

Implementation of Mobile-Based Inventory Management System to Improve Stock Accuracy in SMEs

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Abstract

The SME partner faced significant issues with manual stock recording, resulting in discrepancies, delayed reporting, and input errors. This community service activity aimed to implement a mobile-based inventory management system to improve stock accuracy and operational efficiency. The methods included needs assessment, system design, cloud-based mobile deployment, training for 12 employees, and evaluation using the Stock Accuracy Rate and transaction recording time. The results showed an increase in stock accuracy from 83% to 96%, a reduction in stock discrepancies from 17% to 4%, and a decrease in recording time from 9 minutes to 3 minutes per transaction. The system enabled real-time reporting and automatic minimum stock notifications. The implementation significantly enhanced operational efficiency and data-driven decision-making.

Keywords: digital inventory, SMEs, mobile application, stock accuracy, digital transformation.

1. INTRODUCTION

Small and Medium Enterprises (SMEs) are key contributors to economic growth, employment generation, and regional development. However, many SMEs still rely on manual operational systems, particularly in inventory management. Manual recording systems often cause discrepancies between physical stock and recorded data, delayed reporting, and human errors (Nasution & Fauzi, 2023). Digital transformation has become an essential strategy for improving operational efficiency and competitiveness. Digital inventory enables real-time tracking, improved transparency, and enhanced decision-making (Putri et al., 2023). Research shows that mobile-based inventory systems significantly reduce operational errors and improve stock visibility (Le et al., 2023). The SME partner involved in this community service operates in retail distribution, employs 12 people, and manages over 500 stock items. Preliminary observations revealed stock discrepancies averaging 17% monthly and delayed reporting of up to 48 hours. This condition impacted financial reporting accuracy and customer satisfaction. Therefore, this community service activity aimed to implement a mobile-based inventory management system to: Improve stock accuracy, reduce manual recording time, enable real-time reporting, and enhance the digital literacy of employees. Digital inventory systems integrated with barcoding and cloud-based technology have been proven to improve SME resilience and operational efficiency (Revathi et al., 2024; Usuemera et al., 2024).

Therefore, this community service activity aimed to implement a mobile-based inventory management system designed to address operational inefficiencies and improve overall inventory performance within the SME partner organization. The first objective was to improve stock accuracy by minimizing discrepancies between physical stock and recorded data through real-time synchronization and automated validation features such as barcode scanning. By reducing manual input errors and enabling instant updates, the system was expected to create a more reliable inventory database that supports accurate financial and operational reporting. The second objective was to reduce manual recording time, which previously involved repetitive, time-consuming documentation processes. Through a mobile interface integrated with a cloud database, transaction entries for incoming and outgoing goods could be completed more efficiently, thereby accelerating workflow and improving employee productivity. The third objective was to enable real-time reporting by providing dashboard-based monitoring tools that allow managers to access up-to-date stock information anytime and anywhere. This feature enables faster, data-driven

decision-making. Finally, the activity aimed to enhance employees' digital literacy by providing hands-on training and continuous mentoring, ensuring sustainable adoption of digital tools and fostering a culture of technological adaptability within the organization.

2. RESEARCH METHODOLOGY

This service activity was conducted over a three-month period using a participatory and applied technology approach to ensure effective implementation and sustainable impact. The participatory approach involved active collaboration between the service team and the SME partner, including managers and operational staff, in identifying problems, designing solutions, and evaluating outcomes. This ensured that the developed system aligned with the actual needs and operational conditions of the organization. Meanwhile, the applied technology approach focused on the practical deployment of a mobile-based inventory management system integrated with cloud computing and barcode features, enabling immediate utilization and measurable improvements in daily inventory operations.

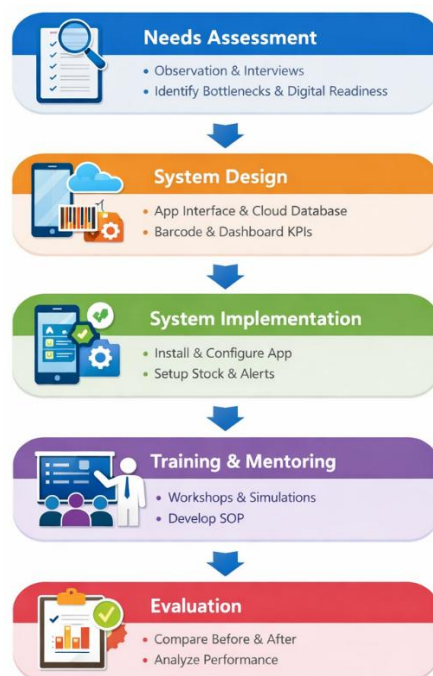


Figure 1. SME Inventory Management Improvement Workflow

The diagram illustrates a structured five-stage workflow of the community service (PkM) implementation for a mobile-based inventory management system. The process begins with a Needs Assessment, during which observations and interviews are conducted to identify operational bottlenecks and digital readiness. It then proceeds to System Design, which includes developing the mobile interface, integrating the cloud database, the barcode module, and the KPI dashboard. Next is System Implementation, involving application installation, configuration, and stock parameter setup. The fourth stage, Training & Mentoring, focuses on workshops, simulations, and SOP development to ensure sustainable adoption. Finally, the process concludes with Evaluation, where pre- and post-performance indicators are compared to measure improvements in stock accuracy and operational efficiency.

3. RESULTS AND DISCUSSION

3.1. Initial Condition Analysis

Before implementation, inventory was recorded manually in notebooks and Excel files. Problems identified included: delayed transaction entry, Lack of real-time stock monitoring, no automated minimum stock alerts, and

a High human error rate. Before implementation, the inventory system relied on manual bookkeeping and basic spreadsheets, resulting in operational inefficiencies. Transactions were often recorded late, causing discrepancies between physical and recorded stock. The absence of real-time monitoring and automated alerts increased the risk of stockouts. Additionally, frequent human errors reduced data accuracy and reliability.

3.2. Implementation Outcome

The implementation of the mobile-based inventory system resulted in significant operational improvements. Stock data became synchronized in real time, reducing discrepancies and improving accuracy. Transaction recording became faster and more efficient. Automated minimum stock alerts helped prevent stockouts, while dashboard reporting enabled better monitoring and more informed, data-driven decision-making.

Table 1. Comparison of Performance Indicators

Indicator	Before	After	Improvement
Stock Accuracy	83%	96%	+13%
Recording Time	9 min	3 min	-67%
Stock Discrepancy	17%	4%	-13%

The results demonstrate significant operational improvement. The reduction in recording time by 67% indicates enhanced efficiency. Stock accuracy improvement aligns with findings from *Zelbst et al. (2023)*, who highlighted digital transparency as a driver of operational performance.

3.3. Impact on Operational Performance

The implementation resulted in: Real-time stock monitoring, Automated reorder alerts, Faster financial reconciliation, and Increased employee digital competence. Cloud-based integration improved data accessibility across devices (*Usumerai et al., 2024*).



Figure 2. Cloud-based inventory management in action

3.4. Challenges and Mitigation

Challenges encountered: Resistance to technology adoption, Initial data migration errors, and limited internet stability. Mitigation strategies included continuous mentoring, simplified SOP documentation, and offline data backup features.



Figure 3. Technology implementation challenges and solutions

4. CONCLUSION

The implementation of a mobile-based inventory management system significantly improved stock accuracy and overall operational efficiency within the SME partner organization. Prior to implementation, inventory discrepancies were frequent due to manual recording practices, resulting in unreliable data and delayed decision-making. After deployment, measurable improvements were observed, including an increase in stock accuracy from 83% to 96%, a substantial reduction in stock discrepancies, and significantly faster transaction processing times. The integration of real-time monitoring, automated reorder alerts, and barcode validation features minimized human error and enhanced data transparency. These improvements streamlined daily inventory operations and strengthened financial reconciliation processes. Beyond operational performance, the initiative also contributed to enhancing employees' digital competence through hands-on training and continuous mentoring, fostering greater confidence and adaptability in using digital tools. The transition encouraged a culture of data-driven decision-making and technological openness within the organization. However, ensuring long-term sustainability requires periodic system evaluation, regular updates to maintain technological relevance, and gradual integration with accounting and financial modules. Continuous improvement efforts will enable the SME to further optimize inventory control, strengthen financial reporting accuracy, and maintain competitive advantage in an increasingly digital business environment.

5. ACKNOWLEDGMENTS

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