

Design of a Mobile-Based Information System for Service Ordering at Teguh Design Printing and Screen Printing Services

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Abstract

This study aims to design a mobile-based information system for service ordering at Teguh Design, a printing and screen-printing business. The primary issue identified is the absence of an effective information system, as current ordering processes rely on manual methods, leading to potential data loss and record-keeping errors. Data collection methods included direct observation of the existing system, interviews with stakeholders, and a literature review to support analysis. The findings reveal that the current ordering system is inefficient and prone to errors, impacting customer satisfaction and company performance. Consequently, the implementation of a structured, mobile-based information system is essential to enhance operational efficiency and service quality. With the new system, orders can be placed online, allowing customers to make reservations more easily and quickly. Additionally, the system will improve data management, ensuring greater accuracy and security. Recommendations include employee training, regular monitoring and evaluation, and collaboration with relevant stakeholders to optimize system development. These steps are expected to enhance Teguh Design's competitiveness in the market.

Keywords: *Mobile, Design, Unified Modeling Language (UML), Ordering, Information system*

1. Introduction

As technology in information and communication continues to develop rapidly, society's need for fast, accurate, and efficient access to information has significantly increased. This change has impacted various sectors of life, ranging from education, government, to business. In the business world, technological advancements have had a major effect on how companies operate, including the ways in which they disseminate information, communicate with customers, and manage company data. Use the "Insert Citation" button to add citations to this document.

Digital technology, particularly mobile-based technology, has increasingly become the primary solution to facilitate information access and business transactions anytime and anywhere [1].

One sector particularly impacted by this technological development is the printing industry. Printing, an essential industry in disseminating information to the public, now faces new challenges in the digital era. Traditional printing processes need to adapt to market demands that are increasingly shifting toward digitization and automation. Modern printing operations require not only advanced printing machines but also information systems capable of managing orders, transactions, and data efficiently. Therefore, the application of information technology in the printing business is crucial for enhancing competitiveness and service quality [2].

Generally, small and medium printing businesses still use manual systems to handle orders and product management. Customers must visit the location in person to place orders and make payments in person. This process leads to long waiting times and more complicated data processing, which is prone to errors. Furthermore, the lack of an integrated information system causes data management to be inefficient and vulnerable to human error in calculations and transaction records. These issues significantly affect customer satisfaction and operational efficiency in printing businesses [3].

In Tegal City, one of the growing printing businesses is Percetakan dan Sablon Teguh Desain, located in Pagiyanten Village. This business offers various printing products, such as banners, billboards, posters, brochures, business cards, and others. Although it has a steady customer base, Percetakan dan Sablon Teguh Desain still faces significant challenges in its operations, particularly with the manual ordering and payment processes. These outdated methods lead to slow order processing, inefficiency, and additional administrative burdens for the business owner.

The manual process applied in this printing business not only wastes time but also increases the risk of record errors, resulting in inaccurate data and improper calculations. Additionally, the business still relies on paper as the primary means of recording data, which can be damaged or lost. Without a system that simplifies the ordering process, data management, and payment, this printing business will struggle to improve service quality and competitiveness in the increasingly competitive market.

As society becomes more dependent on the convenience of digital technology, customers expect systems that allow them to place orders and complete transactions quickly without needing to visit the business in person. Therefore, to enhance customer satisfaction and

operational efficiency, a mobile-based information system is needed [4], [6], [7]. With such a system, customers can easily place printing product orders, track order statuses, and make payments quickly and securely [8], [9], [10].

On the other hand, the implementation of a mobile-based system will also help the printing business manage customer data, transactions, and orders more effectively. With this system, information on products, prices, and order quantities can be managed centrally and accessed by the business efficiently. This will improve transparency in transactions and minimize the risk of errors in the manual system.

Additionally, the integration of financial reporting and transaction records will allow the printing business to monitor cash flow and operational performance more efficiently. As a result, the business can focus more on improving product quality and services, as well as expanding its operations. The mobile-based information system will also enable the printing business to reach a broader market, even beyond the Tegal City area, without being constrained by location and time [11], [12].

This research aims to design and develop a mobile-based information system for ordering printing products to address the various challenges faced by Percetakan dan Sablon Teguh Desain. With this system, it is expected that customers will be able to easily place orders, receive faster and more efficient service, and enjoy greater transaction transparency and accuracy. Furthermore, the system will also assist the printing business in managing customer and order data more effectively and in generating financial reports.

Through this research, it is hoped that solutions to the problems faced by the printing business can be found, and that it will contribute to the development of small and medium-sized businesses in Indonesia, particularly in facing the challenges of digitalization in the modern era. The proper application of information technology can be the key to improving the efficiency and competitiveness of printing businesses amidst increasingly fierce competition [13].

2. Research Methodology

This study aims to analyze and design a more efficient ordering system for Teguh Desain, a printing and screen printing company, with a primary focus on improving the order recording and management process. The existing system is still based on manual processes, leading to data inaccuracies and delays in order processing. To achieve this objective, a descriptive-analytical approach is used to identify and explain the existing information flow, as well as to highlight the system requirements for a more structured solution. Additionally, this research aims to address the challenges in the current system, such as errors in order recording, communication issues between customers, admins, and the production team, and delays in product delivery.

Data collection was carried out through direct observation of the ongoing ordering process at Teguh Desain. The research team conducted interviews with relevant stakeholders, including the admin/seller and members of the production team, to gain deeper insights into the current order processing practices. The primary goal of the observation was to map the entire ordering process, from when customers place their orders to when they pick up the products. This process includes steps such as order recording, product availability checks, and product retrieval by customers. The data obtained from this observation provided a clear picture of the weaknesses in the current system.

System analysis was then carried out using an approach that focuses on three main aspects: output, input, and process. The output analyzed is the customer invoice, which serves as transaction proof and an important record for both the company and the customer. The invoice contains details such as the ordered product, quantity, price, and transaction information. The input analyzed consists of the order data collected from customers through the order form. The existing system relies heavily on manual data processing, which carries a high risk of entry errors. The process analysis covers the flow from receiving orders to the product being retrieved by the customer, which often takes longer than expected due to the uncertainty in information management.

Based on the analysis, several significant issues with the current system were identified. One of the primary issues is the inaccuracy in order recording, which often leads to confusion between customers and the admin. Additionally, the manual management of orders increases the risk of data loss or delays in processing orders. Another issue is the inefficient flow of information between the admin, production team, and customers, leading to delays in product delivery. A solution is needed to address these problems and improve overall operational efficiency.

To solve the identified issues, this study proposes the development of a mobile-based ordering system that is more structured and automated. This system is designed to streamline the data recording process, improve transaction accuracy, and accelerate the flow of information between stakeholders. By using a mobile application, customers can easily place orders, while the admin can manage the orders more efficiently and provide timely information to the production team. Moreover, this system will allow for real-time tracking of order status, enabling customers to follow the progress of their orders without needing manual updates.

For the development of this system, suitable hardware and software to meet the company's operational needs will be used. Smartphones and laptops will be employed by the admin and production teams to access the ordering system, while the application will be developed using compatible platforms such as Android Studio and Flutter. The system will also be equipped with features to facilitate order data input and minimize human error. Training will be provided to the admin and sales staff as part of the system implementation, ensuring they are proficient in operating the new system effectively. This training will also cover important aspects of data management and communication within the team while using the system.

It is expected that the implementation of this mobile-based ordering system will improve the operational efficiency of Teguh Desain, reducing errors in order recording and speeding up the order processing timeline. Additionally, this new system is expected to enhance customer satisfaction, as they will be able to place orders easily and track the status of their orders in real-time. Overall, the development of this system aims to not only improve operational efficiency but also provide long-term benefits to the company by enhancing service quality and increasing competitiveness in the printing and screen printing market.

3. Result and Discussion

Based on the system analysis, it was found that the ordering process and sales report recording at Percetakan dan Sablon Teguh Desain are still done manually. The current system relies on paper as the medium for recording order and sales data. Every transaction involves creating a customer receipt, which serves as proof of the transaction. Although this system is functional for recording sales, significant issues have been identified, such as the loss of transaction data or inaccuracies in record-keeping, which can lead to incorrect reports and inefficient data management.

One of the major issues arising from this manual system is the risk of losing transaction data due to accidental mishaps. For instance, the paper used for recording orders or transactions can get damaged or lost, causing important information to become unavailable for future reference. Inaccuracy in record-keeping is also a problem, as manual entries heavily depend on the person recording the data. This can lead to errors in financial reports or stock management, ultimately affecting the company's operations and business decisions.

The process running in the current manual system involves several parties, including the customer, admin/seller, and the production team. The process begins when the customer places an order with the admin, who then records the order data and creates a sales receipt. After the transaction is completed, the recorded order data is handed over to the production team for further processing. Although this process seems straightforward and structured, the reliance on manual record-keeping hampers operational efficiency. This results in difficulties in monitoring the status of orders in real-time.

This process flow can be seen in Figure 1: Order Document Flow below. In this flow, once the customer places an order, the admin records the order and issues a receipt. This receipt serves as proof of transaction and part of the record-keeping process for both the customer and the company. Once the transaction is completed, the recorded data is then transferred to the production team for further action. While this flow is established, the dependency on manual record-keeping complicates the real-time tracking of orders. When customers inquire about the status of their orders, the admin must manually check paper records, which is time-consuming and inefficient.

The reliance on manual records also makes it difficult to track order status directly. For example, when customers ask about the status of their orders, the admin or seller must manually check paper records to provide the necessary information, which is time-consuming and inefficient. Additionally, stock management becomes more challenging because there is no automatic data update. This can lead to discrepancies between order data and available stock, which in turn affects production and distribution processes.

These inefficiencies also exacerbate order and stock management, ultimately affecting customer satisfaction. With delays in processing orders or errors in stock management, customers may become dissatisfied with the service. Decreased customer satisfaction can lead to reduced loyalty and negatively impact the company's reputation, which could result in fewer orders in the future. Therefore, it is essential for the company to address these issues by adopting a solution that enhances the efficiency of the ordering process and sales report recording.

To address the identified issues, a shift from a manual system to a more structured and automated system, such as a mobile application or digital software, is necessary. By using a more modern system, the ordering process can be completed more quickly, transactions can be recorded more accurately, and data can be accessed in real-time, ultimately improving overall operational efficiency.

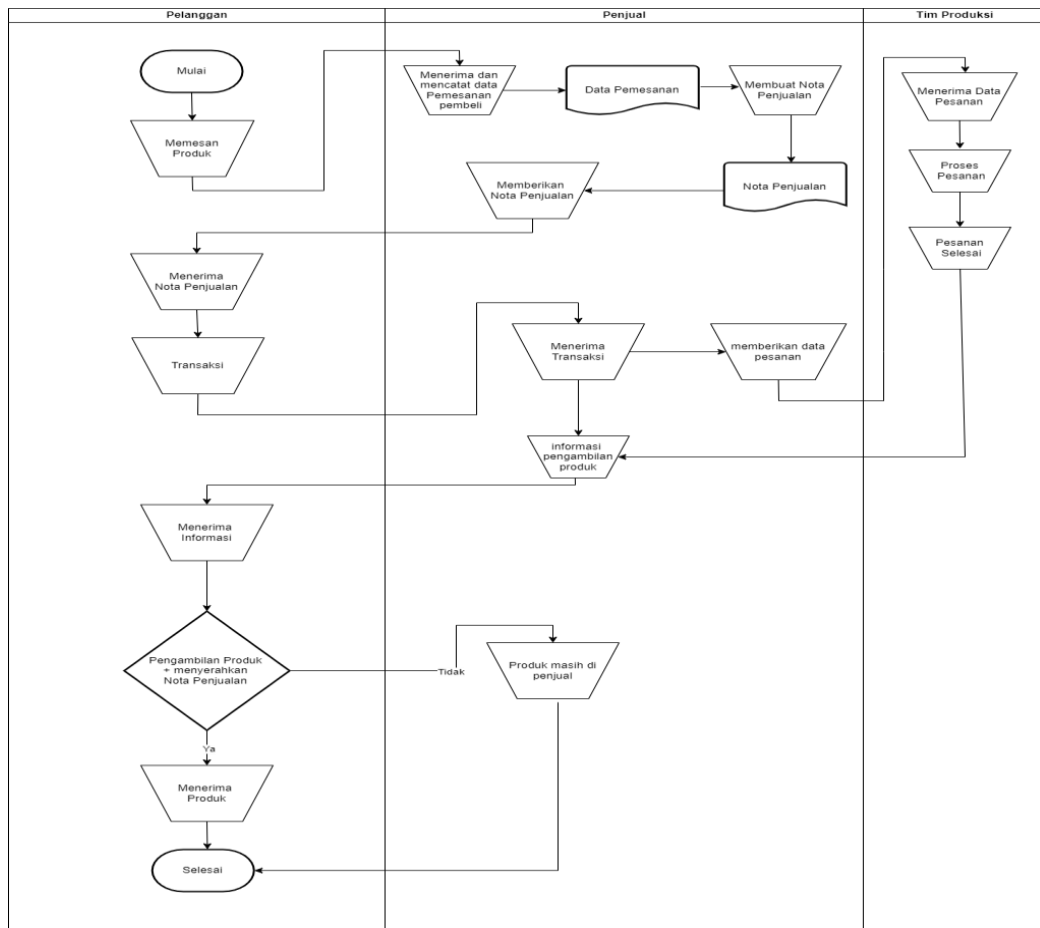


Fig. 1: Flow of Document Pemesanan

As a solution to these issues, the development of a mobile-based ordering system is proposed to replace the manual process with a more modern and integrated system. By using a mobile application, the ordering process can be carried out more quickly and efficiently, with order data directly recorded in the system and available for real-time monitoring by all parties involved. This system will also automatically record sales reports, minimizing the possibility of data loss. It is expected that this system will improve communication between customers, admins, and the production team, as well as enhance operational efficiency and customer satisfaction.

3.1. Usecase Diagram

The use case diagram is crucial in this research as it illustrates the interactions between actors (such as customers, and admin/sellers) and the system to be developed. This diagram helps identify the functional requirements of the system, such as product ordering, sales report recording, and real-time order status monitoring. By visually depicting these processes, the use case diagram makes it easier to understand how the system should operate, clarifies workflows, and ensures that the developed system will meet the operational needs of **Percetakan dan Sablon Teguh Desain**. Additionally, this diagram serves as an effective communication tool between developers and stakeholders to ensure that the system design aligns with user needs.

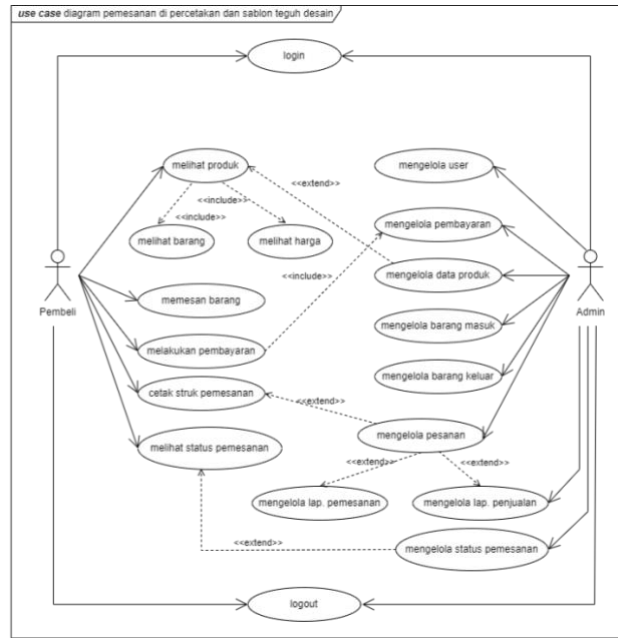


Fig. 2: Usecase Diagram of Percetakan dan Sablon Teguh Desain

3.2. Class Diagram

The class diagram plays an important role in this research as it illustrates the structure of the system to be developed, showing the existing classes, their attributes, and the relationships between these classes. In the context of the ordering and sales record system at **Teguh Design Printing and Screen Printing**, the class diagram is used to design a structured data model, such as classes for orders, customers, sales receipts, and products. With the class diagram, developers can better understand how data will be stored, accessed, and linked between entities within the system. This diagram also helps in designing an efficient system flow, ensuring that each system component interacts well and supports the existing business processes.

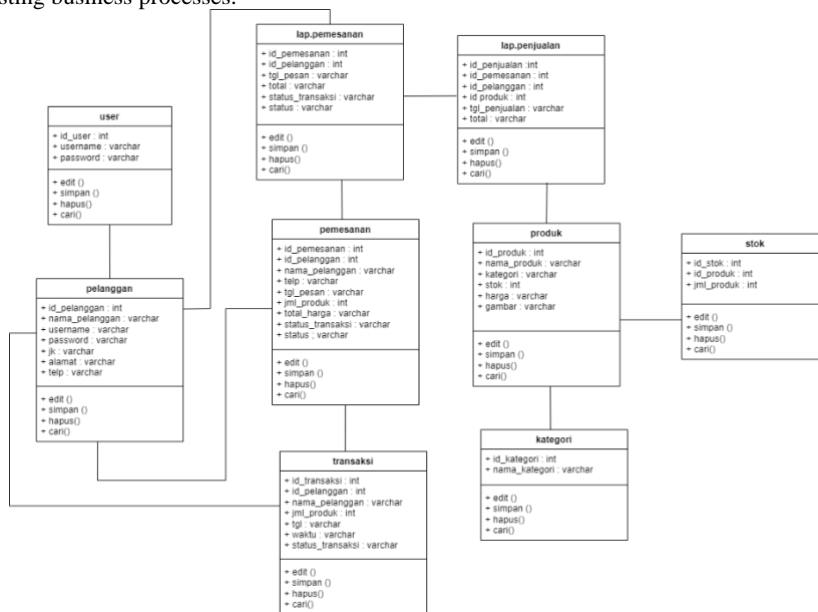


Fig. 3: Class Diagram of Percetakan dan Sablon Teguh Desain

4. Conclusion

Based on the analysis and design of the ordering information system that has been conducted, it can be concluded that the ordering system currently used at Percetakan dan Sablon Teguh Desain still employs a manual method. This method leads to several issues, such as the risk of losing customer and order data, which could negatively impact the company. The manual ordering process also limits the company's ability to reach a broader market, thus reducing potential revenue. Therefore, it is essential for the company to develop a more efficient and integrated system to improve business performance and minimize existing risks.

Additionally, this research has provided a clear overview of the challenges faced by Percetakan dan Sablon Teguh Desain with its existing ordering system. Identified issues, such as inaccurate record-keeping and difficulties in tracking the status of orders, indicate that a shift to a more modern and technology-based system is highly necessary. This study also proposes the use of a mobile-based ordering system that can enhance efficiency and simplify the ordering process as well as sales record-keeping.

In this research, the design of the system has also been presented, including various diagrams such as use case diagrams and class diagrams, which will be used in the development of a better information system. These diagrams provide guidance for system developers to understand the flow and data structure required for the development of the ordering application. With these diagrams, it is expected that the system being built will be more structured, efficient, and easier to operate by the relevant parties.

Overall, this research provides significant contributions to the company in addressing the issues of the ordering system still relying on manual methods. The implementation of the proposed system could improve operational efficiency, enhance the accuracy of data recording, and facilitate the monitoring and tracking of order statuses. It is hoped that with this system, Percetakan dan Sablon Teguh Desain can improve customer service and optimize the existing business potential.

References

- [1] Agyztia Premana, Gian Fitralisma, Andi Yulianto, M. Badruz Zaman, dan M. A. Wiryo. 2020. "Pemanfaatan Teknologi Informasi Pada Pertumbuhan Ekonomi Dalam Era Disrupsi 4.0." *Journal of Economic and Management (JECMA)* 2(2): 1–6. doi:10.46772/jecma.v1i101.219.
- [2] Diman, Rima, dan Muh Sabir. 2022. "Analisis Kreativitas Bisnis Terhadap Keunggulan Bersaing Pada Percetakan Undangan Pernikahan Di Kota Timika." *Jurnal Kritis* 6(2): 113–41..
- [3] Ramadhini, Tasya Rizki, Fenty Ariany, dan Akhmad Jayadi. 2023. "Sistem Informasi Presensi Karyawan Berbasis Android (Studi Kasus: Asuransi Panin Dai-Ichi Life)." *Jurnal Teknologi Sistem Informasi* 4(1): 81–88.
- [4] Muammar Khadapi, & Ramadan, S. . (2024). Optimization Of Sandal Production Using Linear Programming. *Journal of Artificial Intelligence and Engineering Applications (JAIEA)*, 3(3), 631–638. <https://doi.org/10.59934/jaiea.v3i3.470>.
- [5] M. Khadapi, A. M. H. Pardede and N. Novriyenni, "Providing Recommendations to New ILMCI Edu Voucher Customers Using the Market Basket Analyst Algorithm," *2023 International Conference of Computer Science and Information Technology (ICOSNIKOM)*, Binjia, Indonesia, 2023, pp. 1-6, doi: 10.1109/ICoSNiKOM60230.2023.10364536.
- [6] Ramdan, D S. 2020. "Aplikasi Desktop Multi Platform Untuk Redis Client Berbasis Teknologi Web Menggunakan Framework ElectronJS dan ReactJS." *Jurnal TEDC* 14(3): 226–31.
- [7] Pudyawardana, Wahyu. 2023. "Perancangan Sistem Informasi Pemesanan Makanan Dan Minuman Berbasis Web Pada Restoran Lamongan Cahaya." *ALMUISY: Journal of AI Muslim Information System* II(1): 2023.
- [8] Ramadan, S., & Meily, I. (2024). Web-Based Tuition Payments Information System At Al-Wafi Kindergarten. *Journal of Artificial Intelligence and Engineering Applications (JAIEA)*, 3(2), 595–600. <https://doi.org/10.59934/jaiea.v3i2.439>
- [9] Muammar Khadapi. (2023). IMPLEMENTATION OF THE SPIRAL METHOD FOR ANALYZING AND DESIGNING FINANCIAL INFORMATION SYSTEMS AND FINANCIAL ARCHIVES FOR CASHIER FINANCIAL MANAGEMENT SECTION (CASH INFORMATION REPLACEMENT). *Journal of Artificial Intelligence and Engineering Applications (JAIEA)*, 2(2), 53–58. <https://doi.org/10.59934/jaiea.v2i2.160>
- [10] Adwiya, R. A. (2022). RBA WEB-BASED STICKER ORDERING INFORMATION SYSTEM: WEB-BASED STICKER ORDERING INFORMATION SYSTEM. *Journal of Artificial Intelligence and Engineering Applications (JAIEA)*, 1(3), 242–247. <https://doi.org/10.59934/jaiea.v1i3.108>
- [11] Muhammad Rayhan Erzha, Halim, M. A. H., Arfa Azka Santosa, Maulana Imran Ravasia, & Eka Kusuma Pratama. (2024). Designing a School Information System and Admission of New Students at Gunadarma Middle School Based on a Website Using the Prototype Method. *Journal of Artificial Intelligence and Engineering Applications (JAIEA)*, 3(3), 659–666. <https://doi.org/10.59934/jaiea.v3i3.485>
- [12] Yunita, I., Suendri, & Harahap, A. M. (2024). Android Based Outdoor Equipment Rental Information System. *Journal of Artificial Intelligence and Engineering Applications (JAIEA)*, 3(3), 734–739. <https://doi.org/10.59934/jaiea.v3i3.505>
- [13] Anwar, A., Zulman, M. R., Arhami, M., Nahar, N., & Safriadi, S. (2024). Development of a Cloud Computing-Based Collaboration Information System. *Journal of Artificial Intelligence and Engineering Applications (JAIEA)*, 4(1), 562–566. <https://doi.org/10.59934/jaiea.v4i1.692>