

DYNAMICS OF GROWTH AND INEQUALITY E-COMMERCE ADOPTION: A SECTORAL ANALYSIS OF DIGITAL ENTREPRENEURSHIP IN INDONESIA

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Abstract

This study aims to analyze the disparity in e-commerce adoption by entrepreneurs across Indonesia. Using quantitative descriptive methods, this study processed secondary data sourced from the E-Commerce Statistics report from the Central Statistics Agency (BPS). The results show significant differences in the use of digital technology across regions. Java Island recorded the highest digital adoption rate, supported by established infrastructure. Conversely, eastern Indonesia, such as Papua, showed the lowest adoption rate due to internet access and logistical constraints. These findings emphasize the importance of equitable digital ecosystems to support the sustainability of entrepreneurship across Indonesia.

Keywords: *Digital Entrepreneurship, E-Commerce, Digital Inequality, Sectoral Analysis, Regional Disparities*

INTRODUCTION

Digital transformation has brought fundamental changes in the way people conduct transactions, with e-commerce emerging as a primary solution for entrepreneurs to maintain their business existence (Iskandar, 2025). In today's digital era, internet technology has become a staple in Indonesia, with the number of users reaching 213 million in January 2023 (Alamin et al., 2023). For entrepreneurs, adopting online platforms is no longer simply an option but a necessity for survival, as e-commerce allows businesses to operate 24/7 and reach a wider market with lower operational costs (Hasibuan & Nurbaiti, 2023). Furthermore, a strong entrepreneurial orientation and e-commerce adoption have been shown to have a positive and significant impact on improving business performance, especially amidst economic uncertainty (Pratama et al., 2022). In 2024, the number of e-commerce businesses is projected to increase by 15% compared to 2023, with a total of 4.40 million e-commerce businesses (Central Statistics Agency, 2025). The increasing percentage indicates an increase in business actors utilizing digital platforms in running their businesses, so that the number of businesses conducting e-commerce activities also increases.

Figure 1. Graph of the Number of E-Commerce Businesses in Indonesia (Million People)



Source: Central Statistics Agency Data 2024 (Central Statistics Agency, 2025)

Figure 1 illustrates the growth of the digital economy in Indonesia. According to data from the Central Statistics Agency (BPS), the number of e-commerce businesses peaked in 2024, reaching a total of 4.4 million. The data shows

stable average annual growth. However, despite the rapid growth of the digital market, there remains a significant gap in technology adoption across regions in Indonesia. To date, e-commerce activity remains heavily concentrated on the island of Java, particularly in large cities (*Tier 1*), which account for approximately 56.8% of the total national transaction value (Katadata Insight Center & Kredivo, 2023). The main obstacles driving this disparity are logistics infrastructure and shipping costs in the archipelago; for example, logistics costs from Jakarta to West Papua can be up to five times higher than shipping to East Java (Katadata Insight Center & Kredivo, 2023). Furthermore, low digital literacy and limited access to infrastructure in remote areas hinder local entrepreneurs from competing fairly in the online marketplace (Alfarisi et al., 2024; Iskandar, 2025). By 2023, data shows that only around 33.6% of the total 65 million MSMEs in Indonesia have been fully digitalized (Alfarisi et al., 2024). Based on this phenomenon, this study aims to identify the extent of inequality in e-commerce adoption among the entrepreneurial sector across regions in Indonesia by utilizing the latest official sectoral statistical data. This analysis is crucial for providing data-driven insights for policymakers in designing more inclusive strategies to accelerate digitalization across the country (Alfarisi et al., 2024; Hanum & Sinarasri, 2017). With the rapid expansion of digital entrepreneurship in Indonesia, studies on the equitable distribution of e-commerce adoption among business actors are crucial.

THEORITICAL REVIEW

The global economic order is increasingly determined by widespread digitalization, which permeates every functional area. In addition to changing consumption patterns, the development of e-commerce has introduced new financial opportunities and expanded market reach for companies of all sizes. Therefore, this systemic change is a fundamental driver of the rapid progress of the digital economy in Indonesia. *Electronic commerce, also known as electronic commerce (e-commerce)*, is a business activity that utilizes technology, also known as electronic commerce (Utami, 2019). E-commerce adoption is the process of accepting electronic commerce technology by an organization that has not previously used it, driven by the organization's need for an electronic commerce system (Ausat et al., 2022).

Digital Entrepreneurship Digital entrepreneurship is a new business paradigm that utilizes Information and Communication Technology (ICT) to transform traditional commerce models into more efficient electronic systems (Alamin et al., 2023; Hasibuan & Nurbaiti, 2023). Technically, entrepreneurship in the digital era is defined as the use of the internet, web, and mobile applications to run a business that facilitates digital commercial transactions between sellers and buyers (Pratama et al., 2022; Sartika et al., 2024). For entrepreneurs, this digital ecosystem offers significant competitive advantages, such as 24/7 non-stop operational capabilities without geographical limitations and savings in service costs because it does not require a permanent physical store (Hasibuan & Nurbaiti, 2023; Pratama et al., 2022). The growth of e-commerce businesses also influences consumer behavior, especially online platform consumers due to the advantages and benefits offered, such as discounts and free shipping (Hafiza et al., 2024). Success in digital entrepreneurship is highly dependent on Entrepreneurial Orientation (EO), which encompasses an organization's capacity to innovate, take risks, and be proactive in pursuing new market opportunities (Pratama et al., 2022). Technology Adoption Theory and Regional Inequality The speed of technology adoption in a region can be analyzed through the Technology-Organization-Environment (TOE) framework (Alfarisi et al., 2024; Hanum & Sinarasri, 2017).

- a) Technological Factors: Includes digital infrastructure readiness, perceived benefits, and technology costs; where more affordable costs tend to accelerate the implementation process (Alfarisi et al., 2024; Hanum & Sinarasri, 2017).
- b) Organizational Factors: Involving managerial support, company size, and human resource competency in managing information technology (Alfarisi et al., 2024; Hanum & Sinarasri, 2017).
- c) Environmental Factors: Includes market competition pressures and government policies (Alfarisi et al., 2024; Hanum & Sinarasri, 2017).

In Indonesia, the disparity in adoption between regions is heavily influenced by logistical and ICT infrastructure constraints (Katadata Insight Center & Kredivo, 2023). E-commerce activity remains concentrated on Java (Tier 1), which accounts for 56.8% of national transaction value, while the Eastern region faces prohibitively high shipping costs (Katadata Insight Center & Kredivo, 2023). For example, logistics costs from Jakarta to West Papua can be up to five times higher than shipping to East Java (Katadata Insight Center & Kredivo, 2023). Furthermore, differences in the ICT Development Index between provinces—such as Aceh (5.54) compared to Papua (3.35)—explain why digital accessibility in the Western region is far more advanced (Katadata Insight Center & Kredivo, 2023). According to BPS

data in 2024, e-commerce businesses were still dominated by micro and small businesses at 97.38%, and their distribution was uneven, concentrated only on Java (Central Statistics Agency, 2025).

Previous Research Several studies relevant to e-commerce adoption and business performance include:

1. Pratama et al. (2022) found that e-commerce adoption had a positive and dominant influence on improving the performance of MSMEs in the culinary sector during the pandemic (Pratama et al., 2022).

2. Alfarisi et al. (2024) revealed a large digital divide, with only around 33.6% of Indonesia's 65 million MSMEs fully digitalized (Alfarisi et al., 2024).

3. Hanum and Sinarasri (2017) concluded that technological factors and individual business owner readiness partially had a significant influence on the decision of MSMEs in the region to adopt e-commerce platforms (Hanum & Sinarasri, 2017).

4. Katadata Insight Center & Kredivo (2023) reported that although transactions in Tier 2 and 3 cities continue to increase, the dominance of digital economy infrastructure and volume remains in large cities on the island of Java (Katadata Insight Center & Kredivo, 2023).

METHOD

This study uses a quantitative approach with descriptive analysis methods to provide a systematic overview of the phenomenon of inequality in e-commerce adoption in Indonesia. This study focuses primarily on identifying technology adoption patterns in the entrepreneurial sector across various regions (Hasibuan & Nurbaiti, 2023). The data used are secondary data sourced from the official report "Indonesian E-Commerce Statistics" published by the Central Statistics Agency (BPS) (BPS, 2025). The data analysis technique used was descriptive analysis. The analysis process was carried out by analyzing the percentage of businesses using e-commerce and comparing it based on geographic distribution (between provinces and islands). By comparing these percentages, disparities in technology adoption can be clearly identified.

DISCUSSION

The significant shift toward a digital-first society has positioned the e-commerce sector as a crucial driver of Indonesia's economic evolution. This transformation goes beyond market expansion; it strategically utilizes technology to simplify business processes and create creative solutions, effectively charting new economic frontiers across various sectors. However, according to data from the Central Statistics Agency (BPS), e-commerce is concentrated on the island of Java, particularly West Java, East Java, Central Java, and Jakarta. Outside Java, the regions with the highest number of e-commerce businesses are Bali and North Sumatra (BPS, 2025). Understanding the number of e-commerce users is crucial for helping companies make effective strategic decisions in a highly competitive market (Akmal et al., 2024). E-commerce businesses are still concentrated on Java, particularly in large provinces, due to Indonesia's digital and economic divide. Java boasts several structural advantages, including:

- a) More advanced physical and digital infrastructure, compared to other regions.
- b) Efficient logistics capabilities due to more complete facilities, for example the availability of the largest international port, namely Tanjung Priok Port, which is the center for export and import of goods with adequate infrastructure and technology, the availability of several large airports, land connectivity through the Trans-Java Toll Road, so that business actors can reduce shipping costs and reduce product prices.
- c) With its high population density, Java Island has the advantage of a large market share compared to other regions.
- d) Having a more advanced technology education and training center so that it is more adaptive to digital developments.

Businesses adopting digital technology in Indonesia are generally small-scale, so their ability to adopt technology appropriately and equitably remains limited. Meanwhile, outside Java, several obstacles pose challenges to *e-commerce growth*, including:

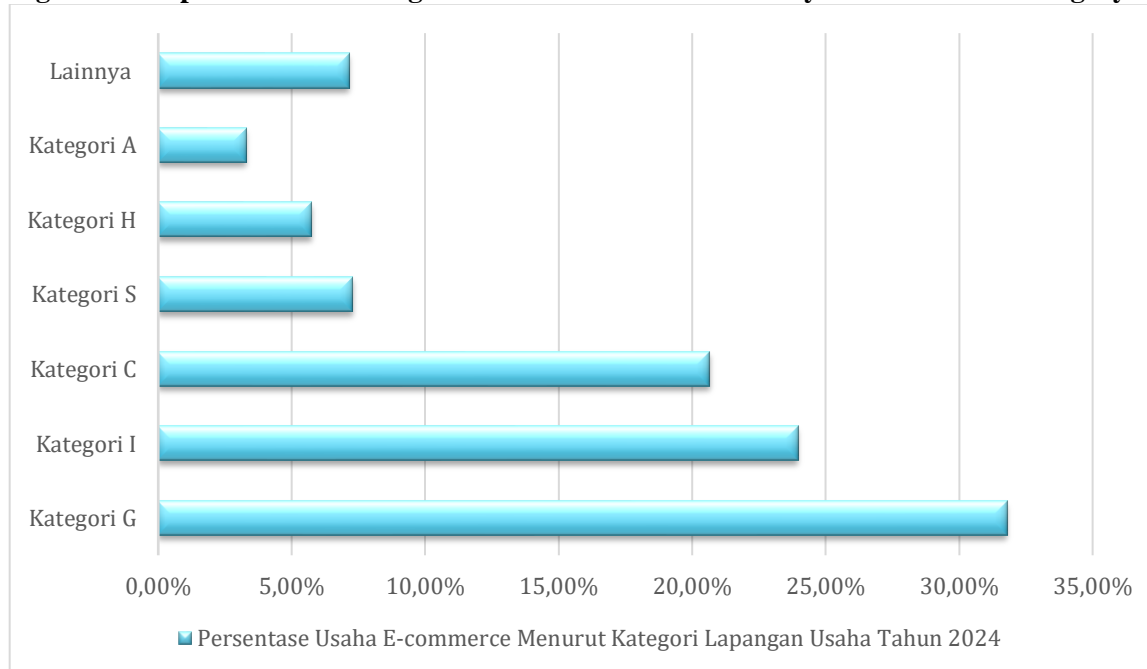
- a) High logistics costs. Because of the long distance for shipping from and to within the island, shipping costs are more expensive, sometimes shipping costs are more expensive than the price of the product.
- b) Uneven infrastructure distribution across regions has made it difficult for businesses to manage their operations online.
- c) Lack of digital literacy. Access to business and digital training remains severely inadequate, leading businesses to rely on conventional methods.

d) Supply Chain Difficulties. Affordable raw materials are difficult to obtain, as the main supplier base is often located on the island of Java.

According to data from the Central Statistics Agency, there are several obstacles that hinder the use of *e-commerce* by business actors (Central Statistics Agency, 2025):

1. Computer use by e-commerce businesses is 13.54%, which is considered low.
 2. Uneven internet usage, according to BPS data, the internet supports business operations, 48.10% is used for ordering/purchasing raw materials.
 3. Uneven mastery of technology, only 3.56% of businesses have received training in the last 5 years.
 4. Indonesia's economy is projected to grow by 5.04% in 2024, but the benefits are not evenly distributed across the e-commerce sector. The majority of businesses (55.49%) experienced revenue stagnation, with only 19% recording an increase. This is due to growth inequality, with large-scale companies having an advantage in capitalizing on digital opportunities compared to MSMEs, which still face challenges such as capitalization, marketing, and limited digital skills.
 5. Product marketing barriers to reach new consumers and intense price competition on online platforms.
 6. Lack of digitally skilled workforce, so that business actors can excel in competing in the dynamic digital economy era.
- e-commerce* companies through the lens of industry sectors provides a comprehensive understanding of the forces driving today's digital economy. These findings indicate that despite widespread digital adoption, certain groups dominate business concentration due to their large market share and integrated supply chains. Based on data from 2020-2024, Indonesian *e-commerce* experienced significant growth, driven by technological advancements and internet access. Businesses are shifting to digital platforms, making it easier for consumers and expanding market share. The variety of goods and services reflects the evolving market dynamics.

Figure 2. Graph of the Percentage of E-Commerce Businesses by Business Field Category in 2024



Source: Central Statistics Agency Data 2024 (Central Statistics Agency, 2025)

Figure 2. Explains the percentage based on *e-commerce* business categories with the following categories: (1) Category G (31.88%): Represents the Wholesale and Retail Trade sector; Car and Motorcycle Repair and Maintenance. This sector has the largest percentage because it contributes greatly to online sales. (2) Category I (23.98%): Includes Provision of Accommodation and Provision of Food and Beverages. The large number of this category illustrates the high trend of digital food delivery. (3) Category C (20.62%): Processing Industry Sector (Manufacturing). Many producers have marketed their products through *e-commerce platforms*. Other Sectors include category S: Other services (7.33%),

category H: Transportation and Warehousing (5.76%), category A: Agriculture, Forestry, and Fisheries (3.31%), and other categories: Combined other small sectors (7.12%).

Table 1. Percentage of E-Commerce Businesses by Province and Major Obstacles in 2024

Ranking	Province	E-Commerce (%)	Main Obstacles	Region
1	DKI Jakarta	63.54	Lack of capital, product marketing constraints	Java
2	DI Yogyakarta	56.72	Product Marketing Constraints, lack of capital	Java
3	Lampung	52.17	Lack of capital, Limited delivery services	Sumatra
4	Bali	51.37	Lack of capital, product marketing constraints	Bali-Nusa
5	East Kalimantan	50.61	Lack of capital, Others	Kalimantan
6	Central Java	45.18	Lack of capital, product marketing constraints	Java
7	Riau islands	44.22	Lack of capital, Others	Sumatra
8	South Kalimantan	43.43	Lack of capital, product marketing constraints	Kalimantan
9	West Java	43.38	Lack of capital, product marketing constraints	Java
10	Bangka Belitung Islands	42.93	Lack of capital, product marketing constraints	Sumatra
11	West Kalimantan	40.02	Lack of capital, Lack of skilled labor	Kalimantan
12	Banten	40.10	Lack of capital, product marketing constraints	Java
13	Bengkulu	39.86	Lack of capital, Others	Sumatra
14	North Kalimantan	39.03	Lack of capital, Lack of skilled labor	Kalimantan
15	South Sulawesi	38.66	Lack of capital, product marketing constraints	Sulawesi
16	South Sumatra	37.84	Lack of capital, Lack of skilled labor	Sumatra
17	Aceh	37.65	Lack of capital, product marketing constraints	Sumatra
18	East Java	37.54	Lack of capital, product marketing constraints	Java
19	Riau	36.93	Lack of capital, product marketing constraints	Sumatra
20	North Sumatra	35.38	Lack of capital, Lack of skilled labor	Sumatra
21	Central Kalimantan	35.01	Lack of capital, Lack of skilled labor	Kalimantan

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22	North Sulawesi	34.38	Lack of capital, Others	Sulawesi
23	Jambi	33.90	Lack of capital, Lack of skilled labor	Sumatra
24	Maluku	31.30	Lack of capital, Others	Maluku-Papua
25	Central Sulawesi	30.12	Lack of capital, Lack of skilled labor	Sulawesi
26	West Nusa Tenggara	29.83	Lack of capital, Lack of skilled labor	Bali-Nusa
27	South Papua	28.98	Lack of capital, product marketing constraints	Maluku-Papua
28	Central Papua	28.78	Lack of capital, Limited delivery services	Maluku-Papua
29	West Sumatra	28.75	Lack of capital, product marketing constraints	Sumatra
30	West Sulawesi	28.26	Lack of capital, product marketing constraints	Sulawesi
31	Southeast Sulawesi	27.63	Lack of capital, Others	Sulawesi
32	Southwest Papua	24.68	Lack of capital, Others	Maluku-Papua
33	Papua	23.29	Lack of Capital, Others	Maluku-Papua
34	North Maluku	21.93	Lack of capital, Lack of skilled labor	Maluku-Papua
35	Gorontalo	21.37	Lack of capital, Lack of skilled labor	Sulawesi
36	West Papua	16.09	Lack of capital, Lack of skilled labor	Maluku-Papua
37	East Nusa Tenggara	14.19	Lack of capital, Lack of skilled labor	Bali-Nusa
38	Papua Mountains	2.70	Limited Internet Access, Product Marketing Constraints	Maluku-Papua

Source: Central Statistics Agency Data 2024 (Central Statistics Agency, 2025)

Based on data analysis from Table 1, digital adoption in Indonesia shows a *gap* between regions. The national average is 42.02% . The centers of digital economic growth are dominated by DKI Jakarta (63.54%) and DI Yogyakarta (56.72%) . Conversely, a very high *digital divide* occurs in eastern Indonesia, especially in the Papua Mountains with an adoption percentage of 2.70% . However, several provinces outside Java, such as Lampung (52.17%) and East Kalimantan (50.61%), show high performance and exceed the national average, indicating the potential for equal distribution of the digital economy in other regions. Table 1 also shows the various obstacles for each province. Overall, the main obstacles are (1) lack of capital (36.41%), (2) Product Marketing (20.52%), (3) Lack of skilled labor (16.03%) which is the main problem in developing countries, and (4) Limited Internet access (3.11%) which is a problem in certain regions.

CONCLUSION AND SUGGESTIONS

There are barriers related to infrastructure and business readiness for businesses seeking to implement *e-commerce* . In regions with the lowest adoption, such as Highlands Papua, the primary issue is technical/structural barriers (internet access). Meanwhile, in regions with high adoption, such as Java and Bali, the barriers shift to economic competition (marketing and capital).

The gap in the quality of human resources in provinces with high tourism and trade potential, such as Bali and North Kalimantan, is actually hampered by a lack of skilled labor, which reaches more than 23%. Other obstacles for island regions such as Maluku (26.43%) and Papua (29.18%) have a high percentage of Other Obstacles, possibly occurring in large numbers due to geographical constraints and expensive logistics costs. Based on the high level of digital adoption and the diversity of structural constraints between regions, steps are needed to mitigate the digital divide. This effort aims to encourage *e-commerce-based economic equality* based on the characteristics and dominant constraints in each region. Some of the mitigation steps include; (1) Infrastructure Equity: Prioritizing the development of internet networks in areas with extreme access constraints such as Mountainous Papua, Regional Capital Access: as the biggest national problem, local governments need to expand digital microcredit schemes for MSMEs, (3) Digital Skills Training: to improve the quality of skilled workers in areas with high economic potential but low adoption, such as North Kalimantan and Bali.

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