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Understanding Digital Logistics Adoption in an Indonesian Food-Based SME: A Qualitative Exploration of Operational Efficiency and Logistics Coordination

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ABSTRACT

Digital transformation has become an essential strategy for small and medium-sized enterprises (SMEs) to improve operational performance, responsiveness, and competitiveness in the Industry 4.0 era. In food-based SMEs, logistics activities require effective coordination, accurate inventory management, and rapid information exchange to address dynamic customer demands. However, many SMEs continue to face limitations in technological readiness, financial resources, and operational infrastructure, resulting in gradual digital adoption. This study aimed to explore how digital logistics practices were adopted by an Indonesian food-based SME and how these practices contributed to operational efficiency and logistics coordination. This research employed a qualitative descriptive approach using semi-structured interviews and operational observations. Data were collected from five informants consisting of the business owner, warehouse staff, online sales administrator, distribution administrator, and inventory personnel. Thematic analysis was applied to identify patterns related to digital logistics adoption, operational efficiency, coordination processes, challenges, and future expectations. The findings revealed that the SME utilized accessible digital tools, including WhatsApp, Google Sheets, Shopee, TikTok Shop, and WhatsApp Business, to support inventory monitoring, order management, communication, and distribution activities. These digital practices improved information flow, inventory visibility, operational responsiveness, and coordination efficiency. However, challenges remained regarding budget constraints, employee adaptation, technology integration, and infrastructure readiness. This study concluded that practical digital logistics adoption could enhance SME operational performance while highlighting the need for more integrated and automated digital systems in the future.

INTRODUCTION

Digital transformation has become an important strategic approach for businesses to improve operational performance and organizational responsiveness in the Industry 4.0 era. The rapid development of digital technologies has encouraged businesses, including SMEs, to integrate digital systems into operational and logistics activities to enhance coordination, information flow, and operational efficiency (Putra & Mahendrawathi, 2024). In logistics and supply chain environments, digital transformation is increasingly associated with digital logistics practices that support inventory management, operational communication, and distribution activities (Saidane et al., 2024). Increasing supply chain complexity and dynamic

customer demands require businesses to become more responsive and operationally flexible (Panchal et al., 2024). Previous studies have further suggested that digital transformation supports operational improvement through faster coordination and improved process integration across organizational activities (Merín-Rodrígáñez et al., 2024).

Operational efficiency has become one of the primary benefits associated with digital technology adoption in logistics activities. Previous studies have indicated that digitalization improves workflow coordination, process integration, operational visibility, and information sharing, contributing to greater operational effectiveness and reduced operational risks (Rodbundith et al., 2026; Tran et al., 2026). Digital logistics practices are also associated with faster communication, reduced operational delays, enhanced inventory visibility, and simplified workflows through digital systems and logistics platforms (Abdelfattah et al., 2025). Furthermore, real-time operational systems and technologies, such as the Internet of Things (IoT) and blockchain, support faster decision-making, operational transparency, and logistics efficiency within supply chain activities (Liu et al., 2025; Neumannová & Štofková, 2026).

Beyond operational efficiency, logistics coordination has also become a critical aspect of digital technology adoption within supply chain activities. Previous studies have suggested that digital technologies support coordination through real-time data sharing, integrated information systems, and digital communication platforms (Zerrad et al., 2025). Information integration and communication systems improve synchronization between logistics and operational activities by enabling faster information exchange and more responsive coordination processes (Yang et al., 2025). Furthermore, digital systems and information and communication technology (ICT)-based communication technologies contribute to smoother coordination and enhanced operational responsiveness across logistics activities and supply chain stakeholders (Hu & Lu, 2025; Simons et al., 2024; Dehshiri, 2025).

The relevance of digital logistics practices is increasingly evident not only for large organizations but also for SMEs operating under limited operational and technological conditions. SMEs play an important role in economic growth and employment generation but often face challenges related to financial limitations, technological capabilities, and operational infrastructure (Elhusseiny & Crispim, 2023). Previous studies have indicated that digital technologies support SMEs in improving operational flexibility, communication processes, and business responsiveness despite resource constraints (Rojas-García et al., 2024). The increasing accessibility of digital platforms has also encouraged SMEs to adopt practical digital tools to support operational coordination and business activities (Anjaningrum et al., 2024).

In Indonesia, SMEs significantly contribute to national economic activities and business development across various sectors (Srimulyani et al., 2023). The growth of digital technologies and online business environments has encouraged Indonesian SMEs to gradually adopt digital platforms and operational technologies to maintain competitiveness (Nugraha et al., 2022). However, many SMEs continue to face challenges related to limited financial resources, technological readiness, and operational infrastructure, which influence the scale and complexity of digital adoption (Faiz et al., 2024). Consequently, Indonesian SMEs commonly rely on affordable and accessible digital tools, such as messaging applications, spreadsheets, social media platforms, and online marketplaces, to support operational coordination and business activities (Anjaningrum et al., 2024). Previous studies have also

indicated that accessible digital technologies enable SMEs to become more adaptive and responsive despite operating under resource limitations (Al-shami et al., 2024).

This condition is particularly relevant in food-based SMEs, where operational activities depend heavily on inventory availability, timely coordination, and responsive distribution processes. In Indonesia, SMEs account for approximately 99% of all business units, with accommodation, food, and beverage businesses representing one of the largest SME sectors (Kamar Dagang dan Industri Indonesia [KADIN], 2025). Statistics from the Ministry of Tourism indicate that food and beverage service businesses in Indonesia reached approximately 5.28 million businesses in 2024, reflecting annual growth of 8.71% compared with 2023 (Biro Data dan Sistem Informasi Kementerian Pariwisata Republik Indonesia, 2026). The rapid expansion of digital platforms, online food delivery services, and mobile commerce has encouraged food-based SMEs to adopt digital technologies to support operational activities, customer responsiveness, order management, inventory monitoring, and logistics coordination (Alfan et al., 2026). However, many SMEs continue to experience limitations related to digital literacy, technological readiness, infrastructure, and resource availability, causing operational activities to remain dependent on relatively simple digital tools (Desmaryani et al., 2024). Therefore, understanding digital logistics practices within food-based SMEs is increasingly important due to the sector's operational complexity, rapid digital growth, and strong dependence on responsive logistics activities.

Previous studies have extensively examined digital transformation and digital logistics practices within supply chain and organizational contexts (Tran et al., 2026; Abdelfattah et al., 2025). Existing research has also explored the role of digital technologies in improving operational efficiency, information integration, and logistics coordination (Rodbundith et al., 2026; Liu et al., 2025; Yang et al., 2025). However, studies on SMEs have primarily focused on technology acceptance, digital literacy, and adoption factors using quantitative approaches (Desmaryani et al., 2024; Alfan et al., 2026). Although previous research has highlighted the increasing adoption of digital platforms among Indonesian culinary SMEs (Alfan et al., 2026), limited studies have qualitatively explored how digital logistics practices are implemented within daily SME operations, particularly in food-based business environments. Therefore, this study aimed to qualitatively explore how an Indonesian food-based SME adopted digital logistics practices and how these practices contributed to operational efficiency and logistics coordination within daily business operations.

METHOD

This study employed a qualitative descriptive approach to explore the implementation of digital logistics practices within an Indonesian food-based SME. This approach was selected because it enabled the study to obtain contextual insights into operational activities, digital technology adoption, and logistics coordination within daily business processes.

The study was conducted in a selected Indonesian food-based SME that utilized digital tools to support inventory management, online sales activities, operational communication, and product distribution. The business was selected based on its operational characteristics, which involved continuous inventory movement, customer order fulfillment, and logistics coordination activities.

Data were collected through semi-structured interviews with five operational informants consisting of the business owner, warehouse staff, online sales administrator, distribution administrator, and inventory personnel. The informants were selected using purposive sampling because they were directly involved in operational and logistics activities within the business. The interviews focused on digital logistics adoption, operational efficiency, logistics coordination, operational challenges, and future expectations regarding digital technology implementation.

In addition to interviews, operational observations were conducted to examine the utilization of digital tools in daily logistics and operational activities. The study examined the use of digital communication platforms, inventory recording systems, online marketplaces, and operational coordination practices within the business environment.

To obtain operational insights regarding digital logistics practices, interviews were conducted with representatives directly involved in inventory management, online sales activities, warehouse operations, and distribution coordination. The profile of the informants involved in this study is presented in Table 1.

Table 1. Informant Profile

Informant	Position	Main Responsibility
Informant 1	Owner	Operational management and business decision-making
Informant 2	Warehouse Staff	Inventory handling and warehouse operations
Informant 3	Online Sales Admin	Customer order processing and online sales activities
Informant 4	Distribution Admin	Delivery coordination and shipment scheduling
Informant 5	Inventory PIC	Inventory monitoring and stock recording

Source: Processed by the author (2026)

The involvement of informants from different operational functions allowed the study to obtain diverse perspectives regarding digital logistics implementation and operational coordination within the business.

The collected data were analysed using thematic analysis. Interview findings were categorized into several themes related to digital logistics adoption, operational efficiency, logistics coordination, challenges of digital adoption, and future operational expectations. The analysis process aimed to identify patterns and contextual insights regarding how digital technologies support operational and logistics activities within the selected SME.

RESULTS AND DISCUSSION

This section presents the findings of the study regarding the implementation of digital logistics practices within the selected Indonesian food-based SME. The findings are based on semi-structured interviews conducted with operational informants directly involved in inventory management, online sales activities, warehouse operations, and product distribution processes.

The discussion focuses on several key themes related to digital logistics adoption, operational efficiency, logistics coordination, challenges of digital adoption, and future

expectations regarding the use of digital technologies within SME operational activities. The findings provide contextual insights into how practical and accessible digital tools are utilized to support operational performance and logistics coordination within the selected business environment.

The interview findings were categorized into several major themes related to digital logistics practices, operational efficiency, logistics coordination, operational challenges, and future expectations. A summary of the main findings is presented in Table 2.

Table 2. Summary of Thematic Findings

Theme	Key Findings
Digital Logistics Adoption	Use of affordable digital tools such as WhatsApp, Google Sheets, and marketplaces
Operational Efficiency	Faster coordination, improved inventory visibility, and operational responsiveness
Logistics Coordination	Improved communication and synchronization between operational activities
Challenges of Digital Adoption	Budget limitations, technology adaptation, and operational integration issues
Future Expectations	Need for more integrated and automated operational systems

Source: Processed by the author (2026)

The thematic findings provide an overview of how digital logistics practices are operationally implemented within the selected SME and how these practices contribute to operational coordination and efficiency.

4.1 Digital Logistics Adoption

The findings indicate that the selected SME has gradually adopted several digital tools to support operational and logistics activities. The adoption mainly involves accessible and low-cost digital platforms such as WhatsApp, Google Sheets, and online marketplaces including Shopee and TikTok Shop. These tools are primarily used for inventory monitoring, operational communication, customer order management, and delivery coordination.

Based on the interview results, the SME relies on several practical digital tools to support daily operational processes and logistics coordination activities. The primary digital tools identified during the interviews are summarized in Table 3.

Table 3. Digital Tools Used in Operational Activities

Digital Tool	Operational Function
WhatsApp	Operational communication and coordination
Google Sheets	Inventory recording and stock monitoring
Shopee	Online order management
TikTok Shop	Marketplace sales activities
WhatsApp Business	Customer communication and order confirmation

Source: Processed by the author (2026)

The findings demonstrate that the selected SME primarily relies on affordable and accessible digital technologies to support operational coordination, inventory visibility, and customer order fulfilment activities.

Findings from the Owner revealed that the business utilizes WhatsApp, Google Sheets, and marketplace platforms to support order management and operational coordination. The Owner explained that the increasing number of customer orders made manual coordination more difficult, especially during busy operational periods. Before digital tools were utilized more consistently, order coordination mainly relied on handwritten notes and personal chat records, which occasionally caused missed order information and slower response times. Similarly, the Warehouse Staff stated that shared spreadsheets and WhatsApp groups are used to coordinate incoming and outgoing products and stock availability updates. The Warehouse Staff also explained that stock monitoring was previously handled through separate written records, making stock checking more time-consuming and increasing the possibility of miscommunication between operational teams.

The Online Sales Admin highlighted that digital platform such as Shopee, TikTok Shop, and WhatsApp Business play an important role in managing customer communication and online order processing. Before integrating marketplace platforms and digital communication systems, customer orders from different channels were often handled separately, requiring repetitive manual confirmation and making payment and delivery tracking more difficult. Meanwhile, the Distribution Admin explained that delivery coordination activities are mostly conducted through WhatsApp communication and digital shipment updates. The Distribution Admin noted that shipment coordination previously depended heavily on phone calls and manual delivery notes, which sometimes delayed delivery updates during high delivery volumes. In addition, the Inventory PIC stated that inventory records are digitally updated through Google Sheets to monitor stock movement daily, allowing operational teams to access stock information more quickly compared to previous manual recording practices.

These findings indicate that the SME adopts practical and affordable digital logistics practices rather than sophisticated logistics technologies. The digital tools are mainly used to improve communication speed, operational coordination, inventory visibility, and operational responsiveness. This finding is consistent with previous studies suggesting that digital technologies and communication platforms support operational visibility, workflow coordination, and information exchange within logistics activities (Rodbundith et al., 2026; Liu et al., 2025). The findings also reflect previous research emphasizing that SMEs commonly adopt accessible digital tools such as messaging applications, spreadsheets, and marketplace platforms to support operational flexibility and coordination within resource-constrained business environments (Anjaningrum et al., 2024; Alfan et al., 2026). Furthermore, the findings suggest that digital adoption within SMEs often develops gradually from practical operational needs rather than large-scale technological transformation initiatives.

The findings also demonstrate that SMEs tend to adopt simple and financially accessible digital technologies to support operational activities. This condition aligns with previous studies highlighting that SMEs commonly rely on low-cost digital technologies to support operational efficiency, communication processes, and logistics coordination (Desmaryani et al., 2024). Furthermore, the findings indicate that accessible digital technologies help SMEs

improve operational responsiveness while maintaining flexibility within resource-constrained business environments.

4.2 Operational Efficiency

The findings demonstrate that digital logistics practices contribute positively to operational efficiency within the selected SME. The use of digital communication platforms, digital inventory recording, and online order systems has helped operational activities become faster, more organized, and easier to coordinate.

According to the Owner, digital tools have improved communication and operational coordination, making daily business activities more organized. The Owner also explained that customer requests can now be responded to more quickly compared to previous manual processes, where order information and operational updates were communicated separately through personal chats or handwritten notes. Similarly, the Warehouse Staff stated that stock checking and recording activities have become easier after the implementation of digital recording systems. The staff also mentioned that stock mismatches occur less frequently because inventory updates are digitally recorded and more easily accessed by operational teams.

The Online Sales Admin emphasized that digital systems help accelerate customer order processing and improve communication efficiency, particularly during high-demand periods. Digital marketplace platforms and messaging applications also simplify coordination between customer communication, payment confirmation, and order processing activities, reducing delays that previously occurred under manual coordination processes. Meanwhile, the Distribution Admin explained that delivery schedules have become easier to coordinate due to faster information sharing through digital communication tools. The Inventory PIC also reported that digital inventory records improve inventory visibility and reduce the need for repeated physical stock verification during routine stock checking activities.

The findings suggest that digital logistics practices support operational efficiency through improved information exchange, faster operational response, better workflow coordination, and improved inventory visibility. Real-time access to stock information also helps reduce delays caused by stock uncertainty and supports more responsive operational decision-making. The findings additionally indicate that practical digital tools help SMEs maintain operational responsiveness despite operating under limited technological and financial conditions.

These findings are consistent with previous studies discussing the role of digital technologies in improving operational efficiency and logistics responsiveness within supply chain activities. Previous research suggests that digital systems contribute to faster information exchange, improved workflow coordination, operational visibility, and process integration within logistics operations (Rodbundith et al., 2026; Liu et al., 2025). The findings also align with studies emphasizing that digital communication platforms and operational systems support businesses in improving operational synchronization and reducing operational delays (Kam et al., 2026; Abdelfattah et al., 2025). Furthermore, the findings reflect previous research highlighting that SMEs commonly rely on accessible and affordable digital technologies to improve operational flexibility, inventory management, and communication efficiency within resource-constrained business environments (Anjaningrum et al., 2024; Alfan et al., 2026).

4.3 Logistics Coordination

The findings reveal that communication and coordination play an essential role in managing logistics and operational activities within the selected SME. Since operational activities involve inventory management, online order processing, packing activities, and product distribution, continuous coordination between operational staff is necessary to maintain workflow efficiency.

The Owner explained that operational coordination is conducted through continuous communication between warehouse, inventory, sales, and distribution staff to support daily operational activities. Before digital communication tools were more consistently utilized, coordination often depended on verbal communication and manual confirmation between teams, which occasionally delayed operational responses during busy periods. Similarly, the Warehouse Staff mentioned that stock updates and packing activities are currently coordinated through WhatsApp groups, allowing operational information to be shared more quickly between operational teams. The Warehouse Staff also explained that digital communication reduces repetitive coordination processes that previously occurred when stock information had to be checked manually between divisions.

The Online Sales Admin stated that customer orders are synchronized with warehouse and inventory staff before shipment processing to minimize delays caused by stock discrepancies. Digital communication platforms also help operational teams coordinate customer orders more efficiently, particularly when handling high order volumes from multiple marketplace channels. Meanwhile, the Distribution Admin explained that delivery schedules are coordinated based on order readiness and courier availability through continuous communication with operational teams. The Distribution Admin further noted that shipment updates and delivery adjustments can now be communicated more quickly compared to previous manual coordination methods. In addition, the Inventory PIC reported that inventory updates are continuously shared with operational staff to maintain stock accuracy and support operational decision-making.

The findings indicate that digital communication tools improve logistics coordination by accelerating information exchange, simplifying workflow coordination, and reducing operational delays within daily logistics activities. WhatsApp groups and shared digital records allow operational staff to coordinate activities more efficiently while improving communication responsiveness between operational functions. The findings also suggest that accessible digital communication technologies support operational synchronization and coordination flexibility within resource-constrained business environments.

These findings support previous studies emphasizing the importance of digital coordination and communication systems within logistics and supply chain activities. Previous research suggests that digital platforms facilitate operational synchronization, information sharing, and coordination efficiency across logistics operations, enabling businesses to improve responsiveness and workflow integration (Kam et al., 2026; Zerrada et al., 2025). The findings also align with studies highlighting that digital communication systems and real-time information exchange support smoother operational coordination and logistics responsiveness within dynamic business activities (Hu & Lu, 2025; Simons et al., 2024). Furthermore, the findings reflect previous studies emphasizing that SMEs commonly utilize accessible digital

communication technologies to support coordination efficiency and operational flexibility within resource-constrained environments (Anjaningrum et al., 2024; Hosseini Dehshiri, 2025).

4.4 Challenges of Digital Adoption

Despite the operational benefits of digital logistics practices, the findings indicate that the selected SME still experiences several challenges in implementing digital technologies within operational activities. The challenges mainly relate to financial limitations, technological adaptation, operational integration, and human resource capabilities.

The Owner explained that budget limitations and employee familiarity with digital systems remain major challenges for the business. The Owner mentioned that implementing more advanced systems often requires additional costs for software subscriptions, upgraded devices, internet infrastructure, and employee training, which may not always align with the business's operational scale and revenue capacity. The Owner also noted that some operational staff still use older personal smartphones, limiting the use of multiple digital applications simultaneously during busy operational periods. Similarly, the Warehouse Staff stated that some operational activities still depend on manual checking processes, especially when stock movements become too frequent to be updated immediately into digital records.

The Online Sales Admin explained that marketplace platforms occasionally experience technical delays, particularly during promotional periods or high-traffic sales events, affecting operational responsiveness and order synchronization. Furthermore, the Distribution Admin reported that delivery coordination still partly depends on external logistics providers, making some shipment updates difficult to monitor in real time because courier systems are not always fully integrated with internal operational coordination. Meanwhile, the Inventory PIC stated that maintaining real-time inventory updates can become difficult during peak operational periods because operational staff simultaneously handle packing, stock checking, and shipment preparation activities. The Inventory PIC also explained that human error may still occur during stock recording activities when operational teams manage high order volumes within limited operational time.

These findings indicate that although SMEs increasingly adopt digital tools, the implementation process remains constrained by limited operational resources, technological readiness, and operational capability differences. The findings support previous studies suggesting that SMEs commonly experience challenges related to financial limitations, digital literacy, infrastructure readiness, and employee adaptation during digital transformation processes (Desmaryani et al., 2024). Previous research also highlights that operational integration and technology coordination remain important challenges in the implementation of digital systems within logistics and operational environments (Kam et al., 2026; Zerrada et al., 2025). Furthermore, the findings align with studies emphasizing that SMEs often continue to rely on partially manual operational processes despite increasing digital adoption due to resource limitations and operational flexibility considerations (Anjaningrum et al., 2024; Alfan et al., 2026).

4.5 Future Expectations

The findings indicate that all informants believe digital logistics practices will become increasingly important for SMEs in the future as online business activities and customer expectations continue to grow. Increasing operational complexity and faster customer response expectations encourage SMEs to improve operational responsiveness, communication efficiency, and logistics coordination through digital systems and communication platforms.

The Owner stated that SMEs will increasingly depend on digital systems to remain competitive in the future, particularly in managing operational activities and customer orders more efficiently. The Owner also expressed interest in adopting more integrated operational systems such as POS applications, barcode-based inventory systems, or centralized dashboard platforms that can automatically synchronize marketplace orders, inventory updates, and sales reports. Similarly, the Warehouse Staff explained that digital systems help operational activities become more organized and easier to monitor, while also expressing expectations for simpler stock scanning systems using barcode scanners or tablet-based inventory checking to reduce repetitive manual stock recording activities. The Online Sales Admin also emphasized that the growth of online business activities and marketplace transactions will increase the need for faster digital coordination and more responsive communication between operational teams, particularly through integrated marketplace management applications that can combine Shopee, TikTok Shop, and WhatsApp Business activities within a single operational platform.

Meanwhile, the Distribution Admin stated that delivery activities will require faster and more integrated coordination systems as shipment volumes continue to increase. The Distribution Admin also expected better synchronization between courier tracking systems, Google Maps navigation, and operational communication platforms to improve delivery monitoring and shipment coordination. The Inventory PIC additionally highlighted the importance of more systematic and partially automated inventory monitoring processes, such as real-time stock notification systems or cloud-based inventory applications accessible through mobile devices. The informants also expressed expectations for improved operational infrastructure, including more stable internet connections, updated smartphones or tablets for operational staff, and integrated operational platforms that can simplify workflows and reduce coordination delays within daily business activities.

These findings suggest that SMEs increasingly recognize the strategic importance of digital logistics practices in supporting future operational sustainability, operational responsiveness, and business competitiveness. The findings align with previous studies emphasizing that digital technologies and digital coordination systems are becoming increasingly important in supporting operational integration, communication efficiency, and supply chain responsiveness within SME environments (Kam et al., 2026; Tran et al., 2026). Furthermore, the findings reflect previous research highlighting that SMEs are gradually adopting digital operational practices to improve flexibility, coordination efficiency, and operational adaptability within increasingly competitive and digitally connected business environments (Anjaningrum et al., 2024; Alfan et al., 2026).

CONCLUSION

This study explored how an Indonesian food-based SME adopted digital logistics practices and how these practices contributed to operational efficiency and logistics

coordination within daily business operations. The findings indicated that the SME adopted practical and accessible digital tools, such as WhatsApp, Google Sheets, Shopee, TikTok Shop, and WhatsApp Business, to support inventory monitoring, operational communication, order management, and distribution coordination. The implementation of these tools contributed to faster information exchange, improved inventory visibility, more responsive coordination, and reduced operational delays compared with previous manual processes. However, the findings also revealed that digital adoption within SMEs remained gradual and constrained by financial limitations, technological readiness, infrastructure conditions, and employee adaptation challenges. Despite these limitations, SMEs continued to develop practical digital operational practices and expressed expectations for more integrated and automated coordination systems in the future.

Overall, this study contributed qualitative and contextual insights into how digital logistics practices were implemented within Indonesian food-based SMEs. Future studies are recommended to involve SMEs from different sectors and business scales to provide broader comparative insights into digital logistics adoption within emerging economy contexts.

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