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## Article

# The Impact of COVID-19 Pandemic on the Performance of Indonesian MSME with Innovation as Mediation

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## MANAGEMENT | RESEARCH ARTICLE

# The Impact of COVID-19 Pandemic on the Performance of Indonesian MSME with Innovation as Mediation

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**Abstract:** This paper investigates how the impact of the COVID-19 pandemic crisis affects the innovation of Micro, small and medium enterprises (MSME) in Indonesia and how innovation, namely product, process, marketing, and organizational innovation, acts as a mediator for MSME performance. An integrated conceptual framework is developed and empirically tested using cross-sectional survey design data from 300 MSME owners in Indonesia. Structural Equation Modelling (SEM) software Smart PLS examines the hypotheses testing. Descriptive analysis is also used to provide demographic data of the owners of MSMEs in Indonesia. This study reveals that the COVID-19 pandemic crisis significantly and positively impacts four dimensions of innovation. The results indicate that the pandemic triggered the MSME owners to innovate or adapt. This study also found that four dimensions of innovation partially mediate the COVID-19 pandemic crisis and MSME performance relationship. The results show that product, marketing, and organizational innovation significantly impact MSME performance. With marketing innovation as the lowest innovation dimension that affects performance, and organizational innovation as a major contributor that significantly impacts MSME performance. However, the results also demonstrate that among the four dimensions of innovation, process innovation does not significantly impact MSME performance which is highlighted by an indicator such as reducing production cost. This shows that reducing production costs is optional and does not mean that the performance of MSME will increase significantly. Therefore, the findings of this study are set to advance theories in MSME innovation and performance. It also presents important implications for the MSME owners to develop a successful and sustainable MSME industry.

**Subjects:** Innovation Management; Small Business Management; Asian Business

**Keywords:** COVID-19 pandemic crisis; innovation; Indonesian MSME; MSME performance; marketing innovation; product innovation; process innovation; organizational innovation

## 1. Introduction

Micro, small and medium enterprises (MSME) are renowned worldwide for their significant contribution to employment growth, export promotion, and entrepreneurship (Esubalew & Raghurama, 2020). The number of MSME in Indonesia also has been growing continuously, and based on the data from (Databoks, 2021a), the number of MSME reached 52.8 million units in 2010 and increased to 65.5 million units in 2019. In Indonesia, there are 98.67% micro, 1.22% small, and 0.1% medium enterprises (Ministry of Cooperative and Small Medium Enterprise of Republic

Indonesia, 2019). Compared to *Regulation of the Government of the Republic of Indonesia Number 7 Year 2021*, (2021) article 35 paragraph 3, micro-enterprises are defined as enterprises that have an annual sales of two billion rupiahs, small enterprises have annual sales of two billion rupiahs to fifteen billion rupiahs, and medium-sized enterprises have an annual sales of fifteen billion rupiahs to fifty billion rupiahs and having more sales can contribute to a higher Gross Domestic Product (GDP) for Indonesia. However, the facts show that Indonesia's number of small and medium enterprises is much lower than micro-enterprises (SMEIndonesia, 2018).

According to the data from (Ministry of Cooperative and Small Medium Enterprise of Republic Indonesia, 2019), 99.9% of business enterprises in Indonesia are MSME, which contribute 60.51% of the GDP. On the other hand, the large enterprises that are part of 0.01% of the total can contribute to 34.9% of GDP. In addition, the number of small enterprises in Indonesia is 1.22%, which is more prominent than medium enterprises, and in terms of GDP contribution, it can only contribute 9.60%, and medium enterprises can contribute 13.70%. This shows that despite the high numbers of MSME, the contribution per enterprise is relatively lower than small and large enterprises.

This condition worsens when the COVID-19 pandemic arises, causing economic turmoil, driving economic conditions into shock, and making the economy unstable. The financial crisis caused by this pandemic also affected the development and growth of MSME in Indonesia (Ministry of Finance of the Republic of Indonesia, 2021). According to the data by (Indonesian BDS Association, 2020), 55.2% of MSME experienced a decline in sales, 4.5% of MSME did not experience growth, 36.7% of MSME had no sales during the pandemic, and only a tiny proportion of MSME saw an increase during the pandemic, namely 3.6%. A data survey from Bank Indonesia also reported that COVID-19 pandemic has caused MSME performance to decline sharply. In line with the deteriorating performance of MSME during the pandemic, MSME credit data also experienced negative growth of minus 1.18%. However, MSME saw an increase in 2021, although not too large, and only 0.4% compared to credit growth before the COVID-19 pandemic (Databoks, 2021b). This situation is because, during the COVID-19 pandemic, the government had to implement a large-scale social restriction policy to reduce the transmission rate of the COVID-19 virus. The restriction policy led to an 84.20% drop in revenue for MSME (CNBCIndonesia, 2022).

Although Indonesia is one of the countries with the highest number of micro, small and medium enterprises and one of the biggest contributors to GDP in Indonesia, however, due to the emergence of COVID-19 pandemic, MSME experienced a decline in performance which also, in accordance with studies by Shen et al. (2020), that COVID-19 pandemic has a negative impact on the performance. These are caused by factors such as cash retention and shrinking demands which leads to a decline in performance and according to the data, some MSME also experienced an increase. Still, more MSME experienced a decrease in sales compared to MSME that experienced an increase in sales. This entails the need to take measures to address the performance issues of MSME, given the large number and GDP contribution of MSME to Indonesia.

To address this problem in MSME, innovation is needed, it is also supported by research from Ebersberger and Kuckertz (2021) that states a study in Asia, Oceania, North America, and Europe revealed that MSME had overcome this condition through innovation. Furthermore, CNBCIndonesia (2021) believed that innovation is one of the critical factors to be considered by MSME that are facing challenges during the COVID-19 pandemic. Unfortunately, according to the Global Innovation Index (GII) data released by World Intellectual Property Organization (2021), Indonesia's innovation ranking is still far behind and ranked 87, and viewed from the GII pillar, Indonesia's performance is still below average. This data is also supported by Central Bureau of Statistics (2021) which shows that only 29.74% of companies in Indonesia are innovative. According to Organisation for Economic Co-operation and Development (2005), innovation includes product, process, marketing, and organizational innovation. Several studies have already conducted research about innovation, for example, the relationship between four dimensions of innovation and SMEs performance during a crisis in Greece by Kafetzopoulos et al. (2019). A study by

Phan (2019) has also researched innovation, especially organizational innovation, in organizations in Vietnam. Behind the importance of innovation, there is a lack of empirical studies and awareness of the importance of innovation in the face of crises such as the COVID-19 pandemic, especially in emerging markets like Indonesia.

Furthermore, Ebersberger and Kuckertz (2021) and Jin et al. (2021), conducted to examine the impact of COVID-19 pandemic on innovation activities, however this study did not discuss the type of innovation and COVID-19 pandemic still requires further research on its effect on innovation. The study by Latifah et al., (Latifah et al., 2021) examined the impact of innovation on performance. Still, this study does not explain in detail the four dimensions of innovation, and the research also focuses only on Java, especially the Special Region of Yogyakarta and Semarang. This is also coupled with the absence of research that explains the effect of the COVID-19 pandemic on innovations that affect the performance of MSME in Indonesia. This type of research on Indonesian MSME is the least studied. It gives a clear gap and purpose to research on this topic.

Based on the above identified gap, the authors believe that it is important to analyze the impact of COVID-19 pandemic crisis on product, process, marketing, and organizational innovation in Indonesian MSME. Secondly, this study will determine the effect of the product, process, marketing, and organizational innovation on the performance of MSME in Indonesia. To sustain their business performance, MSME in Indonesia can use this study to innovate during and after the pandemic. Furthermore, this study can also help assess the impact of MSME innovations in improving their business performance.

## 2. Literature Review

### 2.1. COVID-19 pandemic

In early 2020, all activities were disrupted and altered worldwide because of the impact of COVID-19, which created a crisis. A crisis here can be defined as an unexpected event that requires a response from every individual, organization, and institution (Haneberg, 2021). The outbreak of the COVID-19 pandemic had a tremendous impact on the global economy, which has changed dramatically (Turulja & Bajgoric, 2018). Because of its effect on the economy, this crisis has spread to businesses. Over the long term, businesses can experience sharp declines in orders, cost pressures such as rent, wages, and taxes, rising raw material prices, insufficient consumer demand, and difficulty finding alternative suppliers (Messabia et al., 2022; Sucheran, 2022). One of the most vulnerable businesses is the MSME business which has a vital role in the economy of a large country (Belas et al., 2022).

Many MSME fail and experience no growth due to pre-existing issues such as little or no improvement in market knowledge, lack of technical and business management skills, lack of formal planning and demand forecasting, and limited resources. Therefore, this makes MSME very vulnerable to internal and external framework events (Eggers, 2020). Due to the pandemic, the global government has come together to create an emergency response that includes measures to contain the pandemic and economic policies (Hoshi et al., 2022). Rodrigues and Noronha (2021) studies also examine the effects of COVID-19 on startups. This can also be seen in the COVID-19 crisis that occurred in Kuwait, which greatly affected SMEs' business, labor, supply chains, and cash flow (Belas et al., 2022)

### 2.2. Innovation

This research uses innovation theory. Innovation theory applies new ideas in an organization manifesting as products, processes, and services in organizational management and marketing systems (Maguire et al., 1994). According to Schumpeter (1983), there are five types of innovation: the introduction of new products, new production methods, the opening of new markets, the development of new sources of supply, and new industrial structures. Schumpeter's theory also became one of the foundations of Oslo's Manual research. Innovation is the application of

significantly improved products (goods or services), new processes, new marketing methods, and new organization methods in business practices, workplace organization, and external relations (Organisation for Economic Co-operation and Development, 2005).

This study refers to the theory of innovation that explains the growth due to change, and the Resource-Based View (RBV) complements it (Dabic et al., 2011). The RBV (Resource Based View) refers to the application of unique capabilities and diverse resources that are valuable, rare, cannot be perfectly imitated, and cannot be replaced by companies that impact the performance innovation of MSME to be better (Jay, 1991). Innovation is the activity of realizing and making new original ideas by producing a new product and creating a new business model or production process. Therefore, innovation's core is creating customer value by implementing new methods (Schmuck & Benke, 2020). Innovation is a crucial thing for companies. Innovation is not only a priority in building performance, but the most important thing is uncertainty and continuous turbulence for companies to survive (Kafetzopoulos et al., 2019). There are four dimensions of innovation, namely product innovation (providing a better product), process innovation (providing new ways in the production process), marketing innovation (providing new ways in the marketing process), and organizational innovation (providing new sources of business; Rajapathirana & Hui, 2017).

#### 2.2.1. Product Innovation

Product innovation significantly improves a new product introduction (YuSheng & Ibrahim, 2018). The success of product innovation can be seen in the introduction of new products and how much the product's novelty level and the buyer's perception of new products can be accepted in the market (Turulja & Bajgoric, 2018). An increase in innovation on product functionality and others will benefit customers and increase customer satisfaction with a product (Zaefarian et al., 2017). Product innovation itself can be a signal to consumers that a company may have the ability to invest in developing its products and satisfying consumers. This product innovation becomes a mediation in Sharma's research which examines 1356 food brands and finds that product innovation can also affect brand value in the marketplace (Sharma et al., 2016).

#### 2.2.2. Process Innovation

According to Dost et al. (2020), process innovation is an application to implement a new series of activities and provide added value. Process innovation can introduce changes to achieve efficiency and faster processes (Kahn, 2018). Process innovation has some advantages that are organized into productivity gains, product quality improvements, and time and cost savings (Lee et al., 2017). Process innovations that are carried out based on routines in organizations can become a competitive value and are difficult for competitors to imitate (Phung et al., 2021). In (Chai et al., 2020) research, the innovation process applied to Grupo Bimbo, the world's largest cake company, that introduced a sales dashboard in the form of a mobile phone. This process innovation is beneficial in increasing their sales because of fast access to real-time data on their performance, thus speeding up the decision-making process.

#### 2.2.3. Marketing Innovation

Marketing innovation involves applying new methods in the significant changes that follow marketing elements such as product development, packaging, promotion, positioning, and pricing (YuSheng & Ibrahim, 2018). It aims to meet customer needs better, penetrate new markets, or position the company's products to increase its sales (Rajapathirana & Hui, 2017). In order to interact with clients and consumers on new and various levels, marketing innovation may involve new kinds of promotional initiatives. By increasing awareness, brand identification, and product distinctiveness, a marketing innovation helps to fuel demand (Kahn, 2018). Studies by Quaye and Mensah (2019) found that MSME embrace marketing innovation as one of the most important types of innovation to turn products into profit. This can also be seen in Chinese companies that can survive during the pandemic because they are implementing the right marketing innovation strategies (Wang et al., 2020).



#### **2.2.4. Organizational Innovation**

Organizational innovation is the implementation of new methods within the organization in business activities or external relations of the company (Rajapathirana & Hui, 2017). Organizational innovation is closely related to efforts to update an organization's system, procedure, mechanism, and routine (Phan, 2019). With the existence of new organizational methods, such as a more efficient management system, is expected to improve business efficiency (Baumane-Vitolina et al., 2022). It can lead to increased performance by reducing administrative and transaction costs to increase satisfaction in the work environment. This can also be seen in SMEs in Pakistan, where organizational innovation is beneficial in achieving the goals that have been set (Donkor et al., 2018).

#### **2.3. Performance**

Performance is a broad category that reflects how well a company can achieve its market operations, growth, and financial goals within a specific time frame. There is also another definition of performance which is a measure of the result of a business or organization related to market conditions and the industry or organization (Kafetzopoulos et al., 2019). A good performance is a crucial indicator of a company's success because good performance will help to maintain the company's financial position and competitive advantage (Guo et al., 2019). Financial and non-financial terms are also generally measured in performance. Performance in financial terms is sales growth, company value, and earnings such as return on investment and assets, stock market index, and liability ratios. Meanwhile, non-financial performance is profit over a period, competitor position, customer satisfaction level, innovation, employee engagement, and organization reputation (Mabenge et al., 2020).

There are three factors that affect the performance of MSME, such as the characteristics of an entrepreneur, for example, the nature and education of the entrepreneur. The second factor is the organization's characteristics, such as the location or form of a company, and the last factor, namely the company's strategy (Prima Lita et al., 2020). The performance of MSME can be measured using several metrics, such as an increase in employment, financial performance, expansion of existing businesses, and employee motivation (Kyal et al., 2021). The research conducted by (Latifah et al., 2021) states that the higher the innovation, the better the company's performance.

#### **2.4. The relationship between the COVID-19 pandemic and innovation dimensions**

The COVID-19 pandemic continuing to emerge, MSME are accelerating the need to implement and determine new strategies (Lorange, 2021). This crisis brings many impacts and new ways to pursue business strategy. The COVID-19 pandemic is wreaking havoc worldwide and provides opportunities for new perspectives on what innovation to implement (Jin et al., 2021). Moreover, in this pandemic situation, organizations and companies also strive to collaborate and coordinate their capabilities to explore innovative solutions in the face of unforeseen changes (Al-Omouh et al., 2022). There are four dimensions of innovation, namely product innovation, process innovation, marketing innovation, and organizational innovation (Martin-Rios & Ciobanu, 2019).

Research conducted Pair (2022) stated that with the COVID-19 pandemic, companies are increasingly aware of an opportunity in a crisis and adapt to the events that occur by innovating. Additionally, research by Zaazou and Salman Abdou (2020) has also indicated that adopting a flexible culture and focusing on investing in innovation can enable companies to weather the pandemic crisis of COVID-19 successfully. In line with the previous study, Adžić and Al-Mansour (2021) also state that the COVID-19 pandemic has a negative impact on business in Serbia. One of the factors that cause the greatest negative impact on Serbia's business is because of lacks innovative strategies. Loss and financial instability for businesses are unavoidable consequences of failing to innovate. For instance, in this case, business success and survival under the current uncertainties are attributed to innovation success, such as the delivery of meals in place of dining in restaurants. However, research on the relationship between the COVID-19 pandemic and each

dimension of innovation is still limited. Therefore, the COVID-19 pandemic indirectly encourages MSME to create and implement innovations to cope with the drop in performance caused by the crisis. Thus, the proposed hypotheses are:

*H1: COVID-19 pandemic has a significant impact on product innovation.*

*H2: COVID-19 pandemic has a significant impact on process innovation.*

*H3: COVID-19 pandemic has a significant impact on marketing innovation.*

*H4: COVID-19 pandemic has a significant impact on organizational innovation*

### **2.5. The relationship between innovation and MSME performance**

Innovation activity is how a company creates and implements new ideas for products, services, production, marketing, and technology. Therefore, innovation plays a vital role in boosting a company's performance (Prima Lita et al., 2020). The research by Exposito and Sanchis-Llopis (2018) also stated that achieving good business performance depends on how innovation contributes to increasing the value of a company. According to Hallak et al. (2017), innovation positively impacts a company's performance. With the implementation of innovation, a company's performance can increase quality and reputation, reduce production costs, and increase sales.

Research by (Kafetzopoulos et al., 2019) shows that product, process, and marketing innovation have a significant and positive relationship with performance. It is because product and process innovation produce more tangible results for customers and employees to increase business performance and be better. This is also supported by Ramadani et al. (2018), who state that product innovation positively impacts firm performance. This study examines the research carried out in 9 countries of the European Union not only on product innovation but also on organizational and marketing innovation. Although, this study focused more on the impact of the two innovations on R&D (research and development) and product innovation. While marketing innovation has an important relationship with performance, it takes longer to be accepted by customers and the market.

*H5: Product innovation has a significant impact on the performance of MSME.*

*H6: Process innovation has a significant impact on the performance of MSME.*

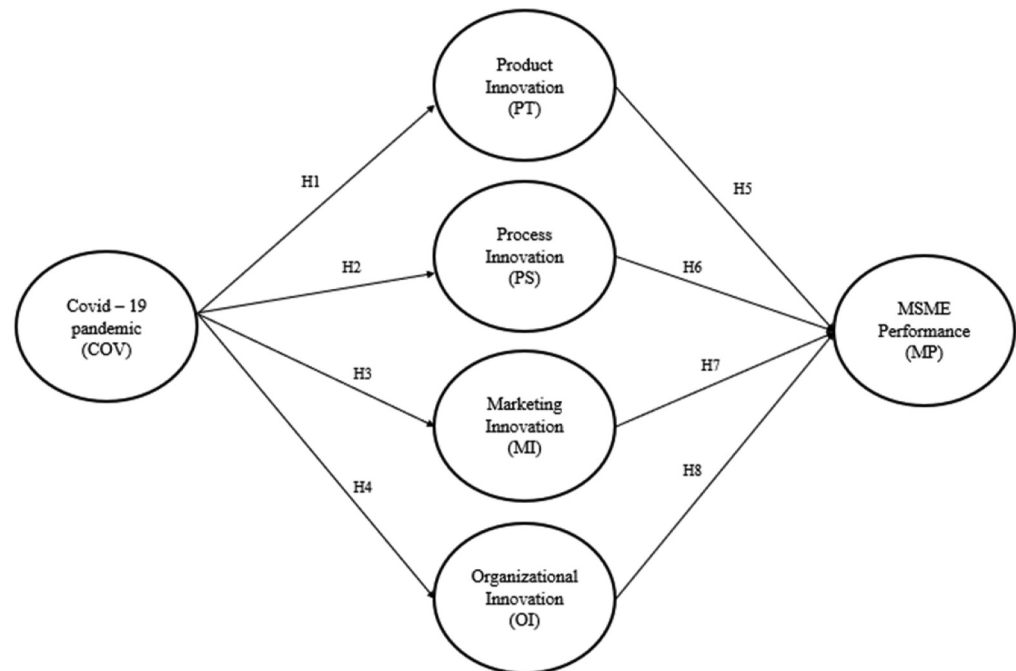
*H7: Marketing innovation has a significant impact on the performance of MSME.*

Meanwhile, organizational innovation does not have a significant relationship with performance because organizational innovation adopted by a firm may lead to internal changes in a firm's business environment, which may prevent a firm from adapting and not functioning well (Kafetzopoulos et al., 2019). However, research by (Phan, 2019) shows that organizational innovation positively impacts a company's performance. Because the results show that the more Vietnamese companies implement organizational innovation, the more experienced Vietnamese companies will be, which will help improve their performance. In addition, (Exposito & Sanchis-Llopis, 2018) also state that all innovation types assert significant and positive impacts on performance. Thus, the proposed hypotheses are:

*H8: Organizational innovation has a significant impact on the performance of MSME.*



**Figure 1. Proposed research model.**



The above hypotheses can be described using the proposed research model, as shown in Figure 1.

### 3. Methodology

#### 3.1. Sample and data source

This research uses applied research to solve problems regarding the performance of MSME in Indonesia. This study uses a quantitative analysis approach to examine the relationship between variables and uses a structured questionnaire, survey, and statistical analysis. The unit of analysis in this research is an organization, namely MSME, in Indonesia. The business owner will be a representative of an MSME business unit, and the time horizon used is cross-sectional, a research data collection carried out over a while. The method used in this study is a non-probability sampling method, that is, a sampling method in which elements of the population have no probability of being selected as sample subjects. Also, the sampling technique of this method uses convenience sampling, which is the collection of information from members of the population who are available to provide it, and the data analysis technique uses SEM-PLS.

The number of samples in this study was obtained from the Hair formula, where the number of items was multiplied by ten. Where there are 23 items times ten, it should be 230 population, but we get 300 population (Hair et al., 2010). This study used primary data obtained from a questionnaire survey. The questionnaire survey was addressed directly to MSME owners in Indonesia by distributing questionnaires assisted by third parties in the data collection process from 4 July 2022, and completed on 12 July 2022. From the survey data collected, the respondents' demographics include age, gender, education, province, and type of business. In addition to the survey data, there are also statements regarding research variables, consisting of 23 statements to be answered by MSME owners in Indonesia.

#### 3.2. Construct measurement

In this study, the indicators used to measure the variables were obtained from several previous studies. The COVID-19 pandemic crisis variable is the independent variable in this study. In

research by Hermundsdottir et al. (2022), the COVID-19 pandemic crisis variable was measured based on four indicators, including how COVID-19 pandemic crisis affects a business in terms of delivery, demand, funding, and funding pressure on MSME finances. The innovation variable is the mediating variable in this study, and the innovation variable includes product innovation, process innovation, marketing innovation, and organizational innovation. Indicators of product innovation consist of increasing the types of products, expanding the market with the development of new products based on (Gupta, 2021; Kafetzopoulos et al., 2019) research, and launching market-relevant products resulting from (Gupta, 2021; Latifah et al., 2021) research.

The process innovation variable is measured using four indicators, such as the increase in the speed of implementation (Kafetzopoulos et al., 2019; Rajapathirana & Hui, 2017), the reduction in the variable costs (El Chaarani et al., 2021; Rajapathirana & Hui, 2017), using advanced technology in the production process (Gupta, 2021; Kafetzopoulos et al., 2019) and using new research-based methods and procedures (Chege et al., 2019). The marketing innovation variable is measured using three indicators, including new media or techniques based on research by (El Chaarani et al., 2021; Kafetzopoulos et al., 2019; Rajapathirana & Hui, 2017), new sales channels or placements based on research by Rajapathirana and Hui (2017) and new delivery channels based on research by (El Chaarani et al., 2021; Kafetzopoulos et al., 2019; Rajapathirana & Hui, 2017).

Organizational innovation variables are measured based on five indicators, including new business practices, new knowledge management systems, and the development of new ways of building relationships with customers (Paudel, 2019; Rajapathirana & Hui, 2017), distribution of responsibilities and decision-making (Rajapathirana & Hui, 2017) and updating the organizational structure (Bodlaj et al., 2018; Rajapathirana & Hui, 2017). MSME performance variables are measured based on four indicators, including an increase in employment, expansion of existing businesses, employee motivation (Kyal et al., 2021), and financial performance (Kyal et al., 2021; Udofia et al., 2021). All indicators were measured using a Likert scale ranging from 1 (strongly disagree) to 5 (Strongly Agree).

## 4. Findings and Discussion

### 4.1. Sample characteristic

In this study, 300 respondents who are the owners of MSME in Indonesia were collected. Demographic data consists of gender, age, educational background, province, domicile, and type of business, as presented in Table 1.

Respondents came from 19 provinces where female respondents outnumbered male respondents, with 185 female respondents followed by 115 male respondents. The highest age range of respondents is 17–25 years old, with 132 respondents, followed by 25–33 years old, with 97 respondents. The highest average education level of respondents is high school or vocational high school, with 143 respondents, and a bachelor's degree, with 114 respondents. From Table 1, it can also be seen that the five provinces with the most respondents were West Java, with 77 respondents, the Special Capital Region of Jakarta, with 49 respondents, East Java, with 40 respondents, Central Java, with 29 respondents, and Banten with 25 respondents. In addition, the five types of businesses with the most respondents are accommodation providers and catering providers with 108 respondents, large and small businesses with 94 respondents, and activities whose boundaries are not clear for 42 respondents, Transport, storage, communication for 23 respondents, and education services for 19 respondents.

When viewed from the three provinces with the highest number of MSME respondents in Indonesia, the first province with the highest number of respondents is West Java, with the highest number in the female gender, amounting to 49 respondents, and the male gender with a total of 28 respondents. The second province with the highest number of respondents is the Special Capital Region of Jakarta, with 28 female and 21 male respondents. The third province with the highest

**Table 1. Sample Characteristics**

<b>Gender</b>	<b>%</b>	<b>Age</b>	<b>%</b>	<b>Educational background</b>	<b>%</b>	<b>Province</b>	<b>%</b>	<b>Business Type</b>	<b>%</b>
Female	61.7%	17–25 years old	44.0%	High School/ Vocational High School	47.7%	West Java	25.7%	Accommodation Provider and Food & Drink Provider	36.0%
Male	38.3%	25–33 years old	32.3%	Bachelor's degree	38.0%	Special Capital Region of Jakarta	16.3%	Wholesale and Retail	31.3%
		33–41 years old	14.7%	Diploma (D1/D2/D3)	9.7%	East java	13.3%	Activities that have no clear boundaries	14.0%
		>41 years old	7.0%	Master's degree	3.0%	Central Java	9.7%	Transportation, Warehousing, and Communication	7.7%
		<17 years old	2.0%	Junior high school	1.3%	Banten	8.3%	Education Services	6.3%
				Primary school	0.3%	North Sumatra	6.0%	Agriculture, Hunting, and Forestry	2.7%
						Special Region of Yogyakarta	4.3%	Individual Services Serving Households	0.7%
						South Sulawesi	3.3%	Community Services, Socio-Cultural, Entertainment, and Other Individuals	0.7%
						Bali	2.0%	Construction	0.3%
						South Kalimantan	2.0%	Financial Intermediary	0.3%

(Continued)

Table 1. (Continued)									
Gender	%	Age	%	Educational background	%	Province	%	Business Type	%
						Lampung	1.7%		
						West Sumatra	1.7%		
						Riau	1.7%		
						South Sumatra	1.0%		
						Special Region of Aceh	1.0%		
						East Kalimantan	1.0%		
						West Papua	0.3%		
						North Sulawesi	0.3%		
						Bangka Belitung Islands	0.3%		

number of respondents is East Java, with 27 female and 13 male respondents. From this, it can be seen that of the three provinces with the most respondents, these three provinces have the highest number of female respondents.

In addition to gender, the respondent's age range in the province with the highest number of respondents can also be seen. It can be seen that the highest age of respondents in West Java is in the age bracket of 17–25, with a total of 31 respondents. The second highest age range is 25–33, with 29 respondents, and the third highest age range is 33–41, with ten respondents. The second province is the Special Capital Region of Jakarta, which has the same age range with most of the respondents as West Java. Namely, the age range of 17–25 with a total of 23 respondents, an age range of 25 – 33 years old with a total of 11 respondents, and an age range of 33 to 41 years old with a total of 10 respondents. The third province with the highest number of respondents is East Java, with an age range of 17–25 with a total of 19 respondents; the second is an age range of 25–33 with a total of 12 respondents and followed by an age group of below 17 years, 33–41 years and > 41 years who both have one respondent. It can be concluded that the age group of 17–25 years of the three provinces is the largest age group of respondents.

From the type of business they run, the average age range is 17–25, and they have business types in accommodation and food and beverage providers with 48 respondents. The second type of business is wholesalers and retailers, with a total of 45 respondents. The third business is in trade and education service activities, whose limits are not yet clear with the same number of respondents, namely 12.

#### **4.2. Model assessment**

Before proceeding to further data analysis using statistical software SmartPLS version 3.0, it is essential to understand and know about the construct, as shown in Table 2. Furthermore, it is essential to perform a test to measure construct reliability and validity using the PLS algorithm in SmartPLS version 3.0, as shown in Table 2.

The first test performed was to test the factor loading of each constructed item, with the recommended norm being 0.708 (Hair et al., 2018). In one of the items of Process Innovation which is PS2, after being tested with the PLS algorithm, it was found that the load factor was 0.583, which was lower than the standard, which is 0.708, so it was decided to remove the PS2 item from the research. The next test is the internal reliability consistency, with a recommended standard of 0.6 to 0.9 using Composite reliability and Cronbach's Alpha (Hair et al., 2018; Sekaran & Bougie, 2016). Based on the data above, it can be seen that Composite reliability is above 0.6 and Cronbach's Alpha is above 0.6, which is the recommended threshold. So it can be assumed that each indicator in this study is reliable.

Furthermore, it can be seen from the AVE (Average Variance Extracted) to measure the validity of the research construct. The standard or threshold AVE is 0.5 or more (Henseler, 2021). Each construct has an AVE greater than 0.5, indicating that the construct explains more than half of the item variance on average. This, therefore, shows that the model has a high level of convergent validity. The measurements on the VIF (Variance Inflation Factor) also show that it is clearly below 10, meaning there is no multicollinearity in this model (Hair et al., 2018).

Next, another test was performed for discriminant validity to determine the extent to which the construct was empirically different from other constructs in the structural model using the PLS algorithm and the Heterotrait—Monotrait Indicator (HTMT; Hair et al., 2018). The standard measurement of the HTMT ratio is less than 0.9 (Henseler, 2021). Each construction shows that the value of the HTMT ratio is less than 0.9. We can conclude that the discriminant validity indicates that the constructs in the path models are conceptually more different (more conservative). The next test is the coefficient of determination by looking at  $R^2$ , which has several standards, such as > 0.75 is substantial, > 0.50 is moderate, and < 0.25 is low (Hair et al., 2014).

Judging from the performance of MSME, it has a value of 0.552, which means that the performance of MSME (MP) can be predicted by 55.2% by product innovation (PT), process innovation (PS), marketing innovation (MI), and organizational innovation (OI). In comparison, 44.8% are predicted by other variables and can be considered high. The value of  $R^2$  on Product Innovation (PT), Process Innovation (PS), Marketing Innovation (MI), and Organizational Innovation (OI) has a value of 0.120, 0.124, 0.1, and 0.138, which means Product Innovation (PT), Process Innovation (PS), Marketing Innovation (MI), and Organizational Innovation (OI) can be predicted to be 12.0%, 12.4%, 10.0%, and 13.8% respectively from COVID-19 (COV). Model fit analysis is an analysis that is carried out further using the PLS Algorithm. Based on (Wetzels et al., 2009), Goodness of fit is considered a significant fit with a result of 0.39 greater than 0.36 as the GoF large threshold, and the result of Standardized Root Mean Square Residual (SRMR) is 0.062, which is still on the threshold of the fit model more than 0.06 (Henseler, 2021). This shows that the model is considered in accordance with the actual conditions.

#### 4.3. Hypothesis testing

To test the hypothesis, the model was run using the SmartPLS bootstrap with a subsample of 5000, and the results are shown in Figure 2 below.

Structural model analysis was performed to determine whether or not the research hypothesis was accepted. The hypothesis is accepted if the absolute value of  $t$  ( $\alpha = 0.05$ ) is greater than 1.96 with a positive coefficient. The results of the hypothesis tests are summarized in Table 3 and 4.

COV: COVID—19 Pandemic, PT: Product Innovation, PS: Process Innovation, MI: Marketing Innovation, OI: Organizational Innovation, MP: MSME Performance

Based on the study's results, COVID-19 had a positive and significant impact on four dimensions of innovation, especially organizational innovation, with  $\beta = 0.372$  and  $t$ -values = 6379. Additionally, the effect of COVID-19 on innovation was followed by process innovation with  $\beta = 0.352$  and  $t$ -values = 5.986 and product innovation with  $\beta = 0.346$  and  $t$ -values = 6.026. Meanwhile, COVID-19 also positively affects marketing innovation with  $\beta = 0.316$  and  $t$ -values = 5.470, although the impact and significance are lower among other innovation dimensions.

Based on the research findings, product, marketing, and organizational innovation are major contributors to MSME performance. Meanwhile, this study's process innovation ( $\beta = 0.048$  and  $t$ -values = 0.743) has no impact and significance on MSME performance because  $t$ -values < 1.96. Organizational innovation has the most impact and significance among the four dimensions of innovation, with  $\beta = 0.376$  and  $t$ -values = 4.922. This shows that implementing new business practices, updating the organizational structure, implementing a new knowledge management system, distributing responsibility and decision-making, and developing new ways to build relationships with customers can affect the internal state of an MSME. This can make MSME adapt, gain business experience, and implement innovations to achieve performance.

In line with previous research by Kafetzopoulos et al. (2019), the results obtained for product innovation with  $\beta = 0.234$  and  $t$ -values = 3.678 is highlighted by PT2 and PT3, which are the expansion of the market of firms with the development of new products to improve the performance of MSME. However, marketing innovation with  $\beta = 0.195$  and  $t$ -values = 3.064 is highlighted by MI3, which is the use of shipping services to distribute the products, and it takes longer for the market and customers to accept the innovation. In comparison, process innovation in this study has no effect and significance with  $\beta = 0.048$  and  $t$ -values = 0.743 compared to the other three dimensions. This is highlighted by PS2, that reducing production costs does not mean that the performance of MSME will increase significantly.



**Table 2. Reliability and Validity Tests and Factor Analysis**

<b>Construct</b>	<b>Items</b>	<b>Cronbach's Alpha (0.6–0.9)</b>	<b>Composite Reliability (0.6–0.9)</b>	<b>Average Variance Extracted (&gt; 0.5)</b>	<b>Factor Loading (&gt;0.708)</b>	<b>t-value (&gt;1.96)</b>
COVID-19		0.850	0.899	0.689		
COV1	We are experiencing significant issues in shipping supplier and consumer goods during the COVID-19 pandemic.				0.785	24.697
COV2	We have experienced a drop in business demand/sales during the COVID-19 pandemic.				0.806	22.807
COV3	We are struggling to find funding sources for businesses during the COVID-19 pandemic.				0.855	33.760
COV4	We are experiencing liquidity (financial) difficulties during the COVID-19 pandemic.				0.871	46.418
MSME Performance		0.876	0.915	0.728		
MP1	Our company can create or increase job opportunities.				0.843	40.125
MP2	Our company's revenue from digital technology can increase.				0.849	35.478
MP3	Our company is trying to expand our existing business.				0.885	54.597
MP4	Our company has a strong motivation.				0.836	31.914

(Continued)

**Table 2. (Continued)**

<b>Construct</b>	<b>Items</b>	<b>Cronbach's Alpha (0.6–0.9)</b>	<b>Composite Reliability (0.6–0.9)</b>	<b>Average Variance Extracted (&gt; 0.5)</b>	<b>Factor Loading (&gt;0.708)</b>	<b>t-value (&gt;1.96)</b>
Marketing Innovation		0.849	0.908	0.767		
MI1	We use social media in marketing.				0.872	49.952
MI 2	We sell through marketplaces such as Shopee, Gojek, Tokopedia, and others.				0.875	39.275
MI 3	We use a delivery service to distribute the products.				0.882	52.502
Organizational Innovation		0.869	0.906	0.659		
OI1	We use a new strategy/way of doing business.				0.859	53.162
OI2	We apply new management and knowledge to increase revenue, for example, data storage, advertising media, and MSME financial application system.				0.837	33.607
OI3	All employees are empowered to take responsibility and make decisions.				0.670	13.805
OI4	We develop new ways to build relationships with customers.				0.851	38.969

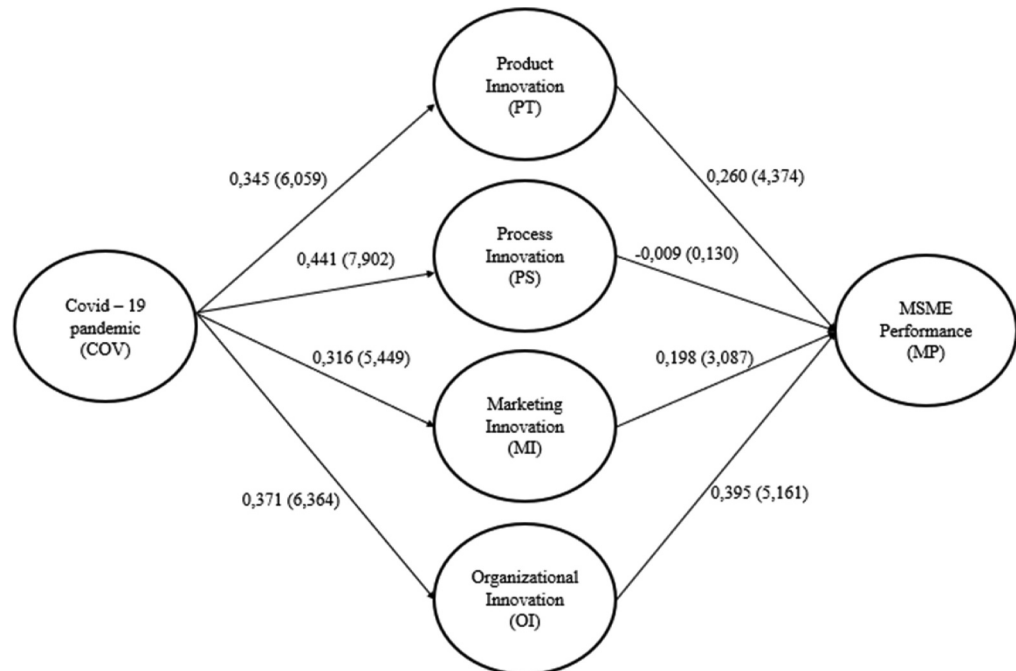
(Continued)

**Table 2. (Continued)**

<b>Construct</b>	<b>Items</b>	<b>Cronbach's Alpha (0.6–0.9)</b>	<b>Composite Reliability (0.6–0.9)</b>	<b>Average Variance Extracted (&gt; 0.5)</b>	<b>Factor Loading (&gt;0.708)</b>	<b>t-value (&gt;1.96)</b>
<i>OI5</i>	We change the business organization structure according to business challenges.				0.827	35.474
Process Innovation		0.815	0.890	0.730		
<i>PS1</i>	We increased the speed of the production process.				0.828	30.540
<i>PS3</i>	We use appropriate technology in the production process.				0.875	49.820
<i>PS4</i>	We use a new method (way) in the production process.				0.859	43.119
Product Innovation		0.809	0.886	0.721		
<i>PT1</i>	We increase the variety and quantity of products.				0.803	25.500
<i>PT2</i>	We expand the business market with the development of new products.				0.879	47.477
<i>PT3</i>	We launch products according to market demand.				0.865	50.663

Table 3. Discriminant Validity Assessment Result (Fornell-Larcker Criterion Analysis)						
	COVID 19	MSME Performance	Marketing Innovation	Organizational Innovation	Process Innovation	Product Innovation
Impact from COVID-19 (COV)	0.830					
MSME Performance (MP)	0.272	0.854				
Marketing Innovation (MI)	0.316	0.597	0.876			
Organizational Innovation (OI)	0.372	0.700	0.684	0.812		
Process Innovation (PS)	0.352	0.565	0.504	0.670	0.855	
Product Innovation (PT)	0.346	0.622	0.513	0.676	0.713	0.849

**Figure 2. Results of bootstrap structural measurements with 5000 subsamples.**



**Table 4. The results of the hypotheses tested using SEM**

Hypotheses	Structural paths	Standardized coefficient ( $\theta$ )	t-values	Hypothesis test
H1	COV -> PT	0.346***	6.026	Supported
H2	COV -> PS	0.352***	5.986	Supported
H3	COV -> MI	0.316***	5.470	Supported
H4	COV -> OI	0.372***	6.379	Supported
H5	PT -> MP	0.234***	3.678	Supported
H6	PS -> MP	0.048	0.743	Not Supported
H7	MI -> MP	0.195**	3.064	Supported
H8	OI -> MP	0.376***	4.922	Supported

#### 4.4. Discussion

Our finding indicates that COVID-19 pandemic crisis significantly affects four dimensions of innovation such as product, process, marketing, and organizational. Product innovation, marketing innovation, and organizational innovation also significantly impact the performance of MSME. However, process innovation does not significantly affect the performance of MSME. Contrary to previous research by (Chege et al., 2019; Kafetzopoulos et al., 2019; Rajapathirana & Hui, 2017), who found that process innovation impacts the performance of MSME. This could be understood that the MSME wants to directly apply the innovation without setting up or establishing a structured process. It may also be because, during the COVID-19 period, process innovation was not very important for MSME owners to implement, considering most of the owners have an age span between 17–25 years old. They could have done the innovation without any structured strategy. Basically, the construct in the middle of the conceptual framework is a mediating variable whose purpose is to strengthen the performance of MSME.

Furthermore, this study found that organizational innovation is the construct that has the most impact on the performance of MSME. During COVID-19 pandemic crisis, MSME in Indonesia attach

significant importance to organizational innovation to help improve their performance. Organizational innovation can be applied by MSME using new ways of running their traditional business to become more modern, such as using new media to sell their products and using social media to run their business. Along with these social media, they can also help build relationships with customers. In addition, implementing new management and new knowledge that follows the current state of the environment is also necessary. The next thing is to use a new advertising medium, a new financial application system, and more suitable data storage using iCloud. It is then a question of modifying the company's organizational structure according to the challenges encountered during the economic turbulence caused by COVID-19 pandemic crisis, which also forces the renewal of human resources to carry out organizational innovation. This can be done by empowering employees to take responsibility and make decisions in the face of a situation.

The second most important thing in doing business is the product offered to the customer. With a vast number of MSME, business competition has become very tight, coupled with environmental conditions that have undergone many changes during the COVID-19 pandemic. While innovation is needed in products that can help improve the performance of MSME, primarily by increasing the variety and quantity of products so that the products offered to customers are not monotonous. However, the new products produced should also adapt to the market demand, as this can also contribute to the expansion of the market because the newer products are made, the broader the target market will be.

We found that marketing innovation also significantly impacts the performance of MSME. Because marketing is also essential for increasing sales. In organizational innovation, new ways of doing business are also linked to marketing innovation, especially using social media, and e-commerce can also be used to market and increase sales of MSME. In addition, during the pandemic, adaptation is necessary due to many online purchases, so delivery services are necessary for MSME or use delivery services in Indonesia such as Gojek, Grab, and parcel delivery. Strategically, MSME are advised to be more innovative to deal with the drop in performance that occurs during economic turmoil. MSME can use innovation strategies adapted to the environmental situation of MSME. Additionally, MSME can leverage existing technology and media to improve their performance in the face of economic turmoil, especially during the current COVID-19 pandemic MSME can take advantage of several dimensions of innovation, especially in Indonesia; they can use organizational, product, and marketing innovation (Directorate General Of Higher Education, 2021).

## 5. Conclusion

Although innovation has been a key surpassing performance, a considerable amount of research on COVID-19 pandemic crisis into the dimensions of innovation on MSME performance still needs to be done. So the current study seeks to expand and explain this topic. From the results of this study, we can conclude that the application of innovation dimensions such as product, marketing, and organizational innovation are mediating the phenomenon of the COVID-19 pandemic to the MSME performance, especially organizational innovation, which has a positive effect on the operational side of an MSME, except the process innovation.

From this, MSME especially in Indonesia, can consider applying the dimensions of innovation to their business, especially on innovations that greatly impact performance, namely organizational innovation, not limited to general innovations such as products and processes. In addition, the COVID-19 pandemic crisis is also a consideration for MSME when creating innovations that are used to improve MSME performance. This is because the COVID-19 pandemic crisis impacts innovation, especially organizational innovation.

## 6. Implication, limitations, and suggestions for further research

From a theoretical point of view, the proposed studies contribute to a better understanding of the MSME performance through innovation during the pandemic situation. This study found that the



COVID-19 pandemic impacts MSME, and innovation is needed to bring better performance to MSME. This finding is in line with the previous research conducted by Zaazou and Salman Abdou (2020) that COVID-19 pandemic impacted SMEs in Egypt, therefore, investing in innovation is a way to combat this crisis. This is also supported by Exposito and Sanchis-Llopis (2018), who state that innovation is a crucial driver of increasing performance. This study also established that the innovation and performance relationship largely depends on the types of innovation dimensions. Likewise, our findings found that out of the four innovation dimensions, organizational innovation has the most significant impact on MSME performance and process innovation has no effect in increasing MSME performance. This is affirmed by similar studies by Kafetzopoulos et al. (2019) that process innovation has a greater impact on production costs but a smaller impact on an organization's revenue growth and market share.

The present study offers clear, practical implications for MSME practitioners who desire to implement innovation dimensions to improve the performance of MSME. It shall also help MSME to consider the decision-making to implement the right innovation strategy to enhance MSME performance. The research complements the previous and recent study, which provides the phenomenon of MSME business in emerging markets, where Indonesia is one of them. However, the finding of process innovation does not reflect the condition in Indonesian MSME. This study recommends that MSME should prioritize innovation, particularly in times of crisis, and should always be ready. Especially post in COVID-19, MSME can continue applying the previous innovation and create more innovation to maintain their business performance. It is advised that the government develop policies aimed at enhancing human resources in managing MSME by offering instruction and training in leadership. In particular, during crises, the government must conduct surveys and make contact with MSME to understand and determine their true objectives, requirements, and aspirations.

This study has several limitations notably; first, this research is cross-sectional in which data collection is only done at one point in time, so it may only capture some of the impacts of the pandemic on MSME in Indonesia. Second, the data collection method was designed using non-probability sampling, where the captured data do not represent Indonesia's whole province. Third, this study didn't discuss further about the demography of MSME owners, for example, age, business type, gender, etc. The authors suggested that the future study consider external factors such as the impact of government policies, culture, and organizational resilience to provide much broader visibilities that will provide a much better and more structured strategy to compete in the MSME business. The authors also suggested that future studies should examine more about the impact of COVID-19 pandemic crisis on MSME performance through innovation by focusing more on the demographic data.

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