RESILIENCE ACCELERATION MODEL OF SMALL AND MEDIUM ENTERPRISES THROUGH DIGITAL TRANSFORMATION

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ABSTRACT

This research aims to simulate SMEs' digital transformation approach to improve their commercial toughness in the aftermath of the Covid-19 outbreak. Quantitative research employing the unit analysis of 200 SME proprietors in Bandung, Indonesia, is utilized. The Structural Equation Model (SEM) analyzes data that examines the influence between variables. The outcomes show that 1) the setting for entrepreneurship and digital transformation has an impact on collaboration capabilities, 2) the environment for entrepreneurship and the digital transition has an impact on the ups and downs of digital transformation, 3) digital transformation and collaboration capability influence innovation value, and 4) digital transformation, collaboration capabilities, and innovation value influence the resilience of SMEs. This study established that digital transformation, collaboration capability, and innovation value substantially impact the resilience of SMEs.

Keywords: entrepreneurial ecosystem; digital transformation; collaboration capability; SMEs

INTRODUCTION

Throughout the Covid-19 pandemic, the academic community's focus on SME resilience research has intensified (Saad et al., 2021). The expansion of small and medium-sized firms (SMEs) has been significantly impacted by crises at various points throughout history, such as in the 1930s and the 2000s. Up to the most recent is the crises experienced by almost all countries in the world caused by the Covid-19 virus in 2020 (Tsilika et al., 2020, Nguyen et al., 2021). SMEs are considered to have the best resilience to crises. However, during the Covid-19 pandemic, SMEs were one of the hardest hit (Jones et al., 2008). This needs to be studied, considering that many countries in the world depend on SMEs to play a role in supporting their country's economy. Small and medium-sized businesses (SMEs) provide an important role in attaining a variety of socioeconomic goals, which makes them important for all countries in the globe, such as economic growth or higher job creation, export promotion and entrepreneurship development, offering innovative and competitive products and services, and expanding international trade through diversification (Birch, 1979; Porter, 1980; Keskin & Şentürk, 2010; Iftikhar, 2012; Schumpeter, 2013; Thaha, 2020).

As a developing country, Indonesia also depends on SMEs to support the country's economy. The number of SMEs in Indonesia is 64.2 million, with a contribution to GDP of 56-59%, total employment of 99%, and investment absorption of 50%. In numerous earlier studies undertaken in Indonesia, research on the implications of the pandemic caused by the Covid-19 virus on SMEs was conducted (Thaha, 2020), but research on the resilience of SMEs is still limited. Holing is an ecologist from Canada who first introduced the concept of "resilience" (Mamouni et al., 2014; Bhamra et al., 2011; Alberti & Ferrario, 2018). An ecosystem's resilience is its capacity to adjust to environmental changes and quickly restore after a crisis (Korber & McNaughton, 2018; Bhamra et al., 2011; Mamouni et al., 2014; Salisu et al., 2020). Although resilience was first introduced in the field of ecology, in its development, the concept of resilience has been used in various fields such as engineering (Patriarca et al., 2018; Woods, D. D., Hollnagel, E., Hollnagel, E., & Woods, D. D. 2016), psychology (Yates et al.,

2015; Zimmerman, 2013; Bonanno, G. A. 2004), sociology (Pavićević, 2016; Adger, W. N. 2000), and business (Saad, M.H., Hagelaar G., Van Der Velde, G., & Omta, S.W.F. 2021; Vogus, T. J., & Sutcliffe, K. M. 2003). In fact, referring to the results of 144 articles that discuss resilience from various multidisciplinary sciences, 92 of these articles are research in the field of business and management (Korber & McNaughton, 2018).

The business processes for SMEs, which are mostly carried out conventionally, are the biggest obstacle for SMEs to survive in the pandemic era. This is due to social distancing policies implemented in almost all countries to reduce the spread of the virus. SMEs are encouraged to innovate, which enables them to respond quickly to ongoing market and environmental changes. The ease of accessing business innovations by SMEs will be faster with the facilitation of digital transitions (OECD, 2017). Digitalization can be an accelerator for SMEs' resilience in increasing their capacity to anticipate, react, and adapt to changes that occur due to major shocks such as the Covid-19 pandemic (Bianchini & Kwon, 2021; Pürhani et al., 2023). The massive effect of the global pandemic of Covid-19 on SMEs has placed the digitalization of SMEs as a major concern for policymakers in various countries as a solution to accelerate the recovery of SMEs.

Digital transformation creates new opportunities that will accelerate the growth of SMEs through market expansion. So that in supporting this digital transformation, collaboration capabilities are needed. The collaborative strategy SMEs need to develop in Indonesia to maximize their business potential is to build networks and good partnerships with marketing assistance agencies, competitors, academics, customers, suppliers, domestic distributors, and foreign distributors (Chetty & Stangl, 2010; Nyuur et al., 2016). The assumption underlying this concept is that collaboration capabilities enable SMEs to overcome their weaknesses through good market access and the use of external resources where these factors are not well owned by them (Jørgensen & Ulhøi, 2010; Zaid, 2022).

The resilience of SMEs through digital transformation strategies, collaboration capabilities, and flexibility will certainly be realized if the entrepreneurial ecosystem is strong, as expressed by Gil Forer (2020) that

building a strong ecosystem intentionally can help organizations become more adaptive and resilient. Since the concept of the entrepreneurial ecosystem was introduced, this approach has always been used to refer to interactions between various stakeholders in encouraging the entrepreneurial growth of SMEs (Isenberg, D.J. 2011). New businesses have more opportunities to grow and generate jobs in a dynamic ecosystem than existing businesses. Based on the background, this study aims to model the digital transformation strategy carried out by SMEs in increasing their business resilience after the Covid-19 pandemic.

LITERATURE REVIEW

Entrepreneurship Ecosystem

Entrepreneurial ecosystems are the social, economic, political, and cultural interactions of individuals, companies, and communities that combine to effectively facilitate innovative entrepreneurs' development to generate economic wealth and prosperity (Prahalad, 2005; Spigel, 2017). The entrepreneurial ecosystem results from a conducive culture that encourages innovation and risk-taking in business activities (Ratten & Nanere, 2020).

Digital Transformation

Utilizing digital technology in business, such as social media, smartphones, analytics, and embedded devices, can enhance operations, optimize the customer experience, and develop new business models (Fitzgerald et al., 2013). Therefore, according to McDonald and Rowsell-Jones (2012), digital transformation extends further only digitalization sources and generates money and value from digital resources (McDonald and Rowsell-Jones, 2012). Stolterman and Fors define "digital transformation" as the transformation that technological innovation brings about or affects across facets of life (Stolterman and Fors, 2004). The term "digital transformation" today refers to employing technology for communication and information to create substantially innovative abilities in society, business, and everyday existence (Martin, 2008). Client experience, innovation in products, plans, company, digitization of procedure, teamwork, technological innovation, cultural and knowledge, and transformation management

are the nine components that comprise Berghaus, Back, and Kaltenrieder's framework for digital transformation (Berghaus, Back, and Kaltenrieder's, 2017).

Collaboration Capability

Law No. 9, 1995 on Small Businesses, Article 1 point 8. "Business partnership or business is business cooperation between Small Businesses and Medium Enterprises or with Large Enterprises accompanied by guidance and development by Medium Enterprises or Large Enterprises by showing the principles of mutual need, mutual strengthening, and mutual benefit". General Provisions of Government Regulation of the Republic of Indonesia No. 44, 1997 Article 1 states that "Business partnership is a business cooperation between Small Enterprises and Medium Enterprises and or with Large Enterprises accompanied by guidance and development by Medium Enterprises and or Large Enterprises by taking into account the principles of mutual need, mutual strengthening, and mutual benefit". Partnerships extend from connecting parties to collaboration to establishing and mediating relationships and bridging various knowledge, competencies, and capability gaps (De Silva et al., 2018).

Innovation Value

According to Mansfield (1988), innovation speed is the period between the start of research on a new product or process and the day that it is officially released on the market. Value innovation simultaneously aims to improve customer value and lower business costs.

SMEs Resilience

Resilience in SMEs is defined as the capacity or ability of an organization to adopt strong situation-specific and transformative actions when it encounters unexpected and complex new risk environments. This enables the enterprises to identify and respond to constantly changing risks, withstand disruption, and gain an advantage over less adaptable competitors (Sanchis & Poler).

METHODOLOGY

This research used a quantitative method

using a questionnaire as a data collection technique. The sample was owners of SMEs in Bandung, Indonesia; as many as 200 respondents were taken using purposive sampling techniques. The variables consisted of entrepreneurial ecosystem, digital transformation, collaboration capability, innovation value, and SMEs resilience. Hypothesis testing to measure the interrelationship between variables using the Structural Equation Model (SEM).

RESULTS AND DISCUSSION

Fit Overall Model

The Structural Equation model suitability test above yielded df= 224 with a Chi-Square value of 201.11 < a table Chi-Squares of 204.69, and a P-value of 0.07 > 0.05 means indicate a fit model. An RMSEA value of 0.039 ($\leq$ 0.08) means the model fits with the data. Furthermore, the value of CFI, GFI and AGFI have an index that is larger than the criteria of $\geq$0.90, which means fit the model with the data (see Table 1).

Table 1: Fit Overall Model

Goodness Of Fit	Testing Result	Cut Off Value	Criteria
Chi-Square (df=224)	201,11	χ^2hit < χ^2tabel (204,69)	Fit
P-value	0.07	$\geq$ 0.05	Fit
RMSEA	0.039	$\leq$ 0.08	Fit
CFI	0.987	$\geq$ 0.90	Fit
GFI	0.951	$\geq$ 0.90	Fit
AGFI	0.922	$\geq$ 0.90	Fit

Source: Author's work

The overall model test in Table 1 reveals a parameter value larger than the cutoff value, indicating that the overall model constructed is fit with the data.

Fit Measurement Model

The measurement model on the construct of exogenous variables is carried out to measure the indicators that build the entrepreneurial

entrepreneurship variable. According to Malhotra (2015), the loading factor value of each indicator must be > 0.5 because the high Loading Factors indicator indicates the indicators converge on the same variable. Meanwhile, reliability testing is indicated by construct reliability (CR) of more than 0.70 and a variance extract (VE) of less than 0.50.

Table 2: Measurement Model Fit

			Estimate		S.E	C.R.	P	CR	AVE
			RW	SRW					
EE1	<---	EE	0.888	0.762	0.017	63,767	***	0.996	0.977
EE2	<---	EE	0.993	0.801	0.018	55.968	***		
EE3	<---	EE	0.796	0.774	0.022	47.667	***		
EE4	<---	EE	0.899	0.758	0.013	79.705	***		
EE5	<---	EE	0.894	0.781	0.013	69.374	***		
EE5	<---	EE	1.000	0.729					

Table 2: Continued

			Estimate		S.E	C.R.	P	CR	AVE
			RW	SRW					
DT1	<---	DT	1,000	0,791				0,994	0,966
DT2	<---	DT	0,934	0,754	0,033	40,076	***		
DT3	<---	DT	0,981	0,779	0,030	36,625	***		
DT4	<---	DT	0,964	0,744	0,040	32,435	***		
DT5	<---	DT	0,938	0,709	0,011	89,027	***		
DT6	<---	DT	0,994	0,800	0,010	93,047	***		
CC1	<---	CC	1,000	0,783				0,997	0,978
CC2	<---	CC	0,989	0,653	0,011	78,656	***		
CC3	<---	CC	0,982	0,891	0,010	86,939	***		
CC4	<---	CC	0,986	0,709	0,010	95,729	***		
CC5	<---	CC	0,990	0,660	0,017	61,335	***		
CC6	<---	CC	0,989	0,682	0,016	69,267	***		
CC7	<---	CC	0,997	0,684	0,019	51,989	***		
IV1	<---	IV	1,000	0,771				0,995	0,985
IV2	<---	IV	0,997	0,858	0,014	72,372	***		
IV3	<---	IV	0,973	0,823	0,016	65,580	***		
SR1	<---	SR	1,000	0,881				0,996	0,992
SR2	<---	SR	0,986	0,872	0,013	74,515	***		

EE: Entrepreneurial Ecosystem

DT: Digital Transformation

CC: Collaboration Capability

IV: Innovation Value

SR: SMEs Resilience

Source: Author's work

Based on Table 2, the loading factors value for each indicator on the entrepreneurial ecosystem, digital transformation, collaboration capability, innovation value, and SMEs resilience variable are more than 0,5. It means that all indicators are valid to measure each variable. The reliability test results also show that all variables have a CR > 0.70 and a VE > 0.50. This means that the measurement model has reliability in measuring Entrepreneurial Ecosystem, Digital Transformation, Collaboration Capability, Innovation Value, and SMEs Resilience.

Fit Structural Model

The primary objective of the structural framework analysis is to assess the parameters that show a causal link or the impact of one latent variable on another. The following is a picture of the standardized loading factor estimation parameters.
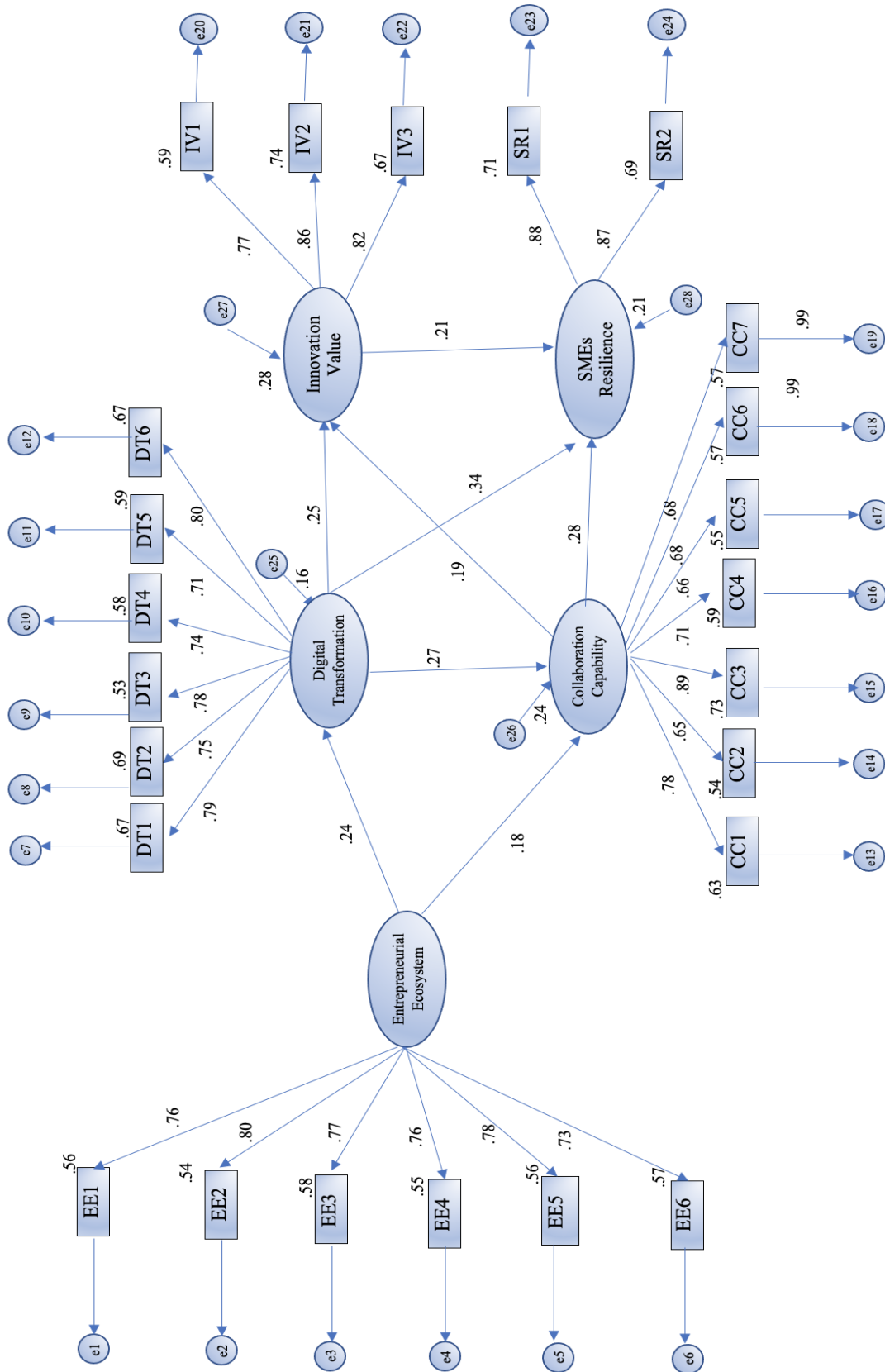
Figure 1: Structural Model
Source: Author's work.

Figure 1 shows the overall structural model parameter estimates. Clearer recapitulation results are presented in Table 3.

Table 3: Summary of The Result of The Estimation of Structural Model Parameter

			Estimate		S.E.	C.R.	P	R2
			RW	SRW				
EE	→	DT	0,604	0.241	0.028	2.573	***	0.058
EE	→	CC	1.234	0.183	0.036	2.156	***	0.107
DT	→	CC	2.782	0.272	0.100	2.884	***	
DT	→	IV	0.522	0.253	0.026	2.648	***	0.158
CC	→	IV	0.324	0.193	0.013	2.281	***	
DT	→	SR	0.289	0.342	0.012	3.235	***	0.333
CC	→	SR	0.084	0.279	0.004	2.895	***	
IV	→	SR	0.566	0.210	0.012	2.393	***	

Source: Author's work.

Hypothesis 1: The Effect of Entrepreneurial Ecosystem on Digital Transformation

The research's findings, which demonstrate that the entrepreneurial environment significantly affects digital transformation, are explained in Table above. This can be seen from the value of SRW 0.241 > 0 with a p_{value} of ≤ 0.05, then Ho is rejected, it indicates that the entrepreneurial environment has a substantial impact on the evolution of technology. The magnitude of the entrepreneurial ecosystem's influence on digital transformation of 0.241 or (0.2412x100%) = 5.8%. The R2 value for the entrepreneurial ecosystem influence model on digital transformation is 0.058. The estimated structural equation for digital transformation is:

$$Digital\ Transformation =$$
$$0.241\ entrepreneurial\ Ecosystem +$$
$$0.16e\ ;\ R^2 = 0.058 \qquad\qquad (1)$$

Hypothesis 2: The Effect of Entrepreneurial Ecosystem and Digital Transformation on Collaboration Capability

Research findings show that the increase or decrease of collaboration capability significantly affects the entrepreneurial ecosystem and digital transformation. This can be judged from the value of each SRW > 0 with a p_{value} of ≤ 0.05. When Ho is rejected, it indicates that entrepreneurial circumstances and technological developments enormously affect cooperation capacity. The magnitude of the entrepreneurial ecosystem's influence on collaboration capability is 0.183 or (0.1832x100%) = 3.3%. Meanwhile, the magnitude of the influence of digital transformation on collaboration capability is 0.272 or (0.2722x100%) = 7.3%. The R^2 value for the entrepreneurial ecosystem and digital transformation influence model on collaboration capability is 0.107. Estimation of structural equations for collaboration capability are:

Collaboration Capability = 0.183 entrepreneurial Ecosystem + 0.272 Digital Transformation + 0.24e; R2=0.107 (2)

Hypothesis 3: The Effect of Digital Transformation and Collaboration Capability on Innovation Value

The research findings show that the increase or decrease in Innovation Value significantly affects digital transformation and collaboration capability. This can be judged from the value of each SRW > 0 with a p_{value} of ≤ 0.05. Consequently, Ho's rejection indicates that there is a considerable relationship between digital change and ability to collaborate and innovative potential. The magnitude of the influence of digital transformation on innovation value of

0.253 or (0.2532x100%) = 6.4%. Meanwhile, the magnitude of the effect of collaboration capability on innovation value is 0.193 or (0.1932x100%) = 3.7%. The R2 value for the model of the influence of digital transformation and collaboration capability on innovation value is 0.158. The estimation of structural equations for innovation value is:

Innovation Value = 0.253 Digital Transformation + 0.193 Collaborative Capability + 0.28e;

R2 = 0.158.

Hypothesis 4: The Effect of Digital Transformation, Collaboration Capability, and Innovation Value on SMES Resilience

Research findings show that the increase or decrease SMES resilience is a significant effect by the high low level of digital transformation, collaboration capability and innovation value. This can be judged from the value of each SRW > 0 with a pvalue of ≤ 0.05, Ho is thus rejected, indicating that there is a strong impact of digital change, cooperative capacity, and innovative potential on SMEs resilience. The magnitude of the influence of digital transformation on SMEs resilience of 0.342 or (0.3422x100%) = 11.7%. Meanwhile, the magnitude of the effect of collaboration capability on SMEs resilience is 0.279 or (0.2792x100%) = 7.80%. The magnitude of the effect of innovation value on SMEs resilience of 0.210 or (0.2102x100%) = 4.41%. The R2 value for the model of the influence of digital transformation, collaboration capability and innovation value on SMES resilience is 0.333. The estimated structural equation for SMEs resilience is:

SMEs resilience $=$
0.342 digital transformation $+$
0.279 collaboratice capability $+$
0.210 innovation value $+ 0.21e$; $R^2 =$
0.333.   (3)

One of the tactics businesses use to create excellence and ensure the viability of their operations is to make SMEs more resilient. The notion of resilience has reportedly been explored from various perspectives, including economics, ecology, environmental sustainability, psychology, engineering, and others (Duarte and Krajsic, 2016). The capacity of a business to continue carrying out a specific function, procedure, or response in the face of disruption is known as business resilience. Business resilience is an organization's ability to bounce back from challenging circumstances, including the impacts of a crisis or tragedy. In a variety of sectors, resilience is thought to be crucial to research, particularly in the fields of business and entrepreneurship (Yulita et al., 2020). Demmer claims that SMEs may benefit from the resilience-building factors identified in the literature of big business studies Demmer et al., 2011). Two phases of elements impact the resilience of SMEs. Building the basis for renewal is the first stage, during which senior management promotes innovation, strengthens internal networks, develops external networks, moves toward organic organizational structures, and introduces mechanisms for strategic planning with an entrepreneurial focus. The second stage involves implementing a sustainable strategy renewal integrated into the customer value chain, proactively seeking fresh possibilities and externalizing innovations. Innovation and value are given equal weight in value innovation. Focusing on value at scale, which creates value but is inadequate to differentiate you from the competition, is a common practice in value generation without innovation. Aiming towards something consumers aren't ready to embrace and consume, worthless inventions frequently rely on technology, market pioneers, or the future. Digital transformation, in the opinion of McDonald and Rowsell-Jones, comprises more than merely digitizing resources and creating value and money from digital materials (McDonald and Rowsell-Jones, 2012). Because of technology, every aspect of existence has experienced a digital change (Fors and Stolterman, 2004). The word "digital transformation" is increasingly frequently used to describe the use of information and communication technologies when automation is fundamentally inventive rather than just carried out.

The entrepreneurial ecosystem is a planned method to encourage economic growth, small-business growth, and innovation. The exploitation and commercialization of ideas as a supplement or alternative to existing corporate assets is a function of the entrepreneurial and business ecosystems, two sets of components of the regional economic ecosystem (Cantner et al., 2020). The entrepreneurial ecosystem

dimension stated by (Isenberg, D. J. 2011) consists of six factors, namely policies, finance, markets, culture, human resources, and support for building a sustainable entrepreneurial ecosystem. The research of Spigel, the result of the business sector is entrepreneurial activity, which may lead to new chances for innovation and the formation of new values in society in order to promote regional development (Spigel B. 2017).

CONCLUSION

Entrepreneurial ecosystems have a significant effect on SMEs digital transformation. Entrepreneurial Ecosystem and Digital Transformation have a significant impact on Collaboration Capability. Digital Transformation and Collaboration Capability have a significant effect on Innovation Value. Therefore, Digital Transformation, Collaboration Capability, and Innovation Value have significant effects on SMES Resilience.

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