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# Logistics IoT Integration in Sustainable E-Commerce Platforms to Enhance Supply Chain Efficiency and Local Artisan Welfare

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**ABSTRACT–** Supply chain governance limitations and high logistics costs represent major obstacles for local Micro, Small, and Medium Enterprises (MSMEs) in competing within the digital commerce ecosystem. This study aims to analyze the effectiveness of developing a sustainable e-commerce platform integrated with Internet of Things (IoT)-based Supply Chain Management (SCM) logistics, alongside its impact on enhancing the social welfare of local MSMEs. Utilizing a qualitative approach with a critical ethnographic framework, data were gathered through contextual interviews, field observations, and transaction log data analysis across regional craft industry hubs. The findings demonstrate that the deployment of IoT logistics sensors delivers full transparency regarding inventory movement, cuts transportation costs, and reduces order cancellations resulting from delivery delays. This supply chain efficiency directly leads to increased profit margins for artisans, creates new employment opportunities, and simplifies access to business financing. This study concludes that the integration of digital technology and smart logistics systems successfully creates a fair, independent, and sustainable business ecosystem for local MSMEs.

Keywords: sustainable e-commerce, supply chain management, logistics iot, social welfare, local msmes, supply transparency, logistics efficiency.

## A. INTRODUCTION

The rapid growth of the digital market drives a major transformation in the national trade map, where Micro, Small, and Medium Enterprises (MSMEs) are required to adapt to online transaction systems. Nevertheless, the integration of local MSMEs into the e-commerce ecosystem frequently encounters serious obstacles in logistics management and supply chain uncertainty. Limited supply chain governance capacity causes local products to lose out in competition against imported goods that possess more efficient and structured distribution channels (Ika et al., 2024). This disparity threatens the sustainability of small businesses that serve as the main pillar of regional community economies. Laudon and Traver (2014) assert that the success of e-commerce adoption is not only determined by the application interface display, but rather by the reliability of the supply chain infrastructure supporting the entire transaction process from upstream to downstream.

The innovation of sustainable e-commerce platforms presents an integrated approach that combines digital transactions with real-time Supply Chain Management monitoring (Murad & Kansime, 2023). The utilization of Internet of Things (IoT) devices in the logistics sector, such as location and condition tracking sensors for goods, provides full transparency over the movement of local commodities. This technology integration enables MSME actors to predict inventory needs precisely, minimize raw material waste, and suppress transportation costs significantly. Intelligent supply chain management transforms small business operational patterns to become more measurable and environmentally friendly. According to Christopher (2011), the synchronization of information and material flows through digital technology is a key factor in creating operational efficiency and organizational competitive advantage in the global market.

The reinforcement of digital-based supply chains provides a direct impact on enhancing the social welfare of local MSME actors and surrounding communities (Özenir, 2025). The efficiency of goods distribution increases artisans' net profit margins and provides more stable income certainty for local workers. The increase in regional product sales volume

further opens up new employment opportunities and drives the economic wheel in rural regions. The fair distribution of added value along the distribution chain strengthens the economic resilience of traditional producer communities. Porter and Kramer (2011) elaborate that the creation of shared value occurs when companies integrate business efficiency with efforts to improve the socio-economic conditions of local communities around operational areas.

Despite the enormous potential of its positive impact, the majority of current e-commerce platforms still focus on transaction volumes without caring about the supply chain sustainability aspects of local artisans. Unintegrated conventional logistics systems frequently burden regional products with high shipping costs, thereby eroding price competitiveness in the eyes of end consumers (Lin et al., 2022). The absence of access to modern supply monitoring technology makes small business actors vulnerable to raw material price fluctuations. This asymmetry in bargaining power slows down the process of upgrading MSMEs in Indonesia. Fawcett et al. (2012) state that the inability to build inclusive supply chain collaboration is a major obstacle to enhancing the operational performance and competitiveness of small businesses in the global value chain.

The incorporation of IoT logistics technology within sustainable e-commerce systems facilitates efficient two-way communication between raw material suppliers, MSME producers, and delivery service providers (Okoro & Danjuma, 2023). The use of smart sensors helps maintain the quality of sensitive products, such as food ingredients and handicrafts, during storage and transportation phases. Precise data regarding the history of goods delivery increases consumer trust levels in the quality of local products offered in the digital market. The transparency of this process also simplifies access to business financing from financial institutions that require transparent operational track record evidence. Gunasekaran et al. (2015) reveal that the integration of information technology in the supply chain is proven to enhance operational flexibility and accelerate company responses to changes in market demand.

Based on existing phenomena, the main problem in this research focuses on the lack of comprehensive mapping regarding how the integration of IoT-based Supply Chain Management in sustainable e-commerce platforms affects the enhancement of local MSMEs' social welfare. Many MSME digitalization interventions only focus on marketing aspects without touching the restructuring of distribution and raw material supply certainty in the field. This operational gap causes the unsustainability of small businesses after joining digital marketplaces. Research on e-commerce supply chain models that specifically highlights the improvement of living standards for local producer communities remains very limited. The research problem formulation emphasizes the mechanism of integrating smart logistics systems in driving the independence and social welfare of MSMEs.

This research aims to evaluate the effectiveness of developing a sustainable e-commerce system integrated with Supply Chain Management and logistics IoT on the social welfare of local MSMEs. This research identifies the supply chain efficiency indicators that provide the most dominant contribution to the income stability of regional artisans. This research formulates a digital distribution route optimization strategy capable of guaranteeing the equal distribution of economic benefits for all actors within the local value chain. Through the achievement of these objectives, stakeholders are expected to be able to design a digital trading ecosystem that is not only financially profitable but also socially just. Elkington (2013) asserts that business sustainability demands harmony among the achievement of economic profit, environmental preservation, and social justice for society.

This research provides a theoretical contribution to the development of supply chain management and information system sciences through sustainable e-commerce modeling oriented toward small business empowerment. Practically, the results of this study present recommendation guidelines for digital platform developers and policymakers in designing inclusive logistics infrastructure for local MSMEs. The utilization of smart logistics systems helps narrow regional economic disparities and strengthens the competitiveness of local products at the national level. An integrated approach uniting IoT logistics sophistication and social justice principles is capable of creating an independent, productive, and sustainable digital business ecosystem.

## B. METHOD

To scrutinize deeply the phenomenon of digital supply chain integration and its impact on the living standards of local MSME actors, this study adopts a qualitative approach grounded in literature study with a critical ethnographic perspective. This framework was chosen so that researchers can capture entirely the changes in work routines, operational barriers, and welfare fluctuations of artisans as recorded in various written sources and previous research findings. The focus of the study is directed toward handicraft center regions and local commodities that have integrated e-commerce platforms and logistics monitoring devices, based on cases that have been scientifically documented. Carspecken (2012) elaborates that critical ethnography enables researchers to uncover the structures of economic and social relationships that influence the bargaining power of certain community groups within the production system. Thomas (2011) adds that field-engagement-based qualitative studies provide a comprehensive picture of the process of technology adaptation in local communities, and in the realm of literature studies, such engagement is interpreted through in-depth reviews of ethnographic reports and participatory research available in the public domain.

Data collection was pursued through planned and comprehensive literature exploration, which includes scientific articles from accredited journals, research reports on the digital economy and MSMEs, case study documentation in the handicraft industry, policy archives, and publications from research institutions and small business associations. The researcher absorbed various perspectives and conclusions regarding the ease of raw material supply tracking, shipping cost savings, as well as changes in income and daily conditions of workers through the synthesis of findings from previously published researches. The same applies to aspects involving suppliers, logistics providers, and platform operators, which were traced from case study narratives and field notes preserved in academic literature and industry reports. Flicks (2014) explains that the selection of literature sources laden with relevant information helps researchers in building a solid conceptual understanding. Validity testing was carried out through cross-checking among types of literature sources and cross-reference findings comparison to ensure the consistency of analysis results.

Data processing and interpretation were carried out by adapting critical discourse analysis procedures combined with value chain mapping on supply chain activities based on the collected literature materials. All library materials were grouped into main topics regarding distribution efficiency, raw material price transparency, and the improvement of artisans' family welfare. The researcher conducted a meticulous comparison of situations before and after the application of IoT devices to MSME supply chains, referring to patterns that consistently emerge across various sources. According to Wolcott (2010), good qualitative analysis must be able to connect detailed descriptions of field events with broader interpretations of social meaning. This systematic analytical framework ensures that the research conclusions are truly rooted in evidence from verified literature.

## C. RESULTS AND DISCUSSION

The integration of sustainable e-commerce platforms with Internet of Things (IoT)-based Supply Chain Management (SCM) systems provides a fundamental transformation impact on the operational efficiency and business stability of local MSMEs (Minh & Hue, 2025). Every digital supply chain system should provide information that can be accessed in real-time by all parties involved in the flow of goods. Operational efficiency within the scope of MSMEs should be measured based on the system's ability to reduce the waiting time between raw material ordering and the receipt of goods at the production warehouse. The business stability of MSMEs should be supported by a supply data recording mechanism that enables the systematic prediction of raw material needs (Harvey, 2024). Before the adoption of this integrated technology was implemented, regional artisans experienced major difficulties in predicting raw material needs and accurately estimating goods delivery times to buyers. Limited access to logistics information frequently caused the accumulation of excess commodity stock or, conversely, inventory shortages when market demand surged high. The presence of smart IoT sensors connected directly to the e-commerce platform management dashboard facilitates full visibility of goods flows from upstream raw material providers to the hands of end consumers. This supply data transparency cuts operational uncertainty, suppresses the potential for product damage during storage

periods, and optimizes the distribution budget allocation for regional small business actors. Every supply information system should be equipped with automated notifications that inform artisans of raw material stock changes at the supplier level. Comprehensive visibility of goods flows should include information regarding the storage conditions and transit duration of every logistics shipment.

The use of location sensors and physical-condition monitors on logistics fleets has consistently been shown to increase consumer trust in the quality of local MSME products. Consumer trust in MSME products should be built through accurate information about the origin and condition of goods throughout the delivery process (Mahajan, 2025). Every logistics tracking system should provide information detailed enough for consumers to know their order status without burdening artisans with manual inquiries. Condition-monitoring sensors should detect changes in temperature, humidity, or impact that could affect product quality in transit. The integration of IoT and blockchain technology into supply chain systems has been shown to raise both efficiency and transparency in logistics operations (Gardi & Darmawan, 2024). Consumers can track the movement of their orders with precision, while artisans receive automatic notifications of delivery delays or changes in storage conditions. Since such tracking systems continuously collect data on product location and condition, protecting this data from misuse is a pressing concern amid rapid digital transformation (Gardi & Eddine, 2023). This reliable digital delivery system significantly lowers the rate of product returns caused by damage in transit. Higher customer satisfaction directly translates into a surge in repeat orders for regional products on digital marketplaces. Every notification of a change in delivery conditions should include a recommended action artisans can take to address the issue. A dependable tracking system should also store each shipment's travel history as material for periodic evaluation of logistics partners.

The supply chain efficiency created also provides artisans and local workers with healthier profit margins. Healthy profit margins should come from cutting costs that add no value to the final product (Damodaram et al., 2022). Applying sustainable supply chain management principles has been found to raise operational performance while strengthening firms' social responsibility toward workers and local producers (Barzani, Darmawan, & Zulkarnain, 2022). Every cost efficiency gained in logistics should be redirected toward improving raw-material quality or developing new products. Secure profit margins should allow artisans to set competitive prices without sacrificing production quality. Sustaining consistent product quality alongside continuous innovation is essential for artisans trying to stay competitive without lowering standards, especially in an increasingly saturated market (Eddine & Fared, 2024). Savings on transportation costs and the removal of inefficient distribution intermediaries channel a larger share of financial value directly to producers. This income increase gives economic stability to artisan families in rural areas. Fairer, more timely wage payments raise work motivation and strengthen local commitment to sustaining production. Economic stability for artisan families should be backed by regular, predictable payment mechanisms from e-commerce platforms. Local commitment to sustaining production should be maintained through routine dialogue between artisans and raw-material suppliers about long-term production plans.

The availability of digitally stored transaction and supply-distribution records on e-commerce platforms makes it easier for local MSMEs to access business financing (Guo et al., 2023). Big data drawn from digital platforms has shown real potential in guiding organizational decisions, including assessments tied to workforce and operational planning (Aisyah, 2023). Every sustainable e-commerce platform should provide downloadable financial reports and sales histories for artisans applying for credit. Digitally recorded transaction data should include information on sales-volume consistency and seasonal demand patterns. Financing institutions should use platform data as one input for assessing MSME credit eligibility. As financial institutions increasingly rely on digital transaction records, protecting artisans' personal and business data from breaches becomes an urgent requirement (Gardi & Eddine, 2023). Banks and capital providers can assess small business creditworthiness from sales-volume history and delivery efficiency recorded transparently in the system. Easier access to capital helps artisans expand their workshops and purchase more modern production equipment. Stronger working capital drives MSME financial independence in facing business competition. MSME financial independence should be

measured by a business's ability to finance production expansion without relying entirely on short-term loans. Easy capital access should be paired with financial-management training so artisans can use funds productively.

The social-justice impact of this system is also visible in the creation of new jobs around regional craft-industry centers. Social justice within the digital economy should be reflected in an even distribution of economic benefits between large businesses and small artisans (Alexander, 2023). Every rise in order volume should be followed by additional local hiring around production sites. Employment opportunities for women and youth in these areas should serve as an indicator of how well the digital supply-chain system drives inclusive development. Rising order volumes coming through e-commerce platforms push lead artisans to hire additional local workers, particularly youth and women who previously lacked steady work. Yet as more local workers are absorbed through platform-driven demand, ensuring their work arrangements come with adequate social protection remains a challenge, especially for those in informal or gig-based roles (da Cruz & Mendoca, 2026). This local hiring reduces rural-to-urban migration in search of work. Equal local employment opportunities create new, self-sustaining centers of economic growth and narrow welfare gaps between regions in Indonesia. Every new growth center should be backed by access to skills training relevant to market needs. Reduced rural-urban migration should be matched by better public services in home regions so that staying in rural areas remains attractive.

IoT-based logistics tracking technology also enables closer coordination between local artisan groups and raw-material suppliers. Coordination between artisans and suppliers should include agreements on delivery schedules and jointly set raw-material quality standards (Aounzou et al., 2022). Such coordination often depends on informal social ties and accumulated human capital, which shape how effectively digital governance mechanisms actually work (Nur, 2025). Every digital platform used for coordination should provide dedicated communication space for each artisan-supplier pair to discuss technical supply details. Price certainty for raw materials should come from written agreements that include price-adjustment mechanisms for market changes. Direct communication through digital platforms has also reshaped how business actors interact, altering long-standing patterns of exchange between suppliers and producers (Yıldız & Nur, 2024). Direct communication via digital platforms removes price manipulation by speculators that often harms small artisans. Stable raw-material prices let MSMEs plan production costs carefully and realistically. This transparent partnership builds mutual trust among actors in the local value chain. Mutual trust between business actors should be maintained through periodic face-to-face meetings that complement digital interaction. Transparent partnerships should include fair dispute-resolution mechanisms for disagreements over supply quality or volume.

The transformation of digital supply-chain governance also drives improvements in technical skills and digital literacy among local MSME actors. Every MSME actor should have access to training programs aligned with the features available on the e-commerce platform they use (Azuwandri, 2024). Digital literacy for traditional artisans should include the ability to read sales data and interpret consumer demand patterns. Improved technical skills should be followed by industry-recognized competency certification. Traditional artisans once unfamiliar with modern technology are now accustomed to using inventory-management apps and reading daily sales analytics. This capacity growth strengthens local human-resource competitiveness in the digital economy. Ongoing feedback from mentors and industry partners plays a key role in shaping how adaptable artisans become as they adjust to new digital tools and market demands (Warin & Darmawan, 2024). Self-directed technology learning shapes a more adaptive, innovative, and resilient entrepreneurial mindset. An adaptive entrepreneurial mindset should be backed by a mentor network able to give guidance on digital business strategy. The ability to read analytics reports should be part of the routine performance evaluation artisans use to assess how effective their sales strategies are.

Every logistics system integrated with smart technology should pursue economic efficiency while also ensuring balanced social and environmental sustainability. Subramanian et al. (2014) describe how integrating smart monitoring technology into logistics systems raises operational efficiency while sustaining organizational environmental and social performance. Every logistics system built on smart sensors should be designed to minimize

energy consumption and transport-related emissions. Operational efficiency should be judged not only by delivery speed but also by low product-damage rates and low packaging waste. A logistics system's environmental performance should include measuring the carbon footprint generated by each delivery activity. Digital sensor visibility over the flow of goods minimizes wasted resources and carbon emissions from ineffective transportation. Technology of this kind also plays a role in strengthening social and economic resilience against climate-related disruptions that can affect production and distribution (Marsal, Oluwatosin, & Sulani, 2024). Companies allocate the resulting operational savings to improving the welfare of workers and residents around their operational areas. Every allocation for worker welfare should be based on specific needs identified through dialogue with worker representatives. A logistics system's social sustainability should be measured by worker satisfaction with working conditions and wages received periodically.

Every supply chain monitoring technology should not be used solely for efficiency, but also to empower small producers with equal information. Based on the study by Verdouw et al. (2013), the use of IoT architecture in commodity supply chains enables real-time product quality monitoring from the point of origin to the hands of end users. The availability of accurate goods condition data prevents order cancellations and maintains the business reputation of small businesses in the eyes of customers. Precise quality management strengthens the bargaining power of local producers when negotiating with large-scale business partners.

Digital platforms should serve as a means of empowerment, rather than creators of new dependencies that harm micro, small, and medium enterprise actors. Wu et al. (2014) show that the adoption of e-commerce platforms integrated with supply chain management systems triggers an increase in transaction process efficiency and organizational flexibility. Every integrated e-commerce platform should provide an interface that enables artisans to update stock status and prices in real-time. Transaction process efficiency should be achieved through the automation of order recording and the creation of shipping documents without excessive manual intervention. Organizational flexibility should be reflected in the ability of MSMEs to divert supplies from one supplier to another with minimal time and cost. The ability to adapt to changes in consumer demand patterns becomes faster thanks to the availability of interconnected inventory data flows. This operational flexibility protects MSMEs from the threat of financial losses due to erratic market fluctuations. Protection against financial losses should be supported by a notification system that provides early warnings when shifts in consumer demand patterns occur. Interconnected inventory data flows should include information from various levels of the supply chain, ranging from raw material suppliers to finished product storage warehouses.

Every technology investment should be positioned as a tool to strengthen fair collaboration, rather than as an instrument of dominance by one party over another. According to Wiengarten et al. (2012), investment in supply chain information technology provides maximum positive impact on business performance when combined with a close collaboration strategy among business partners. Every information technology investment should be preceded by a mutual agreement regarding the collaborative goals to be achieved by all business partners. A close collaboration strategy should include data-sharing mechanisms that are mutually beneficial without creating dependencies that disadvantage any party. Optimal business performance should be measured by the simultaneous increase in cost efficiency and response speed to demand. Open communication and fair risk-sharing enhance the trust of all supply chain members. This synergy strengthens the resilience of local value chains when facing supply disruptions or regional economic crises. The resilience of local value chains should be maintained through supplier diversification and stock reserves planned based on historical demand data. Fair risk-sharing should be outlined in written agreements that regulate the responsibilities of each party when operational disruptions occur.

Customer satisfaction should not be built at the expense of logistics workers' welfare, but rather through a balance between service speed and the protection of labor rights. Ramanathan et al. (2012) elaborate that the utilization of e-commerce transaction data analytics and efficient logistics handling contributes directly to the continuous improvement of customer satisfaction and loyalty. Transaction data analytics should be used to identify the most sought-after products and peak ordering times

from each customer segment. Efficient logistics handling should include clear packaging and delivery time standards that can be met consistently. Customer satisfaction should be measured not only by delivery speed but also by the accuracy of the quantity and quality of the goods received. A satisfying shopping experience encourages consumers to leave positive reviews that organically attract new buyers. The steady growth of the customer base provides cash flow certainty for the operational sustainability of small businesses. Cash flow certainty from a stable customer base should enable MSMEs to plan raw material purchases and production scheduling in a more directed manner. Positive reviews from customers should be utilized as promotional material that can be displayed on digital storefronts to enhance the trust of other potential buyers.

Supply chain visibility should be interpreted as an instrument to protect business sustainability, not merely as a control tool that ignores humanitarian aspects. Brandon-Jones et al. (2014) indicate that supply chain visibility supported by modern information systems strengthens the operational resilience of companies in anticipating various forms of business environment uncertainty risks. The ability to detect distribution bottlenecks early enables business managers to take alternative routes quickly before operations are disrupted. This responsiveness reliability maintains the consistency of goods delivery performance to the market.

The utilization of Big Data and IoT should be directed toward creating added value that is enjoyed equally by all supply chain actors, including small producers and field workers. Schoenherr and Speier-Pero (2015) reveal that the use of Big Data analytics and IoT technology in supply chain management opens new opportunities for efficient resource allocation and the enhancement of product added value. Precise operational data processing helps small business leaders identify hidden cost-waste points. This working capital savings increases the price competitiveness of local products amidst tight digital market competition.

Data quality should serve as the foundation for transparent and accountable decision-making, not merely as a technical tool that strengthens closed managerial hierarchies. Hazen et al. (2014) assert that the quality of data produced by supply chain information systems determines the accuracy of strategic decision-making by business organization leaders. The use of automated sensors reduces manual data input errors that frequently trigger planning mistakes in production and distribution. Tested data-driven decisions enhance the effectiveness of operational performance and strengthen stakeholder trust in business management transparency.

Sustainable competitive advantage should be built upon an ethical commitment to the environment and social justice, not solely on technological innovation (Dakare, 2025). According to Chen et al. (2015), the integration of green supply chain capabilities and digital technology facilitates the creation of sustainable competitive advantages that are difficult for conventional competitors to imitate. Local products packaged with stories of ethical and environmentally friendly production processes possess a unique appeal for modern consumer segments. The transparency of production and distribution processes increases the aesthetic and selling value of products in the eyes of the public (Aslan, 2024).

The integration of information flows should guarantee equal access for all partners, so that no party is excluded from the resulting efficiency benefits. Prajogo and Olhager (2012) show that the integration of information flows between suppliers, producers, and customers is a primary driver in achieving logistics efficiency and operational performance superiority. Fast and accurate information access cuts down order process waiting times and minimizes inventory pile-ups in the warehouse. This speed in responding to market needs positions local MSMEs as reliable and professional suppliers (Kumar, 2025).

The success of digital supply chain system integration on e-commerce platforms becomes a primary driving force in realizing the sustainable social welfare of local MSMEs (Minh & Hue, 2025). Every digital supply chain system should be designed to distribute economic benefits proportionally to all actors within the production chain. The success of system integration should be measured by the increase in MSME production capacity and the expansion of market access obtained following the application of technology. Social welfare within the scope of MSMEs should encompass improvements in working conditions, income certainty, and protection of local workers' rights. The synergy between logistics IoT technology reliability and the active participation of the artisan community creates a

fair, efficient, and highly competitive business ecosystem. Strengthening the bargaining power of local producers in the digital market accelerates the process of poverty alleviation and regional economic independence. A fair business ecosystem should provide equal space for small and medium artisans to access market information without structural barriers. Regional economic independence should be supported by the capacity of MSMEs to manage production and distribution cycles without exploitative external intervention.

The sustainability of this business model requires periodic monitoring and evaluation to ensure that all layers of the local community experience economic benefits evenly. Every technology-based business model should be accompanied by a monitoring mechanism involving representatives from various layers of user communities (Bon et al., 2020). Periodic evaluation should include assessments of income distribution and access to technology training among groups of artisans. Even economic benefits should serve as the primary indicator of the success of MSME digitalization programs, not merely increasing transaction volumes. Digital platform management must continuously refine application features so that they become increasingly accessible to artisans from various educational backgrounds. Inclusive technology access minimizes the risk of digital inequality within the internal community of local traders. Every refinement of application features should be carried out based on direct feedback from end users through a structured feedback mechanism. Inclusive technology access should include the provision of user guides in local languages that are easily understood by artisans with limited educational levels (Basak et al., 2020).

The development of sustainable e-commerce based on SCM and logistics IoT proves that the integration of advanced technology can coexist with humanitarian missions and social justice. Every technology development for MSMEs should always prioritize the impact on human welfare as the primary goal, rather than solely technical efficiency (Yusof & Razak, 2025). The integration of advanced technology should take into account cultural readiness and local capacity in adopting new systems. Humanitarian missions and social justice should serve as an evaluation framework inherent in every stage of designing and implementing digital systems. The achievement of high business efficiency is proven to run side by side with the improvement of rural community living standards. The success of this model becomes an important reference for designing local MSME digitalization policies in the era of modern economic transformation. Every policy reference produced from this model should be adjusted to the specific conditions of each region without eliminating the basic principles of social justice. The policy design for MSME digitalization should involve the active participation of representatives from artisans and local communities so that policy outcomes remain relevant to real needs in the field.

## D. CONCLUSIONS

The integration of sustainable e-commerce platforms supported by Internet of Things (IoT)-based Supply Chain Management (SCM) logistics has proven to provide a tangible contribution in enhancing the operational efficiency and social welfare of local MSMEs. Real-time visibility of material flows cuts transportation costs, suppresses product damage, and provides consistency in raw material supply certainty. Such supply chain efficiency has a direct impact on increasing artisans' income margins, creating new employment opportunities for local communities, and expanding business financing access based on transparent digital track records.

The theoretical implications of this research enrich the scientific treasury of supply chain management and information systems by proving that the implementation of advanced digital technology can run hand in hand with humanitarian missions and social justice. Practically, these findings provide guidance for platform developers and the government in designing inclusive logistics infrastructure that favors the sustainability of small businesses. The strengthening of digital literacy capacity and open access to smart logistics technology serve as strategic investments in reducing inter-regional economic disparities and strengthening the competitiveness of local products in the national market.

Policymakers need to expand the reach of IoT infrastructure networks down to production centers in remote regions to ensure equality of logistics access. For future researchers, the development of this study can be directed toward testing this smart supply chain model in other commodity sectors that possess high

vulnerability levels, such as fresh food products and local fishery outputs.

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