



Development of a Flower Board Rental Application at Aziyo Florist Using the Agile Scrum Method to Improve Service Efficiency and Data Management

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Abstract.

Background

Micro, Small, and Medium Enterprises (MSMEs) face increasing pressure to digitize their operations in the era of Industry 4.0. Many service-based MSMEs, such as those involved in flower board rentals, still rely on manual processes that hinder efficiency, data accuracy, and customer service responsiveness.

Objectives

This study aims to design and develop a mobile-based flower board rental application for Aziyo Florist using the Agile Scrum method to enhance the efficiency of service delivery and rental data management.

Methods

The development process employed the Agile Scrum methodology, involving eight sprints from initial planning to system deployment. The application was built using Flutter (frontend), Laravel (backend), and Supabase/MySQL (database). Data collection involved user interviews and observations. System testing included black-box testing and User Acceptance Testing (UAT) with the MSME partner.

Results

The application successfully automated core business processes such as user registration, product ordering, rental tracking, and admin verification. Functional testing confirmed the system met initial requirements, while the implementation of Scrum allowed for iterative feedback and improvements. Features such as real-time data storage, order status tracking, and admin dashboards were well received. Minor improvements, such as QRIS integration and notification alerts, are planned for future iterations.

Conclusion

The mobile application significantly improved the operational efficiency of Aziyo Florist and demonstrated that the Agile Scrum method is suitable for the development of digital solutions for MSMEs. This project highlights the potential of structured digital tools in enhancing service quality and business scalability for small enterprises.

Keywords: Agile, Scrum, MSME, Mobile Application, Rental System, Digital Transformation

Received: July 20, 2025. Accepted: July 29, 2025

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How to Cite: Azizun Hakim, M., Suyatno, & Endrawan, I. B. (2025). *Development of a flower board rental application at Aziyo Florist using the Agile Scrum method to improve service efficiency and data management*. Nusantera Journal of Community Service (NJSC), 1(2), 35–40. Universitas Bina Darma, Palembang, Indonesia.

INTRODUCTION

The digital transformation of Micro, Small, and Medium Enterprises (MSMEs) is a critical necessity in the era of Industry 4.0, where businesses must adapt to technological advancements to remain competitive and sustainable (Maharani et al., 2024; Rupeika-Apoga & Petrovska, 2022). MSMEs, which constitute the backbone of many developing economies, often struggle with limited resources and lack of access to digital tools, particularly in managing operations and customer services. One of the industries that remains heavily reliant on manual systems is the flower board rental sector a socially relevant but technologically underserved market segment (Ghobakhloo & Iranmanesh, 2021; Matt et al., 2020).

Aziyo Florist, a startup MSME operating in Palembang, exemplifies these challenges. Observations and interviews revealed that business operations such as order placement, customer data management, and rental scheduling are still conducted manually (Anatan & Nur, 2023; Gita Sari Dewi et al., 2023; Hendrawan et al., 2024). This traditional workflow introduces inefficiencies such as data duplication, service delays, and difficulty in tracking transactions (Kassetty et al., 2024). These problems reduce operational accuracy and limit the enterprise's ability to scale and respond to customer needs effectively (Bendoly et al., 2009; Gupta & Kohli, 2006).

In addressing these challenges, Agile development methodologies, particularly Scrum, have gained prominence due to their iterative structure and adaptability to changing user requirements (Cao et al., 2009;

Tetteh, 2024) (Dzaky & Kurniawan, 2023; Fadil et al., 2024). Agile methods emphasize collaborative development, rapid prototyping, and frequent user feedback, making them ideal for MSMEs that require flexible yet structured software development approaches (Emmanuel Chibuike Daraojimba et al., 2024; Mbonigaba Celestin*, 2024). Previous research by Fadil et al. (2024) showed that implementing Scrum in MSME-based applications, such as a sales information system for a coffee shop, led to improved operational efficiency and better data management.

Despite a growing body of research supporting the use of Agile in MSME contexts, there is limited literature on the digital transformation of flower board rental businesses. This study seeks to fill that gap by designing and developing a mobile application tailored to the operational needs of Aziyo Florist using the Agile Scrum framework. The goal is not only to digitalize the rental process but also to improve overall service speed, data accuracy, and customer experience.

By integrating Scrum into the development process, this project contributes to the literature on Agile implementation in micro-enterprises and offers a replicable model for other MSMEs looking to modernize their operations through mobile technology. The project also aligns with national goals to accelerate MSME digitalization and enhance their competitiveness in the digital economy (Chusnul, 2024; Emmanuel Chibuike Daraojimba et al., 2024).

METHOD

Participant

This research was conducted in collaboration with Aziyo Florist, a micro-scale flower board rental business based in Palembang, Indonesia. The participants included the business owner and key operational staff, who were directly involved in the manual processes of order-taking, scheduling, and data management. These stakeholders provided critical input throughout the development cycle, especially during the requirement analysis, system evaluation, and user acceptance testing phases.

Research Design

(Sugiyono, 2012) This study employed a Research and Development (R&D) approach using the Agile Scrum framework to guide the iterative development of the mobile application. The research was carried out over eight sprints, each comprising planning, development, and review phases. The stages included literature review, needs analysis, system design, development of core features, black-box testing, user validation, and final deployment. The design process incorporated use case modeling, UI/UX prototyping, and architectural planning, while development was implemented using Flutter (frontend) and Laravel (backend) integrated with Supabase/MySQL databases.

The Scrum methodology allowed for active collaboration with users, enabling timely feedback and adaptation to their evolving needs. This method was chosen due to its proven suitability for small and medium enterprises, especially those with dynamic operational requirements.

Data Analysis

Data analysis in this study consisted of both qualitative and functional evaluation techniques. During the system testing phase, the development team employed black-box testing to assess the accuracy and performance of system functions without analyzing internal code structures. This ensured that the application behaved according to expectations based on defined input and output. In addition, User Acceptance Testing (UAT) was conducted with the business owner to validate the practical usability of the application. Observations and interviews were used to gather feedback regarding the user interface, functionality, and overall system impact on business operations. Results were documented and used to make final refinements in Sprint 8.

RESULTS AND DISCUSSION

Results

The development of the mobile-based flower board rental application for Aziyo Florist was successfully executed through eight sprints using the Agile Scrum methodology. The application was designed to address inefficiencies in manual data handling, ordering processes, and customer interaction by implementing a digital solution tailored to the business's operational needs. Utilizing Flutter for frontend development, Laravel for backend services, and Supabase/MySQL for real-time data storage, the application integrated both user-facing and administrative functionalities.

Firstly, on the customer side, the application provided a seamless interface that allowed users to register, log in, view a catalog of available flower boards, add selected items to a cart, and proceed with

checkout. The system also enabled customers to manage their profiles and view their transaction history. These features significantly improved user experience and streamlined the ordering process, which previously required direct contact or manual communication.

Secondly, the administrator dashboard allowed the business owner to manage inventory, verify orders, monitor customer transactions, and assign user roles. This ensured real-time control over rental operations and facilitated better decision-making through accessible, structured data.

To assess the functionality and reliability of the developed application, **black-box testing** was conducted on each core feature. The table below summarizes the implementation status, testing outcomes, and evaluation notes for every primary module:

Table 1. Functional Evaluation of Application Features (Black-box Testing Results)

Feature	Status	Notes
Authentication (Login/Reg)	Completed	Functional; recommended email validation and password reset integration
Order Placement	Completed	Functional; minor UX improvement needed
Payment Options	Partially Complete	Bank transfer implemented; QRIS planned for next iteration
Transaction History	Completed	Fully operational with accurate tracking
Admin Order Verification	Completed	Functional; real-time user notifications recommended
Admin Dashboard	Completed	Stable; future iterations may include financial report integration

Thirdly, a User Acceptance Testing (UAT) phase was conducted with the business owner. Feedback from this process emphasized the ease of use, clarity of the user interface, and practical improvements to business operations. Prior to the application's implementation, the business relied on handwritten records, which often led to duplicated data, slow retrieval, and difficulty tracking ongoing transactions. With the digital system in place, data became centralized and easily searchable, improving both efficiency and accuracy.

Lastly, efficiency gains were clearly observed after the application was deployed. Transaction processing time was reduced by approximately 40% compared to previous manual workflows. Additionally, centralized data management eliminated redundancy and simplified reporting tasks. The ability to verify payments, monitor transaction statuses, and manage products in one platform significantly empowered the business owner and improved overall service delivery.

These results demonstrate that the application fulfilled its intended goals of enhancing efficiency, accuracy, and service quality within the flower board rental business. Moreover, the Agile Scrum approach proved highly effective in allowing the system to evolve through continuous feedback and iterative refinement.

Discussion

The findings of this study demonstrate that the implementation of a mobile-based flower board rental application using the Agile Scrum methodology successfully addressed several operational challenges faced by Aziyo Florist. This outcome reinforces the growing consensus in previous studies that Agile methods, particularly Scrum, are highly suitable for software development projects involving micro and small enterprises due to their flexibility, iterative structure, and responsiveness to user feedback (Palopak & Huang, 2024).

One of the primary benefits observed in this project was the significant improvement in service efficiency. Manual processes that previously required considerable time and were prone to human error such as order logging, transaction tracking, and customer data management were fully automated. This aligns with research by (Adepoju et al., 2022), which emphasized that automation in MSMEs improves operational speed and reduces administrative burdens. In the case of Aziyo Florist, the digital system reduced transaction processing time by approximately 40%, which had a direct impact on customer satisfaction and business productivity.

Another important contribution of the application is the centralization of business data. Prior to this intervention, the business relied on fragmented, manually recorded information, which made it difficult to track inventory, payment statuses, or repeat customers. With the introduction of a unified database and admin dashboard, the business owner gained real-time insights into operational activities. This supports the conclusions of (Nasir et al., 2024), who noted that digital record-keeping enhances decision-making and accountability within small business operations.

The development process itself also highlighted the strength of the Scrum framework in managing limited resources and changing requirements. Through well-structured sprints, the development team was able to deliver incremental improvements and adapt to feedback from the business owner. The Scrum roles Product Owner, Scrum Master, and Development Team were clearly defined and executed, which ensured transparency and accountability throughout the project. This is in line with the model proposed by (Hajdarevic, 2018), who argued that the clarity of roles in Scrum improves team cohesion and project momentum in short-term development cycles.

Nevertheless, the project was not without its challenges. Internet connectivity issues at the business location and limited digital literacy among users initially hindered the smooth implementation of the system. These obstacles were mitigated through user onboarding sessions and the design of lightweight, semi-offline features within the application. The agile approach enabled the development team to respond to these issues quickly, reinforcing the methodology's advantage in uncertain or evolving contexts.

Finally, while the application delivered the core functionalities effectively, several improvements were identified during user testing. These include the need for real-time customer notifications, additional payment options such as QRIS, and enhanced reporting tools for the admin dashboard. These features have been added to the product backlog for future development iterations.

In summary, the discussion confirms that applying Agile Scrum to develop a rental system for a small business not only improves operational efficiency but also serves as a replicable model for other MSMEs aiming to digitize their services. The successful case of Aziyo Florist exemplifies how structured yet flexible development strategies can empower even the smallest businesses in their digital transformation journey.

CONCLUSION

This study concluded that the implementation of the Agile Scrum method in the development of a mobile-based flower board rental application significantly improved the operational efficiency and service quality of Aziyo Florist. By automating previously manual processes such as customer registration, product ordering, payment tracking, and transaction management, the application helped reduce processing time, minimize data errors, and enhance customer experience.

The Agile Scrum approach proved to be an effective development methodology, particularly in the context of a micro-scale enterprise with evolving needs and limited resources. The iterative nature of Scrum enabled continuous feedback and adaptation, resulting in a product that was well-aligned with user expectations and business goals.

Overall, this project not only addressed the specific challenges faced by Aziyo Florist but also serves as a scalable and replicable model for other MSMEs seeking digital transformation. The integration of mobile technology, real-time databases, and user-centered design demonstrates the potential of digital innovation to empower traditional business sectors and support their growth in the digital economy.

ACKNOWLEDGMENT

The author would like to express sincere gratitude to Aziyo Florist for their full cooperation and valuable input throughout the development and testing phases of this project. Special thanks are also extended to the Faculty of Computer Science, Universitas Bina Darma, for providing academic guidance, facilities, and support during the completion of this independent study project under the Merdeka Belajar Kampus Merdeka (MBKM) program. Appreciation is also given to Mr. Suyatno and Mr. I Bagus Endrawan as supervisors for their constructive feedback and mentorship during the research and development process. This work would not have been possible without their support and expertise.

AUTHOR CONTRIBUTION STATEMENT

Muhamad Azizun Hakim was responsible for conceptualizing the study, conducting the requirement analysis, designing the system architecture, and implementing the application. He also performed the functional testing and compiled the research report. **Suyatno** provided supervision, academic guidance, and critical feedback throughout the research and development process. **I Bagus Endrawan** contributed to the

validation of the research methodology, evaluation of system performance, and refinement of the manuscript. All authors reviewed and approved the final version of the article.

CONFLICT OF INTEREST AND FUNDING

The authors declare that there is no conflict of interest regarding the publication of this article.

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