Innovation network for micro, small and medium enterprises in Indonesia

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CHRONICLE	ABSTRACT
	This study aims to develop an innovation network model to help MSMEs recover from the downturn due to the pandemic. The basic model used is an innovation network consisting of associations, suppliers, customers and government. The basic model was developed by adding capital and digitalization variables to suit the needs. Data processing uses a structural equation model and the sample is MSMEs in West Java province. This study is the first on the innovation network model for MSMEs affected by the pandemic and the largest number of MSME respondents. The results conclude that according to MSMEs in Indonesia, suppliers, customers, government, associations, capital, and digitalization have an effect on the innovation network. This study concludes that associations, suppliers, customers, government, capital and digitalization all have a positive effect on the innovation network. This finding is the first in the innovation network model for MSMEs that accommodates the needs of the industry to recover from the pandemic situation and adds new literature on industrial innovation networks. While previous studies have a lot of similar literature, all focus on certain types of businesses and on normal economic conditions. This study is different from similar studies because it was conducted on MSMEs in all business sectors and economic conditions in crisis due to the pandemic. These results can be used as a reference in decision making to increase the growth of MSMEs with limited resources.

1. Introduction

Press release of the Coordinating Ministry for Economic Affairs of the Republic of Indonesia dated October 1, 2022 stated that the role of Micro, Small and Medium Enterprises (MSMEs) is very large for the growth of the Indonesian economy, which amounts to 99% of all business units. The contribution of MSMEs to Gross Domestic Product (GDP) is also up to 60.5%, and to the absorption of 96.9% of the total national workforce absorption. The total number of MSMEs in Indonesia reached 8.71 million business units by the end of 2022 (Kementerian Koordinator Perekonomian RI, 2022).

The Covid-19 pandemic that occurred from early 2020 to mid-2022 has had a serious impact on the MSME sector. The Ministry of Cooperatives and Micro, Small and Medium Enterprises of the Republic of Indonesia stated that during the pandemic, more than 50% of MSMEs only survived for a few months. A survey conducted by the International Labor Organization (ILO) Indonesia in 2021 concluded that 52% of MSMEs closed and stopped operating, 32% lost more than half of their income, and the rest reduced the number of workers (Indonesia, The National Team For The Acceleration of Poverty Reduction, 2022). A press release from the Ministry of Economy of the Republic of Indonesia dated April 21, 2021 stated that the Covid-19 pandemic has caused MSMEs to experience many difficulties, including in the field of capital. Business capital is the assistance program most needed by MSMEs to recover from the downturn due to the Covid-19 pandemic (Kementerian Koordinator Perekonomian RI, 2022).

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The Indonesian government has made various efforts with various policy schemes and capital stimulus to revive MSMEs, one of which is through the National Economic Recovery program. According to the Coordinating Ministry for Economic Affairs of the Republic of Indonesia, the Indonesian government has provided support incentives for MSMEs through the National Economic Recovery program in 2020 and continued in 2021. The realization of the National Economic Recovery program was IDR 112.84 trillion in 2020, and in 2021 it was IDR 121.90 trillion to support MSMEs (Sari, 2022). However, this assistance has not been able to help all MSMEs affected by the pandemic, of the 83.72% of MSMEs in need, only 16.13% received the assistance. The rest must make their own efforts to rise from the slump due to Covid-19 (Sari, 2022).

One of the efforts other than government assistance that can be done by MSMEs is to implement digitization (Karr et al., 2020; Uno, 2023) and a good innovation network (Wardner et al., 2015). MSMEs digitalization is the process of using digital technology in various operational and managerial aspects of a business, including the use of the internet, software and hardware, and other digital platforms. The application of digitalization can help the growth of MSMEs (Angadi et al., 2023). While innovation networks can support in starting a business, developing it and helping to achieve business profits (Wardner et al., 2015). Innovation networks can improve efficiency and effectiveness, innovation, excellence, collaboration and foster cooperation between stakeholders (Shah et al., 2017). Innovation networks are a way to get to a bigger company (Laperche & Liu, 2013). Innovation networks can increase competitiveness and reciprocal relationships for their businesses (McAdam et al., 2014). Innovation networks will complement each other between innovation partners to expand resources and overcome resource constraints (Mohannak, 2007; Rehm & Goel, 2017).

The proven innovation network model is the model from Kaplan & Winby (2012) which consists of associations, suppliers, customers, and government as shown in the following Fig. 1.
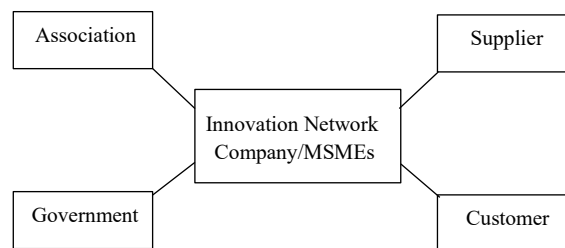
Fig. 1. Innovation Network
Sources : Kaplan & Winby (2012)

This study is based on the perception that the above model is not fully applicable to MSMEs affected by the pandemic. Therefore, this study will refine the model by adding digitalization variables (Karr et al., 2020; Uno, 2023) and capital variables (Kementerian Koordinator Perekonomian RI, 2022). The results of this study can be used as a reference in decision making to increase the growth of MSMEs, especially those affected by the pandemic. Structural Equation Modeling - Partial Least Square (SEM-PLS), a method with a covariance basis, is the instrument to investigate this (Byrne, 2016). This statistical application program is frequently used on research data with a reasonably big number of samples (>100 samples), however it still manages to display the entire data. It can be used to solve multilevel models simultaneously (Rahi & Abd Ghani, 2018).

2. Literature Review

2.1 State of the Art

The Covid-19 pandemic has caused MSMEs to experience many difficulties. Digitalization and business capital are the assistance programs most needed by MSMEs to recover. The business innovation network is one of the efforts that MSMEs can make to recover from adversity (La Rocca & Snehota, 2014; Acemoglu et al., 2016). An innovation network is a business development network to support starting or developing a business and help achieve business profits (Wardner et al., 2015; Shah et al., 2017).

The Innovation Network concept was popularized in the 80s by Christopher Freeman when mapping the interaction between innovation actors, namely between the government, universities, research institutions, and industry in Japan. Freeman concluded that the progress of technological innovation in Japan was inseparable from the interaction of these actors (Freeman, 1991).

Innovation networks have long been an important source of competitive advantage, although this advantage is not easy to obtain (Liu et al., 2020). There are various definitions of innovation networks, but in general it is a mechanism by which organizations produce products, processes and systems needed to adapt to dynamic markets, technology and competition (Dougherty & Hardy, 1996; D'aveni, 2010; Utterback et al., 2018). A proven innovation network model for developing a business is the model from Kaplan & Winby (2012) which consists of suppliers, customers, government and associations.

There are several studies on the development of innovation networks conducted in various countries, including by Lefebvre et al., (2014) who studied a sample of 231 MSMEs in six European Union countries. The results showed that MSMEs prefer networks consisting of producers and supply chain members.

According to Najafi-Tavani et al. (2018) Innovation networks focus on the collaboration of various actors leading to innovation, the elements of the innovation network are suppliers, customers, competitors, and research institutions. A conceptual model of how to complement each other in the SME innovation network with the help of information systems to improve company capabilities (Rehm & Goel, 2017).

Dodourova & Bevis (2014) conducted an investigation on the application of the innovation network concept to the European automotive industry. The data used were taken from knowledgeable respondents through interviews in seven European countries. The results concluded that the innovation network needed by the automotive industry is an intermediary or distributor. This is also the same as Lin's (2004) findings that manufacturing companies in Taiwan require a network of intermediaries or distributors

Several studies in various countries on innovation networks have also been conducted by Clifton et al., (2010); Gardet & Mothe, (2012); Batterink et al., (2010); Gretzinger et al. (2010) but none of them have discussed innovation networks for MSMEs affected by the Covid-19 pandemic. Therefore, this study will develop the Kaplan & Winby (2012) innovation network model by adding capital and digitalization variables.

2.2 Research hypothesis

Hypothesis is very necessary to direct researchers in searching and collecting data. Hypothesis can also clarify conditions that were previously still vague, and help predict things that might happen (Deutsch, 2018). This study will test the development of an innovation network model with the following hypotheses:

2.2.1 Hypothesis 1: Suppliers have a positive effect on innovation networks

A business entity that supplies raw materials to other business organizations is known as a supplier. According to Kaplan and Winby (2012), suppliers are at the top of the supply chain. The following characteristics of suppliers are examined in this study: selecting raw material suppliers with substantial capital, offering discounts, offering competitive pricing, tolerating payment delays, delivering orders quickly, introducing new products and their benefits, suppliers who result in lost potential profits should they switch suppliers, and valuable suppliers.

2.2.2 Hypothesis 2: Customers have a positive effect on innovation networks

Customers are people, homes, organizations, or businesses that buy products or services generated through economic activity (Kaplan & Winby, 2012). The variables that define customers in this study are: recruiting new customers, identifying large customers, anticipating large customers' appearance in certain seasons, managing customers by issuing a complete product catalog, a complete price list, guidelines for discounts, selling products wholesale and retail.

2.2.3 Hypothesis 3: Government has a positive influence on innovation networks

The government is an organization that has the power to create and implement laws together with the Act and the authority to regulate communities in a country's territory (Kaplan & Winby, 2012). The government variable in this study explains several things, namely the government must create regulations related to raw materials, pricing, taxes, protection, subsidies, and tax equality.

2.2.4 Hypothesis 4: Associations have a positive effect on innovation networks

Associations are organizations established by a group of entrepreneurs or business people with the aim of fighting for common interests in the business sector to increase profits and strengthen the bargaining power of its members in business (Kaplan & Winby, 2012). In this study, associations must play a role in the development of this industry, help their members to develop, be at the forefront of defending industry rights, ensure that no company is dominant in the industry, and be a mediator when there is a conflict.

2.2.5 Hypothesis 5: Capital has a positive effect on innovation networks

According to Bliss (2014), capital is property that can be utilized to create goods and services that will enhance wealth and profit. The capital variable is described by the ease with which financial capital loans can be obtained, as well as by low-interest loans, government and private sector capital, and government support during times of crisis.

2.2.6 Hypothesis 6: Digitalization has a positive effect on innovation networks

According to Yoo (2010), digitalization is the process of integrating digital technology into many managerial and operational facets of a company. The variables of applying digitalization to achieve efficiency, productivity, quality, and safety, utilizing content marketing strategies (blogs, videos, and podcasts), Search Engine Optimization, Social Media Marketing, Pay-Per-Click Advertising, and email and instant messaging to boost sales, all contribute to the explanation of the dimensions of digitalization.

The research model in Fig. 2 below describes the research model that will be validated in the industry, based on the explanation of the state of the art and the formulation of the hypothesis.
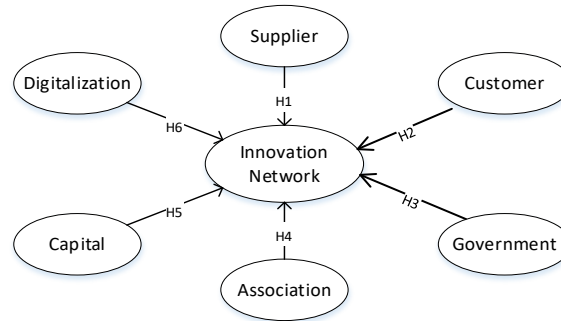
Fig. 2. Development model

3. Methodology

Bougie and Sekaran (2019) stated that research based on its objectives is divided into three, namely exploratory study, descriptive study, and hypothesis testing. So based on these categories, this research is included in hypothesis testing, because this research will examine the influence of innovation network dimensions on the development of MSMEs in Indonesia.

3.1 Sample and Data Collection

Questionnaires are data collection tools that describe samples for conversations between researchers and respondents (Bougie & Sekaran, 2019). The role of questionnaires is very vital in survey activities, so to reduce response errors, questionnaires must be made properly (Krosnick, 2018). Lee and Paek (2014) concluded that the questionnaire scale of four to six answer choices is the ideal number. This research questionnaire uses a six-point scale to avoid bias (Pardiyono & Nugrahati, 2020). Odd-numbered scales are no better than even-numbered scales (Simms et al., 2019). So this research questionnaire uses six points, namely 1 very unimportant, 2 unimportant, 3 less important, 4 somewhat important, 5 important and 6 very important.

The questionnaire uses closed and open questions, closed questions limit respondents to answer, while open questions give respondents freedom to answer (Chrabanski, 2014). The contents of the questionnaire are divided into two, the first contains respondent data and the second is an assessment of the innovation network elements. The questionnaire data must then be tested to ensure validity and reliability using scale reliability and Spearman Rho correlation (Gibbons & Chakraborti, 2011).

The population in this study were MSME actors in West Java Province, Indonesia, totaling 464,346 business units (Indonesia, Open Data Jabar, 2023). This study assumes that the entire population has the same turnover so that the sample used is not divided into strata (sub-populations). Determination of the minimum sample size uses a calculation of 5 times the number of manifest variables (Hair et al., 2019; Black & Babin, 2019; Pardiyono et al., 2022), so if the variables in this study are 38 items, then the minimum total respondents are 190 respondents.

3.2 Measurement Data Analysis

The method used must be empirical and rational, empirical means it can be observed by human senses, and rational means the research is carried out in a reasonable way (Antwi & Hamza, 2015). Based on the category of Bougie, & Sekaran (2019) this study is included in hypothesis testing, because it will examine the dimensions of the innovation network model.

Analysis methods that can be applied to all data scales and don't require a lot of assumptions include data processing utilizing Structural Equation Modeling - Partial Least Square (SEM-PLS) (Afthanorhan, 2013; Thakkar & Thakkar, 2020). Validity analysis, model reliability, and hypothesis verification are the two stages that the PLS-SEM methodology requires (Díaz-Vega & Gutierrez-Rincon, 2024). The findings of outer loading, the reliability construct, and the average variance extracted (AVE) are used in convergent validity to assess the appropriateness between independent and dependent variables. If the outside loading can be satisfied, that is, above 0.7, then more testing can be conducted (Nfuka & Rusu, 2011). When it is more than 0.7, it is said to have good construct reliability (Cao et al., 2015; Huang et al., 2013). For every independent factor in the reflective model, the average communality (variance) is reflected in the AVE value. It is required that the AVE value be more than 0.5 (Huang et al., 2013; Shau, 2017).

Independent variables and dependent variables, or vice versa, are connected by the structural model. The following values are utilized in the structural model: a) The R-Square value indicates the extent to which the dependent variable may be explained by the independent variables that are hypothesized. A model is considered high quality if its R2 value is greater than 0.7, indicating that the resulting model has good accuracy (Huang et al., 2013). b) To assess the path model, Q-square is computed. The model has predictive importance if the Q-square is larger than zero, and the formula yields the Q2 value;

$$Q^2 = 1 - (1 - R_1^2)$$

4. Result

4.1 Respondent Demographic

Based on data collection, there were 240 respondents who were given questionnaires but 216 respondents returned and filled out all statement items. The questionnaire identified the demographic variables of respondents considered in this study, namely the field of business (manufacture, service and other), length of business (2-5 years, 6-10 years, and >10 years) and whether the respondents felt the impact of the Covid-19 pandemic. The following demographic information of respondents is presented in Table 1 below.

Table 1
Respondent Demographic

Respondent Profile		Amount	Percent (%)
Business Field	Manufacture	197	91,2%
	Service	6	2,8%
	Other	13	6,0%
Business Duration	2-5 years	28	13%
	6-10 years	162	75%
	> 10 years	26	12%
Impacted by Covid-19	Yes	203	94%
	No	13	6%

4.2 Hypotheses Testing

The process of hypothesis testing will determine whether to accept or reject the hypothesis. Following a path diagram analysis, bootstrapping values on the path diagram is used to determine the significance value for the t-test, if the t value is greater than 1.96, it indicates a significant relationship between the independent and dependent variables (Ringle et al., 2015). According to data processing, all dependent variables on capital, associations, government, suppliers, consumers, and digitalization have outer loading values greater than 0.7, indicating that the model is valid and that there is a suitable fit between the independent and dependent variables (Huang et al., 2013). The results of the overall outer loading value are presented in Table 2.

Table 2
The overall outer loading value of the variables

Variable	Code	Indicator	Loading Factor
A supplier is an individual or business that supplies or supplies products, goods or services to other businesses, whether to individuals or companies (Kaplan & Winby, 2012).	S1	Raw material suppliers are companies with strong capital	0.782
	S2	Suppliers have competitive prices.	0.728
	S3	Suppliers provide discounts	0.822
	S4	Suppliers accept payment delays	0.801
	S5	Suppliers ship orders quickly	0.778
	S6	Suppliers introduce new products with their advantages	0.702
	S7	Loss of potential profits if switching suppliers	0.822
	S8	Costs arise if switching suppliers	0.705
	S9	The company supplied is valuable in the eyes of the supplier	0.770
Customers are individuals or organizations that purchase or use products or services offered by a company (Kaplan & Winby, 2012).	C1	The company issues a complete product catalog to make it easier for consumers	0.734
	C2	The company issues a complete price list	0.869
	C3	The company has guidelines for discounts	0.855
	C4	The company sells products wholesale and retail	0.874
	C5	New customers always appear	0.859
	C6	Big customers can be identified	0.832
	C7	Big customers appear in certain seasons	0.845
A government is described as an entity that is tasked with enforcing laws and regulations over communities within a specific territory, usually a nation (Kaplan & Winby, 2012).	G1	Raw material rules are governed by the government	0.742
	G2	The government controls laws pertaining to price.	0.775
	G3	The government controls the laws pertaining to taxes.	0.730
	G4	The state offers defense.	0.732
	G5	The state offers financial assistance	0.723
	G6	The same taxes that other industries pay are levied by the government.	0.820
An association is a company that provides services to companies in a certain sector (Kaplan & Winby, 2012).	A1	Associations play a role in the expansion of this economic sector.	0.844
	A2	Associations assist in members' personal development	0.703
	A3	The front-runners in defending industry interests are associations.	0.762
	A4	Associations make ensuring that no business dominates the relevant industry.	0.711
	A5	When there is a dispute. associations can serve as mediators.	0.764
Capital is property that can be used to produce something that can increase wealth and profit (Bliss, 2014).	Cp1	Easy to get financial capital loans	0.797
	Cp2	Easy to get loans with low interest	0.765
	Cp3	Easy to get capital from the private sector	0.707
	Cp4	The government provides assistance when there is a crisis	0.703
	Cp5	Easy to get capital from the government	0.888
Digitalization is the process of using digital technology in various operational and managerial aspects of a business (Yoo, 2010).	D1	The application of digitalization in industry can increase efficiency. productivity. quality and safety	0.709
	D2	Content marketing (blogs. videos. and podcasts) can increase sales	0.790
	D3	Search Engine Optimization can increase sales	0.856
	D4	Social Media Marketing can increase sales	0.898
	D5	Pay-Per-Click advertising has the potential to boost revenue	0.711
	D6	Instant messaging and email can boost sales.	0.791

4.3 Convergent Validity

By evaluating construct reliability, convergent validity seeks to ascertain the validity of each link between indicators and independent variables. Average variance extracted (AVE) and composite reliability are the two metrics used in construct reliability testing. When the composite reliability value is more than 0.7, it is considered to have good build reliability (Cao et al., 2015; Huang et al., 2013). According to the test results, every variable in this study has a composite reliability value larger than 0.7, meaning that all of the variables can be used.

The average variance extracted (AVE) value is used in the subsequent convergent validity test. In the reflective model, this value represents the average communality (variance) for each independent factor. According to the test results, the AVE value is greater than 0.5, indicating that the independent variable can represent the data in the dependent variable (Shau, 2017; Huang et al., 2013). The model is considered reliable as the AVE value is greater than 0.5 and the composite reliability is greater than 0.7. The average variance extracted and composite reliability (CR) values are summarized in Table 3.

Table 3
Convergent validity test

Constructs	CR	AVE
Supplier	0.764	0.553
Customer	0.779	0.576
Association	0.753	0.536
Government	0.765	0.583
Capital	0.743	0.613
Digitalization	0.702	0.571

4.4 Structural Model Testing (Inner Model)

The dependent variable's R-Square or R2 value indicates how much the independent variable has influenced the dependent variable and how accurate that influence was. How well the independent variable in the equation can explain the dependent variable is indicated by the R2 value.

Table 4
Value R-Square

	R Square	R Square Adjustive
Innovation Network	0.771	0.762

The innovation network is explained by the variables supplier, customer, association, government, capital, and digitalization, which account for 77.1% of the R-square value in table 4 above (0.771), with the remaining 22.9% being explained by variables outside the model. These conclusions are based on the results of data processing. An indication of the model's good accuracy is its R2 score of 0.762, which is above the "strong" category of 0.67 (Huang et al., 2013).

Q-Square Predictive Relevance

The Q^2 value calculation yielded a result of 0.77, indicating strong predictive relevance for the research model. This is because the Q^2 value is more than zero, indicating that the independent variable has a good prediction level versus the dependent variable.

$$Q^2 = 1 - (1 - R_1^2) = 1 - (1 - 0.77) = 0.77$$

4.5 Hypothesis Testing Result

A judgment about whether to accept or reject the hypothesis will be made after this test. Based on table 5's findings on supplier factors' influence, which indicate a positive link and significant impact on the innovation network (β: 0.689, p: 0.013, t: 6.815), hypothesis 1 is accepted. Similar findings support hypothesis 2, which states that there is a positive correlation and a noteworthy influence of the customer variable on the innovation network (β: 0.675, p: 0.000, t: 11.240). According to hypothesis 3, there is a substantial and positive correlation between the government variable (β: 0.579, p: 0.000, t: 8.592) and the innovation network. It is also possible to accept hypothesis 4, which states that the innovation network is positively and significantly impacted by the association variable (β: 0.813, p: 0.001, t: 5.210). The innovation network is positively impacted by capital (β: 0.930, p: 0.012, t: 16.955) and digitalization (β: 0.794, p: 0.006, t: 17.001). However, both effects are positive and substantial.

Table 5
Direct effects

Independent Variable	Dependent Variable	β	t	p	Decision
H1: Supplier	→ Innovation Netwoork	0.689	6.815	0.013	Supported
H2: Customer	→ Innovation Netwoork	0.675	11.240	0.000	Supported
H3: Government	→ Innovation Netwoork	0.579	8.592	0.000	Supported
H4: Association	→ Innovation Netwoork	0.813	5.210	0.001	Supported
H5: Capital	→ Innovation Netwoork	0.930	16.955	0.012	Supported
H6: Digitatalization	→ Innovation Netwoork	0.794	17.001	0.006	Supported

Fig. 1 shows the results that the supplier variable can explain 51.5% of the innovation network dimension. The customer variable can explain 86.5% of the innovation network dimension of Micro, Small and Medium Enterprises. The government variable can explain 70.5% of the innovation network dimension. The association variable can explain 74.2% of the innovation network dimension. The capital variable can explain 58.0% of the innovation network dimension and the digitalization variable can explain 88.9% of the innovation network dimension of Micro, Small and Medium Enterprises. Factor loadings of the indicators and t values are presented in Fig. 3 and Fig. 4, namely.
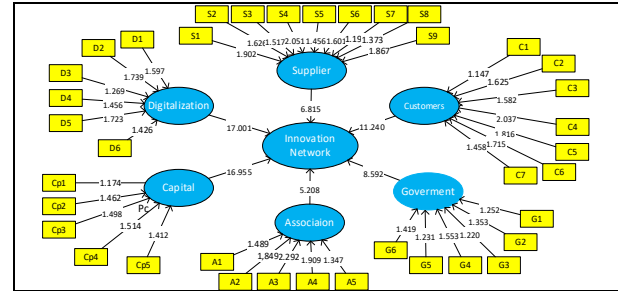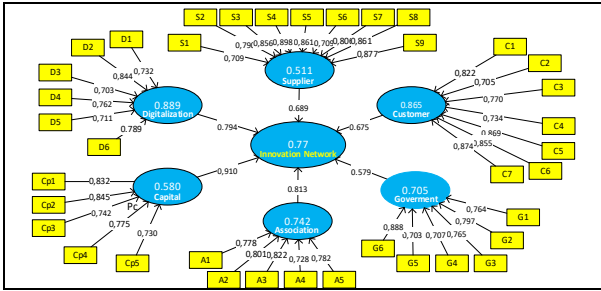

Fig. 3. Factor loadings of the indicators, beta, and R2 values.

Fig. 4. T-statistics of the indicators and beta coefficients

5. Discussion

This is the first study in the realm of MSMEs' innovation networks; the study's original idea came from the way the Covid-19 pandemic affected MSMEs' performance in Indonesia. The Covid-19 pandemic in Indonesia had an impact on nearly all MSMEs in 2021–2022, ranging from financial difficulties to complete business closure. Creating an innovative network that includes suppliers, consumers, the government, associations, and capital is one way that MSMEs can cooperate to rebound from the effects of the pandemic and economic crisis. Several references that state that innovation networks can help the development, competitiveness and overcome the limitations of MSMEs resources include (Shah et al., 2017; Laperche & Liu, 2013; McAdam et al., 2014; Mohannak, 2007; Rehm & Goel, 2017) and it is also necessary to implement digitalization (Karr et al., 2020; Uno, 2023; Wardner et al., 2015).

The results of data processing obtained supplier variables can explain 51.5% and have a positive impact on innovation networks. This finding also validates the findings of Partanen et al., (2014); Dooley & O'SULLIVAN, (2007); Martin, (2015) that indicators on supplier variables are one of the most important things in building a business innovation network. Another conclusion is that customers have a positive impact and can explain innovation networks by 86.5%. This finding is in line with previous research by Kaplan & Winby (2012) and validates the results of research by Partanen et al. (2014); Martin (2015) that customer variables have a significant effect on building innovation networks. Furthermore, the government also has a positive impact and can explain innovation networks by 70.5%. This finding is in line with previous research by Kaplan & Winby (2012) and validates the research results of Partanen, et al. (2014); Martin (2015) that the government has a significant influence in building innovation networks. We also found that association also has a positive impact and can explain innovation networks by 74.2%. This finding is in line with previous research by Kaplan and Winby (2012) and validates the research results of Dooley and O'SULLIVAN (2007) that association is proven to have an influence on the success of business innovation networks. We found that capital also has a positive impact and can explain the innovation network by 58.0%. This finding is in line with previous research by Bradley et al. (2012) and validation of research from Potts, (2019) that the capital indicator is one of the determinants of success in business innovation networks. We also found that digitalization also has a positive impact and can explain the innovation network by 88.9%. This finding is in line with previous research by Omelyanenko et al. (2023, May) and validates the results of research by Holmström et al. (2024); Ge et al. (2023) that digitalization has an effect on the success of business innovation networks.

Overall, this study is in line and proves that innovation networks can support starting a business, developing it and helping to achieve business profits (Wardner et al., 2015). In addition, it also proves that innovation networks can improve efficiency and effectiveness, innovation, excellence, collaboration and foster cooperation between stakeholders (Shah et al., 2017), increase competitiveness and reciprocal relationships for their businesses (McAdam et al., 2014). The findings of this study also confirm that innovation networks will complement each other between innovation partners to expand resources and overcome resource constraints (Mohannak, 2007; Rehm & Goel, 2017).

6.   Conclusions

The results of this study are the first on the innovation network model for MSMEs that accommodate the needs of the industry to recover from the pandemic situation. This finding is also the first with the largest number of MSME respondents who are the objects of research. The results conclude according to MSMEs actors in Indonesia that suppliers, customers, government, associations, capital, and digitalization influence the innovation network and can be used for the development of MSMEs. This also answers the hopes of the government of the Republic of Indonesia for MSMEs to adapt to the development of the digital world. This study uses testing and a suitable method approach so that the results truly reflect

actual conditions. Collaboration from raw material suppliers, individual customers or industry, government regulations that favor business actors, the role of associations in helping to develop members and capital owners (individuals or banks) and the implementation of digitalization that synergizes with each other in this innovation network will help develop and achieve business profits. Industry players must ensure that the synergy of network members runs well to increase efficiency and effectiveness, innovation, excellence, collaboration and foster cooperation between stakeholders.

6.1 Implications for theory and practice

The results of this study will add new literature in the field of industrial innovation networks to help owners make decisions for their business development. This study focuses on innovation networks to overcome MSMEs affected by the Covid-19 pandemic by adopting the needs of MSMEs, namely capital and digitalization. While previous studies have a lot of similar literature, all focus on certain types of businesses and normal economic conditions. This study is different from similar studies because it was conducted on MSMEs in all business sectors and economic conditions in crisis due to the pandemic. These results can be used as a reference in decision making to increase the growth of MSMEs to grow and develop. The results of this study can be the basis for making policies to help development, competitiveness and overcome resource limitations. The practical impact is in the form of a decision-making model tool for MSME managers for business development by implementing all aspects in this innovation network, starting from the supplier aspect by choosing raw material suppliers with strong capital, competitive prices, providing discounts, accepting payment delays, fast order delivery, introducing new products with their advantages, suppliers that cause loss of potential profits if they change suppliers, and suppliers that are valuable. Besides, the aspect of MSME actors must implement the second network member, namely managing customers by issuing a complete product catalog, a complete price list, guidelines for discounts, selling products wholesale and retail, recruiting new customers, identifying large customers, and anticipating large customers appearing in certain seasons. The government must create regulations related to raw materials, pricing, taxes, protection, subsidies, and tax equality. Associations must play a role in the development of this industry, help their members to grow, be at the forefront of defending industry rights, ensure that no company is dominant in the industry, and be a mediator when there is a conflict. While the fifth aspect is capital, namely there must be efforts to make it easy to obtain financial capital loans, obtain loans with low interest, obtain capital from the private sector, the government provides assistance when there is a crisis, and the ease of obtaining capital from the government. The last is digitalization, through the application of digitalization for efficiency, productivity, quality and safety, using content marketing strategies (blogs, videos, and podcasts), Search Engine Optimization, Social Media Marketing, and Pay-Per-Click Advertising, as well as Email and Instant Messaging to increase sales.

6.2 Limitations and future research directions

It is necessary to mention some of this study's limitations. First off, since every respondent originated from a single province West Java we are unable to extrapolate the results to all MSMEs in the Republic of Indonesia. In contrast, there are 38 provinces in the Republic of Indonesia. Second, it is necessary to communicate with all MSME stakeholders as the study's conclusions were subsequently disseminated and put into practice. In conclusion, we suggest that additional research be done on the same topic in various provinces. Better techniques can be used in future study.

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