Strengthening Entrepreneurial Ecosystem to Achieve Sustainability Through Digitalization and Innovation: A Case of Indonesian MSMEs Ecosystem

Wawan Dhewanto, Prawira Fajarinda Belgiawan, Rozan Hanifan, Aang Noviyana Umbara
School of Business and Management
Bandung Institute of Technology
Bandung, Indonesia
w_dhewanto@sbm-itb.ac.id, fajar.belgiawan@sbm-itb.ac.id, rozan_hanifan@sbm-itb.ac.id, aang.noviyana@sbm-itb.ac.id,

Abstract

The entrepreneurial ecosystem, a set of multidimensional factors that interact in an entrepreneurial environment, is one of the constellations that can strengthen entrepreneurial activity and support sustainable economic growth. Despite the importance of the entrepreneurial ecosystem, there is a void in research about how the entrepreneurial ecosystem can also help enterprises improve digitalization and innovation performance. These performances are essential in all fields of enterprises to sustain in this industrial 4.0 era, especially for MSMEs. Thus, this study aims to explain the mediating effect of digitalization and innovation on the relationship between the entrepreneurial ecosystem and sustainability among MSMEs in Indonesia. This study utilized four well-known entrepreneurial ecosystem frameworks to assess how entrepreneurial ecosystem elements are indispensable in enhancing MSMEs' digitalization and innovation which will end up amplifying sustainability. This research uses a structured survey questionnaire-based data collection method with Indonesian MSME actors as respondents. This study contributes by providing a mediation analysis of digitalization and innovation in channeling the entrepreneurial ecosystem element to boost operational, economic, and marketing sustainability. Through this study, EE elements such as the government, higher education institutions, professional infrastructure, and entrepreneurs themselves are suggested to collaborate to improve Indonesian EE quality by adopting digitalization and nurturing innovation to reinforce sustainability growth in Indonesia.

Keywords
Entrepreneurial Ecosystem, Sustainability, Digitalization, Innovation, MSMEs

1. Introduction
Entrepreneurship policies around the world are currently transitioning from increasing the quantity of entrepreneurship to improving the quality of entrepreneurship. These policies are implemented through the support of strengthening elements of the entrepreneurial ecosystem, be it MSMEs, startups, or large-scale industries. This entrepreneurial ecosystem approach is defined as a new framework that accommodates policy transitions and is capable of supporting significant economic development. This approach begins with the emphasis on entrepreneurs being able to bring about social and economic transformation (Cavallo et al., 2019).

In this case, elements of technology, innovation, and entrepreneurs are key players in creating an ecosystem and keeping the existing ecosystem healthy (Dhewanto et al., 2015). Technological advances and innovation in the entrepreneurial ecosystem allow for integration along the value chain to create a dynamic production system based on real-time data on demand and supply levels. Also, implementing innovative technology enables the acceleration of the overall production system so that companies will be able to optimize production time, which will impact production costs (Gao et al., 2021; Zang and Li, 2017).

This study focuses on MSMEs because the number of MSMEs in Indonesia is significant. They can become the backbone of the economy by contributing to the National GDP. However, the business climate in Indonesia during the COVID-19 pandemic is very diverse and full of uncertainty. MSMEs in the accommodation, food and beverage

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sector experienced a decrease in income of 92.47%, followed by MSMEs in the service sector by 90.90% (BPS, 2020). MSMEs that survived during this pandemic were only the ones with good responses and strategies to the crisis (Wenzel et al., 2021).

Strengthening the entrepreneurial ecosystem aligns with one of the priorities in implementing sustainable and inclusive economic development programs. Policymakers can use this research to support economic and financial sustainability through adoption or integration into Bank Indonesia's strategic programs, for example, through:

1. Strengthening policies and synergies with government policies and related institutions to develop the digital economy and finance.
2. Formulation of international cooperation to fight for the progress of digitizing MSMEs
3. Update the idea design and implementation in the roadmap for entrepreneurship and MSME development

This research provides an overview of the key drivers and barriers to the entrepreneurial ecosystem that fosters MSMEs in Indonesia. The results of this study can show how MSME growth mechanisms can contribute to Indonesia's economic growth. In addition, strengthening the entrepreneurial ecosystem in MSMEs also supports the National Economic Recovery program with three central policies: increasing domestic consumption (demand), increasing business activity (supply), and maintaining economic stability and monetary expansion. By improving the quality of the entrepreneurial ecosystem in MSMEs, the impact can increase the capacity, quality and continuity of production, access to marketing, product packaging, and the quality of HR/MSME actors in the managerial, financial and production fields.

In addition, this study also contributes academically. Most of the research on the entrepreneurial ecosystem over the last decade has been in the form of conceptual papers (Isenberg and Onyemah, 2016; Kapturkiewicz, 2021; Stam and van de Ven, 2021). While there is still little empirical research on this topic, let alone research that uses a quantitative approach. On the other hand, this research also covers the concept of digitalization and innovation as a bridge between the entrepreneurial ecosystem and sustainability. Validation of the proposed conceptual model will amplify the importance of the entrepreneurial ecosystem in a region, or Indonesia in the context of this study.

1.1 Objectives

Many MSMEs are collapsing in today's volatile and uncertain business climate. So, it is necessary to strengthen the entrepreneurial ecosystem to implement sustainable and inclusive economic development programs. Since we are in the era of digitalization, the application of technology and innovation will be inevitable in the process of realizing a sustainable economy. However, no research has empirically determined the significance of the relationship between the entrepreneurial ecosystem, let alone the influence of digitalization and innovation that bridges these relationships. Motivated by this research gap, this study aims to demonstrate the importance of the entrepreneurial ecosystem and the mediating effect of digitalization and innovation on the sustainability of inclusive economic development.

2. Literature Review

2.1 Entrepreneurial Ecosystem (EE)

Over the last decade, scholars, politicians, and practitioners have paid close attention to the notion of entrepreneurial ecosystems (Cao and Shi, 2021). Despite the expanding scholarly interest in this field, there is no universally accepted definition of entrepreneurial ecosystem concept. One of the reasons for this might be that each entrepreneurial ecosystem definition has its own characteristics, spatial linkages, and social ties (Grigore and Dragan, 2020).

According to Cohen (2005) entrepreneurial ecosystems represent a “diverse set of inter-dependent actors within a geographic region that influence the formation and eventual trajectory of the entire group of actors and potentially the economy as a whole.” Isenberg and Onyemah (2016) described that an entrepreneurial ecosystem consists of six domains: finance, culture, human capital, markets, policy, and support. These domains are strongly interrelated in ways that encourage, promote, and maintain entrepreneurship. Similarly, Stam et al. (2015) stated that the "entrepreneurial ecosystem comprises a set of interdependent actors and factors that are governed in such a way that they enable productive entrepreneurship."

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This study utilized four well-known EE frameworks to synthesize any EE elements that will be analyzed in this research. The first framework comes from Isenberg and Onyemah (2016). This framework consists of six main elements: policy, finance, culture, support, human capital, and markets. The second framework comes from Stam et al. (2015). This framework consists of ten main elements: physical infrastructure, demand, intermediaries, talent, knowledge, leadership, finance, networks, culture, and formal institutions. The third framework comes from the World Economy Forum (WEF). This framework consists of eight elements: markets, human capital, finance, support systems, infrastructure, education and training, higher education institutions, and cultural support (Bouncken and Kraus, 2022). The last framework comes from the Global Entrepreneurial Monitor (GEM). This framework consists of nine elements: finance, government policies, government programs, education and training, research and development transfer, professional support, markets, physical infrastructure, and cultural norms (Ahmad and Xavier, 2012). After carefully analyzing each element of each framework, this study generates nine elements of EE: finance (FIN), government (GOV), education and training (ET), higher education institute (HEI), support (SUP), market (MAR), physical infrastructure (PI), culture (CUL) and human capital (HC). The synthesis table is presented in Table 1.

Table 1. EE elements synthesis table

EE Model	EE Element								
	FIN	**GOV**	**ET**	**HEI**	**SUP**	**MAR**	**PI**	**CUL**	**HC**
This research	v	v	v	v	v	v	v	v	v
Isenberg	v	v	v		v	v	v	v	v
Stam	v	v		v	v	v	v	v	v
WEF	v	v	v	v	v	v	v	v	v
GEM	v	v	v	v	v	v	v	v	

2.2 EE and Sustainability

Entrepreneurship is an important contributor to economic growth, regional development, and increasing welfare. Entrepreneurship can shape local competitiveness and transform local economies (Bischoff, 2021). However, according to Capello and Lenzi (2016), the climate of the entrepreneurial ecosystem will substantially determine whether and how entrepreneurship can generate economic growth and renewal. Therefore, it is implied that entrepreneurial ecosystems are one of the key drivers of sustainability.

Sustainability can be defined as efforts to ensure that we meet the needs of the present without compromising the ability of future generations to meet their own needs (Robert et al., 2005). This study adopts economic and operational sustainability from Chowdhurry (2014) as this study sustainability construct. Economic sustainability refers to an organization's financial ability to continue operating successfully. While operational sustainability implies that operations run smoothly to guarantee predicted lead times, quality, customer standards, and the utilization of modern, efficient machinery. In addition, this study also adopts marketing sustainability from Kowalska (2020). This term refers to emphasizes socially and environmentally responsible marketing activities, which can meet the needs of consumers and businesspeople or companies at the same time while maintaining and enhancing the ability of future generations to meet their needs.

In the context of the entrepreneurial ecosystem, Cohen (2006) introduced the concept of a sustainable entrepreneurial ecosystem, and he defined it as “an interconnected group of actors in a local geographic community committed to sustainable development through the support and facilitation of new sustainable ventures.” Moreover, according to Han and Shah (2019), factors of the entrepreneurial ecosystem such as funding, organizations, technology and data, strategies, institutional infrastructure, and government policy, would facilitate the scaling up of firms. On the other hand, Venkataraman (2004) discovered that a virtuous cycle of wealth creation may be created by an entrepreneurial ecosystem that fosters the establishment of new enterprises. Entrepreneurial ecosystems, according to Desiana et al. (2022), can impact a company's performance and long-term viability. Furthermore, according to several studies, an entrepreneurial network inside an entrepreneurial ecosystem promotes organizational sustainability by assisting firms in obtaining resources and knowledge (Asamoah et al., 2020; Franco et al., 2016; Pham et al., 2021). Therefore, we proposed following hypothesis:

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H1. Entrepreneurial ecosystem has significant impact on sustainability

2.3 Mediating Role of Digitalization

Digitalization is described as an organizational process involving incremental and disruptive changes enabled by digital technology. Digitalization includes the ability to adapt business models to new technologies and technological advancements in social-economic fields, affecting operations and customer experience (Franco et al., 2021; Matt et al., 2015). According to Cortellazzo et al. (2019), digital transformation is now an inevitable option for any company, regardless of size or industry.

The emerging technological paradigm is leveraging the influence of cooperation and collective intelligence to build and launch more robust and long-term entrepreneurial ventures (Elia et al., 2020). This leads to the definitions of Digital Ecosystem (DE) and Digital Entrepreneurial Ecosystem (DEE). Baran and Berkowicz (2021) defined DE as "collaborative organizations that are digitally connected, modular, non-hierarchical, specialized, connected, and competing." Sussan and Acs (2017) explained DEE as an integration of the entrepreneurial ecosystem and DE. The former focus on agency and the role of institutions, while the latter focus on digital infrastructure and users. DEEs are essential to produce digitally-enabled unicorns by integrating all the elements inside entrepreneurial ecosystem digitally (Torres and Godinho, 2021).

Thus, it can be concluded that digitalization can aid the entrepreneurial ecosystem in realizing sustainability. Successful DEE facilitates value creation mechanisms in the platform ecosystem. These mechanisms are based on the practical and convenient facilitation of transactions and the provision of affordances, making the DEE a breeding ground for new ventures and innovation (Baran and Berkowicz, 2021). According to Liu and Chiu (2021), the application of digital technology can also increase the supply chain's speed, efficiency, and resilience. Endres et al. (2021) highlight the need to implement a digital innovation management system that may help organizations foster entrepreneurial ecosystems by centralizing their innovation initiatives, stakeholders, and resources. Song et al. (2021) also prove that the adoption of Information and Communication Technologies (ICT) brings a traditional ecosystem to become an entrepreneurial one. Therefore, the following hypothesis is proposed:

H2. Digitalization mediates the influence of entrepreneurial ecosystem on sustainability

2.4 Mediating Role of Innovation

Drucker (1985), as one of the pioneers in innovation research, argued that innovation is a combination of invention, commercialization, and innovation sources. This refers to Porter's (1980) explanation of commercialization, which is the use of new methods, or inventions, whereas the process of innovation cannot be separated from corporate strategies and the competitive environment. This leads to the more explicit definition of innovation, such as the ability to introduce, modify or invent a new concept or core technology and enable it to satisfy current or future potential business requirements (Tien et al., 2007). Damanpour (1990) also referred to innovation as a new product or service, a new processing technology, a new management system and structure or a new organizational staffing plan. From these many notions, we can conclude that innovation is about successfully commercialization invention, which mostly takes the form of successful technology evolution. This is linked with technological innovation theory, which explains innovation as implementing a new or significantly improved technology in business practices and workplace organization (Oke, 2007).

Innovation has long been recognized as the key to the success of business performance and resilience (Aldianto et al., 2021; Kosasih et al., 2020; Turner and Lee-Kelley, 2013). Innovation can promote sustainability by introducing new form of product, process, marketing, technology, service, and business operations that did not exist previously (Li et al., 2021). Thus, innovative entrepreneurs plays an critical role to ensure that the use of inventions will contribute to increased productivity and economic growth (Sussan and Acs, 2017).

Entrepreneurial activity, as an output of the entrepreneurial ecosystem, is considered the process by which individuals create opportunities for innovation (Stam and van de Ven, 2021). Igwe et al. (2020) also stated that the integration of entrepreneurial ecosystem elements could stimulate the process of innovation. Entrepreneurs will utilize this system to exchange information, resources, and networks while also channelings knowledge (Desiana et al., 2022; Valackienė and Nagaj, 2021).

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According to Ribeiro and Cherobim (2017), there is a significant link between environmental factors and corporate innovation: the greater the degree of complexity and unpredictability in an ecosystem, the greater the impact on the amount and form of innovation. Chuluun et al. (2017), also stated that diverse network characteristics could influence the inputs and outputs of innovation. Meanwhile, other research claims that network connections between customers, intermediaries, business groupings, and suppliers of products or services influence innovation (Desiana et al., 2022; Pittaway et al., 2004). On the other hand, Gao et al. (2021) declare that social networks are beneficial to improving innovative start-ups' innovation performance. Thus, it can be concluded that innovation has the potential to mediate the relationship between the entrepreneurial ecosystem and sustainability. Based on the explanation above, the following research hypothesis is proposed:

H3. Innovation mediates the influence of entrepreneurial ecosystem on sustainability

3. Methods

This study aims to explain the mediating effect of digitalization and innovation in the relationship between EE and sustainability. Therefore, this study utilizes quantitative research methodology by deploying an internet-mediated questionnaire. The questionnaire consists of questions regarding company profiles, respondent profiles, and the measurement of all four variables included in this study. The four variables are EE as the independent variable, digitalization, innovation capability as mediating variables, and sustainability as the dependent variables. The conceptual framework of this paper is depicted in Figure 1.

EE measurement indicators are self-developed with reference to four well-known EE frameworks. The question item sentences are also adjusted to the questions in the GEM framework. This measurement consists of self-assessment from respondents regarding the Indonesian EE elements condition they feel. These elements refer to the nine elements that have been described previously (refer to Figure 1).

For digitalization capability, we are adopting supply chain digitalization measurement indicators from Liu and Chiu (2021). While for innovation capability, we are adopting the measurement from Pranowo et al. (2021). Regarding sustainability, we adopt the measurement of operational and economic sustainability by Chowdhurry (2014) and marketing sustainability by Kowalska (2020).

All the measurements use a five-point Likert scale allowing ratings from 1 (strongly disagree) to 5 (strongly agree). The Likert scale has the advantage of not expecting a simple yes or no answer from the respondent. Instead, it allows for degrees of opinion and even no opinion. A total of 50 indicators can be seen in table 4.

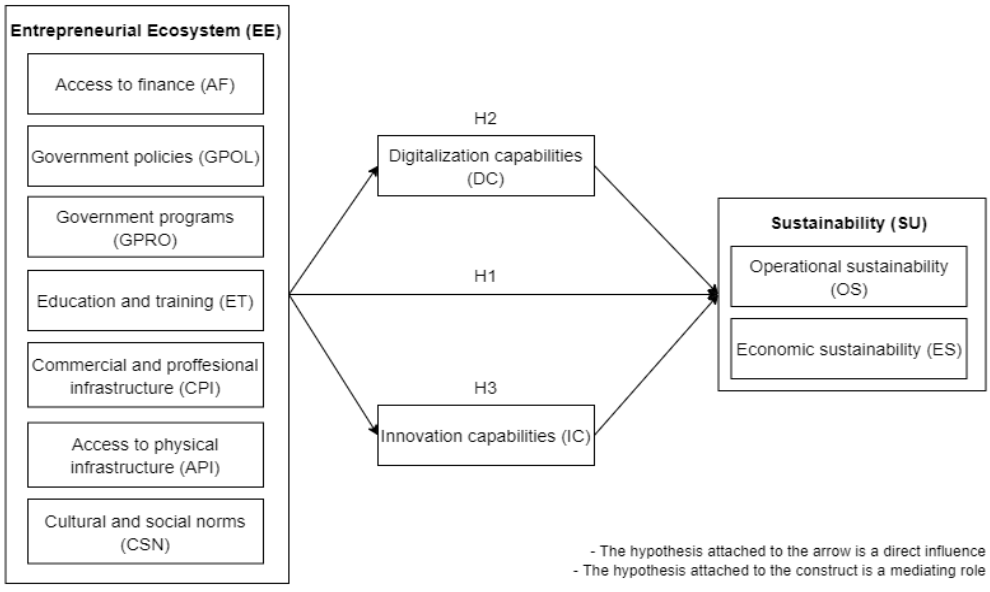

Figure 1. Conceptual framework

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4. Data Collection

This study takes Indonesian MSME actors as its research object. In total, there were 112 final respondents from this study. The respondent and company profiles are presented in table 2 and 3, respectively. The majority of respondents in this study are female (50.89%), aged 21-30 years (50%), and have minimum Diploma education (33.04%). While, the majority of MSME profiles involved in this study are 3-5 years old (38.39%), the number of employees is 6-19 people (50.89%), working in the food and beverages sector (51.79%), total assets are between 50 - 500 million IDR (64.29%), and total revenue are between 300 million – 2.5 billion IDR (51.79%).

Table 2. Respondents profile

Respondent Profile	Categories	Respondents	Percentage (%)
Gender	Male	55	49.11
	Female	57	50.89
Age	21 - 30 years	56	50.00
	31 - 40 years	46	41.07
	> 41 years	10	8.93
Education	High school or less	31	27.68
	Diploma	37	33.04
	Bachelor	24	21.43
	Master/Doctor	20	17.86

Table 3. Company profile

Company Profile	Categories	Respondents	Percentage (%)
Company Age	1-3 years	42	37.50
	3-5 years	43	38.39
	> 5 years	27	24.11
Number of Employees	1 - 5 people	47	41.96
	6 - 19 people	57	50.89
	20 - 99 people	8	7.14
Field	Fashion	15	13.39
	Service	21	18.75
	Craft	10	8.93
	Food and beverages	58	51.79
	Commerce	8	7.14
Asset (in IDR)	< 50 million	26	23.21
	50 - 500 million	72	64.29
	501 million - 10 billion	14	12.50
Revenue (in IDR)	< 300 million	15	13.39
	300 million - 2,5 billion	58	51.79
	2,5 billion - 50 billion	39	34.82

5. Results and Discussion

This study utilized PLS-SEM (Partial Least Square – Structure Equation Modeling) as the data analysis method. PLS-SEM is a causal modeling approach that explains the variance of the latent variables. The definition of a latent variable is a variable that is not directly observable. All variables in this study are included as latent variables. PLS has the advantage of estimating a complex model comprising many item indicators (Hair et al., 2014).

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This study's first stage of the PLS-SEM is to assess indicator reliability. They were continued by construct reliability and validity test. After that, we extract the latent variable score from each construct to generate a higher-order construct (HOC). This HOC is then used to do the mediation analysis. HOC is required because the original construct in this study, especially in EE and sustainability, consists of many lower-order-construct (LOC).

5.1 Indicator Reliability Test

The first measurement is to assess the indicator reliability. This measurement is seen from the factor loadings value of each indicator, where the minimum value that factor loadings must own should not be less than 0.5 (Jogiyanto, 2011). Of the 50 indicators, all of them are already above the threshold. After that, we checked the VIF (Variance Inflation Factor) value of each indicator. According to Hair et al. (2014), a VIF value of not more than 5 will not be a severe multicollinearity problem. Of the 50 indicators, no indicator shows a VIF value above five, so it can be said that there is no multicollinearity problem in the model formed. The value of each indicator's factor loadings, mean, standard deviation, and VIF are presented in Table 2.

5.2 Construct Reliability and Validity Test

Construct reliability and validity test were carried out to inspect the consistency of the indicators representing the construct and the validity of the construct itself. Construct reliability was tested through the Composite Reliability (CR) values, where these test values had a threshold of 0.6. Construct validity, on the other hand, was tested through the value of Average Variance Extracted (AVE), which has a threshold of 0.5 (Hair et al. (2014). Of all construct, there is no construct that violated construct reliability test. On the other hand, almost all of the construct are violated construct validity test. However, according to Fornell and Larcker (1981), We can accept AVE < 0.5 if the CR is > 0.6, because the convergent validity of the construct is still adequate. In addition, there is no violation also in discriminant validity test that analyzed using Fornell-Larcker criterion. All the measurement regarding construct reliability and validity are presented in Table 3.

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Table 2. Indicator reliability test

Variable	Indicator	Loadings	Mean	Std. Dev	VIF
Entrepreneurial Ecosystem	**Finance (FIN)**		4.433		
	Debt Funding	0.705	4.759	0.522	1.093
	Gov. Subsidies	0.583	4.232	0.906	1.055
	Private Funding	0.563	4.375	0.656	1.101
	Micro-loans	0.546	4.366	0.732	1.067
	Government (GOV)		4.585		
	Public Procurement	0.605	4.536	0.626	1.015
	Ease on licensing	0.693	4.598	0.574	1.114
	Tax	0.537	4.634	0.534	1.158
	Gov. Program	0.571	4.571	0.578	1.142
	Education and training (ET)		4.507		
	Pre-University Education	0.656	4.634	0.598	1.112
	Entrepreneurship Education	0.577	4.554	0.624	1.135
	University Education	0.666	4.598	0.574	1.104
	Entrepreneurship Preparation	0.577	4.241	0.793	1.048
	Higher Education Institute (HEI)		4.310		
	RandD Transfer	0.792	4.196	0.7540	1.186
	Access to New Research	0.513	4.420	0.7275	1.126
	Access to New Technology	0.557	4.393	0.7601	1.171
	Commercialization of new concept	0.776	4.232	0.7904	1.341
	Support (SUP)		4.560		
	Professional Services Cost	0.688	4.634	0.567	1.126
	Access to Professional Services	0.751	4.464	0.667	1.144
	Access to Banking Services	0.708	4.580	0.622	1.12
	Market (MAR)		4.330		
	Market Openness	0.726	4.464	0.680	1.122
	Cost of Market Entry	0.687	4.304	0.789	1.036
	Anti-trust Legislation	0.631	4.223	0.716	1.132
	Physical Infrastructure (PI)		4.589		
	Telecommunication Cost	0.663	4.545	0.596	1.053
	Basic Utilities Cost	0.652	4.580	0.592	1.039
	Access to Basic Utilities	0.664	4.643	0.515	1.039
	Culture (CUL)		4.577		
	Positive Image of Entrepreneurship	0.623	4.616	0.571	1.01
	Tolerance Risk	0.649	4.527	0.654	1.052
	Celebration of Innovation	0.662	4.589	0.576	1.057
	Human Capital (HC)		4.292		
	Management Talent	0.719	4.411	0.701	1.113
	Technical Talent	0.502	4.268	0.790	1.092
	Access to Immigrant Workforce	0.84	4.196	0.766	1.156
Digitalization	**Digitalization Capability (DC)**		4.564		
	Apply Digital Technologies	0.578	4.804	0.419	1.053
	Supplier Transaction - Proportion	0.542	4.500	0.641	1.075
	Supplier Transaction - Volume	0.603	4.554	0.580	1.128
	Consumer Transaction - Proportion	0.539	4.455	0.639	1.113
	Consumer Transaction - Volume	0.522	4.509	0.655	1.042

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Innovation	**Innovation Capability (IC)**			4.558		
		Technology Availability	0.555	4.750	0.453	1.072
		Production Equipment	0.576	4.420	0.622	1.062
		Product/Services Design	0.55	4.509	0.627	1.151
		Product/Services Price Variety	0.74	4.554	0.692	1.153
Sustainability	**Operational Sustainability (OS)**			4.656		
		Lead Time	0.83	4.759	0.448	1.104
		Quality	0.786	4.554	0.580	1.104
	Business/ Economic Sustainability (ES)			4.580		
		Cost	0.57	4.527	0.654	1.034
		Profit	0.634	4.589	0.606	1.069
		Sales Growth	0.704	4.625	0.553	1.089
	Marketing Sustainability (MS)			4.338		
		Honesty	0.602	4.429	0.691	1.176
		Two-way Communication	0.53	4.384	0.735	1.108
		Credibility	0.801	4.330	0.795	1.29
		Digital Marketing	0.525	4.214	0.807	1.144
		Zero Carbon	0.608	4.330	0.761	1.169

Table 3. Construct reliability and validity measurement

Construct	Composite Reliability	Average Variance Extracted (AVE)
DC	0.692	0.311
EE.CUL	0.681	0.416
EE.ET	0.714	0.385
EE.FIN	0.693	0.363
EE.GOV	0.695	0.365
EE.HC	0.736	0.492
EE.HEI	0.76	0.451
EE.MAR	0.723	0.466
EE.PI	0.698	0.435
EE.SUP	0.759	0.513
IC	0.7	0.372
SU.ES	0.672	0.407
SU.MS	0.754	0.386
SU.OS	0.79	0.653

5.3 Higher-Order-Construct (HOC) Reliability and Validity Test

HOC is generated by extracting latent variable scores from LOC. After that, we validate the HOC by using the exact measurement as before. The result is presented in Table 4. From all the HOC, a few EE elements have indicator loading lower than 0.5, which are EE. HC, EE.MAR, and EE.PI. So, we decided to eliminate these three constructs to gain more reliable results. As for the composite reliability and validity, there is no violation after the construct elimination.

5.4 Mediation Analysis

Mediation analysis was conducted to examine the mediating effect of DC and IC on the relationship between EE and SU. Mediation analysis were conducted by evaluating each mediator variable's indirect effect, direct effect, and total effect. The results of the mediation analysis are shown in Table 5 below. Based on this analysis, we conclude that DC and IC are partially mediated the relationship between EE and SU. This was indicated by the three values of indirect, direct, and total effect showing significant values ($p < 0.1$).

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Table 4. HOC reliability and validity test

	EE	**DC**	**IC**	**SU**
EE.CUL	0.593			
EE.ET	0.646			
EE.FIN	0.74			
EE.GOV	0.646			
EE.HC	0.474			
EE.HEI	0.558			
EE.MAR	0.449			
EE.PI	0.471			
EE.SUP	0.645			
DC		1		
IC			1	
SU.ES				0.809
SU.MS				0.496
SU.OS				0.747
Composite Reliability	0.824	1	1	0.806
Average Variance Extracted (AVE)	0.443	1	1	0.676

Table 5. Mediation analysis

Path	**Indirect effect**		**Direct effect**		**Total Effect**		**Mediating Effect**
	Coef.	P Values	Coef.	P Values	Coef.	P Values	
EE -> DC -> SU	0.212	0	0.287	0.011	0.593	0	Complementary Partial Mediation
EE -> IC -> SU	0.093	0.031					Complementary Partial Mediation

6. Conclusion

In conclusion, this study proves how digitalization and innovation can mediate the relationship between EE and sustainability. Based on the mediation analysis, we demonstrate that digitalization and innovation capability are complementary and partially mediate EE and sustainability. This means that the company's ability to apply digitalization and innovate is critical to channeling EE elements to boost operational, economic, and marketing sustainability. These results are consistent with previous literature that has already been discussed (Endres et al., 2022; Gao et al., 2021; Liu and Chiu, 2021).

By applying self-developed questionnaires, we conclude that there are at least six significant elements to building sustainability in Indonesian MSMEs: culture, education and training, finance, government, higher education institute, and support system. As for human capital, market, and physical infrastructure, these elements are still irrelevant since the measurement items of these constructs still lack reliability and validity. Thus, further study needs to re-evaluate these measurement items.

This research is still far from perfect because there are still some weaknesses limiting the potential of this research. First, this study is limited to MSME actors' perspectives while there are still many other relevant actors, such as government, higher education institutions, professional infrastructure, etc. By investigating all stakeholders, we can gain more comprehensive information regarding the relationship between EE elements and sustainability. However, this study concludes that these actors can collaborate to enhance digitalization and innovation and amplify sustainability. Second, almost all of the constructs have an AVE value lower than the threshold (0.5). This means that the measurement items are not unique enough to represent the underlying construct. Even though this problem can still be tolerated by looking at composite reliability value, further research must refine the measurement item to avoid further problems.

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Biography

Wawan Dhewanto is a professor of entrepreneurship who joined School of Business and Management, Institut Teknologi Bandung (SBM ITB) in January 2004. He has been involved in developing the Entrepreneurship and Technology Management (ETM) Research Group. He has become head of that Research Group between 2012 and 2017. He also has been involved in developing and has become Director of SBM ITB's newest Study Program, the Bachelor Program on Entrepreneurship, between 2013 and 2018. His research interest is Entrepreneurship Ecosystem, Digital Start-Ups, SMEs, and Business Innovation.

Prawira Fajarindra Belgiawan is a Lecturer at the School of Business and Management, Institut Teknologi Bandung (SBM ITB). He conducted research on Choice Modelling, especially psychological aspects that influence a person's choice decision when he was a master student at Kyoto University. During his doctoral study and postdoc at Kyoto University, he continued the choice modeling research incorporating the perceived influence of others. After that, at IVT ETH Zurich, he continued his research on influence of others on consumer decision as well as conducted research on random regret minimization which is the opposite of random utility maximization. He is now joining the Business Strategy and Marketing (BSM) research group in SBM. His main research interest is on the application of the stated choice experiments, psychological aspects and the discrete choice model on travel behavior and marketing. His other research interest is in studying whether people decision can actually be influenced by their significant others.\

Rozan Hanifan is a postgraduate student in the Master of Science in Management program at the School of Business and Management, Institut Teknologi Bandung (SBM ITB). He is part of the Entrepreneurship and Technology Management (ETM) research group. Before joining SBM ITB, he works as a chemistry laboratory assistant in the Indonesian Institute of Sciences (LIPI) and the ITB basic chemistry laboratory. He is currently interested in Entrepreneurial Competencies, Entrepreneurial Ecosystem, and Creative Economy research topics.

Aang Noviyana Umbara is a graduate from Master of Science Management program at the School of Business and Management, Institut Teknologi Bandung (SBM ITB). Currently, she is working as research assistant in the Entrepreneurship and Technology Management (ETM) Research Group at SBM ITB. Her research interest is related to SMEs, entrepreneurship and management of innovation. She is now conducting research with focus on entrepreneurship ecosystem.

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