Information Technology and Systems
e-ISSN: 3031-1187
Homepage: https://sanscientific.com/journal/index.php/its
1(2) 82-91 (2024)
https://doi.org/10.58777/its.v1i2.190

Research Article

Implementation of an E-Commerce based Online Sales System at the Jaya Bersama Store in Padang

Muhammad Aviv Monry
Information Technology, Faculty of Engineering and Informatics, Bina Sarana Informatika University, Jakarta

Received: February 18, 2024; Accepted: May 29, 2024

Abstract
This study aims to examine the implementation of an e-commerce-based online sales system at Toko Jaya Bersama, Padang. In today's digital era, e-commerce is an effective solution to increase sales and expand market reach. The system development method used is the waterfall development model. Data was collected through interviews, observations, and analysis of documents related to the online sales system implemented in the store. The results showed that the implementation of e-commerce in Toko Jaya Bersama has succeeded in increasing operational efficiency and store revenue. The online sales system implemented includes the creation of a store website, integration with digital payment platforms, and real-time inventory management. In addition, the implementation of digital marketing strategies through social media and SEO also contributes significantly in increasing store visibility and sales. However, there are some challenges faced in the process.

Keywords: Digital Marketing; digital transformation; e-commerce; online sales system; Toko Jaya Bersama;

How to cite: Monry, M. A., (2024). Implementation of an E-Commerce based Online Sales System at the Jaya Bersama Store in Padang, *Information Technology and Systems (ITS) 1(2)*, 82-91

*Corresponding author: Muhammad Aviv Monry (mviv2904@gmail.com)

1. Introduction

The development of information and communication technology has brought significant changes in various aspects of life, including in the field of trade. E-commerce, or electronic commerce, has become one of the main methods in modern business transactions(Syahputri & Anggoro, 2020). This is due to the ability of e-commerce to reach a wider market, reduce operational costs, and increase business efficiency. Therefore, many companies, both large and small, have started turning to e-commerce platforms to increase their competitiveness.

Toko Jaya Bersama, a small and medium business located in Padang, has realized the importance of digital transformation in maintaining its existence and business growth. As a strategic step, Toko Jaya Bersama decided to implement an e-commerce-based online sales system. This step was taken in response to changes in consumer behavior that increasingly prioritize the convenience of shopping online, especially during the COVID-19 pandemic which limits physical interaction.

This study aims to analyze the process of implementing an e-commerce-based online sales system at Toko Jaya Bersama and evaluate its impact on business operations and performance. The study will also identify the challenges faced during the implementation process as well as provide recommendations to overcome these obstacles.

The implementation of an e-commerce-based online sales system has several problems that often occur, such as E-commerce implementations often face technical problems such as server disruptions, errors in payment system integration, and lack of periodic maintenance(Zamzami et al., 2021). Inadequate technology infrastructure can also cause delays in updating inventory data and managing orders. E-commerce implementations often face technical problems such as server glitches, errors in payment system integration, and lack of periodic maintenance. Inadequate technology infrastructure can also cause delays in updating inventory data and managing orders. The e-commerce market is highly competitive, with many large and small players offering similar products (Sugandini et al., 2019). Toko Jaya Bersama needs to develop innovative and different marketing strategies to attract customers and maintain their loyalty. Despite the increasing trend of online shopping, changing consumer behavior remains a challenge. Toko Jaya Bersama must continuously monitor customer preferences and adjust marketing and customer service strategies to meet evolving needs. Real-time inventory management becomes more complex in e-commerce systems. Errors in stock monitoring can lead to a mismatch between the number of items available in the warehouse and those listed on the website, resulting in customer dissatisfaction (Setrisman, n.d.). Efficiency in logistics and delivery processes is the key to e-commerce success (Fadilah & Nasution, 2023). Shipping delays, product damage during delivery, and high logistics costs can be major obstacles that affect customer satisfaction.

To overcome these problems, Toko Jaya Bersama needs to design and implement a comprehensive and sustainable strategy. Measures such as increased staff training, investment in technology infrastructure, strengthening security systems, as well as developing effective marketing strategies will go a long way in optimizing the implementation of e-commerce-based online sales systems.

2. Literature Review

The development of online sales information systems has become a major focus in research and development in the field of information technology, especially along with the rapid growth of e-commerce worldwide(Aprianto, 2021). This literature review will discuss some relevant research and theories that support the design of online sales information system applications, with the aim of providing a strong theoretical foundation for implementation in Toko Jaya Bersama.

Basic Concepts of Sales Information System

A sales information system is a software application designed to assist businesses in managing the sales process efficiently (Faqih & Wahyudi, 2022). (Tambingon et al., 2018) Explain that sales information systems can include various functions such as inventory management, order processing, shipment tracking, and sales analysis. The system aims to improve operational efficiency and provide useful insights for business decision making.

E-commerce and Consumer Behavior
The development of e-commerce has changed the way consumers interact with businesses. According to (Astuti et al., 2020), E-commerce provides flexibility and convenience for consumers, who can shop anytime and anywhere. Research by (Uviyanti et al., 2022) shows that factors such as transaction security, ease of use, and consumer trust greatly influence the success of an e-commerce platform.

System Technology and Architecture
In designing online sales information system applications, the selection of the right technology and system architecture is very important. (Harvey et al., 2016) emphasizing the importance of modular and scalable system architectures to support business growth. Technologies such as relational databases, web frameworks, and APIs for integration with third-party services (e.g., payment gateways) are often used in e-commerce application development.

User Experience (UX) and User Interface Design (UI)
User experience (UX) and user interface design (UI) are key components in the development of online sales information systems. (ROSMANI, n.d.) emphasizes the importance of an intuitive and responsive interface to increase user satisfaction. Research by (Rachmaniar & Ningtyas, 2023) shows that good design can increase sales conversions and customer loyalty.

Security and Privacy
Data security and privacy are critical aspects in online sales information systems. According to (Nafi'ah, 2020), E-commerce systems must have strong security mechanisms in place to protect customer data and transactions from cyber threats. Best practices include data encryption, two-factor authentication, and suspicious activity monitoring.

Implementation and Testing
The implementation and testing phase is an important phase in the software development life cycle (Pricillia, 2021). (Sudipa et al., 2023) emphasizing the importance of a systematic approach in testing to ensure that the system functions according to specifications and is free of bugs. Unit testing, integration testing, and acceptance testing by users are necessary steps to ensure the quality of the system.

Implementation Case Studies
Several case studies of online sales information system implementation provide practical insight into the challenges and successes in implementation. For example, research by (Kusuma, 2021) shows that technology adaptation by staff and integration with legacy systems are common challenges faced. The case study also highlights the importance of user training and ongoing system maintenance.

The literature that has been discussed provides a comprehensive theoretical framework for the design of online sales information system applications. The basic concepts of sales information systems, e-commerce developments, technology and system architecture, UX/UI, security and privacy, and implementation and testing are key aspects to be considered. Implementation case studies provide practical insights that can be adopted and adapted to the context of Toko Jaya Bersama in Padang. With this theoretical basis, it is expected that the design of online sales information systems can be carried out effectively and successfully meet business needs.

3. Methods

The Waterfall model is one of the systematic and structured software development models, which consists of several sequential stages (Maulida, 2022). Each stage must be completed before the next stage begins. The following are the stages in the Waterfall model applied in designing an online sales information system application at Toko Jaya Bersama.

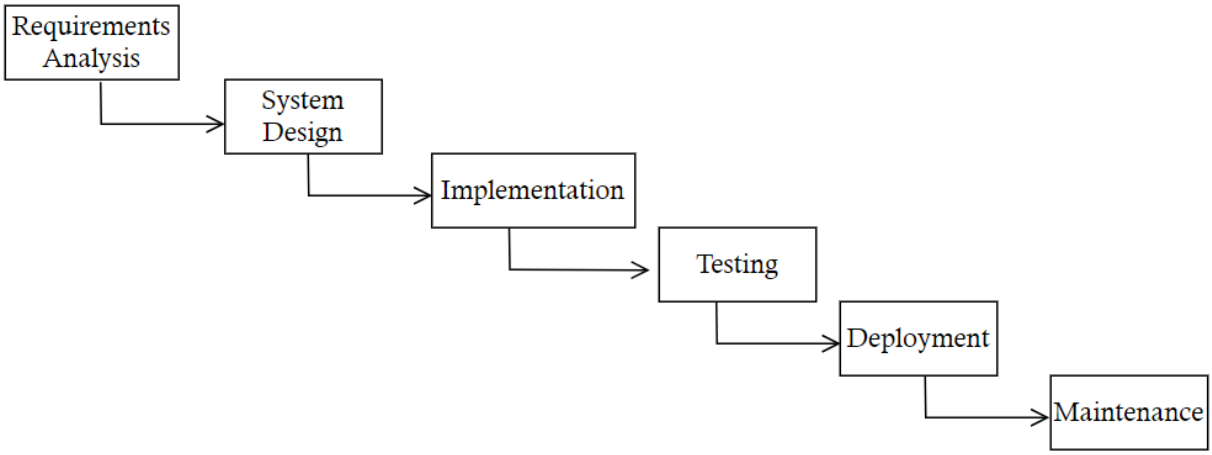

Figure 1. Waterfall System Development Model

Figure 1 describes the stages in the waterfall system development model, namely:
Requirements Analysis
At this stage, a collection and analysis of needs from users and stakeholders is carried out. The result of this stage is a requirements specification document that describes in detail the features that an online sales information system must have. Activities carried out at the needs analysis stage are interviews with store owners and staff, observation of the current sales process. Identification of functional and non-functional needs, preparation of requirement specification documents.

System Design
The system design phase involves designing the overall system architecture, including database design, user interface, and other system components. The result of this stage is a detailed system design document. Activities carried out at the system design stage are system architecture design, database design, user interface design (mockup or prototype), system workflow design (flowchart or UML diagram), and preparation of system design documents.

Implementation
At this stage, the system begins to be developed based on the design that has been created. Each component of the system is implemented using the appropriate programming language. Activities carried out at the implementation stage are coding system modules, user interface development, integration with payment systems, implementation of features in accordance with specifications.

Testing
The testing phase aims to ensure that the system functions according to specifications and is error-free. Tests were conducted on various aspects, including functionality, security, and performance. Activities carried out at the testing stage are unit testing, integration testing, system testing. User Acceptance Testing

Deployment
Once the system has been successfully tested and approved, it is then deployed to a production environment. At this stage, system installation, data migration, and user training are carried out. Activities carried out at the implementation stage are system installation on production servers, data migration from old systems (if any), user training, preparation of system usage documentation.

Maintenance
The maintenance phase is the continuous stage after the system is deployed. This stage involves bug fixes, feature updates, and system performance improvements. Activities carried out at the maintenance stage are monitoring system performance handling problems and bug fixes, feature updates based on user feedback, preparing maintenance reports.

4. Results

This study aims to design and implement an online sales information system application at Toko Jaya Bersama, Padang. Based on the methodology that has been applied, the following are the results obtained from each stage of design and implementation.

From the results of interviews and observations, several functional and non-functional needs were obtained that became the basis for system design:
Functional Needs
Product management, including adding, modifying, and deleting product data.
Real-time inventory management. Secure and easy-to-use online ordering and payment system. Order tracking features for customers and Sales reports and sales data analysis.

Non-Functional Needs
Non-functional needs include the security of customer data and transactions. Scalability to support an increasing number of users. Intuitive and responsive user interface.

System Design
Based on requirements analysis, system design includes:
System Architecture
Web-based system with three-layer architecture (presentation layer, business logic layer, data layer). Use of Laravel framework for backend development and Vue.js for front end.

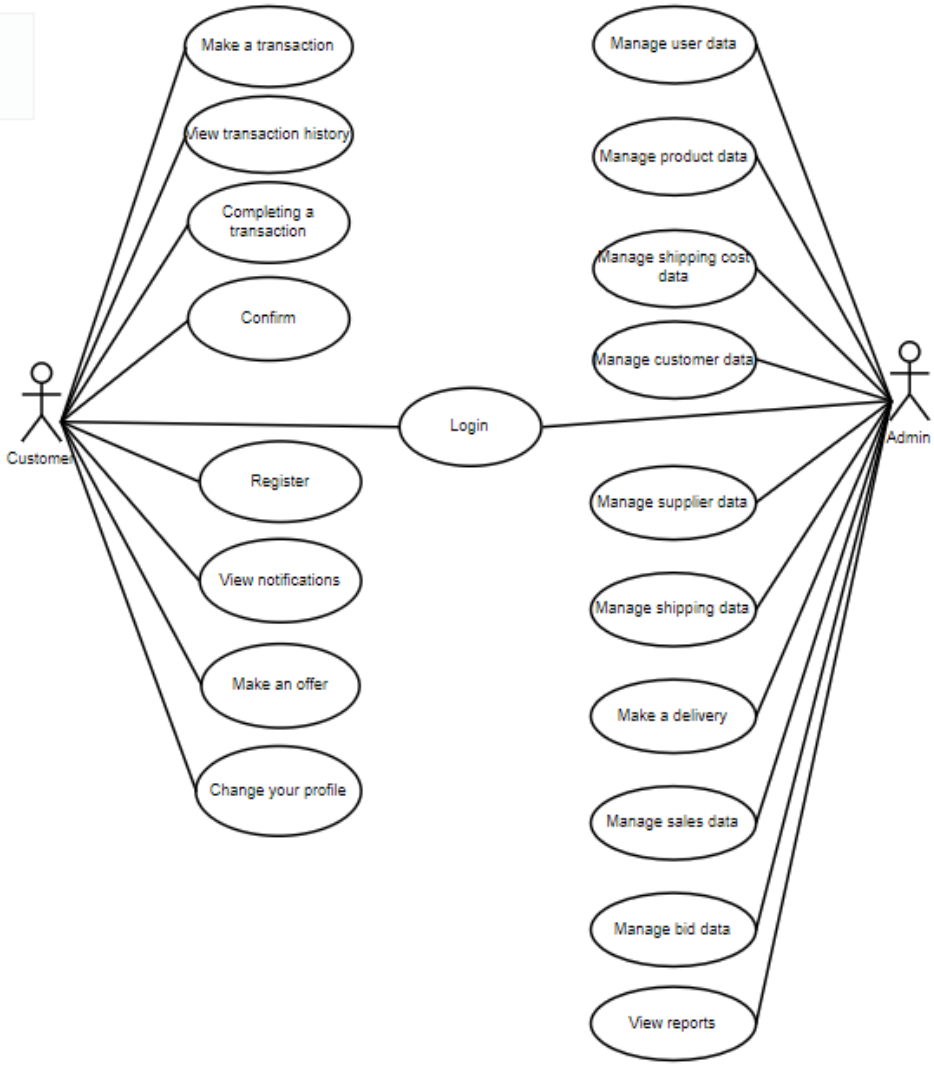

Figure 2. Use Case Diagram of Online Sales Information System

Figure 2 explains the access that can be done by each actor such as customer actors can make order transactions, can view order history, can make order complaints, confirm payments, register, view notifications, can change profiles. While admin actors can manage user data, manage product data, manage shipping costs, manage customer data, manage supplier data, manage shipping data, manage sales data, manage bid data and view sales transaction reports.

Database Design

The relational database uses MySQL with tables for products, users, orders, and payments. The database design is illustrated in the following figure 3.

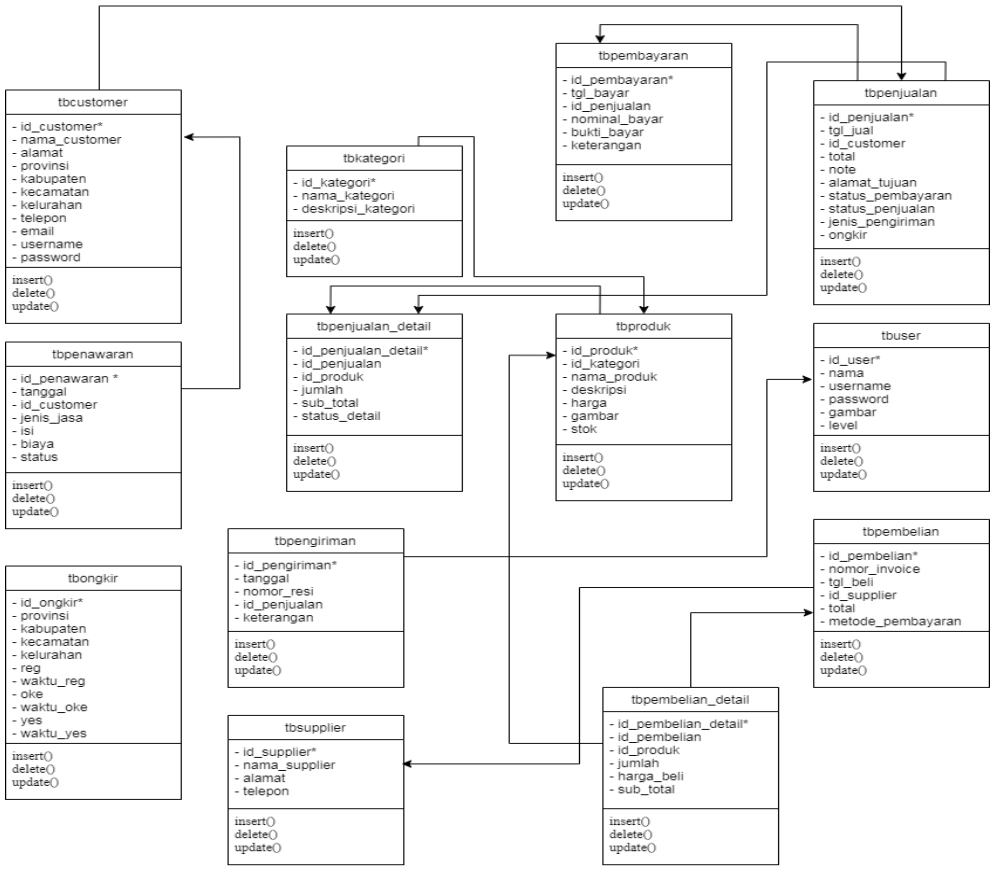

Figure 3. Online Sales Information System Class Diagram

User Interface

The interface design is depicted in figure 4 which is the administrator interface. The interface is designed to be user-friendly with easy-to-understand navigation. User interface mockups and prototypes created using Figma.

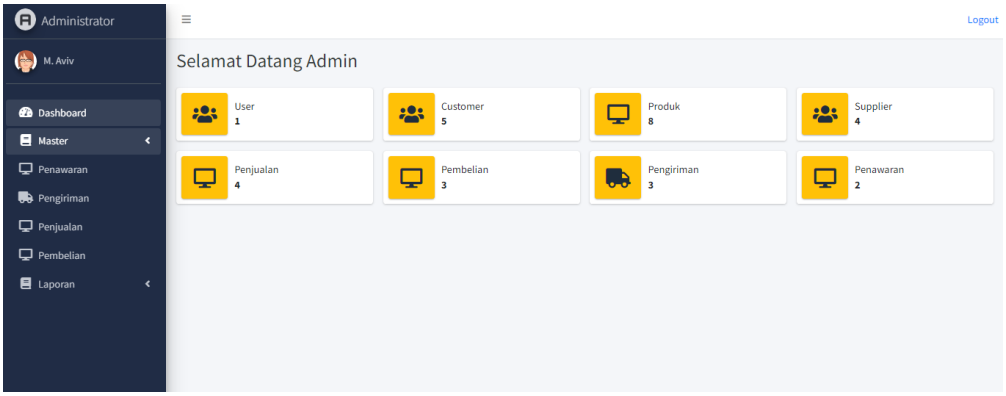

Figure 4. Administrator interface

Implementation
The implementation process includes Backend Development by coding core modules for product management, inventory, and order processing. Integration with online payment gateways. Furthermore, frontend development by implementing an interactive and responsive user interface design. Form validation and visual feedback to improve user experience. Finally, system integration is by integrating between frontend and backend. Then test the integration of the payment system to ensure the transaction runs smoothly.

Testing
Testing is carried out in several stages, namely unit testing by testing each module individually to ensure it functions according to specifications. Integration Testing, testing is carried out to ensure all system components are well integrated. System testing is done by testing the system as a whole to make sure all features run properly. User Acceptance Testing involving end users (store staff and multiple customers) to ensure the system meets user needs.

Application
Once the system has been tested and approved, the deployment steps include installing the system by deploying the system to a production server with adequate security configuration. Data migration is where existing product and customer data in the old system is imported into the new system. User training by providing training to store staff to ensure they can use the system effectively. Launch, i.e. the system is officially launched and begins to be used for daily operations.

5. Discussion

The implementation of the online sales information system application at Toko Jaya Bersama shows several important findings that can be used as a reference for further development and for other small and medium enterprises planning to carry out digital transformation. This discussion will include analysis of research results, evaluation of successful implementation, and identification of challenges and solutions adopted.

Analysis of Research Results
The results showed that the online sales information system designed and implemented has met the functional and non-functional needs identified at the needs analysis stage. The system successfully improves store operational efficiency through several key features such as real-time inventory management, faster order processing, and order tracking capabilities by customers.

Improved Operational Efficiency
The new system allows Toko Jaya Bersama to manage inventory more accurately and efficiently. Previously, this process was done manually which was prone to human error and time-consuming. With the new system, stock information is updated automatically every time there is a sales transaction, reducing the risk of stockouts and minimizing errors in inventory management.

Better Customer Experience
The implementation of the order tracking feature provides transparency to customers regarding the status of their orders, which increases customer trust and satisfaction. In addition, the intuitive and responsive user interface makes the online shopping process easier and more enjoyable for customers.

More In-depth Sales Analytics
Sales reports and data analysis generated by the system provide better insights to store owners for strategic decision making. Information such as sales trends, best-selling products, and peak sales times help stores in planning promotions and managing stock more effectively.

Evaluation of Successful Implementation
The successful implementation of this system can be measured by several key indicators:

User Acceptance: Store staff using the new system showed good adaptation after going through adequate training. Feedback from staff shows that they feel this system makes their work easier.
Increased Sales: Since the implementation of the system, there has been an increase in the number of online sales transactions, which shows that the new system has succeeded in attracting more customers.
Time Efficiency: The ordering process and order processing become faster and more efficient, reducing the time it takes from the moment of order to delivery.

Challenges and Solutions
During the implementation process, several challenges are identified and overcome through effective solutions:
Technology Adaptation by Staff
Some staff initially struggled to adapt to the new technology. Then, after intensive and continuous training and mentoring during the transition period, it helps staff to master the use of the system.

Data and Transaction Security, regarding the security of customer data and online transactions is quite worrying, but the implementation of strong security protocols, including data encryption, two-factor authentication, and monitoring suspicious activity, helps protect the system from security threats.

System Maintenance
System maintenance and handling of bugs found after launch. A responsive IT team and periodic monitoring system help in quickly identifying and fixing problems, as well as ensuring the system remains running properly.

Integration with Payment Systems
Difficulties in integration with secure and reliable payment gateways. Selection of trusted payment gateways and thorough testing before launch ensure that transactions run smoothly and securely.

6. Conclusion

This research aims to design and implement an online sales information system application at Toko Jaya Bersama, Padang, with the aim of improving operational efficiency and customer experience. Based on the results of research and discussions that have been carried out, several things can be concluded as follows: Improved operational efficiency, Better customer experience, deeper business insights, effective challenges and solutions, acceptance and increased sales, user acceptance of the new system is very positive, with staff who are able to adapt well and an increase in the number of online sales transactions. This shows that the online sales information system implemented has had a positive impact on Toko Jaya Bersama's business performance.

Recommendation

Based on the findings and conclusions of this study, several recommendations for further development are system maintenance continue to monitor and maintain the system to ensure optimal performance and continuous security. Feature improvements by adding new features based on user feedback to improve functionality and user experience. Continuous training by providing ongoing training for staff to keep them competent in using the system and maximise its benefits. Mobile App Development by considering mobile application development to reach more customers and provide greater ease of access.

Limitations and avenue for future research

Although this research has successfully designed and implemented an online sales information system application that brings many benefits to Toko Jaya Bersama, there are some limitations that need to be considered, namely limited functionality coverage, limited scope trials, security aspects, technology and infrastructure limitations, user adaptation and training, system maintenance and updates, budget and resource limitations.

References

Aprianto, N. E. K. (2021). Peran teknologi informasi dan komunikasi dalam bisnis. *International Journal Administration Business & Organization*, *2*(1), 8–15.

Astuti, S. R. T., Khasanah, I., & Yoestini, Y. (2020). Study of impulse buying on Instagram users in Indonesia. *Diponegoro International Journal of Business*, *3*(1), 47–54.

Fadilah, T. F., & Nasution, M. I. P. (2023). Pengelolaan Logistik Dan Pengiriman Dalam Pasar Online Dan E-Commerce. *Surplus: Jurnal Ekonomi Dan Bisnis*, *2*(1), 45–51.

Faqih, A. S., & Wahyudi, A. D. (2022). Rancang Bangun Sistem Informasi Penjualan Berbasis Web (Studi Kasus: Matchmaker). *Jurnal Teknologi Dan Sistem Informasi*, *3*(2).

Harvey, N. D., Craigon, P. J., Sommerville, R., McMillan, C., Green, M., England, G. C. W., & Asher, L. (2016). Test-retest reliability and predictive validity of a juvenile guide dog behavior test. *Journal of Veterinary Behavior*, *11*, 65–76.

Kusuma, F. K. (2021). Implementasi Manajemen Sumber Daya Manusia (Msdm) Berbasis Kompetensi Di Era Digital. *Media Bina Ilmiah*, *15*(10), 5579–5590.

Maulida, N. H. (2022). Studi literatur penerapan metoda prototype dan waterfall dalam pembuatan sebuah aplikasi atau website. *Universitas Palangkaraya*.

Nafi'ah, R. (2020). Pelanggaran Data Dan Pencurian Identitas Pada E-Commerce. *Cyber Security Dan Forensik Digital*, *3*(1), 7–13.

Pricillia, T. (2021). Perbandingan metode pengembangan perangkat lunak (waterfall, prototype, RAD). *Jurnal Bangkit Indonesia*, *10*(1), 6–12.

Rachmaniar, A., & Ningtyas, D. (2023). PENGARUH KUALITAS DESAIN IKLAN DIGITAL TERHADAP KEPUTUSAN PEMBELIAN PRODUK MAKANAN SECARA ONLINE. *Prosiding Seminar SeNTIK*, *7*(1), 246–253.

ROSMANI, A. F. (n.d.). *HYBRIDIZATION OF SIGNALING PRINCIPLE AND NIELSEN'S DESIGN GUIDELINE IN A MOBILE APPLICATION*.

Setrisman, R. (n.d.). *Rancang Bangun Sistem Informasi Penjualan dan Stok Produk Berbasis Android (Studi Kasus: Usaha Kecil Dan Menengah (UKM) Pilo Store)*. Fakultas Sains dan Teknologi UIN Syarif Hidayatullah Jakarta.

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.

Sugandini, D., Effendi, M., Istanto, Y., Arundati, R., & Rahmawati, E. (2019). *Pemasaran Digital: Adopsi Media Sosial Pada UKM*. Zahir Publishing.

Syahputri, A. N., & Anggoro, D. A. (2020). Penerapan Sistem Informasi Penjualan Dengan Platform E-Commerce Pada Perusahaan Daerah Apotek Sari Husada Demak. *SINTECH (Science and Information Technology) Journal*, *3*(1), 58–69.

Tambingon, H. N., Yadiati, W., & Kewo, C. L. (2018). Determinant factors influencing the quality of financial reporting local government in Indonesia. *International Journal of Economics and Financial Issues*, *8*(2), 262.

Uviyanti, S., Pramuka, B. A., & Putri, N. K. (2022). Faktor-Faktor Yang Mempengaruhi Niat Pembelian Pada Sistem E-Commerce Dengan Kepercayan Sebagai Pemediasi. *Journal of Public Accounting (JPA)*, *2*(1), 1–10.

Zamzami, F., Nusa, N. D., & Faiz, I. A. (2021). *Sistem Informasi Akuntansi*. Ugm Press.