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Web-Based Customer Relationship Management (CRM) System At Enc Audio to Improve Customer Satisfaction

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ABSTRACT

This study aims to design and develop a web-based Customer Relationship Management (CRM) information system at ENC AUDIO, a business engaged in musical instrument and sound system rental services, in order to improve customer satisfaction and service quality. The main problem faced is that customer data, transaction records, and rental schedules are still managed manually, which often leads to data recording errors, scheduling conflicts, difficulties in tracking customer history, and inefficiencies in service processes. The research method used is the Operational CRM approach, with data collection techniques including observation, interviews, and documentation. The system is developed using the CodeIgniter framework and MySQL database, while system testing is conducted using the black box testing method to ensure that all system functions operate properly according to user requirements. The results of this study indicate that the developed CRM system is able to automate customer service processes, manage booking schedules in real time, and store customer transaction history in a structured and integrated manner. In addition, features such as online booking, automated scheduling, and live chat significantly enhance communication between customers and administrators. Therefore, the implementation of this system improves operational efficiency, reduces errors, and strengthens customer relationships, ultimately contributing to increased customer satisfaction and business sustainability.

INTRODUCTION

Information technology plays a crucial role in supporting operational activities and services across various sectors, including the service industry (Ayuninggati et al., 2021). The use of computer-based systems not only helps streamline work processes and improve data accuracy but also contributes to enhancing service quality and the customer experience through faster and more integrated services (Cahyanti et al., 2021). In the context of customer service, the implementation of information systems enables businesses not only to manage customer data in a structured manner but also to build long-term relationships through more responsive, personalized, and sustainable services (Putra, 2021).

In the service industry, one of the main challenges is how to maintain well-managed customer relationships even though service usage is not always routine (Firmansyah & Herdin, 2021). Customers who have used the service and are satisfied are a vital asset to business sustainability because they are likely to use the service again in the future or recommend it to others (Warsela et al., 2021). Therefore, service business owners need an approach that not only manages customer data but also maintains customer loyalty by improving the quality of interactions and service. One approach used in customer relationship management is Customer Relationship Management (CRM), a system that helps companies manage interactions, service, and relationships with customers in an integrated manner (Hermiati et al., 2021) (Anindira & Imran, 2021). Through the implementation of CRM, businesses not only record customer data, service history, and transaction activities but also utilize this information to enhance customer satisfaction, loyalty, and the sustainability of customer relationships (Wicaksono, 2021).

ENC AUDIO is a family-owned business specializing in the rental of musical instruments and sound systems for various events such as weddings, birthdays, and other entertainment events. Currently, transaction and record-keeping processes are still handled manually through direct communication or via WhatsApp. Customer data, rental schedules, and transaction history at ENC AUDIO are not yet documented in a structured manner, potentially leading to scheduling conflicts, delays in service confirmation, uncertainty regarding schedule availability for customers, and difficulties in identifying customers who have used the service previously. These conditions prevent the business from maximizing opportunities to retain customers and provide repeat services, and limit the business owner's ability to manage data and customer service relationships.

To address these issues, an information system focused on customer relationship management is required, encompassing customer data recording, rental schedule management, and transaction history tracking. This system is

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utilized to improve service quality and sustain customer relationships through an integrated system designed to support a more structured service process (Del Vecchio et al., 2022). Customer Relationship Management (CRM) is the right solution because it helps businesses manage customer data and service systematically (Musthofa & Adiguna, 2022). This study focuses on Operational CRM, which is the part of CRM that emphasizes the automation of direct customer service processes. However, the implementation of these operational aspects remains aimed at supporting the primary goal of CRM, which is to retain customers through fast, integrated, and well-documented service (Ariska et al., 2022).

ENC AUDIO offers several types of rental service packages, including the Malay Orchestra Package, the Margondang Package, and the Karaoke Package. The volume of bookings for ENC AUDIO varies from month to month and across different package types. This situation indicates that ENC AUDIO serves diverse customer needs with varying booking characteristics, necessitating structured management of booking data, customer information, and schedules so that all service information is properly documented and easily accessible when needed.

The information system to be developed will be web-based to allow access by administrators and customers from various locations (Ngelyaratan et al., 2022). This system includes features for customer data management, online booking integrated with the scheduling system so that schedule availability can be updated automatically and in real-time, rental schedule management, transaction history recording, and a web-based live chat feature that enables real-time communication and the storage of customer conversation history (Rahayu et al., 2022). These features support a faster, more structured service process and enhance customer satisfaction and loyalty as part of the implementation of Customer Relationship Management (Anggara et al., 2022).

With a web-based Customer Relationship Management (CRM) system, administrative and service processes can run more efficiently and in a more organized manner (Pangestu & Mardiani, 2022). This system helps business owners identify customers based on their service history, avoid scheduling errors, and provide real-time rental schedule information, thereby minimizing scheduling errors and enhancing customer trust.

LITERATURE REVIEW

Several previous studies have highlighted the important role of Customer Relationship Management (CRM) in improving service quality and maintaining long-term relationships with customers. According to (Hermiati et al., 2021) and (Anindira & Imran, 2021), CRM enables businesses to systematically manage customer data, interactions, and service processes in an integrated manner. Furthermore, (Wicaksono, 2021). explains that the implementation of CRM can increase customer satisfaction and loyalty by providing more personalized and responsive services. In addition, research by (Anggara et al., 2022) and (Pangestu & Mardiani, 2022) shows that web-based CRM systems are effective in supporting marketing activities, improving data accessibility, and enhancing operational efficiency. The use of Operational CRM, which focuses on automating customer-facing processes, has also been proven to streamline service workflows and reduce human errors (Ariska et al., 2022). Moreover, (Del Vecchio et al., 2022) emphasizes that integrating customer data into a centralized system allows businesses to analyze customer behavior more effectively and support data-driven decision-making. Based on these studies, it can be concluded that the implementation of a web-based CRM system is a relevant and effective approach to improving service quality, optimizing business processes, and strengthening customer relationships.

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METHOD

This research has the following stages:

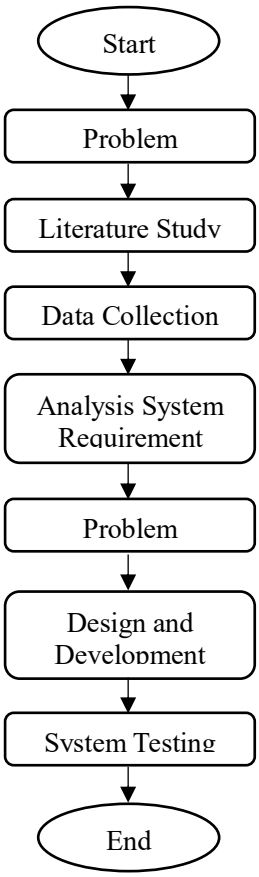

Figure 1. Research Stages

Problem Identification

This phase is the initial step in understanding the actual conditions on the ground. The researcher conducted observations and initial discussions with the owners of ENC AUDIO to identify key issues, such as data entry that is still done manually, the lack of a rental scheduling system, and the absence of a structured customer relationship management system.

Literature Study

The researchers gathered relevant theories from books, journals, and previous studies. The aim was to strengthen the conceptual foundation regarding information systems, CRM, operational CRM, system development, and other concepts that support this research.

Data Collection

Data collection was conducted through observation, interviews, and documentation to gain a deeper understanding of the operational workflow, user needs, and challenges faced by ENC AUDIO in running its sound system rental business.

Analysis System Requirement

The data collected is then analyzed to define the system requirements, including both functional and non-functional requirements. This analysis ensures that the CRM system to be developed is fully aligned with the business's conditions and needs.

Design and Development System

Based on the results of the requirements analysis, the system was designed using the Waterfall method. The design included flowcharts, DFDs, ERDs, and interface designs. This phase was followed by the implementation of a web-based system using the CodeIgniter framework.

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System Testing

Once the system was fully developed, it was tested using the black-box testing method to ensure that every system function operated in accordance with user requirements.

RESULT

Data Analysis

ENC AUDIO offers several types of rental packages, including the Malay Orchestra Package, the Margondang Package, and the Karaoke Package. This data serves as the initial dataset for the CRM system that was developed.

Table 1. ENC Audio Order Data for January–November 2025

No	Month	Category		
		Malay Orchestra Package	Margondang Package	Karaoke Package
1	January	4	2	6
2	February	3	1	5
3	March	5	2	7
4	April	6	3	8
5	May	7	4	9
6	June	4	2	6
7	July	8	5	10
8	August	9	6	12
9	September	6	4	8
10	October	5	3	7
11	November	6	3	8

Table 1 presents the order data of ENC AUDIO from January to November 2025, categorized into three types of service packages: Malay Orchestra, Margondang, and Karaoke. The data shows fluctuations in the number of orders each month, indicating varying customer demand for each service package. The Karaoke Package consistently records the highest number of orders compared to the other packages, suggesting that it is the most popular service among customers. Meanwhile, the Margondang Package shows relatively lower demand, while the Malay Orchestra Package has moderate and stable order levels. This data serves as an important basis for the CRM system to analyze customer preferences, manage service scheduling, and support decision-making in improving service quality and marketing strategies.

System Design

A Use Case Diagram is used to illustrate the relationships between actors and the system to be developed. Figure 2 shows an overview of the system design.

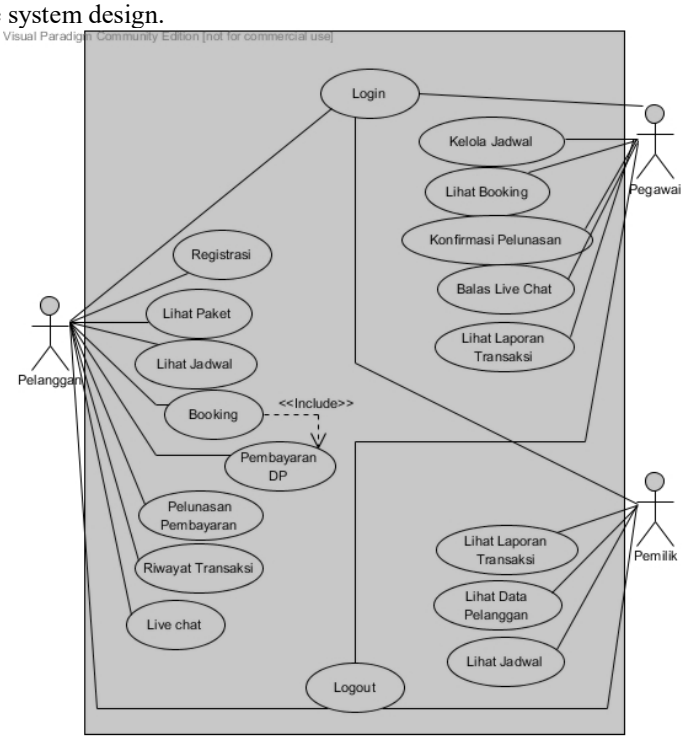

Figure 2. Use Case Diagram Design

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Figure 2 illustrates the Use Case Diagram of the proposed CRM system at ENC AUDIO. The diagram describes the interaction between two main actors, namely the admin and the customer, with the system. The admin has full access to manage customer data, rental schedules, transactions, and system reports. Meanwhile, customers can perform activities such as registration, login, selecting service packages, making bookings, conducting payments, and communicating with the admin through the live chat feature.

The diagram also shows how each function is integrated within the system to support a structured and efficient service process. Through this interaction, the system is designed to automate service workflows, reduce manual errors, and improve customer experience. Therefore, the Use Case Diagram serves as a blueprint that represents the functional requirements of the system and ensures that all user needs are accommodated in the system design.

Implementation

In this phase, the system design is realized into an application that can be operated and utilized to the fullest according to user needs. Here are the results of its implementation.

- **Login Page**

The login page is the initial page used by users to access the system by entering a username and password.

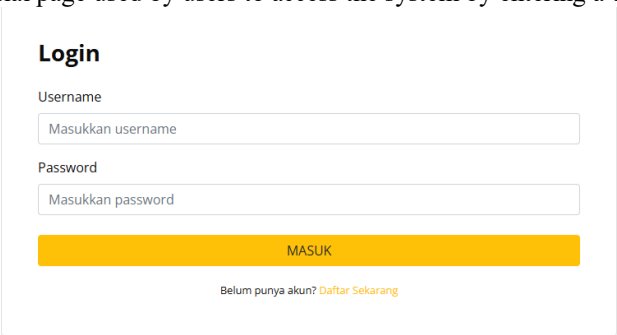

Figure 3. Login Page

- **Register Page**

This page is used by users to create an account and log in to the system. The system validates user input to ensure data security and accuracy.

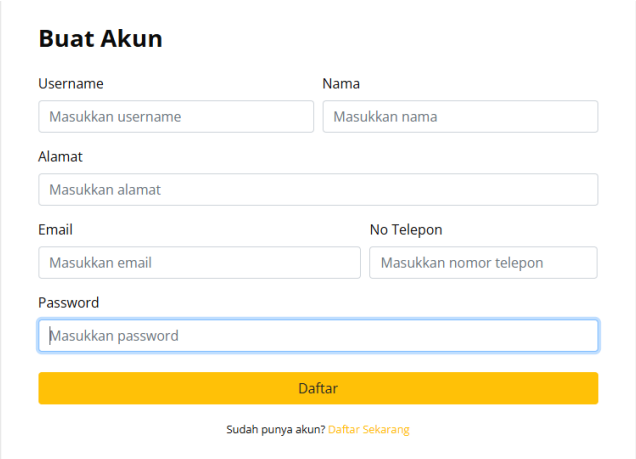

Figure 4. Register Page

- **Dashboard Page**

This page displays information about service packages, rental schedules, and the main navigation menu. Customers can view real-time schedule availability, thereby reducing the risk of schedule conflicts.

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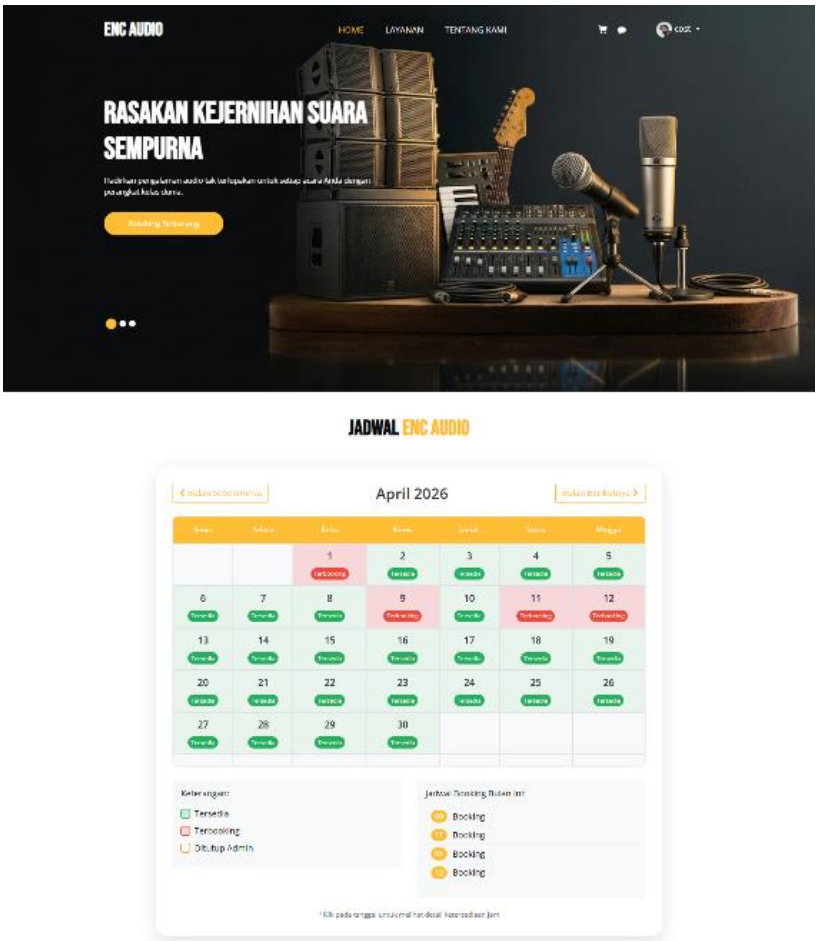

Figure 5. Dashboard Page

- **Cart Page**

Customers can select a service package and specify the rental dates. The system will automatically validate the schedule before the booking is processed.

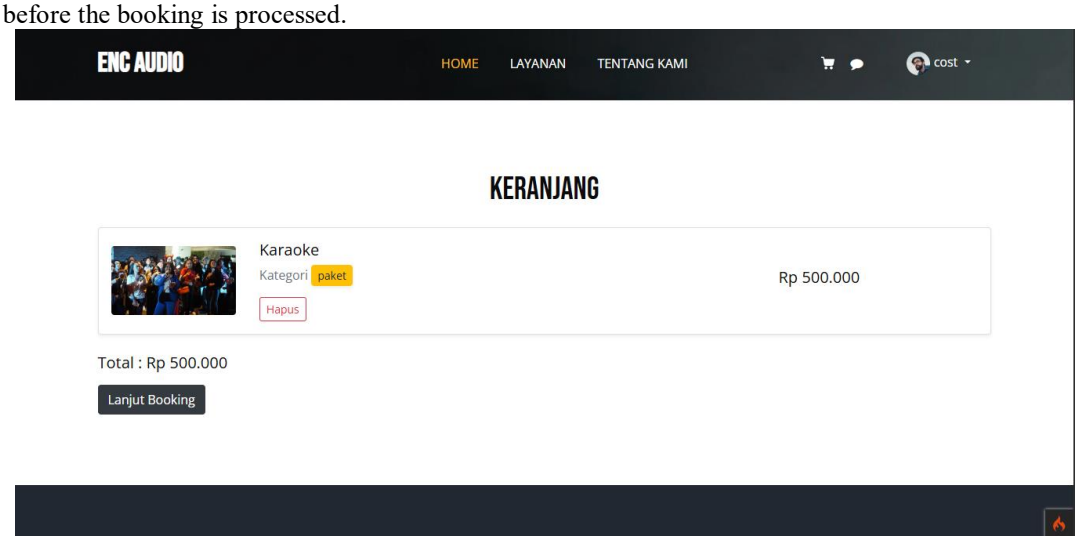

Figure 6. Cart Page

- **Payment Page**

The system is integrated with Midtrans as a payment gateway, allowing customers to make down payments online.

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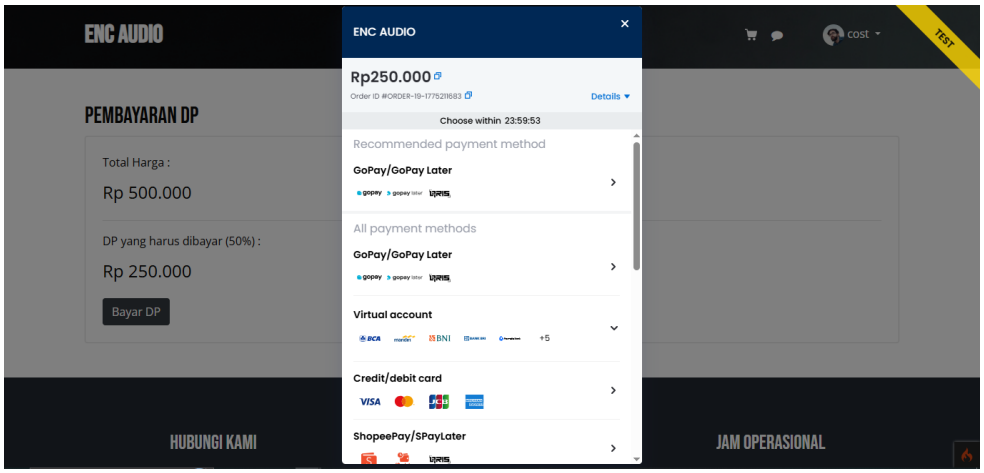

Figure 7. Payment Page

- **Live Chat**

The live chat feature enables real-time communication between customers and admins. All conversations are stored in the database so they can be used as a record of customer interactions in the CRM.

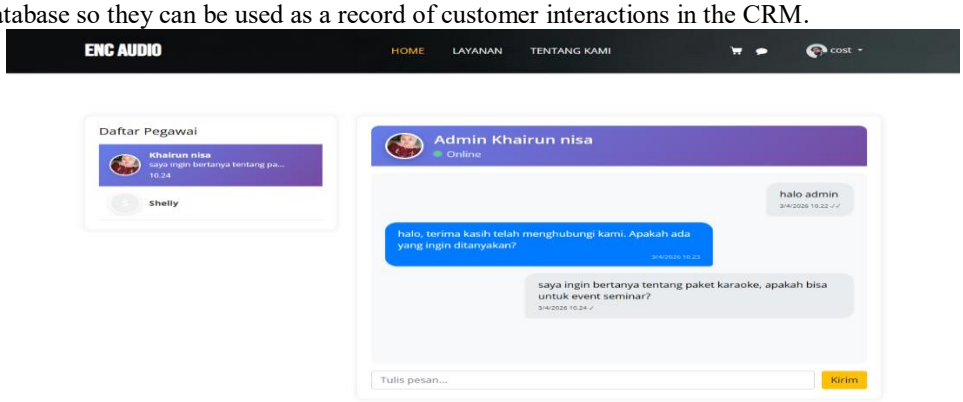

Figure 8. Live Chat

- **Report Page**

The Transaction Report page is used to view data on settled transactions and total revenue for a specific period using the date filter feature. The information is displayed concisely and includes the customer, event date, and total payment. Additionally, a report printing feature is available, allowing users to generate reports in a print-ready format for documentation purposes.

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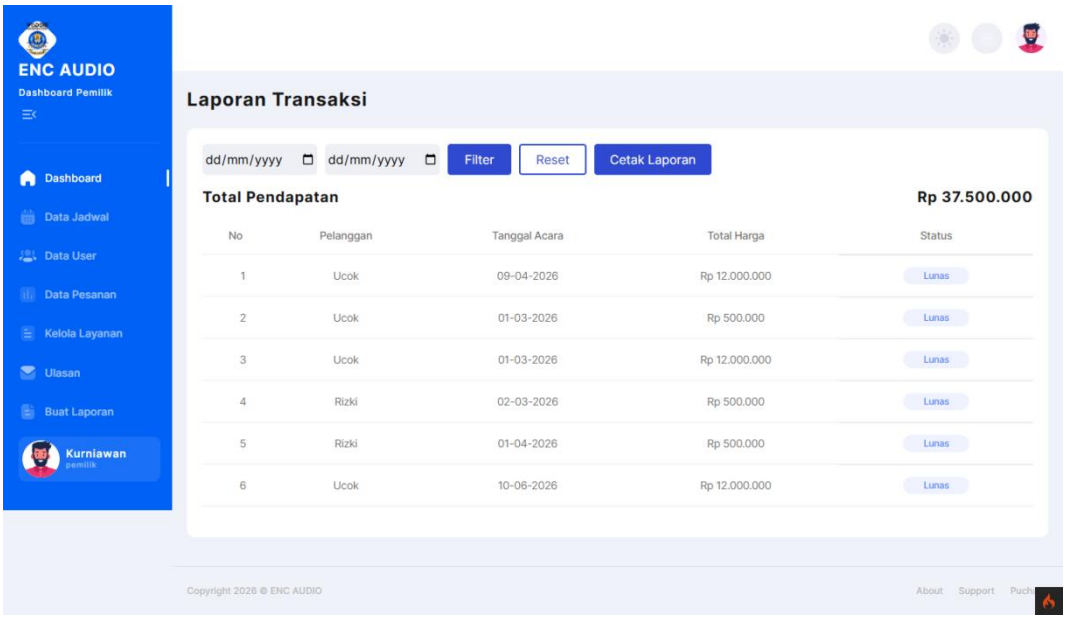

Figure 9. Report Page

DISCUSSION

The implementation of the web-based Customer Relationship Management (CRM) system at ENC AUDIO shows significant improvements compared to the previous manual system. Before the implementation, customer data, transaction records, and rental schedules were managed manually through direct communication and messaging applications, which often led to data inconsistencies, scheduling conflicts, and difficulties in tracking customer history. The absence of an integrated system also limited the business owner's ability to analyze customer behavior and maintain long-term relationships effectively.

After the implementation of the CRM system, all customer-related data is stored in a centralized and structured database, enabling easier access and management of customer information. The system provides features such as online booking, automated scheduling, transaction history recording, and real-time live chat, which significantly improve service efficiency and reduce the risk of scheduling errors. In addition, the availability of customer interaction history allows the business to better understand customer preferences and deliver more personalized services.

Therefore, the CRM system not only enhances operational efficiency but also improves service quality and customer satisfaction. These findings are consistent with previous studies, which state that CRM implementation can strengthen customer relationships and support business sustainability through more effective and integrated service management.

CONCLUSION

Based on the results of the research conducted on the design and implementation of a Web-Based Customer Relationship Management (CRM) System at ENC AUDIO to Improve Customer Satisfaction, several conclusions can be drawn: the Web-Based Customer Relationship Management (CRM) System at ENC AUDIO to Improve Customer Satisfaction has been successfully designed and developed in accordance with the needs for managing customer data, transactions, and service scheduling. This system is capable of replacing manual processes, thereby making data management more structured, integrated, and easily accessible. The developed system provides an online booking feature integrated with automatic scheduling and a web-based live chat feature, thereby supporting a faster, more responsive, and organized service process. Additionally, the system can systematically store and display transaction histories and customer interaction histories, which aids in customer relationship management and supports improved service quality.

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