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Agile-Based Development of a Web-Based Point-of-Sale System Using Scrum to Improve Operational Efficiency

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Abstract

CV Berkah Abadi is a digital printing company that predominantly operates through manual processes to complete sales transactions and track inventory. This dependence often leads to mistakes in recording data, delays in reporting, and lack of oversight of inventory levels. This study was done to find a web-based Point of Sales system that could serve as an efficiency and effectiveness tool for sales transactions, inventory control, and report generation. The development process followed Agile Development using the Scrum framework, followed by the system design using Unified Modeling Language. The system was built using PHP and JavaScript programming languages alongside Black Box Testing. According to the research findings, the proposed web-based POS technology is able to successfully track its sales transactions and inventory, automatic sales report creation, and real-time sales and inventory information processing. According to test outcomes, all major functionalities of the system meet user needs. In such way the implemented web-based POS system promotes enhanced efficiency and effectiveness of sales transaction management at CV Berkah Abadi.

Keywords: Point of Sales, Information System, Website, Scrum, Black Box Testing.

1. Introduction

Advances in information technology have had a significant impact on data management and transaction processes across various business sectors, including the digital printing industry [1]. The rapid development of technology has encouraged companies to adopt computerized systems in order to support business activities more effectively and efficiently. In the digital printing sector, information technology plays an important role in managing customer orders, recording transaction data, controlling inventory, and accelerating service processes [16]. By utilizing modern technology, companies are able to reduce manual errors, improve data accuracy, and provide better services to customers in an increasingly competitive business environment.

The use of web-based information systems can help companies improve operational effectiveness and efficiency, particularly in sales transactions, inventory management, and the generation of computerized sales reports [2]. Through a web-based system, data can be accessed more quickly and accurately, allowing management to monitor business activities in real time. In addition, the system also supports faster transaction processing, more organized storage of sales data, and easier preparation of reports needed for decision-making [17] [18]. This implementation not only increases employee productivity but also helps companies optimize business operations and improve overall service quality.

An information system is a combination of individuals, data, processes, and technologies that interact to support operational activities and decision-making within an organization [3]. The integration of these components enables organizations to manage information systematically and efficiently in accordance with business needs [19]. Human resources act as system users and managers, while data and technology function as the main elements in processing information into useful outputs [20]. Furthermore, processes within the information system ensure that every operational activity can run in a structured and coordinated manner, thereby assisting organizations in achieving their goals more effectively and efficiently.

CV Berkah Abadi is a company engaged in the digital printing industry that provides various printing services and sells related products. Based on the results of observations conducted, the sales transaction management and inventory recording processes at CV Berkah Abadi are still carried out manually. This situation causes several obstacles, such as delays in generating sales reports, the risk of data recording errors, and difficulties in controlling inventory in real-time. Manual processes also make searching for transaction data less effective because all data is still recorded conventionally.

One solution that can be implemented to address this issue is to develop a web-based Point of Sale (POS) system. The implementation of a web-based system is considered an effective approach because it enables transaction and data management processes to be carried out in a more integrated, structured, and computerized manner. In addition, web-based systems can be accessed through various devices connected to the internet, allowing companies to manage operational activities more flexibly and efficiently. The use of this

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technology can also minimize errors in manual data recording, improve the accuracy of transaction processing, and support better data management within the company.

A Point of Sale (POS) system is an information system used to facilitate sales transactions, manage inventory data, and generate sales reports in a more structured and computerized manner [4]. Through the implementation of a POS system, transaction processes can be performed more quickly, accurately, and efficiently, thereby helping to improve service quality and operational management. The system also allows companies to monitor stock availability, store transaction records securely, and generate reports automatically to support decision-making processes. Furthermore, faster and more accurate transaction services can increase customer satisfaction and improve overall business productivity in the digital era.

In this study, the system development method used is Agile Development with the Scrum approach. The Scrum method was chosen because it offers a flexible, iterative development approach capable of adapting to changing requirements throughout the system development process [5]. Additionally, Scrum helps structure the system development process through the stages of product backlog, sprint planning, daily scrum, sprint review, and sprint retrospective [6]. The system was developed using the web-based programming languages PHP and JavaScript to ensure easier accessibility and support for integrated data management [7].

Previous research on the development of web-based POS systems has shown that the implementation of sales information systems can improve operational efficiency, speed up transaction processes, enhance data accuracy, and facilitate more effective management of sales reports and inventory [8]. Therefore, this study aims to design and develop a web-based Point of Sales (POS) system for CV Berkah Abadi to facilitate sales transactions, inventory management, and the generation of sales reports more effectively and efficiently.

2. Research Method

This study employs the Agile Development method using the Scrum approach in the development process of a web-based Point of Sale (POS) system at CV Berkah Abadi. The Scrum method was chosen because it offers a flexible and iterative development approach, enabling it to adapt to changing requirements throughout the system development process [9]. The research process began with a data collection phase conducted through observation, interviews, and literature review. Observations were conducted to understand the sales transaction and inventory management processes at CV Berkah Abadi. Interviews were conducted with relevant parties to obtain information regarding system requirements, while the literature review involved studying journals, books, and previous research related to Point of Sales (POS) systems, websites, and the Scrum method.

The Scrum methodology used in this study consists of several stages: the product backlog, sprint planning, daily scrum, sprint review, and sprint retrospective [10]. The product backlog is used to define the requirements for the system to be developed. Sprint planning is conducted to determine the tasks to be completed during a single sprint. The daily scrum is used to monitor the progress of system development on a regular basis. Next, the sprint review is conducted to evaluate the results of system development, while the sprint retrospective serves as a process for evaluation and improvement for the next sprint. Next Stages of the Scrum Method on Figure 1.

Figure 1. Stages of the Scrum Method

The system was designed using the Unified Modeling Language (UML), which consists of use case diagrams, activity diagrams, sequence diagrams, and class diagrams [11]. In addition, a database and user interface were designed to serve as the foundation for the system implementation process. The system was then developed using the PHP and JavaScript programming languages with a MySQL database [12]. Next Use Case Diagram on Figure 2.

Figure 2. Use Case Diagram

The system testing phase was conducted using the Black Box Testing method to determine whether the system's main functions were operating in accordance with user requirements [13]. Testing was performed on the login feature, inventory management, sales transactions, sales reports, and store settings. The test results showed that all of the system's main features functioned properly in accordance with their intended purposes [15].

3. Result and Discussion

The result of this research is a web-based Point of Sale (POS) system designed to assist with sales transaction

management, inventory management, and sales reporting at CV Berkah Abadi. The system was developed using the Agile Development methodology with a Scrum approach [6]. It was built using the PHP and JavaScript programming languages with a MySQL database. The developed system has several key features, namely user login, dashboard, product data management, product categories, sales transactions, sales reports, and store settings.

The system implementation phase was carried out based on the system design created previously using UML and the user interface (UI) design [14]. The system implementation aims to implement all designed features so they can be used according to the needs of users at CV Berkah Abadi. The login page is used to authenticate users before they log in to the system. On this page, users are prompted to enter their username and password to gain access to the POS system. Next Login Page on Figure 3.

Figure 3. Login Page

After successfully logging in, users will be directed to the main dashboard page, which displays a summary of sales information, inventory levels, and data on best-selling products, helping users monitor data more quickly and systematically. Next Dashboard Page on Figure 4.

Figure 4. Dashboard Page

The system also provides a product data page used to manage the product data available in the store. On this page, users can add, edit, search for, and delete product data as needed, making the product management process more effective and organized. Next Product Data Page on Figure 5.

Figure 5. Product Data Page

In addition to product data, the system also offers a product category feature designed to help organize products, making data management more structured and easier for users to understand. Next Product Category Page on Figure 6.

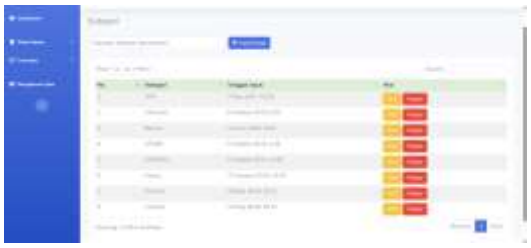

Figure 6. Product Category Page

The sales transaction feature is designed to streamline transactions by making them faster and more automated. The system automatically calculates the total transaction amount and updates inventory levels once a transaction is successfully completed. Additionally, the system supports the printing of transaction receipts as proof of payment for customers. Next Sales Transaction Page on Figutr 7.

Figure 7. Sales Transaction Page

The system also provides a sales reporting feature that allows users to view transaction data, making the reporting process more efficient than the previous manual process. Next Sales Report Page Figure 8.

Figure 8. Sales Report Page

The system testing phase was conducted using the Black Box Testing method to determine whether the system's core functions were operating in accordance with user requirements. Testing was performed on the login feature, inventory management, sales transactions, sales reports, and store settings. Next Black Box Testing on Table 1.

Table 1. Black Box Testing

No	Features Tested	Expected Results	Test Results	Status
1	System Login	The system displays the dashboard page	Successfully displayed the dashboard	Valid
2	System Login	The system displays a login error message	An error message appears	Valid
3	Product Data	Product data is stored in the database	The data has been successfully saved	Valid
4	Product Data	The product data has been successfully updated	The data has been successfully updated	Valid
5	Product Data	The product data has been deleted from the system	The data has been successfully deleted	Valid
6	Product Category	New category saved	Category data successfully added	Valid
7	Sales Transactions	Items displayed in the shopping cart	Items successfully displayed	Valid
8	Sales Transactions	Automatic total calculation system	Total successfully calculated	Valid
9	Sales Transactions	The system displays the change amount	The change is displayed accordingly	Valid
10	Sales Report	The system displays the report data	The report has been successfully displayed	Valid
11	Export Report	The system is downloading the Excel report file	The file has been successfully downloaded	Valid
12	Store Settings	Store data has been successfully updated	Data has been successfully updated	Valid
13	Profile Settings	Profile successfully updated	Data successfully updated	Valid

Based on the test results, all key features of the system function properly as intended. The system is capable of supporting sales transactions, inventory management, and report generation more effectively and efficiently than the previous manual processes. In addition, the system's simple user interface makes it easy for users to operate the web-based Point of Sale (POS) system at CV Berkah Abadi.

4. Conclusion

Based on the results of the research conducted, a web-based Point of Sale (POS) system for CV Berkah Abadi was successfully designed and developed to meet user needs. The system developed is capable of managing inventory data, sales transactions, and stock control, as well as generating sales reports more effectively and efficiently than the previous manual processes. The Agile Development method, using the Scrum approach, helped make the system development process more structured and flexible in response to changing requirements during the development process. Additionally, testing results using the Black Box Testing method showed that all the system's main features functioned properly in accordance with their intended functions and user needs. Thus, the web-based Point of Sale (POS) system developed can help improve the effectiveness and efficiency of sales transaction management at CV Berkah Abadi.

References

[1] Gerung, D. A. J. (2022). Perancangan Sistem Informasi Point of Sales Berbasis Website pada Toko Arpan Electric. *Blend Sains Jurnal Teknik*, *1*(2), 133–156. DOI: https://doi.org/10.56211/blendsains.v1i2.137 .

[2] Kartini, K. S., Anindia Putra, I. N. T., Atmaja, K. J., & Widiani, N. P. S. (2022). Sistem Informasi Penjualan pada Salad Yoo. *Jurnal Krisnadana*, *1*(2), 45–53. DOI: https://doi.org/10.58982/krisnadana.v1i2.112 .

[3] Mulyana, A., & Rusmawan, U. (2023). Rancang Bangun Sistem Informasi Point of Sale (POS) Berbasis Web (Studi Kasus Toko Andorio). *Majalah Ilmiah Unikom*, *21*(1), 43–50. DOI: https://doi.org/10.34010/miu.v21i1.10689 .

[4] Yanti, C. H., & Arnomo, S. A. (2023). Rancang Bangun Sistem Informasi Point of Sale Berbasis Web. *Computer and Science Industrial Engineering (Comasie)*, *9*(3). DOI: https://doi.org/10.33884/comasiejournal.v9i3.7669 .

[5] Mardiyati, S., Khoir Rahman, A., & Nugraha, Y. (2022). Perancangan Sistem Informasi Penjualan barang Berupa Alat Music di Toko Martmusic. *Jurnal Inovasi Informatika*, *7*(1), 86–95. DOI: https://doi.org/10.51170/jii.v7i1.214 .

[6] Rakhmah, S. N., Aulianita, R., Wijaya, G., & Septiani, M. (2023). Rancang Bangun Toko Gadget Berbasis Website Menggunakan Metode Scrum. *Informatics for Educators and Professional: Journal of Informatics*, *7*(2), 153. DOI: https://doi.org/10.51211/itbi.v8i1.2262 .

[7] Rina Noviana. (2022). Pembuatan Aplikasi Penjualan Berbasis Web Monja Store Menggunakan PHP dan MYSQL. *Jurnal Teknik dan Science*, *1*(2), 112–124. DOI: https://doi.org/10.56127/jts.v1i2.128 .

[8] Sistem Informasi Point of Sale Berbasis Web pada Dapur Caringin Tilu Bandung. (2014). *Jurnal Sistem Informasi Universitas Suryadarma*, *10*(2). DOI: https://doi.org/10.35968/jsi.v10i2.1072 .

[9] Badiwibowo Atim, S. (2024). Permodelan Sistem Informasi Penjualan Barang Berbasis Website Menggunakan Metode Agile. *Journal of Artificial Intelligence and Technology Information (JAITI)*, *2*(1), 14–25. DOI: https://doi.org/10.58602/jaiti.v2i1.104 .

[10] Warkim, W., Muslim, M. H., Harvianto, F., & Utama, S. (2020). Penerapan Metode SCRUM dalam Pengembangan Sistem Informasi Layanan Kawasan. *Jurnal Teknik Informatika dan Sistem Informasi*, *6*(2). DOI: https://doi.org/10.28932/jutisi.v6i2.2711 .

[11] Ayu Binangkit, C. A., Voutama, A., & Heryana, N. (2023). Pemanfaatan Uml (Unified Modeling Language) dalam Perencanaan Sistem Pengelolaan Sewa Alat Musik Berbasis Website. *Jati (Jurnal Mahasiswa Teknik Informatika)*, *7*(2), 1429–1436. DOI: https://doi.org/10.36040/jati.v7i2.6858 .

[12] Apandi, A., & Syalis Ibnih Melati Istini. (2023). Pembuatan Website Penjualan Toko Baju Biazra-Store Menggunakan PHP dan MYSQL. *Jurnal Teknik dan Science*, *2*(3), 80–91. DOI: https://doi.org/10.56127/jts.v2i3.998 .

[13] Agil Sakinah, F., Prima Aditiawan, F., & Lina Nurlaili, A. (2024). Pengujian pada Aplikasi Manajemen Aset Menggunakan Black Box Testing. *JATI (Jurnal Mahasiswa Teknik Informatika)*, *8*(3), 2814–2823. DOI: https://doi.org/10.36040/jati.v8i3.9524 .

[14] Ryan, M., & Prahartiwi, L. I. (2023). Analisis dan Perancangan Desain UI/UX Website Badan Penyuluhan dan Pengembangan SDM Kementerian LHK dengan Metode Design Thinking. *Ijis - Indonesian Journal on Information System*, *8*(2), 126. DOI: https://doi.org/10.36549/ijis.v8i2.283 .

[15] Yusmadi, Y., Pramudito, D. K., & Muhidin, A. (2025). Development of an Integrated Web-Based Quality Control Dashboard for Automated Sorting Data Monitoring. *Jurnal Informatika Ekonomi Bisnis*, 659–665. DOI: https://doi.org/10.37034/infeb.v7i3.1268 .

[16] Apriani, R., Haerani, R., Nugroho, P. A., & Farisi, I. (2025). Development of A Web-Based Point of Sale Application Us-Ing the Laravel Framework. *Jurteksi (Jurnal Teknologi dan Sistem*

Informasi), *11*(3), 549–556. DOI: https://doi.org/10.33330/jurteksi.v11i3.3918 .

[17] Darmanto, T., Syaepulloh, R., Rahayu, A. S., Fauzi, L. A., Nasrullah, Y. F., & Ibadurrahman, G. F. (2024). Implementation of Point of Sales at Kopi Lentera using Agile Methods and Scrum Framework. *Keynesia: International Journal of Economy and Business*, *3*(2), 141–154. DOI: https://doi.org/10.55904/keynesia.v3i2.1246 .

[18] Agunawan, A., Zakilah Ifani, A., Ircham Hidayat, A., & Asbara, N. W. (2025). Sistem POS Nobel Press Berbasis Web Menggunakan Metode Agile dengan Teknologi Progressive Web Application. *Journal of Information System Research (JOSH)*, *7*(1), 77–84. DOI: https://doi.org/10.47065/josh.v7i1.8452 .

[19] Ramadhani, I., Nindyasari, R., & Catur Murti, A. (2025). Design and Development of a Web-Based Point of Sale System for Small-Scale Retail Management. *Bit-Tech*, *8*(1), 181–189. DOI: https://doi.org/10.32877/bt.v8i1.2487 .

[20] Melvin, M., Wiratama, J., Sutomo, R., & Sanjaya, S. A. (2023). A Web-based Point of Sales for Automotive Component Industry using Rapid Application Development model. *JOINS (Journal of Information System)*, *8*(2), 167–176. DOI: https://doi.org/10.33633/joins.v8i2.9383 .