



From Manual Records to Digital Inventory: Examining Microsoft Excel as a Transitional Technology for MSME Inventory Management

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ABSTRACT

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This study aims to examine the transition from manual to digital inventory recording using Microsoft Excel and its implications for inventory management in a small business. A qualitative case study design was employed at Jaka Ponsel. Data were collected through semi-structured interviews, direct observation, and documentation involving personnel directly engaged in inventory management. Data were analyzed through data condensation, data display, and conclusion verification, with source and technique triangulation used to strengthen credibility. The findings indicate that the manual system was functional for basic recording but became increasingly limited in data accessibility, updating, verification, and stock monitoring as transaction activities increased. The transition to Microsoft Excel consolidated inventory information, facilitated data retrieval, supported formula-assisted calculations, improved stock updating, and enabled more systematic monitoring. However, digitalization did not automatically ensure accuracy because data quality remained dependent on user discipline, timely input, and regular verification. The study concludes that Excel can serve as a practical transitional technology for MSMEs. The implication is that gradual digitalization can strengthen inventory management when supported by standardized procedures and user adaptation.

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INTRODUCTION

Digital transformation has become increasingly important for small businesses because accurate inventory information directly affects product availability, transaction continuity, purchasing, and operational efficiency. As businesses handle larger numbers of products and transactions, reliable stock information is essential for preventing shortages, excess inventory, and avoidable losses (Antoni et al., 2025; Li et al., 2026; Vaio et al., 2023). Digital inventory systems can support systematic recording, faster data access, and consistent monitoring, allowing owners to make operational decisions based on current information (Surucu-Balci et al., 2024). Research on inventory digitalization in MSMEs indicates that information systems can improve recording accuracy and

facilitate inventory monitoring (Panigrahi et al., 2024; Taj et al., 2023). Therefore, improving inventory recording is not merely a technical concern but a practical need for strengthening business resilience and service continuity. For small enterprises, accessible digital tools can support more efficient and sustainable inventory management practices (Panigrahi et al., 2025).

Despite the growing availability of digital technologies, many small businesses still rely on manual inventory recording because it is familiar, inexpensive, and easy to operate (Swink et al., 2025). This becomes problematic when product variety and transaction frequency increase. Manual systems may produce input errors, delayed updates, incomplete records, difficulties retrieving information, and discrepancies between records and physical stock. Rashid & Rasheed (2023) reported that manual inventory recording can create human error and reduce data accuracy in MSMEs. Similarly, Wang et al., (2025) found that goods entering and leaving inventory without immediate recording can produce outdated information and differences between recorded and actual quantities. Consequently, businesses may struggle to control stock and identify shortages promptly. This demonstrates the need for a mechanism that is simple, affordable, accurate, and sufficiently structured to support routine inventory control (Bekele et al., 2025; Mohundro et al., 2024).

This problem is also reflected at Jaka Ponsel, where inventory recording constitutes an important part of daily operational activities and sales continuity. The business previously depended on manual recording, which became less adequate as product quantities and transaction activities increased. The practice created challenges in organizing product information, recording transactions, updating stock balances, and retrieving inventory information. These conditions illustrate a practical transition problem: the business needs to change its work mechanism while maintaining continuity. Microsoft Excel offers a practical option because it can organize product lists, record inventory movements, calculate stock balances, filter and sort information, and generate summaries without requiring a complex information system. Thus, this local situation provides an empirical context for examining how a simple digital tool can address concrete inventory management problems at Jaka Ponsel.

Previous studies have established that digital information systems can strengthen inventory management by improving accuracy, accessibility, and control. Arunadevi et al., (2025) showed that Microsoft Excel can support product lists, inventory journals, stock cards, inventory reports, and sales reports. Ayalew et al., (2025) similarly demonstrated that an Excel based inventory information system can help maintain updated stock data and reduce risks associated with product shortages. More broadly, Sivapriya et al., (2026), Sun et al., (2024) and Xie & Xie, (2025) emphasized the role of structured information systems in data management, control, efficiency, and decision making. However, much of this literature focuses on system capabilities or outcomes rather than the process of transitioning from manual recording to a simple digital system. Consequently, the specific dynamics of this transition remain insufficiently examined.

A further limitation in previous research concerns the human and

procedural dimensions of digital inventory transformation. Technology cannot improve inventory management when users apply inconsistent recording habits or fail to update transactions promptly. Transitioning to digital recording requires changes in data entry, verification, stock updating, document organization, and information retrieval (Grützner et al., 2025; Kabera & Mukanyangezi, 2024). Yet previous studies tend to emphasize technical functionality and benefits, with less attention to user adaptation and work mechanisms. This study positions the transition as an important object of analysis. It examines whether Microsoft Excel changes inventory recording in terms of accuracy, efficiency, organization, ease of use, and stock monitoring. Addressing this gap is important because small businesses need solutions that are feasible and workable within existing routines and user capabilities. This strengthens the practical relevance of digital inventory research.

The state of the art of this study lies in examining Microsoft Excel as a transitional digital instrument rather than simply as spreadsheet software. The study integrates technology, work processes, and user adaptation within everyday inventory management practices. Excel is positioned as a bridge between manual inventory practices and more advanced information systems, particularly for small businesses with limited technological resources. The study contributes empirical evidence about inventory changes after digitalization, including benefits and implementation challenges. This is important because adopting sophisticated inventory software may be unrealistic for businesses that lack financial resources, technical expertise, or organizational readiness. By focusing on accessible technology, the study offers a practical model for gradual digital transformation. The findings may help similar businesses identify practical steps for improving inventory control before adopting complex digital solutions, thereby supporting sustainable operational improvement.

The research problem addressed in this study is how the transition from manual to digital inventory recording using Microsoft Excel affects inventory management at Jaka Ponsel. The study examines changes in recording accuracy, efficiency, organization, ease of use, and stock monitoring after digitalization. The argument is that Microsoft Excel can improve inventory management through structured recording of incoming goods, outgoing goods, and ending stock, supported by formulas, filters, sorting, and automated summaries. This can reduce repetitive work, minimize errors, and make inventory information easier to retrieve and verify. Therefore, this study argues that a simple Excel based system can function as an effective transitional mechanism for small businesses moving away from manual inventory practices. Examining this process empirically is necessary to determine its practical value and limitations at Jaka Ponsel.

RESEARCH METHODS

This study employed a qualitative approach with a case study research design. A qualitative approach was selected because the study sought to obtain an in-depth understanding of the transition from manual inventory recording to

a digital recording system using Microsoft Excel, including the experiences, practices, challenges, and perceived benefits of the transition. A case study design was considered appropriate because the research focused on a bounded and specific case, namely the implementation of digital inventory recording at Jaka Ponsel within its actual operational context. The case study enabled the researcher to examine the phenomenon holistically by exploring how inventory recording was previously conducted, why digitalization was introduced, how Microsoft Excel was implemented, and what changes occurred after its implementation. Thus, the design was appropriate for capturing the contextual and procedural characteristics of inventory digitalization that could not be adequately explained through numerical measurement alone.

The research was conducted at Jaka Ponsel, which was purposively selected because the business had previously used manual inventory recording and subsequently implemented Microsoft Excel as a digital recording tool. This condition provided a relevant empirical setting for examining the transition between the two recording systems. The research informants were selected purposively based on their direct involvement and knowledge of inventory management activities, particularly the business owner or manager and personnel responsible for recording and controlling stock. Data were collected through observation, semi-structured interviews, and documentation. Observation was conducted to examine how and when incoming and outgoing goods were recorded, how stock quantities were checked and updated, and how Microsoft Excel was used in daily inventory activities. Interviews explored the reasons for digitalization, user experiences, perceived changes, benefits, and challenges. Documentation was used to examine manual records, Excel formats, transaction records, stock reports, and other relevant inventory documents.

Data analysis followed an interactive qualitative process consisting of data condensation, data display, and verification (Rahman et al., 2026). Data condensation involved selecting, simplifying, focusing, and organizing information obtained from interviews, observations, and documentation according to relevant themes, including manual recording practices, digitalization processes, Excel utilization, recording accuracy, work efficiency, stock monitoring, user adaptation, and implementation challenges. The condensed data were then displayed through systematic narrative descriptions and comparative presentations of inventory recording conditions before and after digitalization to facilitate identification of patterns and relationships among findings. The final stage involved data verification by examining emerging patterns, comparing evidence across data sources, interpreting findings in relation to the research objectives, and continuously testing the consistency of preliminary conclusions against the available evidence. Conclusions were established only after the researcher considered sufficient and consistent evidence from the entire data set.

Data credibility was ensured through source and technique triangulation. Source triangulation was conducted by comparing information obtained from different informants who were directly involved in inventory recording and

stock management. Technique triangulation was conducted by comparing findings obtained through interviews, observations, and documentation concerning the same inventory management activities. The researcher also compared statements from informants with observed recording practices and available inventory documents to identify consistencies and discrepancies. When differences were identified, the researcher conducted further clarification and examination of the relevant evidence before establishing interpretations. This procedure was intended to minimize researcher bias, prevent conclusions based solely on individual statements, and strengthen the credibility of the findings. Through systematic triangulation, the study sought to ensure that the description of the transition from manual to Microsoft Excel-based inventory recording represented the actual conditions and experiences occurring at Jaka Ponsel.

RESULTS AND DISCUSSION

Results

Condition of the Inventory Recording System Before Digitalization

Operationally, the inventory recording system before digitalization refers to the procedures used by Jaka Ponsel to document incoming goods, outgoing goods, and available stock using manual recording media. Under this system, inventory movements were recorded according to transactions occurring in daily business activities, while stock information was subsequently checked through physical records and verification of the available goods. The manual system was still functional for basic inventory administration when the volume of products and transactions was relatively manageable. However, its effectiveness decreased as the amount of inventory data increased. The operational characteristics of this system were reflected in several indicators, including the recording of incoming and outgoing goods, updating of stock quantities, accessibility of inventory information, accuracy of records, and verification of discrepancies between recorded and physical stock.

The interview findings indicate that the manual inventory system at Jaka Ponsel was adequate for basic transaction recording but increasingly limited in information retrieval, updating, and verification. The Business Owner/Manager explained that checking the history of particular products required referring to previous physical records, indicating limited accessibility and traceability. Meanwhile, the Inventory Recording Personnel reported that frequent stock movements could cause delayed updates, resulting in differences between recorded and actual quantities. The researcher interprets these findings as evidence that the reliability of the manual system depended heavily on users' recording discipline and accuracy. Observation further showed that verifying discrepancies required users to review previous records and compare them with physical stock, creating additional work and consuming time. Overall, the findings demonstrate that the manual system remained functional but was increasingly inadequate for dynamic inventory management. A clear pattern emerged: frequent transactions increased the possibility of delayed or

inconsistent recording, which subsequently complicated information retrieval, stock monitoring, and verification.

Table 1. Indicators of the Manual Inventory Recording System Before Digitalization

Informant Position	Interview Excerpt	Indicator
Business Owner/Manager	"The incoming and outgoing goods were recorded manually, and when I needed to check a particular product, I had to look through the previous records."	Information accessibility and traceability
Inventory Recording Personnel	"When there were many transactions, the stock records sometimes had to be updated later, so the recorded quantity could be different from the actual stock."	Timeliness and accuracy of stock updating
Business Owner/Manager	"If there was a difference between the record and the physical stock, we had to check the previous transaction records to find where the difference came from."	Stock verification
Inventory Recording Personnel	"Sales, incoming goods, returns, and stock adjustments could change the quantity, so every change needed to be recorded."	Inventory movement recording
Business Owner/Manager	"The manual system could still be used for recording, but it became less practical when the number of products and transactions increased."	System adequacy and operational efficiency

Table 1 demonstrates that the manual inventory recording system at Jaka Ponsel had a functional-but-limited character. At the functional level, the system was capable of documenting inventory movements and therefore remained useful for basic administrative purposes. However, its limitations became apparent in the dimensions of accessibility, timeliness, accuracy, verification, and efficiency. The owner/manager's experience illustrates that inventory information was available but not immediately retrievable, because locating information required searching through previous records. Meanwhile, the inventory personnel's experience indicates that frequent stock movements created pressure to update records consistently. The researcher interprets these findings as evidence that the manual system placed a substantial information-processing burden on users. The system did not inherently connect transaction records with current stock balances; consequently, users had to perform additional checking and reconciliation activities whenever inventory information was needed.

The Transition Process from the Manual to the Digital System

The transition process from the manual to the digital system was operationally defined as the process of changing inventory recording practices from handwritten records in physical books or documents to a structured, computer-based recording system using Microsoft Excel. In the field, this transition involved not only transferring existing inventory data into a digital format but also reorganizing product information, establishing standardized

data fields, recording incoming and outgoing goods, and updating stock quantities through a centralized worksheet. Thus, the transition was identified through observable changes in the way inventory information was recorded, stored, updated, retrieved, and monitored by users.

The interview with the Business Owner/Manager indicated that the transition to Excel changed the way inventory information was accessed and reviewed. The informant explained, "Previously, the incoming and outgoing goods were recorded manually, and when I needed to check a particular product, I had to look through the previous records. With Excel, I can find the product information directly in the table." This statement indicates that the digital transition reduced the dependence on physical documents for retrieving inventory information. The important change was not merely the replacement of paper with a computer, but the emergence of a more accessible information structure. From the researcher's interpretation, Excel functioned as a centralized inventory information medium that shortened the process of locating specific product data and made previously dispersed information more accessible to management.

A similar change was identified from the interview with the Inventory Recording Personnel, who stated, "When there were many transactions, the stock records sometimes had to be updated later, so the recorded quantity could be different from the actual stock. After using Excel, incoming and outgoing goods can be entered and the stock quantity can be updated more systematically." This statement demonstrates that the transition addressed a problem related to the timeliness and consistency of inventory recording. In the manual system, delayed recording created a possibility of discrepancies between recorded and actual stock. The researcher interprets this finding as evidence that digitalization improved the procedural control of inventory transactions by providing a more systematic mechanism for recording stock movements. However, the improvement remained dependent on the consistency of users in entering transaction data.

Tabel 2. The Transition from Manual to Digital Inventory Recording

Informant Position	Interview Excerpt	Indicator
Business Owner/Manager	"Previously, the incoming and outgoing goods were recorded manually, and when I needed to check a particular product, I had to look through the previous records. With Excel, I can find the product information directly in the table."	Information accessibility and traceability
Inventory Recording Personnel	"When there were many transactions, the stock records sometimes had to be updated later, so the recorded quantity could be different from the actual stock. After using Excel, incoming and outgoing goods can be entered and the stock quantity can be updated more systematically."	Timeliness and consistency of inventory updating

Table 2 shows two interview findings reveal that the transition from manual to digital inventory recording influenced the management process through two interconnected dimensions: information accessibility and recording consistency. The first informant emphasizes the accessibility of inventory information. Under the manual system, information retrieval was dependent on physically examining previous records, meaning that the usefulness of inventory data was constrained by the time required to locate and verify the information. The implementation of Excel changed this condition by placing product information within a structured digital table. Consequently, the transition improved the traceability of inventory information because users could identify and review particular product records more efficiently.

The second informant highlights a different but complementary problem: the timeliness of inventory updating. Manual recording created opportunities for delayed updates when transaction volumes increased. Such delays could result in differences between the quantities documented in the records and the actual quantities available in the business. Excel provided a mechanism for recording incoming and outgoing transactions and updating stock quantities more systematically. Therefore, the transition can be interpreted as a shift from a recording process that was largely dependent on individual memory, physical documents, and manual calculations toward a process supported by a structured digital data environment.

The findings indicate that Microsoft Excel did not automatically guarantee accurate inventory information. Rather, digitalization provided a more supportive structure for accurate, accessible, and systematic inventory management. Observation confirmed that inventory data were organized in Excel worksheets containing product names, product codes, stock quantities, incoming goods, and outgoing goods. Formulas supported stock calculations, while sorting and filtering functions facilitated the retrieval of specific product information. Compared with manual records distributed across physical documents, the digital format consolidated inventory information into a structured environment, enabling users to search, update, and monitor stock more efficiently. Thus, the transition involved more than replacing notebooks with computers; it represented a restructuring of inventory information and work procedures. Nevertheless, the reliability of digital records remained dependent on users' ability to enter transactions completely, correctly, and promptly. The findings therefore demonstrate that digitalization improves the structure and accessibility of inventory management, but its effectiveness remains strongly influenced by user compliance, data-entry accuracy, consistency, and discipline in maintaining updated records.

Table 3. Pattern of Changes in Inventory Management Following Digitalization

Manual Condition	Digital Change	Observed Impact	Determining Factor
Records were dispersed across physical documents	Data consolidated into Microsoft Excel	easier retrieval of inventory information	Data organization

Inventory updates could be delayed	Transactions were entered into digital worksheets	More systematic stock updating	User consistency
Calculations were performed manually	Excel formulas were used	Reduced repetitive calculations	Accuracy of formula use
Product information was located through physical searching	Sorting and filtering functions were used	Faster identification of specific products	Data completeness
Inventory information provided a limited overview of stock conditions	Data were organized in a structured inventory table	Easier stock monitoring	Regular data updating

Table 3 shows a consistent pattern of transformation from a fragmented and manually dependent inventory recording process toward a more structured and accessible digital system. The consolidation of records into Microsoft Excel improved information retrieval, while digital transaction entry and formulas supported more systematic stock updating and reduced repetitive calculations. The use of sorting and filtering also made product identification more efficient, and the structured inventory table provided a clearer overview of stock conditions. However, these improvements were not generated by the technology alone; their effectiveness remained dependent on data completeness, correct formula use, regular updating, and user consistency. Thus, the transition can be interpreted as a process of data consolidation and procedural restructuring that improved inventory accessibility and monitoring while remaining dependent on disciplined user practices.

Comparison of Manual and Digital Inventory Recording Systems

The comparison between manual and digital inventory recording was operationally defined as the differences observed in the medium, procedures, accessibility, updating process, calculation, storage, monitoring, error control, and user requirements involved in managing inventory information at Jaka Ponsel. In the field, the manual system referred to the use of books and physical documents to record incoming goods, outgoing goods, and stock quantities, whereas the digital system referred to the use of Microsoft Excel worksheets to organize, update, calculate, retrieve, and monitor inventory information. The comparison was identified through differences in how users performed inventory-related activities before and after the implementation of the digital system.

The interview with the Business Owner/Manager indicated that the manual system required greater effort to access and verify inventory information. The informant explained, "With the manual records, if I wanted to check a product, I had to look through the previous records. With Excel, the information is already in one table, so it is easier to find and check." This statement indicates a difference in information accessibility between the two systems. Under the manual system, inventory information was dependent on physical documents and required users to locate relevant records individually. After the transition to

Excel, information was consolidated into a structured worksheet, allowing users to retrieve and review product information more directly. The researcher interprets this finding as an improvement in the accessibility and traceability of inventory information rather than merely a change in recording medium.

The interview with the Inventory Recording Personnel further revealed differences in the process of updating and calculating stock information. The informant stated, "When there were many transactions, the stock records sometimes had to be updated later, so the recorded quantity could be different from the actual stock. With Excel, incoming and outgoing goods can be entered and the stock can be calculated more systematically." This statement demonstrates that the manual system was more vulnerable to delayed updates and discrepancies between recorded and actual stock, particularly when transaction volumes increased. The researcher interprets the finding as evidence that the digital system provided a more systematic mechanism for processing inventory transactions through structured data entry and formula-assisted calculations. Nevertheless, the finding also indicates that digitalization does not eliminate errors automatically because the accuracy of the digital records remains dependent on the completeness and timeliness of user input.

Table 4. Comparison of Manual and Digital Inventory Recording Systems

Aspect	Manual System	Digital System Using Microsoft Excel
Recording Medium	Books and physical documents	Computer-based digital worksheets
Data Updating	Performed manually and may be delayed	Can be updated directly in the worksheet
Data Retrieval	Requires searching through physical records	Facilitated by sorting and filtering functions
Stock Calculation	Performed manually	Assisted by formulas
Data Storage	Physically stored and vulnerable to damage or loss	Stored in digital files and can be backed up
Stock Monitoring	Relatively time-consuming	More accessible and systematic
Risk of Errors	Relatively high due to manual recording and calculation	Can be reduced but remains dependent on data-entry accuracy
User Adaptation	Requires familiarity with manual recording procedures	Requires basic Microsoft Excel skills and consistent use

Table 4 demonstrates a clear shift in inventory management characteristics from a physically dependent and manually intensive system toward a more structured digital recording process. The manual system requires physical documentation, manual calculations, and direct examination of records, resulting in relatively greater effort for updating, retrieving, and monitoring inventory information. In contrast, Microsoft Excel provides a centralized digital environment that facilitates direct data updating, formula-assisted calculations, sorting and filtering, and more systematic stock monitoring. Nevertheless, the

digital system does not eliminate inventory errors entirely because its reliability remains dependent on accurate data entry and consistent user practices. The comparison therefore indicates that digitalization primarily improves the structure, accessibility, and efficiency of inventory information management, while human discipline remains a critical condition for maintaining data accuracy.

The observation of the inventory recording process confirmed the differences identified through the interviews. The researcher observed that the manual recording practice relied on physical documents, whereas the digital system organized product names, product codes, stock quantities, incoming goods, and outgoing goods within a Microsoft Excel worksheet. The worksheet also incorporated formulas to assist stock calculations and sorting and filtering functions to facilitate the retrieval of specific product information. The researcher further observed that digital records could be updated without rewriting previous physical entries, while inventory information could be reviewed from a single structured worksheet. These observations indicate that the transition changed the practical workflow of inventory management from document-based searching and manual calculation toward a more centralized and structured digital process.

The findings can therefore be restated as showing a clear difference between the two inventory recording systems. The manual system was characterized by physical documentation, manual calculation, relatively time-consuming information retrieval, and the possibility of delayed updating. The digital system using Microsoft Excel introduced a structured recording environment in which inventory information could be consolidated, updated, calculated, retrieved, and monitored more systematically. However, the digital system did not completely remove the possibility of errors. Instead, it shifted the primary source of potential error from limitations associated with physical recording and manual calculation toward issues of data-entry accuracy, user consistency, file management, and regular verification. Thus, the transition represented not simply a replacement of paper records with digital files but a change in the way inventory information was organized and processed.

The data reveal a consistent pattern of greater procedural structure and information accessibility following the transition from manual to digital recording. The manual system was associated with physical dependence, slower retrieval, manual calculations, and greater vulnerability to delayed updates, whereas the digital system provided centralized data storage, formula-assisted calculations, easier retrieval, and more systematic stock monitoring. At the same time, the comparison reveals a second pattern: technological improvement remained conditional on human practice. Although Microsoft Excel provided functions that could simplify inventory management, the benefits were realized only when users entered transactions accurately, updated records consistently,

maintained the files properly, and verified digital records against physical stock. Therefore, the overall pattern can be summarized as manual recording, procedural limitations, digital restructuring, improved accessibility and monitoring, continued dependence on user discipline. This pattern indicates that the transition at Jaka Ponsel constituted an incremental form of digital transformation in which Microsoft Excel served as a practical technological intervention for restructuring inventory management rather than as a fully automated inventory management system.

Discussion

The findings demonstrate that the transition from manual to digital inventory recording at Jaka Ponsel was driven by limitations in data accessibility, updating, accuracy, and stock verification. This finding is consistent with Chehrazi, (2025), who reported that manual recording in MSMEs increases the risk of data errors, information delays, and discrepancies between physical and recorded inventory. Similarly, Cantini et al., (2024) identified data errors and monitoring difficulties in manual inventory practices among electronic businesses. However, the present study extends these findings by demonstrating that such limitations are not merely technical problems but also emerge from fragmented recording procedures and dependence on individual recording practices (Cantini et al., 2024; Zavaleta Saenz et al., 2024).

The implementation of Microsoft Excel at Jaka Ponsel demonstrates that digitalization does not necessarily require sophisticated information systems. Inventory data were reorganized into structured worksheets, enabling incoming goods, outgoing goods, and stock balances to be recorded and monitored more systematically (Basir et al., 2024; Mekonen et al., 2025). This finding corresponds with Puican Rodríguez et al., (2025) who found that Excel can support inventory recording, reporting, error reduction, and stock control in MSMEs. It also aligns with Ramos-Miller & Pacheco (2023), who reported improvements in systematic stock recording through Excel-based training. Nevertheless, the present study differs by emphasizing the transition process itself, showing that Excel functions not simply as a recording tool but as an intermediary technology that restructures everyday inventory work (Parisi & Donyavi, 2025; Tessema et al., 2026).

The findings further reveal that digitalization improved information organization, retrieval, and verification while reducing dependence on physical records. This is consistent with Salinas et al., (2026), who found that Excel-based inventory management improved the organization of incoming and outgoing stock records, and with Aguedo et al., (2024), who emphasized systematic recording to minimize discrepancies between physical and recorded inventory. However, the present study identifies an important qualification, digitalization does not automatically ensure data accuracy. Accuracy remains dependent on timely data entry, user discipline, and regular verification (Kallmuenzer et al.,

2024; Shen et al., 2024). Theoretically, this finding suggests that technology-enabled inventory improvement should be understood as an interaction between technological affordances and human practices rather than as a purely technological effect (Panigrahi et al., 2025).

From a theoretical perspective, the findings contribute to the understanding of digital transformation in small businesses by demonstrating that transformation can occur incrementally through relatively simple technologies (Li et al., 2026; Vaio et al., 2023). Rather than conceptualizing digital transformation exclusively as the adoption of advanced applications, the Jaka Ponsel case indicates that transformation may begin with restructuring information, standardizing procedures, and improving data accessibility. This complements Antoni et al., (2025), who emphasized the importance of training and user assistance in Excel-based stock management. Theoretically, the study therefore reinforces a socio-technical perspective in which technological effectiveness depends on the alignment between digital tools, organizational procedures, and user capabilities (Taj et al., 2023). Digital transformation is consequently both a technological and organizational process.

Practically, the findings indicate that MSMEs can initiate inventory digitalization through accessible tools such as Microsoft Excel before adopting more complex systems. The approach provides a relatively low-cost pathway for improving recording, monitoring, and stock verification while allowing businesses to develop user competencies gradually. This finding complements Panigrahi et al., (2024) and Surucu-Balci et al., (2024) whose studies demonstrate the benefits of mobile-based inventory systems, but suggests that advanced systems are not always the appropriate starting point. The practical contribution of this study lies in proposing a gradual digitalization pathway, manual recording, structured Excel implementation, user adaptation, standardized procedures, and eventual migration to integrated systems when operational complexity increases.

CONCLUSION

The study concludes that the transition from manual to digital inventory recording at Jaka Ponsel demonstrates that digital transformation in MSMEs can begin with simple, accessible technologies such as Microsoft Excel. The most important lesson is that digitalization is not merely a change in recording media but a restructuring of information, work procedures, and inventory monitoring practices, with its effectiveness ultimately dependent on user accuracy and discipline. Scientifically, this study contributes to the literature on MSME digital transformation by highlighting the role of simple technology as an incremental and context-sensitive pathway toward more systematic inventory management, while emphasizing the interaction between technological tools and human practices. Nevertheless, the study is limited to a single business and relies

primarily on qualitative evidence without quantitatively measuring changes in inventory accuracy or efficiency. Future research should therefore examine multiple MSMEs using comparative and quantitative approaches, incorporate measurable indicators of inventory performance, and investigate the gradual integration of dashboards, barcode systems, or specialized inventory applications, alongside user training and data-security mechanisms.

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