DEVELOPMENT OF A WEB-BASED SECOND-HAND GOODS SALES SYSTEM TO SUPPORT THE DIGITAL ECONOMY

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Abstract

The growth of the digital economy encourages the use of information technology in various sectors, including second-hand goods trading. However, second-hand sales are still commonly conducted through social media or direct communication, resulting in unstructured information delivery and limited marketing reach. This study aims to develop a web-based second-hand goods sales system to improve information delivery effectiveness and support the digital economy. The system was developed using the Agile Scrum method, which allows iterative and flexible development based on user needs. The system provides features for managing second-hand goods data, displaying detailed product information, and facilitating direct communication between users and sellers. The developed system is expected to improve the effectiveness of sales information delivery and potentially expand marketing reach. Therefore, this system has the potential to support the digital economy through efficient use of web-based information technology.

Keywords: Innovation, Web-Based System, Second-Hand Goods, Agile Scrum, Digital Economy, Information Technology

1. INTRODUCTION

The current advancement of information and communication technology has significantly bolstered the growth of the digital economy, particularly in electronic commerce and modern business sectors. The utilization of digital platforms has rendered the buying and selling process faster, easier, and more efficient, effectively eliminating the constraints of location and time (Ferry & Halim Wijaya, 2024). A burgeoning business trend among the public is the trade of second-hand goods items that, while no longer used by their original owners, still possess functional and economic value (Setiawan & Santoso, 2024). In the context of second-hand sales, the availability of clear and structured information is a critical factor in providing potential buyers with a comprehensive understanding of the products offered. Thus,effective information delivery plays a vital role in expanding market reach and supporting digital-based economic activities.

In practice, however, the dissemination of information regarding second-hand sales is often conducted through unorganized media. Product details are frequently displayed in isolation, lack consistency, and are difficult to manage over time. This fragmentation prevents potential buyers from obtaining complete information and hinders communication between sellers and interested parties. Furthermore, the reliance on limited media leads to suboptimal inventory data management (Putu Candra et al., 2024). A web-based information system is a fundamental component in business operations, as it enhances productivity and operational efficiency for business actors in managing data and commercial activities (Rachmat & Prasetio,

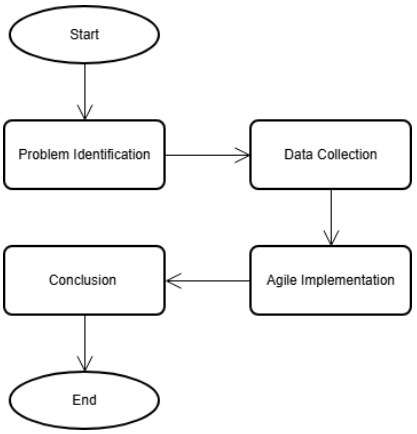
2022).

Research by Kelvin, 2025 suggests that web-based information systems are capable of addressing the challenges of second-hand trading, particularly by providing comprehensive product details and facilitating seamless interaction between users. Consequently, there is a need for a web-based information system solution that can manage and facilitate second-hand transactions in a more structured, secure, and efficient manner specifically tailored for the Surabaya region to ensure broad public accessibility. This study employs the Agile method, specifically the Scrum framework, as it allows for incremental and flexible system development, thereby facilitating requirements adjustment throughout the design process (Paisal, 2025). The developed system is expected to enhance the effectiveness of information delivery in second-hand sales and support the digital economy through the strategic utilization of information technology.

2. METHODOLOGY

This study was conducted through four main stages, beginning with problem identification, followed by data collection, the implementation of the Agile Scrum methodology, and concluding with the formulation of conclusions and recommendations. The development of the web-based second-hand goods sales system followed the Agile methodology, specifically utilizing the Scrum framework. This study outlines a set of practical actions used in managing the software development process, as shown in Figure 1.

Figure 1. Research methodology



2.1 Problem Identification

At this point, the issues that occur during the typical process of selling second-hand items were identified through initial observations. The main issues identified are the restricted market reach, insufficient clarity in product details, and the limited use of digital tools to facilitate transactions for second-hand goods. This stage is focused on identifying the system requirements that will serve as the foundation for creating a system designed to tackle these issues.

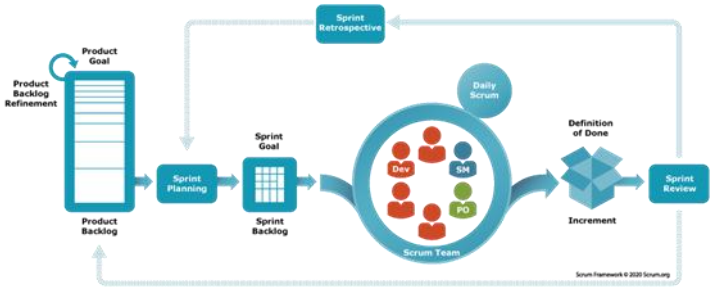
2.2 Data Collection

The data collection phase is designed to gather important information that serves as a basis for building the system. Data were gathered using various approaches, such as observing the sales of second-hand items, conducting

interviews with potential users, and reviewing literature from journals, books, and other sources that discuss web-based systems and the digital economy. The data that was gathered was then utilized to examine both the functional and non-functional needs of the system.

2.3 Agile Implementation

Figure 2. Agile Scrum Method



Source: Scrum.org

The following step is to carry out the Agile development approach by applying the Scrum framework. The implementation of the Agile Scrum methodology allows for a quicker and more flexible development process (Amirussalam et al., 2022). Several studies have demonstrated that systems built with the Agile approach can be consistently updated to adjust to changing conditions throughout each sprint or iteration (Syahputri & Nasution, 2024). In addition, Scrum acts as a supporting framework that provides a strategy for more adaptable and thorough product development, where the team collaborates as a unified group to accomplish common objectives.

2.3.1 Product Backlog

At this stage, a product backlog is compiled to identify user requirements for the secondhand goods sales system.

2.3.2 Sprint Planning

Next is to conduct sprint planning, where the data obtained from compiling the product backlog is analyzed to determine which features will be built and added to the system.

2.3.3 Daily Scrum

Daily Scrum is a daily meeting in the Agile methodology used to monitor the progress of system development and adjust the Sprint Backlog if necessary. Through this meeting, obstacles can be identified early on so that researchers can immediately take the necessary actions and avoid delays in development. In addition, Daily Scrum supports faster decision making and helps ensure that the development process remains aligned with the established Sprint Goal (Putera et al., 2022).

2.3.4 Sprint Review

Sprint Review is an activity conducted at the end of each Sprint to evaluate the work that has been completed based on the Sprint Backlog. This stage is an important stage in the Agile method (Nurmaizal et al., 2023). At this stage, researchers will present the results of the development that has been carried out, discuss problems that arose during development, and use them as material for

improvement so that the quality of the product in the next Sprint can be improved.

2.3.5 Sprint Retrospective

During the Sprint Retrospective stage, researchers assess the implementation of the Sprint by identifying things that went well and aspects that need improvement. Researchers evaluate the work processes used to improve product quality and ensure that the definition of done has been met (Magdalena, 2023).

2.4 Conclusion

The Conclusion and Recommendation stage is the final stage of the research, which contains conclusions based on the results of system development and suggestions for future system development.

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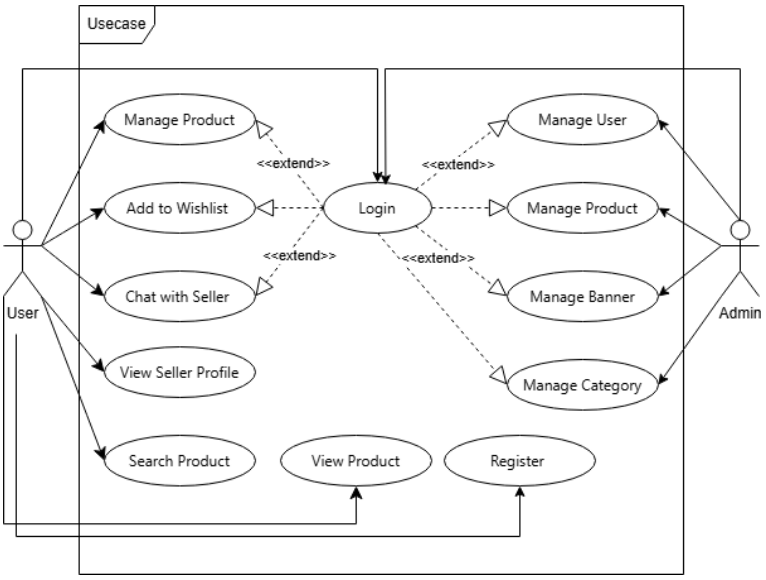
3. FINDINGS AND DISCUSSION

3.1 Use Case Diagram

Use Case Diagrams are used to illustrate the interactions and activities that can be performed by each actor in the system. The Use Case Diagram for the development of a website-based second-hand goods sales system can be seen in Figure 3. The use case diagram illustrates the functional scope of the system and the interactions between actors and system features. As shown in the figure, the system involves two actors, namely the user and the admin, each with different access rights based on their roles. Users can manage items, communicate with sellers, search for products, and access other available features, while the admin is responsible for managing user data, items, banners, and categories. This diagram helps clarify system requirements and serves as a reference during the system development process.

Figure 3. Use Case Diagram



3.2 Product Backlog

The product backlog was prepared based on the use cases designed in the previous section. This backlog serves as a reference for conducting two sprints, where each sprint lasts one week (5 working days). Priority in Table 1 indicates the business priority level assigned by the Product Owner (High, Medium, Low). The

priority level is determined by considering user/business impact, urgency, dependencies, and risk. The estimates are expressed in person-days and are arranged to match the total sprint capacity (10 working days). The product backlog is presented in Table 1.

Table 1. Product Backlog

ID	Name	Priority	Estimate
1	Login Feature	High	1 day
2	Register Feature	High	1 day
3	View Product Feature	High	1 day
4	Manage Product Feature (User)	High	2 day
5	Search Product Feature	Medium	1 day
6	Personal Message Feature	Medium	2 day
7	Manage Banner (Admin)	Low	1 day
8	Manage Category (Admin)	Low	1 day

3.3 Sprint Planning

At this stage, the product backlog is used to determine the scope of work for each sprint and to break down selected backlog items into implementable tasks. Based on the prioritized backlog in Table 1, Table 2 presents the sprint planning for Sprint 1 and Sprint 2, including the selected backlog items and the main tasks to be completed in each sprint.

Table 2. Sprint Planning

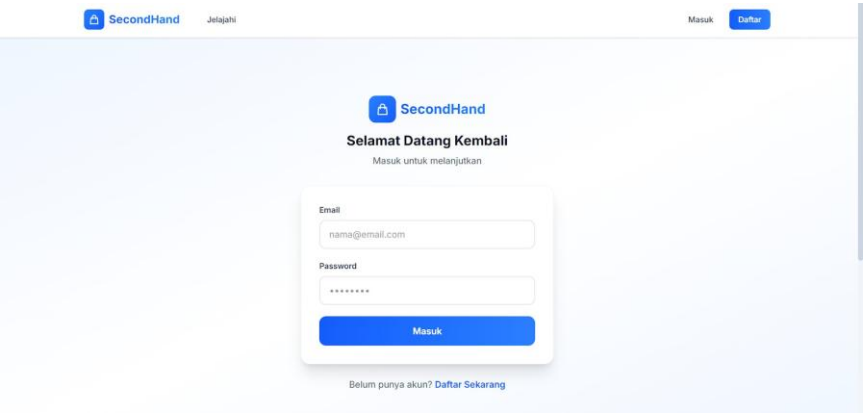
Sprint	Product Backlog
Sprint 1 (Week 1)	Login Feature
Sprint 1 (Week 1)	Register Feature
Sprint 1 (Week 1)	View Product Feature
Sprint 1 (Week 1)	Manage Product Feature (User)
Sprint 2 (Week 2)	Search Product Feature
Sprint 2 (Week 2)	Personal Message Feature
Sprint 2 (Week 2)	Manage Banner (Admin)
Sprint 2 (Week 2)	Manage Category (Admin)

3.4 System Implementation

3.4.1 Login Page

The login page functions as an authentication gateway for registered users to access the SecondHand system. Users can enter their email and password to log in to their accounts, or click the “Register Now” link if they do not yet have an account, which will redirect them to the registration page. After successfully logging in, users can access various features such as managing products, searching for items, communicating with sellers via chat, and other functionalities according to their assigned roles.

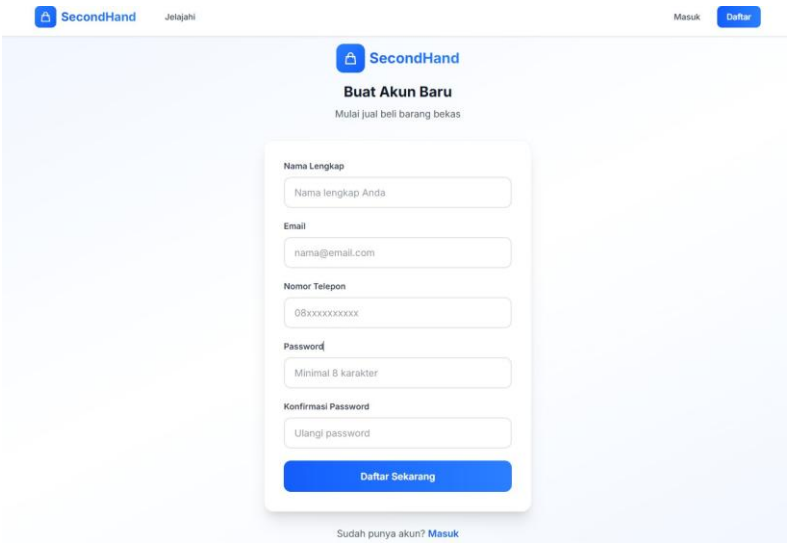
Figure 4. Login Page



3.4.2 Register Page

The registration page is used to create a new account for users who have not yet been registered in the SecondHand system. Users are required to fill out the registration form with personal information, including Full Name, Email, Phone Number, Password, and Password Confirmation, then click the “Register Now” button to create an account. After successful registration, users can log in and access system features such as buying and selling second-hand products.

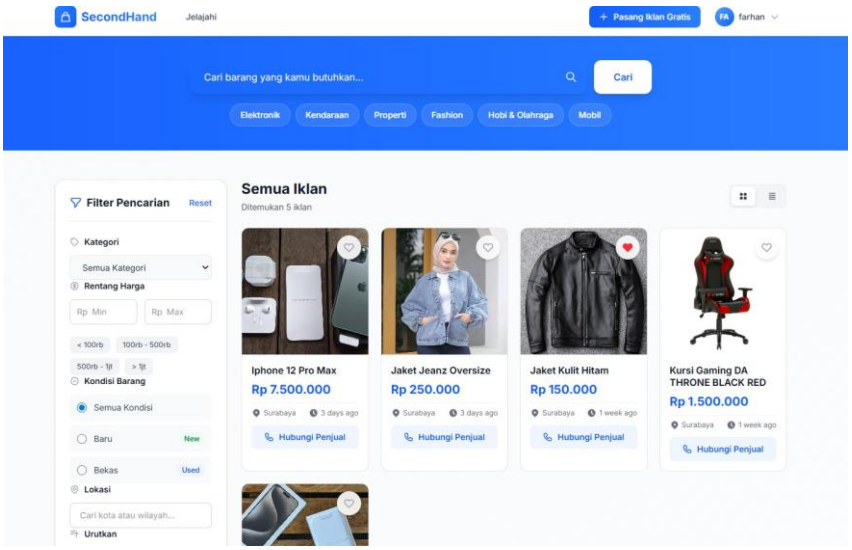
Figure 5. Register Page



3.4.3 Explore Products Page

The home page displays a list of available second-hand products for sale, along with information such as price, seller location, and posting time. Users can search for products using the search bar at the top of the page, filter items by category (Electronics, Vehicles, Hobbies, Fashion, etc.), and refine results based on price range and item condition. Users can also mark products as favorites using the heart icon and click on a product to view its complete details.

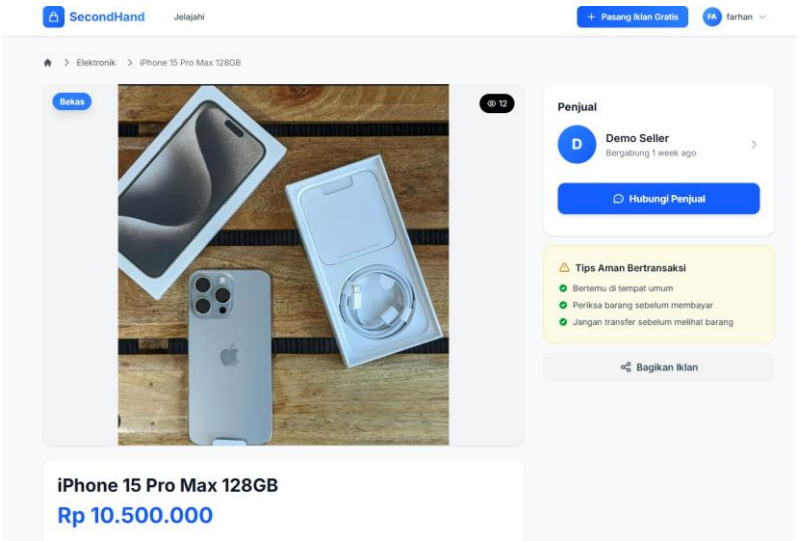
Figure 6. Explore Products Page



3.4.4 Product Details

The product detail page displays complete information about the item, including images, name, price, and seller details. Users can contact the seller through the “Contact Seller” button to initiate a transaction, share the product advertisement with others, and read the safe transaction tips provided by the system.

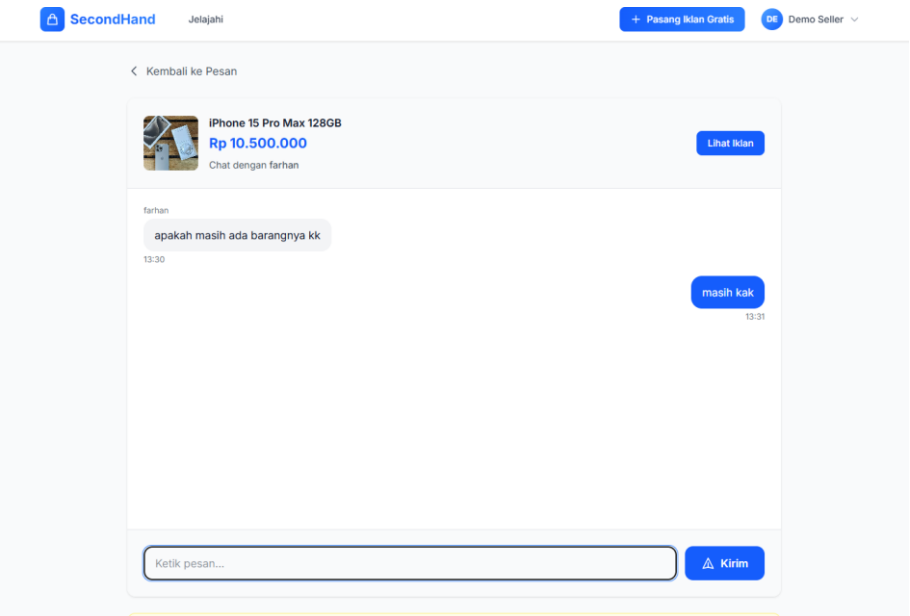
Figure 7. Product Details



3.4.5 Personal Message

The personal message page allows users to communicate directly with sellers regarding product availability and transaction details.

Figure 8. Personal Message



4. CONCLUSION

Based on the results of the study, it can be concluded that a web-based second-hand goods sales system was successfully developed using the Agile method with the Scrum framework. The system development began with the design of use cases, which served as the basis for preparing the product backlog, followed by the implementation of sprint planning in each iteration. Throughout the development process, periodic evaluations were conducted through sprint reviews and sprint retrospectives to ensure that the system aligned with the defined requirements and to support continuous improvement.

The implementation results indicate that the main system features functioned properly and supported digital promotion and ordering of second-hand goods. With the implementation of this system, the process of buying and selling second-hand goods can be carried out more easily and affordably without being limited by space and time. Therefore, the developed system is expected to contribute to supporting the digital economy through the use of web-based technology as a medium for digital transactions and information distribution.

REFERENCES

Amirussalam, E. R., Putra, W. H. N., & Purnomo, W. (2022). *Pengembangan Aplikasi e-Commerce Penjualan Tanaman Anggrek isitaman.com menggunakan Restful API*.

Ferry, G., & Halim Wijaya, A. (2024). Perancangan Marketplace untuk Second Brand dengan Metode Pengujian ISO 25010. *bit-Tech*, *7*(1), 28–36. https://doi.org/10.32877/bt.v7i1.1415

Kelvin. (2025). Rancang Bangun Aplikasi Web Jual Beli Barang Bekas untuk Mahasiswa di Lingkungan Kampus. *IKRA-ITH Informatika : Jurnal Komputer dan Informatika*, *9*(3).

Magdalena, L. (2023). *SCRUM AGILE : OPTIMALISASI KUALITAS PRODUK MANAJEMEN*. https://books.google.co.id/books/about/SCRUM_AGILE_OPTIMALISASI_KUALITAS_PRODUK.html?id=5eXMEAAAQBAJ&redir_esc=y

Nurmaizal, F. G., Setiawan, M. J., & Mulani, A. P. (2023). *Pembuatan Aplikasi Website Second Hand Menggunakan Metodologi Scrum*. *7*.

Paisal. (2025). *Implementasi SCRUM Agile Pada Rancang Bangun E-Commerce*. *8*(1).

Putera, M. I. A., Putra, M. F. W., & Putra, M. G. L. (2022). Pengembangan Sistem Informasi Laporan Penerimaan dan Pengeluaran Kas Pada PT ABC Menggunakan Metode Scrum. *Teknika*, *11*(3), 157–162. https://doi.org/10.34148/teknika.v11i3.503

Putu Candra, A., Dewi, I. G. A. A. A., Wijaya, S. V. C., Jayanti, K. S., Jati, K. G. T. M., Firdaus, R., & Mahendra, G. S. (2024). Sistem Informasi Penjualan Online Thrift Shop Berbasis Web. *Journal of Technology and Informatics (JoTI)*, *5*(2), 116–124. https://doi.org/10.37802/joti.v5i2.586

Rachmat, F. R., & Prasetio, R. T. (2022). *Perancangan Sistem Informasi Penjualan Pakaian Bekas Berbasis Web Pada Unrealhumanthrift*. *3*(1).

Setiawan, I., & Santoso. (2024). *RANCANG BANGUN APLIKASI JUAL BELI BARANG BEKAS ONLINE*. *16*(1).

Syahputri, N., & Nasution, M. I. P. (2024). *Pengembangan Aplikasi E-Commerce Pada Penjualan Produk HNI menggunakan Metode Agile*. *13*.