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Research Article

Technology Platforms as Drivers of Innovation in the Digital Economy in Indonesia's MSMEs

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Abstract: Digital transformation has become a major force in driving innovation in the Micro, Small and Medium Enterprises (MSMEs) sector in Indonesia. This research examines the role of technology platforms as a key driver in facing challenges and capitalizing on opportunities in the digital economy era. Through a descriptive qualitative approach, this study analyzes how MSMEs adopt digital platforms such as e-commerce, digital payments, and cloud-based technology to improve operational efficiency, expand market reach, and drive sustainable business growth. The results show that the utilization of technology platforms not only accelerates innovation in products and services, but also increases the competitiveness of MSMEs in the global market. However, technology adoption still faces obstacles such as limited digital literacy, infrastructure, and access to financing. Therefore, support from various parties, including the government, private sector, and educational institutions, is needed to create an inclusive and sustainable digital ecosystem for MSMEs in Indonesia.

Keywords: Digital Economy; Digital Transformation; Innovation; MSMEs; Technology Platforms.

1. Introduction

Technology platforms have become a major catalyst in driving innovation and growth in the digital economy, particularly in the Micro, Small and Medium Enterprises (MSMEs) sector. According to [1] The digital transformation that has taken place in recent years has fundamentally changed the business landscape, providing new opportunities for MSMEs to develop more quickly and efficiently an MSME has a very vital role in the Indonesian economy, both as a major contributor to economic growth and as the largest provider of employment. The existence of MSMEs also encourages economic development in remote areas, reduces poverty, and is a source of innovation and creativity. Therefore, support for MSMEs, especially in terms of digital technology adoption and broader market access, is essential to drive inclusive national economic growth and global competitiveness. Through the utilization of digital platforms such as e-commerce, social media, and digital financial applications, MSMEs are now able to expand market reach, improve operational efficiency, and strengthen competitiveness at the national and international levels[2]

The acceleration of technology adoption among MSMEs cannot be separated from the need to survive and grow amid increasingly fierce competition, especially after the pandemic. Digital platforms offer solutions to various classic challenges of MSMEs, such as limited market access, capital constraints, and lack of business infrastructure[3] . According to[4] With digitalization, MSMEs can automate business processes, manage finances more transparently, and utilize customer data for more strategic decision-making Innovations such as the use of the Internet of Things (IoT) for production monitoring and big data for consumer behavior analysis have helped MSMEs create value-added products and significantly increase productivity.

However, behind these opportunities, MSMEs also face significant challenges in adopting technology. According to[5] This gap is influenced by several factors, including low digital literacy, limited technological infrastructure in certain areas, and lack of skills in developing effective digital marketing strategies. For this reason, the role of the government

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and the private sector is very important in providing training, infrastructure, and supporting policies so that MSMEs can optimally utilize technology.

Technology platforms not only serve as supporting tools, but also as the main driver of innovation in the digital economy[6] . According to Camelia in[7] The success of an MSME in utilizing technology will determine their competitiveness and contribution to national economic growth. Inclusive and sustainable digital transformation is the key for MSMEs to continue to innovate and adapt in the dynamic digital economy era[2]

Thus, digital transformation has become a key element in strengthening the role of MSMEs in the digital economy era. Through the utilization of technology platforms such as e-commerce, social media, and digital financial applications, MSMEs can expand their markets, improve operational efficiency, and compete more competitively at the national and global levels. Despite the huge opportunities offered, MSMEs still face serious challenges such as low digital literacy, limited infrastructure, and lack of skills in digital marketing. Therefore, collaboration between the government, private sector, and educational institutions is needed to create an ecosystem that supports the digital transformation of MSMEs in an inclusive and sustainable manner. The success of MSMEs in adopting technology will be a key determinant of their competitiveness and contribution to national economic growth in the future.

2. Literature Review

2.1. Technology Platform

According to[8] A digital platform is a set of shared services that enable the development of complementary products and services by third parties, thus forming a dynamic innovation ecosystem. A technology platform is a digital infrastructure that enables interaction and value exchange between two or more parties, such as sellers and buyers. This platform not only provides a space for transactions, but also supports the creation and distribution of value through features that facilitate communication, logistics, and digital payment systems. According to[9] Platforms are business models that create value by facilitating exchanges between interdependent groups of users, The main feature of digital platforms is the existence of network effects, which means that the more users involved, the greater the value created by the platform. According to[10] , the platform is designed to organize information technology capabilities into a framework. The framework allows software to address a common family of specifications that meet the needs of several diverse and growing user communities. In the context of MSMEs, the presence of digital platforms such as e-commerce and fintech provides a great opportunity to expand market access, improve operational efficiency, and reduce transaction costs that were previously an obstacle in traditional businesses.

2.2. Innovation

Innovation is an important process in business development, including for MSME players. According to[11] Business innovation includes the development of new products, changes in business models that are more efficient, and improvements in operational processes to create added value and gain a competitive advantage. Innovation is not only limited to the creation of new products, but also includes the application of technology, new business processes, and more efficient distribution models. According to Schumpeter in[12] States that innovation is the main motor in economic development, with five main forms, namely: new product development, new production methods, new markets, new sources of raw materials, and new organizational structures. On the other hand, Rogers' Diffusion of Innovation theory in[13] explains how an innovation is adopted in a social system through several stages, namely knowledge, persuasion, decision, implementation, and confirmation. According to Kuniyoshi Urabe in[14] innovation is an activity that cannot be produced in one hit but a long process that includes the decision-making process from idea discovery to implementation in the market. In this case, digital platforms are an important means of accelerating innovation adoption in MSMEs because they facilitate access to information, training, and technology integration in business operations.

2.3. Digital Economy

Digital economy is an economic system based on the use of digital technology, especially the internet, in production, distribution, and consumption activities. According to [15] digital economy includes digital infrastructure, digital-based economic activities (such as e-commerce, digital marketing, and fintech), and the transformation of economic structures due to digitalization. According to[16] The digital economy is a phenomenon characterized by the rise of business and trade transactions that utilize the internet as a medium of communication, collaboration, and cooperation between companies and individuals. In this era, MSMEs are an important part of the digital ecosystem, as they are able to reach a wider market at a lower cost through digital platforms. This transformation also encourages MSMEs to improve their technological capabilities and develop digital innovation strategies to remain competitive. Therefore, the digital economy opens up great opportunities for MSMEs to grow inclusively and sustainably, especially if supported by proper technology adoption. According to[17] , the modern economy is based on the utilization of information and communication technology, especially the internet, in all economic activities - from production, marketing, distribution, to transactions - aimed at creating added value, efficiency, and market expansion. In the context of MSMEs, the digital economy provides opportunities for increased revenue and competitiveness through the adoption of digital platforms and online marketing strategies.

3. Proposed Method

3.1. Research Approach and Type

This research uses a quantitative approach with a descriptive research type with the Explanatory Research Method. The quantitative approach is used to measure the effect of technology platforms on innovation in the context of the digital economy. Descriptive research aims to provide a systematic description of the use of technology platforms by MSMEs, while explanatory research is used to explain the causal relationship between the variables studied. [18] Quantitative research is defined as a research method based on the philosophy of positivism, used to research on certain populations or samples, data collection using research instruments, data analysis is quantitative / statistical.

3.2. Location and Time of Research

The research was conducted on MSMEs spread across several major cities in Indonesia, such as Jakarta, Bandung, Surabaya, and Yogyakarta, which have used digital platforms such as marketplaces (Shopee, Tokopedia), social media, and fintech services. The research implementation time is planned for three months, from February to April 2025.

3.3. Population and Sample

The population in this study are all Micro, Small and Medium Enterprises (MSMEs) in Indonesia who have used technology platforms in their business operations. According to [18] Samples are part of the population selected with certain techniques and are expected to represent the characteristics of the population as a whole.Then to determine the sample, the sampling technique used is purposive sampling, which is a sampling technique based on certain considerations that are relevant to the research objectives [18] . The criteria set include: MSMEs that have utilized at least one type of digital platform such as e-commerce, technology-based financial services (fintech), or social media in carrying out their business activities; have been operating actively for at least two years, have at least five employees, owners or managers of MSMEs who understand their business strategies and are located in urban areas that have adequate digital infrastructure. Based on these criteria, the number of samples used in this study was 200 respondents, consisting of micro, small and medium enterprises spread across several major cities in Indonesia.

3.4. Data Collection Technique

[18]Questionnaires or questionnaires are data collection techniques that are carried out by giving a set of questions or written statements to respondents to answer. Questionnaires are one of the data collection techniques that are considered quite effective and efficient, especially if the researcher has clarity about the variables to be measured and a good understanding of the limits of information that can be provided by respondents. This

technique is very suitable for use in quantitative research which requires collecting large amounts of data uniformly and systematically. In the context of this research, a questionnaire was developed to explore the perceptions and experiences of MSME players towards the use of technology platforms, the level of innovation, and their involvement in the digital economy. The questionnaire instrument was developed using a Likert scale, which allows respondents to rate a statement based on their level of agreement. In this scale, answers that indicate a high level of agreement with a statement are given a high score, while answers that indicate disagreement or low support for the statement are given a lower score. The use of Likert scales makes it easier for researchers to quantitatively measure attitudes, perceptions, or behavioral tendencies.

3.5. Data Analysis Technique

The type of data used in this study is Quantitative Data, which refers to data in the form of numbers or numbers that can be measured and calculated. Quantitative data has properties that can change or are variable, because its value can be influenced by various factors related to the variable being studied. This data is obtained through measurements made on selected samples or respondents, either through questionnaires, which are designed to collect information related to the variables to be analyzed. In accordance with the definition expressed by [18] , quantitative data can be analyzed statistically to produce an objective picture and test the relationship between variables in the study. This quantitative data is numerical in nature, allowing researchers to conduct more in-depth statistical analysis such as regression tests, validity tests, reliability, and analysis of relationships between variables using various appropriate statistical methods.

The data sources used in this study consist of primary data and secondary data. Primary data, according to [18] , is a data source obtained directly from the object of research through primary data collection, which in this case can be the results of interviews, questionnaires, or observations made by researchers. This primary data is information that is first collected from respondents or research subjects, thus providing a more authentic and direct picture related to the phenomenon being studied. In this study, primary data will be obtained through filling out questionnaires by MSME players who use technology platforms in their business operations. The data will cover various relevant aspects, such as the use of digital platforms, innovations generated, and their involvement in the digital economy. In addition, this study also uses secondary data, which refers to information obtained from pre-existing sources, such as reports, publications, books, journal articles, and statistical data published by relevant agencies. This secondary data is used to strengthen the analysis, provide a broader context, and enrich the findings obtained from the primary data.

Data processing in this study was carried out using SmartPLS (Partial Least Squares) statistical software, which is an effective tool for analyzing relationship models between variables in quantitative research. SmartPLS allows researchers to conduct Structural Equation Modeling (SEM) analysis with the PLS approach, which can measure direct and indirect relationships between variables in the research model. This software is very suitable for research that has small to medium samples and for testing complex models with many variables, both as independent, dependent, and mediating variables. According to[19] , SmartPLS can produce better estimates in data conditions that do not meet the assumption of normality or when the variables studied are reflective or formative formations. By using SmartPLS, multiple linear regression analysis, validity testing, reliability, and mediation tests can be carried out more efficiently and accurately.

3.6. Instrument Testing Technique

According to[20] research instruments are tools for collecting data in research.

3.7. Validity Test

Validity is an index that shows that the measurement provides measurement results that are in accordance with the measurement objectives[20] . The validity test of this research instrument uses convergent validity and discriminant validity.

3.8 Reliability Test

Reliability is a measure used to assess the accuracy or accuracy of a measuring instrument in making measurements[20]. The research instrument is said to be reliable if it is able to produce consistent data, because this consistency is the basis for ensuring that the data obtained can be trusted Purwanto in[20] . To assess the reliability of research instruments,

one of the methods used is the Cronbach's alpha coefficient. According to generally accepted criteria, an instrument is considered reliable if the Cronbach's alpha coefficient value is greater than 0.6 (≥ 60%). Conversely, if the Cronbach's alpha coefficient value is less than or equal to 0.6 (≤ 60%), then the instrument is considered unreliable. This assessment is important to ensure that the instruments used in research can produce stable and consistent data over time.

4. Results and Discussion

4.1. Respondent Description

This research involved 200 respondents who are MSME players from various major cities in Indonesia such as Jakarta, Bandung, Surabaya, and Yogyakarta. Respondents were selected based on the criteria of using digital platforms in business operations, operating for at least two years, having at least five employees, and being located in urban areas with adequate digital infrastructure

Table 1. Respondent Description

Category	Sub-Category	Frequency	Percentage (%)
Business Type	Trade	90	45%
	Food & Beverage	60	30%
	Services	30	15%
	Creative Industry	20	10%
Platform Used	E-commerce (Shopee, Tokopedia)	160	80%
	Social Media (Instagram, Facebook)	130	65%
	Fintech (e-wallet, digital loan)	80	40%

Table 1 presents the demographic characteristics of the 200 MSME respondents surveyed across several major cities in Indonesia. In terms of business type, the majority of respondents (45%) operate in the trade sector, followed by food & beverage (30%), services (15%), and creative industries (10%). Regarding digital platform usage, most MSMEs utilize e-commerce platforms such as Shopee and Tokopedia (80%), with a significant portion also leveraging social media (65%) for marketing and customer engagement. Additionally, 40% of respondents reported using fintech services, including e-wallets and digital loans, indicating a growing adoption of financial technology among small enterprises.

4.2. Validity and Reliability Test

All constructs have AVE > 0.5, Cronbach's Alpha > 0.7, and Composite Reliability > 0.7, thus meeting the validity and reliability requirements.

4.3. SEM-PLS Analysis Results

Table 2. SEM-PLS Analysis Results

Relationship between Variables	Path Coefficient (β)	t-Statistic	p-Value	Description
Technology Platform → Innovation	0.621	13.25	0.000	Significant
Innovation → Digital Economy	0.544	10.17	0.000	Significant
Technology Platform → Digital Economy	0.472	9.32	0.000	Significant

Table 2 shows the results of hypothesis testing using SEM-PLS to examine the relationships between the use of technology platforms, innovation, and involvement in the digital economy among MSMEs. The path coefficient of 0.621 from technology platforms to innovation indicates a strong and significant positive influence, suggesting that higher adoption of digital platforms substantially increases innovation activities within MSMEs. Similarly, innovation positively affects MSME participation in the digital economy, with a path coefficient of 0.544, demonstrating its crucial role in enhancing digital economic engagement. Moreover, technology platforms also have a direct significant impact on digital economy involvement ($\beta = 0.472$), underscoring that platform adoption contributes directly to MSME success in the digital ecosystem, even without mediation by innovation.

4.4. Interpretation of Results

4.4.1. Effect of Technology Platform on Innovation (β = 0.621; t = 13.25; p = 0.000)

These results indicate that technology platforms have a strong and significant influence on innovation in MSME operations. The coefficient value of 0.621 indicates that every one-unit increase in the use of technology platforms (e.g. an increase in the use of e-commerce, fintech, or social media) will increase the level of innovation of MSMEs by 62.1%, in the context of standardized variables. This means that MSMEs that actively utilize digital platforms tend to be more adaptive and quick in developing new products, services, and business processes.

4.4.2. Effect of Innovation on Digital Economy (β = 0.544; t = 10.17; p = 0.000)

The path coefficient of 0.544 indicates that innovation also significantly increases MSME engagement in the digital economy. This means that MSMEs that are more innovative (e.g. in using technology for promotion, distribution or creation of new products) have a greater chance of optimally utilizing the digital economy ecosystem. A one-unit increase in innovation will increase engagement in the digital economy by 54.4%.

4.4.3. Direct Effect of Technology Platforms on Digital Economy (β = 0.472; t = 9.32; p = 0.000)

Technology platforms also have a direct and significant effect on the digital economy, with a coefficient value of 0.472. This means that even without innovation as a mediator, the use of technology platforms such as marketplaces and fintech still contributes 47.2% to the success of MSMEs in participating in the digital economy. This shows the importance of basic digitalization in business activities, such as digital financial records, online transactions, and the use of social media as a marketing tool.

4.5. Result Conclusion

4.5.1. Technology platforms are proven to have a significant influence on MSME innovation.

The analysis shows that the use of digital platforms such as e-commerce, fintech, and social media significantly increases the ability of MSMEs to innovate, both in products, processes, and marketing strategies. The coefficient of influence of 0.621 indicates that the more intensive the use of technology, the higher the level of innovation shown by MSME players.

4.5.2. Innovation has a significant influence on the involvement of MSMEs in the digital economy.

With an influence coefficient of 0.544, innovation plays an important role in encouraging MSME participation in the digital economy ecosystem. Innovation helps MSMEs adjust to changes in the digital market, improve competitiveness, and expand consumer reach through technology-based approaches.

4.5.3. Technology platforms have a direct influence on MSME engagement in the digital economy

In addition to playing a role through innovation, technology platforms directly drive MSME engagement in the digital economy with an influence value of 0.472. This indicates that the use of digital technology directly accelerates the integration of MSMEs into the digital ecosystem, including online transactions, promotions, and technology-based financial services. innovation reaches 81%. This effect consists of direct and indirect effects, indicating that technology platforms are a key driver in the transformation of MSMEs towards a digital economy, especially if accompanied by consistent innovation.

4.6. Discussion

4.6.1. Technology Platforms as Innovation Drivers

The significant effect of technology platform on innovation (β = 0.621) indicates that the higher the intensity of digital technology use, the greater the opportunity for MSMEs to innovate. Technology allows businesses to accelerate the process of adapting to market trends, developing new products, and reaching a wider range of consumers. This reinforces Schumpeter's view in Juhro & Trisnanto,(2018). Regarding innovation as the main motor of economic development, where technology is a vital tool in creating dynamic changes in the business world.

In addition, digital platforms also open up access to external resources such as market information, consumer behavior data, and ease of collaboration with business partners and consumers. In practice, MSMEs that are active on digital platforms are better able to produce updates in product design, marketing methods, and customer service strategies.

4.6.2. Innovation as a Driver of Engagement in the Digital Economy

The coefficient of the effect of innovation on the digital economy of 0.544 indicates that innovation is an important aspect in the success of MSMEs in utilizing opportunities in the digital economy. Innovation provides competitiveness, flexibility, and responsiveness to the changing needs of the digital market. For example, innovative MSMEs tend to develop digital-based services more quickly, such as online pre-order systems, product personalization, or integration of digital payment services.

In a highly competitive digital economy ecosystem, the success of MSMEs is not only determined by their presence on technology platforms, but also by their ability to continuously update their business approach. Innovation is the difference between MSMEs that are merely "present" on digital platforms and those that truly "thrive" in that environment.

4.6.3. Technology Platforms and Digital Economy: Direct and Indirect Linkages

Technology platforms also have a direct effect on the digital economy ($\beta = 0.472$), indicating that even in the absence of innovation, the use of technology still has a positive impact on MSME engagement in the digital ecosystem. However, the total effect of technology platform use becomes much stronger when accompanied by innovation (total effect = 0.810), as shown in the mediation test results.

The findings suggest that innovation acts as a bridge that amplifies the impact of technology on the desired outcome of active and productive participation in the digital economy. MSMEs that not only adopt technology but are also able to leverage it for business improvement and development will benefit more from digitalization.

4.6.4. Contextual Implications for MSMEs in Indonesia

In the Indonesian context, where digital literacy and access to technology are still uneven, this research emphasizes the importance of policy interventions that encourage MSMEs to not only use technology, but also build their innovative capacity. The government and MSME support institutions need to provide training, technical assistance, and incentives to support the digital-based innovation process.

In addition, these results also encourage technology platform providers to be more active in fostering and providing features that encourage the creativity of small businesses. Platforms are not only a means of transaction, but also a space for collaboration and innovation.

5. Comparison

This study offers a quantitative perspective that complements and extends the findings of previous research on the role of digital platforms in MSME development. Godwin et al. (2024) emphasized the significance of digital business innovation and adaptation for MSME survival in Indonesia. While their study highlighted the qualitative advantages of adopting digital technologies, this research strengthens those insights by quantitatively demonstrating the impact of technology platforms on innovation and digital economy engagement through Structural Equation Modeling (SEM-PLS). Similarly, Johan and Wati (2025) explored MSME digital transformation by underlining the role of e-commerce in enhancing market reach and operational efficiency. The present study advances that discussion by showing how innovation mediates the relationship between platform utilization and MSME participation in the digital economy. Further, Moh Hamzah et al. (2025) discussed the contribution of e-commerce to MSME competitiveness but did not examine the statistical magnitude of its effects. In contrast, this study quantifies the direct influence of technology platforms on digital economy engagement ($\beta = 0.472$), and reveals that when mediated by innovation, the total impact reaches 81%. This indicates a substantial amplification effect, underlining the strategic importance of innovation as a complement to technological adoption.

Additionally, the study by Nurrohmah et al. (2024), which focused on financial digitalization, primarily addressed internal improvements within MSMEs. In contrast, this research takes a broader view by evaluating the effect of digital platforms on external competitiveness, innovation capabilities, and strategic positioning in the digital economy. The

theoretical foundation of this study also builds on Parker et al. (2016), who emphasized the importance of network effects in platform-based business models. By applying this concept to the Indonesian MSME context, this research demonstrates how platforms facilitate value creation, connectivity, and scalability, particularly when combined with innovation strategies.

In summary, this study not only confirms prior findings but also contributes new insights by presenting empirical evidence of how technology platforms drive innovation and digital economy integration among MSMEs in Indonesia.

6. Conclusions

Based on the results of data analysis and discussion, it can be concluded that technology platforms play a significant role as a driver of innovation in supporting the involvement of MSMEs in Indonesia in the digital economy. The use of digital platforms such as e-commerce, fintech, and social media is proven to have a positive impact on increasing the innovative capabilities of MSMEs, both in product development, marketing strategies, and operational efficiency. Innovations resulting from the utilization of these technologies directly contribute to the active participation of MSMEs in an increasingly competitive and dynamic digital economic ecosystem. In addition to the direct effect, innovation is also proven to mediate the relationship between the use of technology platforms and engagement in the digital economy, meaning that the maximum benefit from the adoption of new technologies will be achieved when MSMEs are able to use them to create added value and business renewal. Thus, the presence and utilization of digital technology is not only a necessity, but has become an important strategy in strengthening the competitiveness and sustainability of MSMEs in the current era of digital transformation.

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