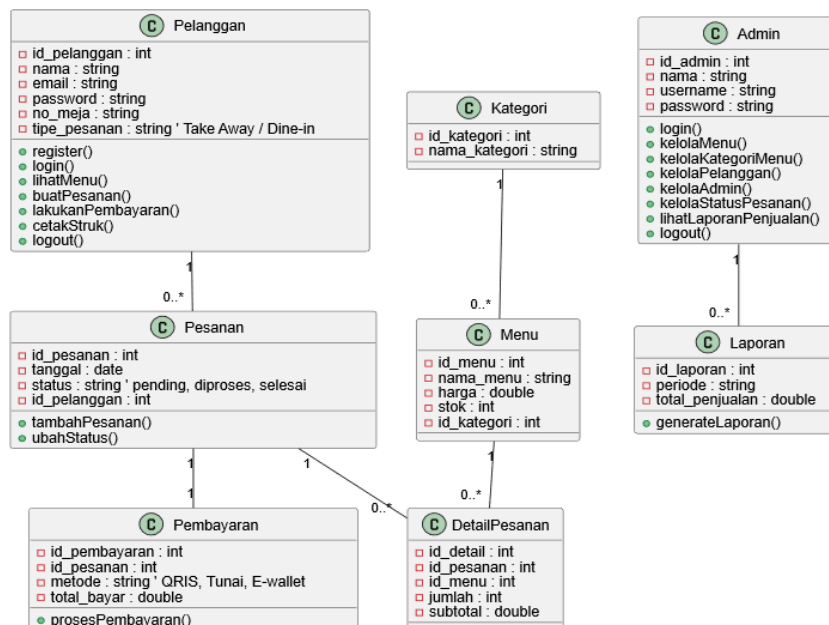


Fig 6. Class Diagram

3.3 User Interface View

A user interface (UI) is the appearance and arrangement of elements within a system or application that serves as a medium for interaction between the user and the software. A UI includes components such as menus, buttons, icons, text, and layouts designed to make it easier for users to understand and perform available functions.

Fig 7. Register Costumer and Admin

The registration page is part of a system or application that new users use to create an account to access available services.

Fig 7. Login

The Login page is the initial display that displays the email and password when the user first accesses the system.

Fig 8. Customer Menu List Page View

This page displays a list of food, drinks, and snacks available at Cafe Urban. Customers can view photos, names, descriptions, prices, and categories for each item.

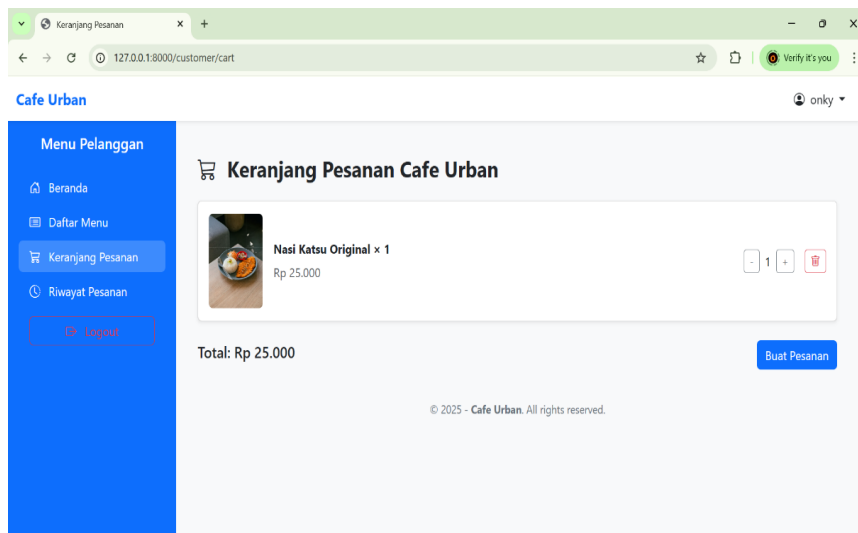


Fig 9. Customer Order Cart Page View

This page displays a list of menus that the customer has selected before making payment.

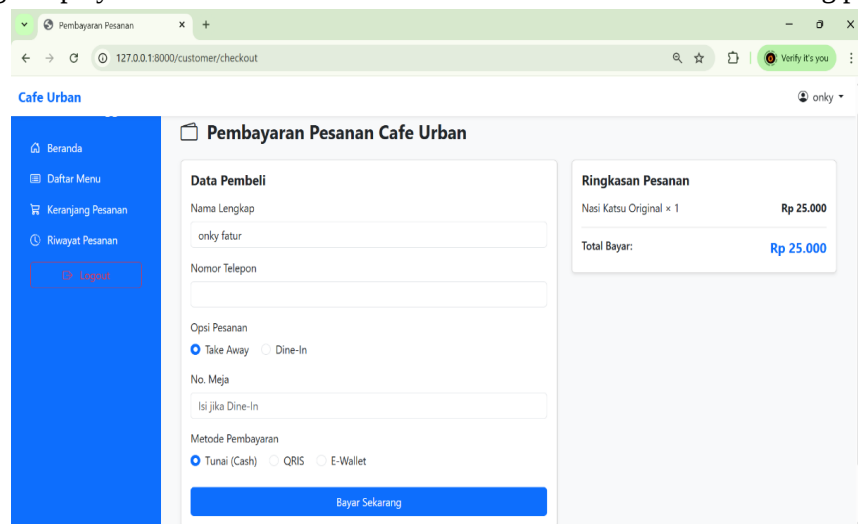


Fig 10. Customer Order Payment View

This page is used by customers to complete their purchase after checking out their shopping cart. Customers can view complete order details, including the total payment, payment method, and customer details.

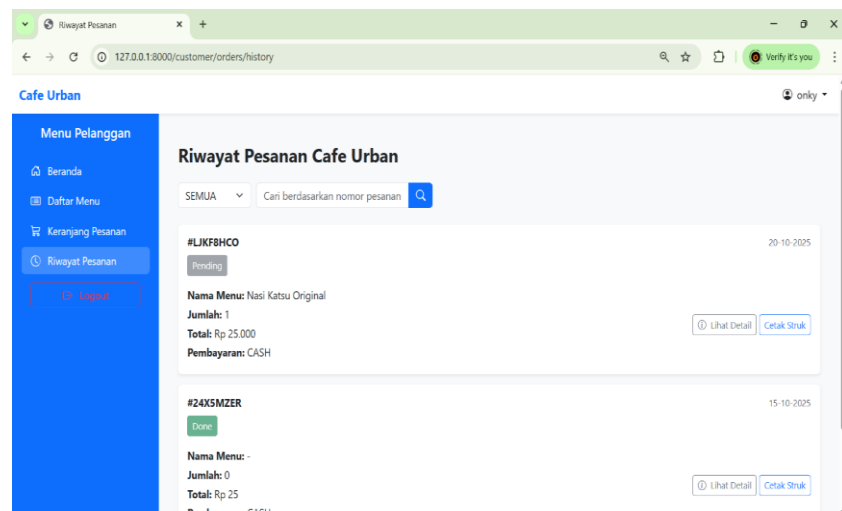


Fig 11. Customer Order History View

This page displays a list of orders that customers have previously placed. Through this page, customers can view the order status, order date, and total payment for each transaction and receipt.

IV. CONCLUSION

This research successfully designed and developed a web-based food ordering information system implemented at Cafe Urban using a *User Centered Design* (UCD) approach. Through this method, the system was designed with a focus on the needs and convenience of both customers and administrators. The resulting system facilitates customers in placing orders, selecting service types (dine-in or takeout), making digital payments, and monitoring order status in real time. For administrators, the system simplifies the integrated management of menu data, customers, categories, payments, and sales reports. The implementation results indicate that the UCD method can improve work efficiency, reduce recording errors, speed up transaction processing, and enhance user satisfaction. Thus, this system not only supports the digitalization of Cafe Urban's services but also contributes to improved service quality and data-driven managerial decision-making.

V. ACKNOWLEDGMENTS

The author would like to thank the State Islamic University of North Sumatra Medan, especially the Faculty of Science and Technology, Information Systems Study Program, which has provided support in the research process and writing of this journal.

REFERENCES

- [1] M. Alda, "Pengembangan Aplikasi Pengolahan Data Siswa Berbasis Android Menggunakan Metode Prototyping Development Application of Student Data Processing Based on Android Using Prototyping Method," *J. Manaj. Inform.*, vol. 13, no. 1, hal. 11–23, 2023.
- [2] Y. P. Aldi dan M. I. Wahyuddin, "Sistem Informasi Penjualan Makanan Menggunakan Metode User Centered Design Berbasis Web," *J. Media Inform. Budidarma*, vol. 6, no. 2, hal. 786, 2022.
- [3] R. Kurniawan, S. Fachrurrazi, S. Informasi, U. Malikussaleh, A. Utara, dan P. P. Masyarakat, "Sistem Informasi Kearsipan Berbasis Web," *J. Sist. Inf.*, vol. 3, no. 2, hal. 83–96, 2019.
- [4] V. Anggini, "Transformasi Paradigma Pendidikan Melalui Inovasi Teknologi Pembelajaran: Analisis Komprehensif Era Digital," *SAIBUMI Sinergi Aksi Inov. Budaya Menulis Inspiratif*, vol. 2, no. 2, hal. 137–146, 2024.
- [5] A. Aditia Prayoga dan Y. Ratih Dewi, "Sistem Informasi Penjualan Makanan Berbasis Web Menggunakan Metode User Centered Design," *Tek. dan Multimed.*, vol. 1, no. 2, hal. 300–308., 2023.
- [6] F. M. Alja, E. Daniati, A. Ristyawan, dan K. Kunci, "PERANCANGAN UI / UX E-COMMERCE MENGGUNAKAN METODE USER CENTERED DESIGN (UCD) Abstraksi Keywords: Pendahuluan Tinjauan Pustaka Metode Penelitian," vol. 6, no. 1, 2024.
- [7] G. Nahar dan S. B. Jain, "User-Centered Design in Agile Software Development Environments: Comparative Evaluation of Usability Testing Approaches," *ShodhKosh J. Vis. Perform. Arts*, vol. 5, no. 1, hal. 1747–1755, 2024.
- [8] R. Dalimunthe, Yahfizham, dan M. Alda, "Sistem Informasi Inventory Obat Berbasis Web Dengan Menggunakan Metode Safety Stock Dan Reorder Point," *JEKIN - J. Tek. Inform.*, vol. 4, no. 2, hal. 324–334, 2024.
- [9] A. Saravanos dan M. X. Curinga, "Simulating the Software Development Lifecycle: The Waterfall Model," *Appl. Syst. Innov.*, vol. 6, no. 6, 2023.
- [10] Onky Fatur Rahman, Ahmad Padil Rambe, dan Iman Adlin Sinaga, "Perancangan Sistem Informasi Absensi Pegawai di Kantor Pengacara," *SATESI J. Sains Teknol. dan Sist. Inf.*, vol. 4, no. 1, hal. 78–83, 2024.
- [11] Z. H. Muhamad, D. A. Abdulmonim, dan B. Alathari, "An integration of uml use case diagram and activity diagram with Z language for formalization of library management system," *Int. J. Electr. Comput. Eng.*, vol. 9, no. 4, hal. 3069–3076, 2019.
- [12] S. Iqbal dan A. B. Santoso, "Sistem Informasi Pemesanan Tiket Berbasis Web," vol. 2, no. 105, hal. 1–12, 2022.
- [13] R. Syabania dan N. Rosmawani, "Perancangan Aplikasi Customer Relationship Management (Crm) Pada Penjualan Barang Pre-Order Berbasis Website," *Rekayasa Inf.*, vol. 10, no. 1, hal. 44–49, 2021.