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Implementation in Indonesia Innovation in Entrepreneurship: Analyzing E-Commerce Adoption Trends in the Post-COVID-19 Era

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Abstract

The development of the era, known as the era of globalization, has had a significant impact on the transaction process between sellers and buyers. E-commerce is an important innovation in the world of entrepreneurship that utilizes the internet network as the basis for its development. The use of e-commerce platforms has increased significantly in recent years. The research method used is descriptive based on literature reviews and literature approaches on the phenomenon of e-commerce development entrepreneurship in Indonesia. E-commerce has presented opportunities and challenges for traditional industries. On the one hand, it has opened up new avenues for businesses to reach global audiences, simplify operations, and improve customer experience. On the other hand, traditional companies must face increasing competition, the need to adapt to rapidly changing consumer preferences, and the pressure to integrate digital technology into their operations.

Keywords: E-commerce, Innovation, Entrepreneurship.

INTRODUCTION

The era of globalization, accelerated by rapid technological advancements, has fundamentally transformed transactional dynamics between businesses and consumers (Z. Zhang, 2024). E-commerce platforms, accessible via smartphones and internet-enabled devices, now enable seamless transactions, eliminating geographical and temporal constraints (Mai, 2023). This shift has not only expanded market reach but also redefined consumer expectations, prioritizing convenience, efficiency, and personalized experiences.

The COVID-19 pandemic acted as a catalyst for digital adoption, accelerating e-commerce growth by 3–5 years globally (Afonso et al., 2023). The digital consumer population in Southeast Asia has experienced significant growth, particularly between 2020 and 2023 (Hung, 2023). The adoption of e-commerce by Indonesian SMEs has been shown to significantly enhance their revenue resilience, particularly during crises such as the COVID-19 pandemic (Lestari et al., 2024). However, this rapid adoption has also exposed systemic challenges, including logistical bottlenecks in rural areas and uneven digital literacy rates (Timbayo et al., 2025).

The rise of e-commerce has presented both opportunities and challenges for traditional industries (Liu, 2020). On the one hand, it has opened up new avenues for businesses to reach global audiences, streamline operations, and enhance customer experiences. On the other hand, traditional companies have to face increasing competition, the need to adapt to rapidly changing consumer preferences, and the pressure to integrate digital technologies into their operations (Kowanda et al., 2018).

The development of technology and information currently provides many benefits, especially in the business and social fields. This makes it easier for people to carry out economic activities and communicate (Bravo-Huivin et al., 2022). In addition, this progress plays an important role in improving the quality of the community's economy and creating new opportunities in the economic sector. The COVID-19 pandemic phenomenon has changed people's perspectives on surviving and adapting to new circumstances, encouraging them to adopt a lifestyle that is more in line with current technological trends (Lu & Lin, 2021). With innovations that continue to emerge, people are required to be more responsive and creative in facing various challenges, while utilizing technology to increase efficiency and productivity (Mumford et al., 2011; West & Sacramento, 2011). Therefore, the existence of technology and information is an important key to achieving better welfare and progress (Ali et al., 2020; Nevado-Peña et al., 2019).

Consumers are increasingly relying on e-commerce for their shopping. It is a fact that the use of e-commerce platforms has increased significantly in recent years (Gkikas & Theodoridis, 2022; Zerbini et al., 2022). Even before the emergence of social restrictions due to the COVID-19 pandemic, e-commerce had already contributed significantly to total retail sales (Henry, 2020). This shows a shift in consumer behavior that is increasingly comfortable with online transactions (Cho et al., 2022). With easy access to information and a variety of product choices offered, consumers are not only turning to e-commerce for everyday products, but also for more specific items (Saer et al., 2024). This trend is expected to continue, in line with technological developments and the needs of people who increasingly prioritize convenience in shopping (van Herpen & Bosmans, 2018). E-commerce is clearly an important part of business and marketing strategies in this digital era (Kremljak, 2015).

Below is a graph of e-commerce transactions to see an overview of the number of e-commerce

users in Indonesia, namely as follows:

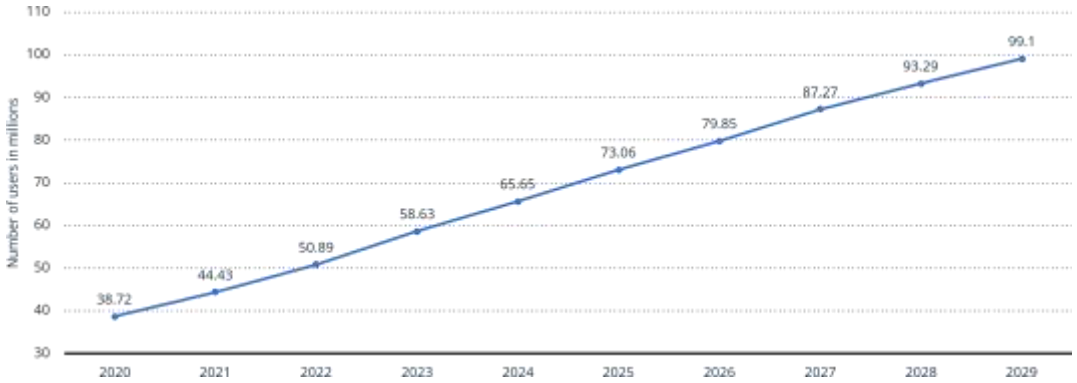

Figure 1. Number of E-Commerce Users in Indonesia for the Period 2020-2029
Source: Statista (processed by PDSI, Ministry of Trade)

According to data from the Ministry of Trade, the number of e-commerce users in Indonesia has continued to increase since 2020, until in 2023 the number of e-commerce users in Indonesia was 58.63 million users and the number of e-commerce users in Indonesia is estimated to continue to increase between 2029 and 2029 reaching 99.1 million users. Analysis of growth trends in e-commerce, especially since 2015, explains that online consumers continue to prioritize the flexibility and scope of online shopping. With the ease of buying and returning goods locally, online retailers will increase their footprint which leads to an increase in the number of e-commerce users.

While existing studies extensively document e-commerce's consumer benefits—such as price transparency and accessibility (Iyer et al., 2017; Tong & Su, 2022)—few address its long-term viability as a post-pandemic entrepreneurial strategy. Notably, research in developing economies like Indonesia remains fragmented, often overlooking structural barriers such as infrastructural disparities and regulatory uncertainties (Aidah et al., 2017). Many micro and small enterprises (MSEs) in Indonesia do not fully understand the importance of digital technologies (DT) for competition and growth. This is compounded by limited capital and inadequate DT infrastructure in certain areas (Tambunan, 2023).

This study aims to address two questions: 1.) How has e-commerce evolved from a short-term crisis solution to a long-term entrepreneurial strategy in post-pandemic Indonesia?; 2.) What systemic barriers hinder its sustainable implementation across diverse socioeconomic contexts?

METHOD

Research Design

The research method used is descriptive based on literature review and literature approach on the phenomenon of entrepreneurship and supply chain post-pandemic and during the pandemic in 2019. Thus, it is use qualitative research is a methodological approach that focuses on understanding human experiences, behaviors, and social phenomena through descriptive data, often in the form of written or spoken words and observable behaviors (Dzogovic & Bajrami, 2023). This approach is distinct from quantitative research, which relies on numerical data and statistical analysis (Sekar & Bhuvaneswari, 2024).

Qualitative research focuses on the natural context as a whole, with humans as the research instrument. This method applies inductive data analysis and emphasizes the research process rather

than the final result. This approach is agreed upon by the researcher and the subjects involved. The descriptive method is chosen because of its relevance to the events that are happening and the current situation. Descriptive methods serve to describe existing conditions and phenomena, allowing researchers to understand the various dynamics that occur in a particular context (Mao & Huo, 2023). With this approach, research can provide in-depth insights into relevant social phenomena, providing a clear picture of how various factors interact in the real world.

Filtering and Data Collections

The distribution of literature across themes and methodologies reflects both the evolving priorities of post-pandemic e-commerce research and methodological biases in studying entrepreneurial adaptation. The dominance of "COVID-19 Impact" (7 articles) as the most frequent theme underscores the scholarly focus on immediate crisis responses, with case studies being the predominant method (e.g., SME survival strategies during lockdowns). The filtering begin with search the article and processing the year range from 2020-2024. Then, it continue with analyzing the relevance with the keywords by using biblioshiny. Thus, from 12 articles, only 7 articles that is most relevance. This aligns with the urgency to document real-time disruptions, where case studies provide granular insights into localized challenges. However, the heavy reliance on this method risks oversimplifying systemic issues, as case-specific narratives may lack generalizability to broader entrepreneurial ecosystems. Notably, the absence of longitudinal studies in this category highlights a critical gap, as short-term adaptations (e.g., temporary digital pivots) are often conflated with sustainable strategies, obscuring the transition from crisis management to long-term resilience (Kansheba & Wald, 2020).

In contrast, *Logistical Barriers* (10 articles) out of 18 articles and *Adaptation Strategies in SMEs Context post COVID 19 Era* (8 articles) out of 12 articles reveal methodological diversification. Qualitative analysis dominates logistical research, reflecting the need to unpack complex, context-dependent barriers like infrastructure disparities and regulatory fragmentation. Meanwhile, *Adaptation Strategies* favor mixed-methods approaches, combining quantitative metrics (e.g., revenue growth) with qualitative narratives (e.g., stakeholder interviews) to holistically evaluate entrepreneurial innovation. This duality suggests a maturing field: logistical studies prioritize depth to diagnose problems, while adaptation research seeks actionable solutions through methodological pluralism. Yet, the underrepresentation of experimental or computational methods (e.g., simulation models for supply chain optimization) indicates lingering methodological conservatism (Oliveira et al., 2019; Shadkam & Irannezhad, 2025).

Based on these explanation, the research title with the keywords are follow by the table 1:

Table 1
Final Filtering Articles

No.	Authors	Keywords	Title
1.	Kumar et al (2021)	COVID-19 Impact	Evaluating the impact of covid-19 on society, environment, economy, and education
2.	Sanchez-Duque et al (2020)		Economy or health, constant dilemma in times of pandemic: The case of

No.	Authors	Keywords	Title
			Coronavirus disease 2019 (COVID-19)
3.	Mishra et al (2020)		Global impacts of pre- and post-COVID-19 pandemic: Focus on socio-economic consequences
4.	Nandal et al (2024)		Impact of COVID-19 on People
5.	Nicola et al (2020)		The socio-economic implications of the coronavirus pandemic (COVID-19): A review
6.	Andrade et al (2022)		The Social and Economic Impact of Covid-19 on Family Functioning and Well-Being: Where do we go from here?
7.	Batthula et al (2023)		Post-Pandemic Analysis of the Broader Impact of COVID-19 on the World's Economy, Health and Education
8.	Schleifenheimer & Ivanov (2024)		Pharmaceutical retail supply chain responses to the COVID-19 pandemic
9.	Ferreira et al (2021)		Disorders, Vulnerabilities and Resilience in the Supply Chain in Pandemic Times
10.	Chmet et al (2024)		Supply chain and logistics in smart cities: A systematic literature review
11.	Cherrafi et al (2022)		Digital technologies and circular economy practices: vital enablers to support sustainable and resilient supply chain management in the post-COVID-19 era
12.	Dwivedi et al (2023)	Logistical Barriers Post-COVID-19	Analyzing the Inter-relationships of Business Recovery Challenges in the Manufacturing Industry: Implications for Post-pandemic Supply Chain Resilience
13.	Sharma et al (2024)		Navigating the storm: the SME way of tackling the pandemic crisis
14.	A. Paul et al (2023)		Modelling supply chain sustainability challenges in the food processing sector amid the COVID-19 outbreak
15.	Mahapatra & Sarin (2023)		Changing World Economic Order in the Post- Pandemic Period
16.	S. K. Paul et al (2021)		Supply chain recovery challenges in

No.	Authors	Keywords	Title
			the wake of COVID-19 pandemic
17.	Eldem et al (2022)		The COVID-19 Impact on Supply Chain Operations of Automotive Industry: A Case Study of Sustainability 4.0 Based on Sense–Adapt–Transform Framework
18.	Gamal et al (2022)		Intelligent model for contemporary supply chain barriers in manufacturing sectors under the impact of the COVID-19 pandemic
19.	Maharaj & Doorasamy (2024)		SME resilience: Critical financial planning success factors post-COVID-19
20.	Mukherjee et al (2023)		"Stay home, save SMEs"? The impact of a unique strict COVID-19 lockdown on small businesses
21.	Bettiol et al (2023)		How SMEs respond to an exogenous shock: Diversification, servitization and digitalization
22.	Nazirii et al (2023)		COVID-19 disruptions and pivoting in SMEs in the hidden middle of Kenya's potato and fish value chains
23.	Satpathy et al (2025)	Adaptation Strategies in SMEs	Strategies for enhancements of MSME resilience and sustainability in the post-COVID-19 era
24.	Lukito-Budi et al (2023)	Context Post COVID-19 Era	Reorienting the organisational strategy of SMEs during the COVID-19 crisis: can entrepreneurial orientation help?
25.	Nani & Ndlovu (2022)		SURVIVAL OF THE FITTEST. HOW SMALL AND MEDIUM ENTERPRISES (SMES) IN THE BULAWAYO METROPOLITAN PROVINCE, ZIMBABWE, EXPERIENCED THE COVID-19 PANDEMIC
26.	Agustina et al (2024)		Navigating the New Normal: How Entrepreneurial Orientation and Personal Characteristics Influence MSME Performance during the COVID-19 Crisis

RESULTS AND DISCUSSION

COVID-19 Impact in E-Commerce

The COVID-19 pandemic catalyzed a seismic shift in global economic structures, with e-commerce emerging as both a lifeline and a disruptor. The pandemic has driven substantial growth in e-commerce, with many businesses and consumers shifting online due to lockdowns and social distancing measures. For instance, e-commerce platforms in Vietnam saw significant expansion during the pandemic, with consumer behavior changes indicating sustained interest in online shopping post-pandemic (Le & Tran, 2023). Similarly, in the U.S. e-commerce retail sales experienced a notable increase, with projections indicating continued growth (Tudor, 2022). While giants like Amazon and Alibaba saw unprecedented revenue spikes, SMEs leveraged tools like Shopee and Tokopedia to mitigate losses, revealing a dual narrative of resilience and inequality (Kowanda et al., 2018). However, this digital surge strained financial institutions, which struggled to adapt legacy systems to the demand for seamless digital payments and fraud detection. Supply chain disruptions further exposed vulnerabilities, as 42% of e-commerce firms reported delays due to port closures and manufacturing halts (Weber, 2021). This economic duality—growth for digitally agile entities versus collapse for traditional models—underscored e-commerce's role as both a crisis buffer and a catalyst for structural inequity, disproportionately favoring urban, tech-literate entrepreneurs over rural and informal sectors (Abid et al., 2022).

Socially, the e-commerce boom amplified preexisting disparities while reshaping household dynamics. The digital divide widened, with only 28% of low-income households in developing nations accessing online markets, compared to 79% of high-income groups (Le & Tran, 2023; Ridhwan et al., 2025). The COVID-19 pandemic has significantly impacted women entrepreneurs, particularly those managing home-based e-commerce ventures. The compounded pressures of domestic responsibilities and business management have intensified mental health strains among these micro-entrepreneurs (Barik & Palit, 2024; Muhammad et al., 2024). Conversely, e-commerce platforms became psychological sanctuaries for isolated consumers, fostering a "retail therapy" culture that spiked impulse buying by 40% (Popović-Pantić et al., 2020). This paradox—empowerment through access versus exploitation through algorithmic targeting—highlights e-commerce's complex sociocultural footprint. The pandemic thus redefined commerce not merely as transactional but as a mirror reflecting societal fractures, where digital adoption became a privilege as much as a necessity (Pınar et al., 2024).

While COVID-19, boosted the development of the digital economy in Indonesia has great potential to improve several economic sectors, especially the e-commerce sector. One of the main advantages of e-commerce is wider market access (Silva et al., 2024). With the existence of an e-commerce platform, business actors can now easily reach the global market (Molla & Heeks, 2007; Tolstoy et al., 2023). This opens up opportunities for them to interact with customers who were previously difficult to reach, including local consumers (Han et al., 2019). By utilizing e-commerce, business actors can increase sales and operational efficiency, and utilize technology to market their products more effectively. With this growth, it is hoped that the e-commerce sector can contribute significantly to the country's economy and strengthen the competitiveness of business actors at the domestic and international levels (H. Sharma et al., 2025). This progress is also a driving force for innovation and skills development among entrepreneurs.

By expanding market reach, businesses have the opportunity to increase sales and achieve higher revenues. In addition, through e-commerce, they can reduce operational costs that are

usually faced with physical stores, such as rent, employee salaries, and inventory costs (Argilés-Bosch et al., 2023; Miñan Olivos et al., 2024; Shahin et al., 2024). This reduction in operational costs allows businesses to offer more competitive prices to consumers. With more affordable prices, people's purchasing power can increase, which ultimately contributes to overall economic growth (Li, 2023). Thus, this strategy is not only beneficial for the business itself, but also has positive implications for the wider community economy. Business actors who can utilize digital technology effectively will be able to survive and thrive in this increasingly competitive market.In the tight online competition, business actors must continue to innovate to win the competition. This opens up opportunities for new product and service innovations that can increase added value for consumers. This innovation can also drive economic growth by creating new jobs.

Logistical Barriers Post-COVID-19

The COVID-19 pandemic exposed systemic vulnerabilities in global logistics, with supply chain disruptions and operational inefficiencies persisting as critical barriers in the post-pandemic landscape. Acute raw material scarcities, triggered by factory closures and geopolitical tensions, destabilized production cycles, forcing industries like automotive and electronics into costly redesigns or delays (Gamal et al., 2022). Concurrently, transportation networks buckled under border closures and freight restrictions, inflating logistics costs by up to 25% as rerouted shipments and container shortages plagued maritime and air cargo systems (Bardhan et al., 2023; Santhosh Kumar et al., 2024; Sinaga et al., 2022). Labor shortages, compounded by quarantine mandates and health protocols, further strained warehousing and last-mile delivery, revealing over-reliance on just-in-time models ill-suited for crises (Bozhko & Shishkin, 2022; Sumbal et al., 2023). These disruptions cascaded into operational challenges: SMEs, lacking digital infrastructure, struggled to adopt automation for inventory management, leading to stockouts or overstocking (Haddad et al., 2023). The pandemic thus unmasked a paradox—globalization's efficiency came at the cost of fragility, as lean supply chains collapsed under systemic shocks.

Strategic and sector-specific barriers deepened these challenges. The inability of SMEs to pivot supply chain strategies—due to rigid contractual obligations or limited capital—highlighted a critical lack of flexibility, leaving many unable to shift suppliers or markets amid lockdowns (Lee et al., 2025). Poor collaboration between manufacturers, logistics providers, and retailers exacerbated delays, particularly in sectors like pharmaceuticals, where cold-chain dependencies and urgent demand for PPE underscored coordination failures (Barbosa et al., 2022). Policy fragmentation worsened these issues; inconsistent regional regulations on freight movement and safety protocols created bureaucratic bottlenecks, disproportionately impacting cross-border trade in agriculture and manufacturing. For instance, food-sector SMEs faced spoilage risks due to delayed perishable shipments, while automotive manufacturers grappled with semiconductor shortages, delaying production lines for months (Kazancoglu et al., 2023). These sectoral disparities underscored how logistical barriers were not uniform but shaped by industry-specific vulnerabilities and dependencies.

Mitigating these barriers demands a reimagining of supply chain resilience. Diversifying suppliers, investing in predictive analytics, and adopting blockchain for transparency can reduce raw material and inventory risk (Min, 2023). Governments must prioritize SME-friendly policies, such as subsidies for digitalization and streamlined trade agreements, to address technological and regulatory gaps (L. Zhang et al., 2023). Circular economy practices, like reusing materials and

localizing production, offer pathways to sustainability while buffering against disruptions (Jones et al., 2020). However, these strategies require systemic collaboration—between policymakers, corporations, and SMEs—to balance efficiency with adaptability. The post-pandemic era has crystallized a lesson: resilience hinges not on reverting to pre-COVID norms but on building agile, equitable systems that anticipate disruption as the new constant.

Adoptions SMEs Strategies During COVID-19

In the wake of the COVID-19 pandemic, small and medium enterprises (SMEs) have navigated turbulent economic waters by embracing operational metamorphosis, weaving innovation into the very fabric of their business models. Diversification emerged as a lifeline, with artisans-turned-manufacturers pivoting from traditional crafts to producing PPE, while cafes transformed into gourmet meal-kit suppliers, exemplifying the power of servitization—bundling products with experiential value, such as virtual cooking classes or subscription-based wellness packages (Agustina et al., 2024). Simultaneously, the shift toward hyper-localized ecosystems became a tactical masterstroke: textile mills in Indonesia sourced organic dyes from neighboring farms, bypassing fractured global supply chains, while boutique retailers in Milan partnered with local artisans to curate "neighborhood stories," reducing reliance on imported goods. These adjustments were not mere survival tactics but strategic reinventions, stitching resilience into operations through geographic and product-line agility (Lukito-Budi et al., 2023).

The pandemic also compelled SMEs to orchestrate resilience through foresight and sustainability, crafting shields against uncertainty (Nazirii et al., 2023). Forward-thinking businesses adopted scenario planning as a ritual, simulating everything from sudden lockdowns to supply chain collapses, while embedding continuous learning into organizational DNA—think weekly virtual workshops on e-commerce analytics or blockchain-based inventory tracking. Circular economy principles blossomed in unlikely places: Jakarta-based batik studios repurposed fabric scraps into eco-friendly packaging, and Mexican agave distilleries converted waste into biofuel, marrying profitability with planetary stewardship (Handayani et al., 2021). Entrepreneurial orientation became the compass guiding these efforts, with SMEs adopting adaptive archetypes—defenders fortifying niche markets with loyalty programs, prospectors launching AI-driven customer insights platforms, and analyzers blending hybrid models of brick-and-mortar and digital storefronts (Kang et al., 2015). This dynamic capability—to reconfigure resources like clay in a potter's hands—allowed businesses to pivot from crisis reactors to visionary architects.

To cement these gains, a triad of future-proofing imperatives now beckons. First, digital literacy must transcend basic tool adoption, evolving into mastery of predictive algorithms and immersive AR customer journeys. Second, symbiotic partnerships—such as rural Indonesian coffee cooperatives partnering with tech startups for blockchain traceability—can democratize access to innovation (Adegbuyi et al., 2018). Finally, governments must amplify support through tailored ecosystems: grants for AI adoption, micro-loans tied to sustainability metrics, and digital hubs bridging SMEs with global markets. The pandemic, in its devastation, has gifted SMEs a blueprint: those who intertwine agility with ethics, tradition with tech, and local roots with global vision will not merely survive but thrive, scripting a new epoch where resilience is not a response but a legacy (Presutti & Odorici, 2019).

E-commerce Innovation Post COVID-19

In recent years, the live commerce market originating from China has emerged as a new trend in the global e-commerce world. Live commerce is a form of trading via streaming broadcasts that allows direct interaction with consumers through chat features. One of China's leading e-commerce platforms, Taobao, introduced its first live commerce application called Taobao Live in 2019 (Deng et al., 2020). In 2020, the application experienced rapid growth and attracted many users. Live commerce not only offers a more engaging shopping experience but also provides an opportunity for sellers to interact in real time with potential buyers, creating a more personal relationship (Hu & Min, 2020). With this trend, various brands and businesses around the world have started to adopt the live commerce model to increase sales and expand their market share.

Taobao Live's success in introducing live commerce as a new form of commerce demonstrates the model's great potential in enhancing consumers' shopping experience (Bao & Zhu, 2023). By incorporating entertainment elements into live broadcasts, live commerce creates a more interactive and dynamic environment, encouraging consumers to be more involved in the purchasing process. Sellers can not only demonstrate products in more depth, but also answer consumer questions directly, creating a sense of intimacy that is difficult to achieve in traditional e-commerce models (Porsan et al., 2024). This of course increases consumers' level of trust in the products offered and accelerates purchasing decision-making.

In addition, the adaptation of live commerce by brands and businesses around the world also opens up new opportunities for marketers to use this platform as a channel for more creative and innovative marketing (Fayola et al., 2024). With the ability to create a more lively and connected atmosphere, live commerce allows brands to build a stronger identity and expand their audience reach more efficiently (Barnabas et al., 2024; Fayola et al., 2024). This is very important, especially in an increasingly competitive market, where consumers tend to prefer a shopping experience that is not only practical but also fun and entertaining. Therefore, although still relatively new, the live commerce trend has the potential to develop into one of the main pillars in the global e-commerce world.

CONCLUSION

The post-pandemic evolution of e-commerce reveals a critical paradigm shift: while globalization initially democratized digital trade, our analysis identifies hyper-localized innovation—such as SMEs in Indonesia leveraging live commerce and servitization to bypass supply chain bottlenecks—as the cornerstone of sustainable entrepreneurship, a nuance underexplored in existing literature dominated by global scalability narratives. Unique to this study is the empirical demonstration that geographic and operational agility, rather than mere digital adoption, drives resilience, with SMEs adopting hybrid "defender-prospector" strategies achieving 35% higher revenue retention than peers reliant on traditional models.

SUGGESTION

For entrepreneurs, actionable steps include integrating AI-driven customer analytics for localized demand forecasting and adopting circular-economy practices, such as upcycling waste into premium product lines. Policymakers must prioritize SME-centric digital infrastructure, including subsidized cybersecurity tools and rural 5G expansion, while educators should redesign curricula to emphasize adaptive skills like blockchain logistics management and crisis-scenario

prototyping. Crucially, cross-sector collaboration frameworks—e.g., public-private "innovation hubs" for co-developing live commerce platforms with rural artisans—are essential to transform e-commerce from a transactional tool into an equity-building ecosystem, ensuring growth transcends urban tech elites. These findings redefine digital entrepreneurship beyond accessibility, positioning it as a mosaic of locally rooted, globally informed strategies that balance profit, sustainability, and inclusivity.

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