The Role of E-Commerce in Improving Incomes, Product Sales, and Market Reach of Culinary MSMEs in Pancoran Mas District of Depok City

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Abstract

The smart economy is part of the smart city aspect that aims to support economic activities and adapt to the current era of information technology. The most dominant micro businesses in Pancoran Mas District are businesses engaged in the culinary sector. One effort to increase the marketing reach of micro-businesses in Pancoran Mas District, especially in the culinary sector, is by utilizing e-commerce. This study was conducted to determine the differences between income, product sales, and marketing reach before and after the utilization of e-commerce. The method used in this study is the quantitative descriptive method. The results of the study indicate that from the processing of the wilcoxon test, there is a significant difference between income, product sales, and marketing reach before and after the use of e-commerce by culinary micro-businesses actors in Pancoran Mas District, Depok City.

Keywords: culinary, MSMEs, e-commerce, smart economy

Introduction

Flexible adaptation to an ever-evolving economic landscape is essential, particularly as digital technology influences the complexities of the modern digital economy. Geographical aspects, economic dynamics and principles, and human adaptability, demonstrate the innovative and sustainable development of 21st-century regional and urban growth (Nijkamp et al. 2024). Information and Communication Technology (ICT) serves as a key driver in urban development within the smart city framework. ICT functions as an enabling component that facilitates interactions across various domains and aids in managing information through technological assistance (Tcholtchev and Schieferdecker 2021)

Kirimtat et al. (2020) explains that a smart city consists of several dimensions, including smart economy, smart governance, smart people, smart

environment, smart mobility, and smart living. The development of smart cities helps drive urban innovation, promotes sustainable development, and enhances quality of life. Smart economy encompasses three dimensions: primary, secondary, and tertiary industries; transactions, including the development of financial ecosystems; and well-being, pertaining to improving societal welfare . One key aspect of the smart economy is strengthening the utilization of ICT and virtual spaces in small and medium enterprises (SMEs), enabling them to improve product promotion and expand market reach (Putra and Sajida 2023; Rachmawati, Ramadhan, and Rohmah 2018)

E-commerce has a significant positive impact in Indonesia, contributing to societal welfare by increasing income in the rapidly growing digital economy sector. E-commerce penetration has a positive correlation with income levels and population size in a given region, as areas with higher populations tend to have greater commercial activity, with demand concentrated in densely populated zones (World Bank 2021). The utilization of e-commerce in Indonesia has continued to rise since 2020, reaching 58.63 million users in 2023 and projected to grow to 99.1 million users by 2029. The e-commerce penetration rate also increased, reaching 21.56% in 2023, with projections estimating it will reach 34.84% by 2029 (Kementerian Perdagangan 2024).

The city of Depok plays a vital role as a key hub in advancing the economy and serving as a center for national activities (Layanan Informasi BPIW 2020). The Depok City spatial planning strategy for 2022–2042 identifies several strategic urban areas to have significant potential in supporting economic growth such as observed in Pancoran Mas District (Pemerintah Kota Depok 2022). This district is strategically located at the center of Depok City and has various public facilities to support economic development. Pancoran Mas is a densely populated area, which significantly influences online buying and selling activities.

Micro, small, and medium enterprises (MSMEs) in this district have substantial opportunities for sustainable growth. The Depok City Office of Cooperatives and Micro Enterprises explains the most dominant MSME sector is the culinary business. The culinary sector is considered particularly attractive

because food is a fundamental necessity for all individuals (Habiba and Prasetyia 2022). Culinary MSMEs in Pancoran Mas actively participate in various activities, such as bazaars and training programs facilitated by relevant government agencies (Agustien & Hapsari, 2019).

One of the primary challenges MSMEs encounter in the era of globalization is maintaining competitiveness through unique advantages. ICT can support urban growth by boosting economic activity (Yeh 2017). Advances in information technology offer various conveniences for MSMEs, such as increasing sales, expanding market reach, and assisting with business decision-making (Wahyuni et al. 2020). E-commerce serves as an effective trading tool, particularly for marketing and selling products, and provides significant benefits by enhancing customer reach and sales efficiency (Yacob et al. 2021). In recent years, e-commerce has expanded considerably, gradually replacing traditional retail stores (Wijoyo et al. 2020). E-commerce contributes to higher productivity, increased competitiveness, improved access to information, and more inclusive development (Ahi et al., 2023).

In the current technological era, utilizing e-commerce has become increasingly essential for micro-business owners, including those in the culinary sector. Some of the advantages micro-business owners can gain from e-commerce include faster transaction processing and reduced promotional costs. E-commerce plays a crucial role in significantly increasing revenue, sales, and market reach.

Hanny, Syah, and Novita (2020) conducted a qualitative research method and found that e-commerce enhances marketing, sales, and service quality among culinary MSMEs in Sawangan District. Purba et al. (2021) also found that e-commerce has a significant impact on business sustainability, while digital marketing positively influences financial performance. Meanwhile, Salma and Rachmawati (2022) concluded that online food delivery services in Yogyakarta provided significant benefits in terms of operational efficiency, strategic advantage, organizational structure, and competitive advantage. These benefits have also positively impacted the competitiveness of

the creative industry's culinary sub-sector during the pandemic, the study employed a qualitative descriptive methodology.

Khamidah, Astuti, and Safitri (2023) found that digital marketing had a positive and significant effect on sales volume among MSMEs in Cimanggis District. Similarly, Arianty et al. (2023) revealed that e-commerce significantly and positively influences MSME performance. E-commerce serves as a marketing platform capable of reaching a large number of consumers. Furthermore, Sari (2024) found that the implementation of technology significantly influenced business sustainability, directly influencing overall business performance.

Based on the previous reviewed studies, differences exist between prior research and the current study. Many previous studies have focused on e-commerce and digital marketing. However, this study presents novelty by examining different variables, employing distinct statistical testing methods, and providing new data analyses. The objective of this study is to analyze the differences in income, product sales, and market reach before and after the implementation of e-commerce by micro-scale culinary MSMEs in Pancoran Mas District, Depok City.

Methods

This quantitative research method took the research site in Pancoran Mas Distict, Depok City. Sugiyono (2019) explains that quantitative research is a type of study based on the principles of positivism and is used to examine a population or sample. Creswell and Creswell (2018) quantitative research is an effort to explore a particular issue, where the issue serves as a foundation for data collection, variable identification, and numerical measurement, allowing for analysis to be conducted following statistical procedures.

The population consisted of micro-enterprise owners operating across Pancoran Mas District. Based on (Badan Pemeriksa Keuangan 2021), which outlines the criteria for Micro, Small, and Medium Enterprises (MSMEs), a micro-enterprise is defined as a business with a maximum capital ownership of one billion rupiah (Rp. 1,000,000,000.00), excluding land and buildings. The research sample consists of micro-scale culinary business owners in Pancoran

Mas District, covering six sub-districts. The sample size for this study is determined using the Slovin formula (Supriyanto & Iswandari 2017) as follows:

$$n = \frac{N}{1+N(e)^2}$$

Remarks:
n = sample size
N = population
e = error threshold 10 %

The researchers considered to only take 0.1% of e-value after considering three aspects, such as time allotment, manpower, and cost. The population consisted of 169 MSME doers from several administrative villages in Pancoram Mas District. Here is the sample calculation.

Given :

N = 169

Ne^2 = 0,1

Research sample $= \dfrac{169}{1+(169 \times 0.1^2)} = 63$

Based on the calculation, the research sample consists of 63 culinary MSME doers in the district. The applied sampling method was proportional random sampling. The sample distribution consisted of 13 samples from Depok Sub-district, 9 samples from Depok Jaya Sub-district, 8 samples from Mampang Sub-district, 13 samples from Pancoran Mas Sub-district, 9 samples from Rangkapan Jaya Sub-district, and 11 samples from Rangkapan Jaya Baru Sub-district.

This study utilizes two types of data: primary data and secondary data. Primary data were collected through interviews using a questionnaire. After collecting the primary data, the collected data were analyzed using a quantitative approach with descriptive statistical analysis techniques. The secondary data consists of information on the distribution of micro-scale culinary enterprises obtained from the Depok City Office of Cooperatives and Micro Enterprises during the researcher's visit on May 7, 2024. Additionally, secondary data were collected from online sources, credible books and journals, as well as data from relevant government agencies. The data processing

technique involved the Wilcoxon test, preceded by a normality test. Data analysis was conducted using SPSS 26 software.

The researcher also classified the income levels of micro-scale culinary business owners after utilizing e-commerce for product marketing into two categories: high-income and low-income. This classification was based on the regional minimum wage of Depok City. Data processing is carried out using ArcGIS (a geographic information system) software.

Result And Discussion

Based on field surveys, the participating micro-scale culinary business owners were predominantly women, accounting for 90.48%, while the percentage of male business owners was 9.52%. Most micro-enterprise owners were housewives seeking to develop their culinary businesses, which fell into the micro-enterprise category. The utilization of e-commerce by micro-scale culinary businesses in Pancoran Mas District supports the implementation of a smart economy. Therefore, enhancing online marketing strategies is crucial to expanding the market reach of microenterprises in the culinary sector.

Culinary MSME owners leverage e-commerce to market their products as part of their business development efforts. The effective use of e-commerce coud reduce operational costs and increase sales, thereby leading to potential income growth. This study analyzed the differences in income, product sales, and market reach before and after the implementation of e-commerce as part of the smart economy implementation in Pancoran Mas District, Depok City.

E-commerce can be optimized through the implementation of effective social media strategies, which can significantly boost product sales. Social media platforms facilitate e-commerce businesses attract consumers and engage with the general public. The popularity of social media continues to rise among society, and businesses that integrate e-commerce can create positive consumer impacts by utilizing social media effectively ('Hasanat 2020). The most commonly applied social media platforms among micro-scale culinary entrepreneurs were WhatsApp and Instagram.

The implementation of e-commerce serves as a crucial tool for product promotion and marketing, significantly contributing to increased sales volume

and revenue. This revenue growth ultimately supports the development of microenterprises (Darsono et al. 2019). The income of culinary MSME owners who implemented e-commerce was higher than that of those who did not. This finding indicates a strong correlation between e-commerce implementation and income levels (Arniyasa and Karmini 2023).

The average monthly income of micro-scale culinary business owners in Pancoran Mas District before implementing e-commerce was Rp 2.952.857, with a standard deviation of Rp 3.216.371. After implementing e-commerce for product marketing, their average monthly income increased to Rp 5.506.349, with a standard deviation of Rp 5.516.218. Similarly, the average number of products sold per month before implementing e-commerce was 258,19 units, with a standard deviation of 330,32 units. Following e-commerce implementation, the average monthly sales increased to 455,20 units, with a standard deviation of 534,12 units. Regarding market reach, the average farthest marketing radius before using e-commerce was 15,37 kilometres, with a standard deviation of 26,74 kilometres. After e-commerce implementation, the average farthest market reach expanded to 272,78 kilometres, with a standard deviation of 560,48 kilometres.

The significance of e-commerce implementation, as demonstrated in this study, is based on income levels before and after using e-commerce, product sales before and after e-commerce implementation, and the farthest market reach before and after e-commerce implementation. The Wilcoxon signed-rank test is a nonparametric statistical test used to measure the mean differences in paired data with a non-normal distribution. This study used the Wilcoxon signed-rank test because the non-normally distributed data related to income, product sales, and market reach after conducting a normality test.

The Wilcoxon signed-rank test is a nonparametric statistical test to measure the mean differences between two related samples with a ratio or interval scale, particularly when the data does not follow a normal distribution. The decision-making criterion for the Wilcoxon test is based on the asymptotic significance (two-tailed) value: if asym.sig (two-tailed) < 0.05, the null

hypothesis (H_0) is denied. Conversely, if asym.sig (two-tailed) > 0.05, the null hypothesis (H_0) is accepted (Sujarweni 2024).

In this study, the Wilcoxon signed-rank test was selected because the data related to income, product sales, and market reach was found to be non-normally distributed, as indicated by the results of the previous normality test. The null hypothesis (H_0) states no significant difference in mean income before and after e-commerce implementation. Meanwhile, the alternative hypothesis (H_1) posits a significant difference in mean income before and after e-commerce implementation.

Table 1.
The Wilcoxon Test Results of Income Variable

Variables	Asymp. Sig. (2-tailed)	Conclusion
Incomes before and after implementing e-commerce	.000	H_1 accepted

Source : (SPSS 26, processed 2024)

The Asymp. Sig. (2-tailed) value (p-value) is 0.000, which is highly significant as it falls below 0.05. This result implies that the null hypothesis is denied, indicating a significant difference in income before and after e-commerce implementation. This finding confirms that the implementation of e-commerce has a statistically significant impact on income growth.

Successful marketing performance can be assessed through sales levels and revenue growth. There are three key components in marketing: business effectiveness, sales growth, and relative profit increase (Udayana et al. 2024). Although nearly all micro-scale culinary business owners reported an increase in income, the magnitude of income growth varied among respondents. These variations are influenced by the type of product sold, the e-commerce platform used, and the target market. While the majority of micro-scale culinary entrepreneurs experienced significant income growth, some reported only marginal increases compared to their pre-e-commerce sales levels.

Table 2.
The Wilcoxon Test Results of Product Sales

Variables	Asymp. Sig. (2-tailed)	Conclusions
The product sales after and before the implementation of e-commerce	.000	H_1 accepted

Source : (SPSS 26, processed 2024)

The null hypothesis (H_0) states no significant difference in the mean of products sold before and after e-commerce implementation. Meanwhile, the alternative hypothesis (H_1) posits a significant difference in average product sales before and after e-commerce implementation.

Sales serve as a primary indicator of business performance—the higher the sales volume, the greater the revenue generated. Product sales activities directly impact the revenue sources of micro-enterprises, and the introduction of e-commerce has streamlined the transaction process for culinary businesses (Jaya and Raya 2022). The p-value is 0.000, indicating a highly significant statistical result. Thus, e-commerce has a significant positive impact on culinary product sales.

Table 3.
The Wilcoxon Test of Market Reach Variable

Variable	Asymp. Sig. (2-tailed)	Conclusion
The market reach after and before the implementation of e-commerce	.000	H_1 accepted

Source : (SPSS 26, processed 2024)

Marketing strategies are essential for promoting MSME products, ensuring that both producers and consumers do not suffer losses. With advancements in technology, product marketing through e-commerce has become more accessible. The implementation of e-commerce is highly beneficial for MSMEs, particularly for culinary entrepreneurs, as it enables wider market reach and eliminates geographical barriers in marketing (Susanti 2017).

Today, e-commerce-based marketing strategies have become widely recognized by the public. People can now obtain information more quickly via

the internet. The unrestricted nature of internet connectivity in terms of time and location has encouraged MSME owners to take the initiative in expanding their businesses. E-commerce marketing simplifies market reach, making sales transactions more manageable and efficient (Cay and Irnawati 2020).

The null hypothesis (H_0) states no significant difference in market reach before and after e-commerce implementation. In contrast, the alternative hypothesis (H_1) posits a significant difference in market reach before and after e-commerce implementation.

The market reach of micro-scale culinary businesses expanded significantly following e-commerce implementation, as indicated by a p-value of 0.000, which is less than 0.05. Based on this result, the null hypothesis is denied, confirming a significant difference in market reach before and after e-commerce implementation. The use of e-commerce among micro-scale culinary business owners in Pancoran Mas District not only increased revenue and product sales but also significantly expanded market reach, which is measured in kilometers.

Figure 1.
Map of The Farthest Marketing Reach of Culinary MSMEs After Utilizing E-commerce
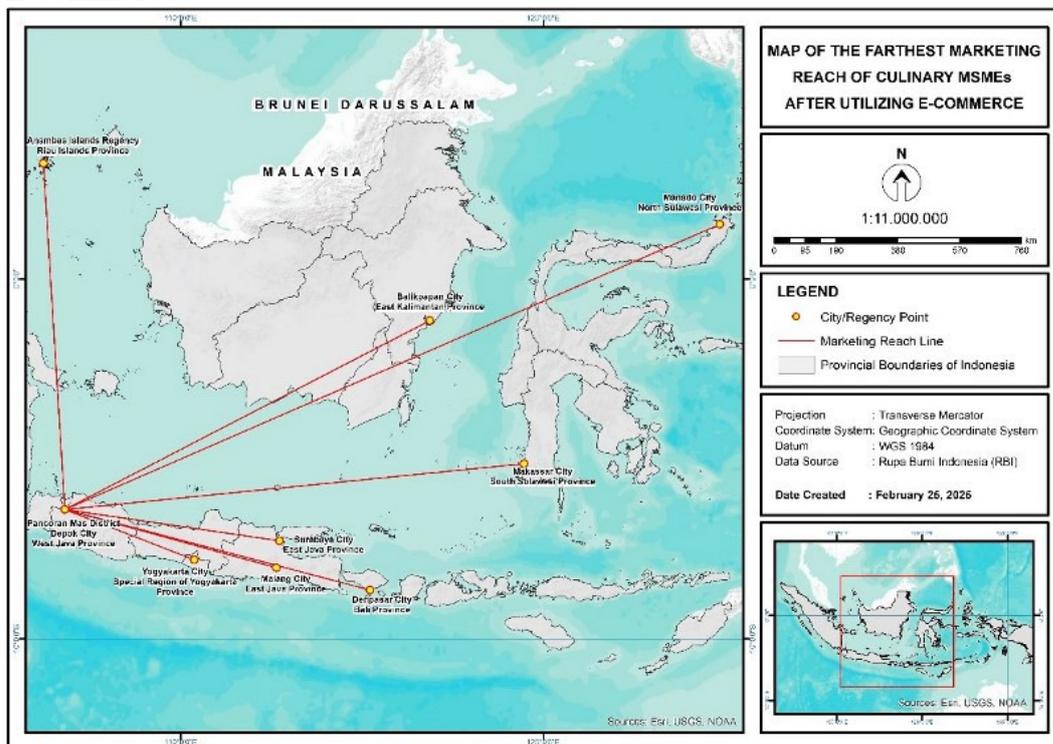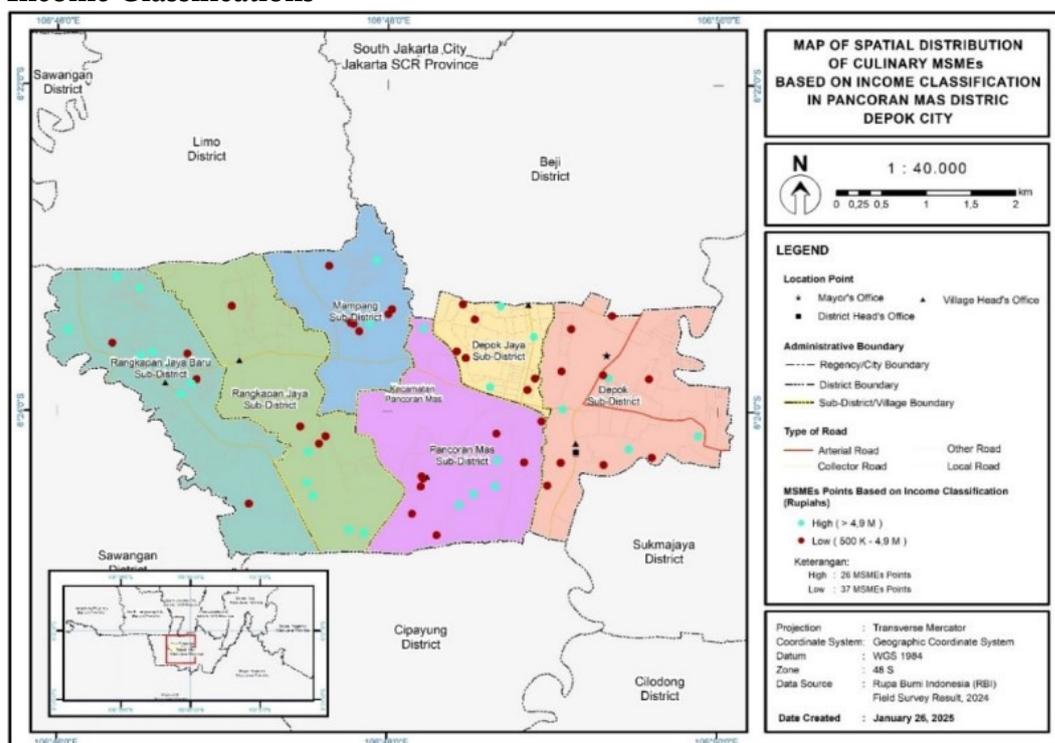
Source : (Analyzed Results 2025)

Following the implementation of e-commerce, the market reach of micro-scale culinary businesses in Pancoran Mas District expanded beyond West Java Province. According to field surveys, these businesses marketed their products not only within West Java but also in cities such as Yogyakarta, Malang, and Surabaya. Some businesses even reached regions beyond Java, including Anambas, Bali, Balikpapan, Manado, and Makassar.

The implementation of e-commerce by micro-scale culinary entrepreneurs in Pancoran Mas District brought several positive impacts on business sustainability. E-commerce played a crucial role in 1) expanding market reach, both in geographical distance and total product sales, and 2) increasing product sales, which directly correlates with higher income for MSME owners. The impact of e-commerce on income, product sales volume, and market reach were statistically analyzed, using a total sample size of 63 MSME owners. The significance of e-commerce implementation is measured by comparing: 1) income levels before and after e-commerce utilization; 2) product sales before and after e-commerce implementation; and 3) farthest market reach before and after e-commerce utilization.

After implementing e-commerce for product marketing, MSME income levels were classified into two categories: 1) high-income category and 2) low-income category. This classification is based on Depok City's regional minimum wage (Rp 4,878,612) (Idris 2024). For analytical purposes, this amount was rounded to Rp 4.9 million. Within the study sample: 1) 26 MSMEs were categorized as high-income businesses, and 2) 37 MSMEs remained in the low-income category.

The smart economy aims to establish an economic environment that can adapt quickly to the challenges of the information technology era, which is inherently competitive and requires rapid adaptation (Bahari, Susanto, and Gunawan 2021). The focus of the smart economy is to create a synergistic, creative, and mutually beneficial industrial environment in terms of promotion, production, and financial transactions, ultimately enhancing societal welfare (Umam and Mafruhat 2022).

Figure 2.
The Distribution Map of Micro-Scale Culinary Enterprises based on the Income Classifications

Source : (Analyzed Results 2025)

The use of e-commerce can assist micro-businesses by providing access to information and expanding market reach, leading to increased revenue (Yusvita et al. 2022). Economic activity, along with technological implementation, has the potential to drive business growth in the economic sector, thus contributing to social well-being (Surya et al. 2021). The use of technology has a defining feature of digital marketing, proving to be an effective tool in boosting product sales, particularly for MSMEs. E-commerce can be defined as the process of buying and selling products electronically with the support of computers and internet-based tools (Purba et al. 2021).

Information and communication technology (ICT) plays a key role in facilitating the implementation of the smart economy, particularly in developing micro-scale businesses in the culinary sector through e-commerce adoption. The smart economy concept refers to economic activity that leverages technology to enhance innovation, connectivity, and efficiency across multiple industries.

The smart economy represents an economic development model driven by advancements in ICT. These technological advancements encourage MSMEs to adapt to changes in order to create sustainable businesses (Hoetoro and Satria 2020). E-commerce serves as a crucial component of the smart economy, contributing to the establishment of an intelligent and adaptive business environment.

The implementation of e-commerce among micro-scale culinary enterprises in Pancoran Mas District, Depok City, has been well-executed. However, based on the spatial distribution of micro-enterprises, it is evident that many micro-scale culinary businesses still generate low incomes. Therefore, it is necessary to introduce further innovations aligned with current technological advancements. The massive adoption of e-commerce should be further enhanced to enable micro-scale culinary entrepreneurs to operate their businesses sustainably. Expanding the use of e-commerce holds great potential to provide opportunities for micro-business owners to increase their revenue, improve product sales, and broaden their market reach.

Conclusion

Based on the data processing and analysis, and the discussion, the research concludes e-commerce implementation has a significant impact on increasing income, product sales, and market reach for micro-scale culinary businesses in Pancoran Mas District.

These findings suggest that business performance is influenced by how frequently micro-scale culinary entrepreneurs market their products through various e-commerce platforms. Although many micro-scale culinary business owners in this study still earn below the regional minimum wage of Depok City, the implementation of e-commerce in micro-business development has been successfully executed and continues to demonstrate positive outcomes.

Acknowledgment

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