

The Role of Technology Usage in Mediating Intellectual Capital on SMEs Performance During the Covid-19 Era

by Faisol Faisol

Submission date: 05-Dec-2021 12:38AM (UTC+1100)

Submission ID: 1720386475

File name: Jurnal_Etikonomi_Vol._20-2-2021-201-216.pdf (1.36M)

Word count: 7266

Character count: 41092

The Role of Technology Usage in Mediating Intellectual Capital on SMEs Performance During the Covid-19 Era

Faisol^{1*}, Puji Astuti², Sigit Puji Winarko³

^{1,2,3}Universitas Nisantara PGRI Kediri, East Java, Indonesia

E-mail: ¹faisol_hambali@yahoo.co.id, ²pujiastuti208@gmail.com, ³sigitpuji@unpkediri.ac.id

¹Corresponding Author

JEL Classification:

O2
O34
M21

Received: 16 January 2021

Revised: 08 May 2021

Accepted: 30 May 2021

Abstract

This study examines technology in mediating human capital, customer capital, and organizational capital on SMEs' performance during Covid-19. To test the hypothesis, the PLS-SEM method was applied. Data collection was conducted by sharing questionnaires to 150 owners of small industrial clusters in East Java, Indonesia. The empirical results show that human capital and technology usage directly affect significantly on SMEs' performance. Furthermore, technology usage has a significant influence in mediating human capital on firms' performance. We provide implications for using technology for practice and using a socio-technical approach by SMEs to face challenges related to their work organization in response to COVID-19 while maintaining their activities. We hope that our reflection will be a source of thought for scholars and practitioners to explore further using technology for SMEs to secure business continuity during COVID-19.

Keywords:

technology usage, covid 19 Era, SMEs performance

How to Cite:

Faisol, Astuti, P., & Winarko, S. P. (2021). The Role of Technology Usage in Mediating Intellectual Capital on SMEs Performance During the Covid-19 Era. *Etikonomi*, 20(2), 411 – 426. <https://doi.org/10.15408/etk.v20i2.20172>.

Introduction

In the case of COVID-19, academics and practitioners discussed a new threat, namely the shock of the global society. If someone compares the current crisis to the 2008 crisis, they will see that the problem is related to challenges related to the supply of capital and the chain of supply and, in particular, disruptions to upstream and downstream flows from that. This is evident in China, where factories are shutting down product supply is reduced, especially auto parts and clothing components. At the same time, worldwide lockdowns and the closure of industries such as travel, hospitality, and retail allowed significant worldwide business closings and further disruptions, including an increase significantly in unemployment, to occur in the months ahead.

Meanwhile, governments worldwide, including Indonesia, are issuing policies and implementing action plans including restrictions (i.e., lockdowns of countries, temporary closure of physical business operations) to prevent the spread of the Covid-19 epidemic. These restrictions impact sustainable business operations, including reducing business activities, human resource issues related to staff disruptions, supply chain, and other activities. These restrictions have a more severe impact on small and medium enterprises (SMEs) than on large and global companies (Saturwa et al., 2021; Beglaryan & Shakhmuradyan, 2020; Sahoo & Ashwani, 2020). Due to SMEs' lack of resources, external crises such as the COVID-19 outbreak threaten the SME market. They are hit with great force and worsen the situation (Eggers, 2020). SMEs face various problems such as declining demand, supply chain disruptions, cancellation of export orders, shortage of raw materials, and transportation disruptions, among others (Shafi et al., 2020).

SMEs are particularly vulnerable because they tend to have lower reserve capital, fewer assets, and lower productivity levels than large firms (OECD, 2020). In addition, small organizations and their leaders face challenges in crisis times (Shane, 2011). Passingly, they explore new opportunities because of their size and flexibility (Davidsson, 2015) and develop emerging strategies for the sustainability of business operations. In the UK, SME businesses account for 99.3% of all private sector business, 47.8 percent of private-sector employment, and 33.2 percent of private sector turnover. Thus, SMEs have implications for the broader economy. So far, limited research has focused on SMEs' experience and how organizational actors interact during the crisis (Cucculelli & Peruzzi, 2020; Doern et al., 2019; Mayr et al., 2017; Ogawa & Tanaka, 2013). More specifically, previous research has neglected identifying appropriate actions and strategies taken by leaders in times of crisis and the effectiveness of these strategies based on the company's capabilities (Bundy et al., 2016; Kunc & Bandahari, 2011), especially in terms of SME context (Appelbaum et al., 2012; Randall, 2018).

Some researchers agree that intellectual capital components such as organizational capital, social capital, and human capital can add value to a company's goals (Khaliq et al., 2013b; Absah et al., 2018; Nhon et al., 2018). Human capital, for example, with a level of education, experience, knowledge, social skills, innovation, and attitude in carrying out its work, will create value to achieve goals. As a result, the creation of added value

by human capital in the performance of their duties and work will provide a company with a sustainable income in the future (Nhon et al., 2018; Absah et al., 2018).

A slew of intellectual capital studies has looked into the direct effects model on business performance within the context of SMEs (McDowell et al., 2018; Williams et al., 2019; Bakhru, 2019). These studies emphasized the evaluation of the intellectual capital parameters of a business school. They considered that intellectual capital parameters can be used by academic administrators and also as a means for compensation of a business school teacher. It finds that the intellectual capital will improve the quality of teaching and help the business school achieve a higher ranking and repute (Bakhru, 2019). The current studies have highlighted the inconsistency of previous research in which an indirect effects model, particularly the use of technology as a significant mediating variable in enhancing the sustainability of SMEs, was overlooked (Jämsä et al., 2011; Kim & Orazem, 2017; Zhong et al., 2020; Adam, 2021). There was also an inconsistency between intellectual capital and SMEs' performance (Absah et al., 2018; Maharani & Fuad, 2020; Ahmed et al., 2020; Mubarik et al., 2020). As a result, through technology, the intellectual capital component indirectly influences SMEs' sustainability. Limited prior empirical research has emphasized the significance of addressing the mediating effect of technology use on the relationship between intellectual capital components and SME performance.

To take on the consequences of extreme events and due to COVID-19, SMEs can use, among other things, technology usage. These include, for example, mobile and internet technology with next-generation telecommunications networks (e.g., 5G), big data analytics, artificial intelligence (AI) using deep learning, and blockchain technology. Technology usage digitizes and crosslinks the value creation process. Firms that use the technology are more important than what they use it for—investment and commitment to the Internet influence successful implementation. Moreover, firms with an existing export sales capability fare better using VECs (virtual export channels). There is evidence in the literature that appropriate strategic adoption of technology can lead to increased competitiveness, productivity, and performance (Bruque & Moyano, 2007; Chan et al., 2018; Kleis et al., 2012). At the same time, companies must have the appropriate capabilities, culture, and talent within the organization to experiment and conceptualize how technology usage (TU) will affect current and future business processes and models (Kane et al., 2015). The internet can provide good external enterprise development conditions, mainly displays two relevant mechanisms (enterprise characteristics and external environment) (Reuber & Fischer, 2011; Terziu et al., 2020), and they can be grouped into six channels (enterprise innovation, enterprise business model, enterprise performance, enterprise productivity, enterprise import and export trade, and enterprise location selection) (Zhong et al., 2020).

This study aims to provide valuable recommendations to business people in designing and managing intellectual capital components and technology usage in the business sector because the use of technology is a newly discovered issue (Terziu et al., 2020; Zhong et

al., 2020; Adam, 2021). The use of technology may enhance the competence of social capital in company productivity, such as in the fields of marketing, production, and service (Kim & Orazem, 2017; Terziu et al., 2020). Additionally, technology can decrease the cost of communication and information processing, changes business processes and work practices, and create new products and values through e-commerce (Jämsä et al., 2011; Jovanovic et al., 2020).

According to the findings of the current studies, other specific aspects of the sustainability of SMEs must consider the use of technology to improve business performance (Zhong et al., 2020; Jovanovic et al., 2020). Firms that adopted technology earlier saw faster productivity gains than similar firms that did not (Fernandes et al., 2019; Ghasemaghaei & Calic, 2019). Companies with higher Internet connection speeds via broadband increase company productivity compared to companies without connections or companies that only have access through dial-up services (Kim & Orazem, 2017). This condition will make it easier for SMEs to improve their performance, such as in the roles of their resources in production, marketing, and sales. Although the relationship between intellectual capital, technology use, and SME performance has been extensively researched, the effects and properties of using technology as a mediating variable in the context of this study have not been adequately discussed (Jovanovic et al., 2020; Zhong et al., 2020). Many researchers argue that a variety of factors could cause this situation. First, many previous studies have extensively described the direct effect of intellectual capital on firm performance (Zuhir, Surin, & Rahim, 2019; Maharani & Fuad, 2020; Ahmed et al., 2020). Second, several previous studies used a structured review approach to the existing literature on the relationship between internet use and corporate development (Zhong et al., 2020). Third, Using the OLS approach, This research paradigm has typically used simple descriptive and association methods to achieve short-term goals and solve immediate problems (Bartelsman et al., 2018; Fernandes et al., 2019). As a result, the study's findings are only recommendations, and they may not be of much assistance to practitioners and academics in understanding the complexities of using technology to sustain SMEs in a globalized and volatile economy.

However, the role of technology as a moderating variable has not been studied. As a result, it is critical to investigate the nature of this relationship. This circumstance motivates the researchers to broaden the literature by investigating the role of technology as a moderator in the relationship between intellectual capital and business performance. Therefore, the objectives of this research are 1) to examine the impact of components of intellectual capital on the performance of SMEs; 2) whether the relationship between components of intellectual capital and the performance of SMEs is mediated by technology usage; 3) whether there is a significant relationship between technology usage and the performance of the firms in terms of growth in sales, satisfaction among customers, financial perspective and internal business process.

This study confirms the role of technology usage, which the company can apply to improve the performance of SMEs. This research's first contribution is to raise awareness among SMEs about the components of intellectual capital and the benefits of technology

use. Second, this study adds to the existing literature's theory by demonstrating that the relationship between intellectual capital and the sustainability of SMEs can be developed by reflecting on technology usage.

Method

This research is a study that examines the role of technology as a mediator of the variables of human capital, customer capital, and organizational capital in improving company performance. This study was conducted in small and medium industries (SMEs) in East Java, Indonesia. Data collection was carried out by distributing questionnaires to 150 owners of small industrial clusters in East Java, Indonesia, and 99 surveys were collected. The questionnaires consist of 20 indicators of the Likert scale with responses (strongly disagree) to 5 (strongly agree). Data collection was carried out by distributing questionnaires to clusters in East Java which consisted of two parts, namely questions related to the characteristics of respondents and the main variables. These characteristics can be seen in Table 1.

Table 1. The demographic profiles of respondents

Location	Cluster	N=99	Category	Frequency	%
Madura	Handicraft of Batik	= 16	Gender		
Mojokerto	Shoes of leather	= 16	Male	= 65	65.66
Sidoarjo	Bags of leather	= 20	Female	= 34	34.34
Pasuruan	Furniture	= 15	Periode of SMEs		
Malang	Processing Food	= 17	1981-1990	= 12	12.12
	Processing Ceramic	= 15	1991-2000	= 28	28.28
			2001-2010	= 35	35.35
			2011-2020	= 24	24.24
			Number of employees		
			1-4 (micro enterprises)	= 39	39.39
			5-19 (small enterprises)	= 45	45.45
			20-99 (medium enterprises)	= 15	15.15

Table 1 displays that the firms are distributed in shoes, furniture, batik handicraft, leather bags, food processing, and ceramic clusters located in selected regions of Madura, Mojokerto, Sidoarjo Pasuruan, and Malang cities. The data showed that male entrepreneurs (65.66%) dominate the business than female entrepreneurs (34.34% for females). Around 84.85% of the entrepreneurs operate micro and small enterprises (MSEs), whereas 15.15% manage medium enterprises. By using 5-Likert's scale, the respondents can choose 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree for replying the questions presented in Table 2.

This research tests the mediating role of technology usage on the relationship between intellectual capital and SMEs performance, including human capital, customer capital, and organizational capital together, and the relationship between intellectual capital on SMEs performance. This research consists of three exogenous constructs (human capital (HC), customer capital (CC), organizational capital (OC), and two endogenous constructs (technology usage (TU), SM Enterprise Performance (EP)). All these constructs were measured based on observed variables.

Table 2. Items of Indicators

<i>Human Capital(HC)</i>	<i>Technology Usage (TU)</i>
HC01 – items related to skills	TU01 – items related to the new model for selling
HC02 – items related to intellectual ability	TU02 – items related to the development of technology
HC03 – items related to knowledge and expertise	TU03 – items related to internet usage in working
HC04 – items related to attitude	TU04 – items related to technology knowledge
<i>Customer Capital (CC)</i>	<i>SMEs Enterprises Performance (EP)</i>
CC01 – items related to loyalty	EP01 – items related to financial perspectives
CC02 – items related to customer satisfaction	EP02 – items related to internal business process
CC03 – items related to customers' complaints	EP03 – items related to growth in sales
CC04 – items related to networking	EP04 – items related to satisfaction among customers
<i>Organizational Capital</i>	
OC01 – items related to infrastructure & system	
OC02 – items related to policies and procedures	
OC03 – items related to exchange & relationship	
OC04 – items related to culture	

Partial Least Square structural equation modeling (PLS-SEM) was applied in this research because it is widely applied by researchers in management, economics, and other fields to test the causal association and effect between unobservable variables (Mourad & Valette-Florence, 2016; Faisol, 2017). For many reasons, PLS-SEM has been adopted in many research areas, such as management information systems, accounting, and management in operation. Firstly, it is suitable for studies with small sample sizes, multiple dependent variables, and a large set of independent variables. Second, it is suitable if the research is at the initial stage of theoretical development (Ribau et al., 2017). Third, PLS-SEM provides researchers to examine the measurement model concurrently with the structural model and presents scholars to apply more complicated research models with both mediating associations (Lee et al., 2011). In this paper, we used SMART PLS 3.0 software. This research performs the bootstrapping of the PLS-SEM method to examine the significance of relationships and the mediating effect of technology usage on the relationship between intellectual capital and SMEs performance.

Result and Discussion

The evaluation of the measurement model applied in this study are the validity test and reliability test. Validity tests include convergent validity that shows the values of loading factor (λ) and average variance extracted (AVE) and discriminant validity that

shows the value of Fornell Larcker criterion and cross-loading. Then, the reliability test shows composite reliability (CR) and Cronbach's alpha (α). Table 3 presents the result of the measurement model.

Table 3. Result of the measurement model

Constructs	Convergent Validity		Reliability		
	λ	significance	AVE	β	CR
<i>Human Capital(HC)</i>					
HC01	0.777	***	0.630	0.706	0.836
HC02	deleted				
HC03	0.836	***			
HC04	0.770	***			
<i>Customer Capital (CC)</i>					
CC01	0.932	***	0.822	0.892	0.933
CC02	0.906	***			
CC03	deleted				
CC04	0.881	***			
<i>Organizational Capital (OC)</i>					
OC01	0.803	***	0.679	0.766	0.864
OC02	.0851	***			
OC03	0.818	***			
OC04	deleted				
<i>Technology Usage (TU)</i>					
TU01	deleted		0.801	0.753	0.889
TU02	0.916	***			
TU03	0.874	***			
TY04	deleted				
<i>SMEs Performance (EP)</i>					
EP01	0.905	***	0.695	0.791	0.872
EP02	0.820	***			
EP03	0.770	***			
EP04	deleted				

Source: processed, 2021

Construct convergent validity was assessed using factor loading and AVE values (Azlis-sani & Dawal, 2013). All factor loadings for all items in each construct (HC, CC, OC, TU, and EP) were higher than 0.5 (Anderson & Gerbing, 1991) and statistically significantly confirmed construct convergent validity using factor loadings criterion achieved. Average variance extracted (AVE) values were found to be higher than 0.5. This value is under suggested by (Chin, 2010).

Construct discriminant validity was assessed through Fornell Larcker criterion and cross-loading. Fornell Larcker is the correlation value between variables with the variable itself and variables with other variables. The assessment is that this value cannot be smaller than the other values (or we can say that the correlation value with the variable itself must be greater than the correlation value of other variables). Cross loading is the correlation value between indicators and variables. Indicators that should affect the variable, the correlation value must be greater than the correlation value with other variables. Table 4 presents the values of the discriminant validity summary.

Table 4. Construct discriminant validity assessment summary

	CC	HC	OC	EP	TU
CC	0.907				
HC	-0.004	0.794			
OC	0.209	0.376	0.824		
EP	0.142	0.511	0.257	0.834	
TU	0.040	0.565	0.383	0.461	0.895

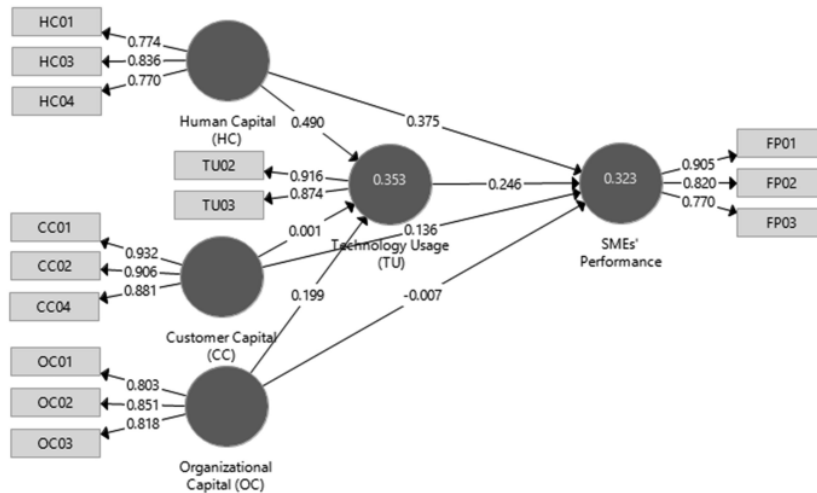
Source: processed, 2021

Table 4 presents discriminant validity among constructs. The correlation value with the variable itself was found more significant than the correlation value of other variables. This indicates adequate discriminant validity. Therefore, the measurement model demonstrated adequate convergent validity and discriminant validity. The construct measures in the measurement model are confirmed as reliable and valid, and the next step is to assess the structural model results. For assessing the structural model, criteria checked are R-Square, T-statistic value, Path coefficient (β value), Predictive Relevance, and Model Fit. In the PLS model, the squared correlation values of 0.68, 0.32, and 0.19 are considered substantial, moderate, and weak, respectively (Chin, 2010). The R^2 value of each latent endogenous construct shown in figure 2 is more significant than 0.3 and is considered substantial.

Table 5 shows the path coefficient value along with the T-statistics (bootstrap) values. The relationship between human capital and SMEs performance is significant with $\beta = 0.375$ and p-value = 3.903 (Table value is 1.96 at 5% level of significance) has a direct positive significant influence on SMEs performance. This indicates that a 100 point change in human capital will bring about 37.5 point change in SMEs' performance effects relationship between technology usage and SMEs performance is significant with $\beta = 0.014$ and p-value = 0.024 effects on SMEs' performance. This indicates that a 100 point change in technology usage will bring out 14 points change the sustainability of SMEs' performance.

The quality of the PLS path model is evaluated by calculating Q^2 statistics. The model can predict by repeating the observed values through blindfolding procedures (Tenenhaus et al. 2005). In the structural equation model, Q^2 greater than zero means the model has predictive relevance, and less than zero means the model lacks predictive relevance (Chin, 2010). As a relative measure of predictive relevance, values of 0.02, 0.15, and 0.35 indicate that an exogenous has a small, medium, or enormous predictive relevance for a selected endogenous construct. By using blindfolding procedures, two types of Q^2 statistics can be estimated – cross-validated communality and Cross validated redundancy. In the path model, the predictive relevance of Technology usage has a value of 0.245, which indicates that the construct of human capital, customer capital, and organizational capital have considerable predictive relevance on technology usage. Then, the predictive relevance of SMEs performance (EP) has a value of 0.197, which indicates that all of the exogenous (HC, CC, OC, TU) has medium predictive relevance on SMEs performance.

Figure 2. The measurement model



Model fit or Goodness of Fit (GOF) is used as an index for the model's overall fit to validate the PLS path model globally (Tenenhaus *et al.*, 2005). GOF is the geometric mean of the average commonality and the average R^2 . For the global validation of the PLS path model, the cut-off values lie between 0 and 1, resulting in GOF small = 0.1, GOF medium = 0.25, GOF large = 0.36 (Akter *et al.* 2011). In this model, the global fit index is 0.684, which indicates that empirical data fits the model very well.

By removing some irrelevant indicators, the constructs satisfy the values of α , CR, AVE, and λ . They recommended that the scores of α , AVE, and CR be more significant than 0.6, whereas the score for λ should be greater than 0.5. The measurement of indicators is depicted in Figure 2. Figure 2 displays that technology usage mediates the performance of SMEs' human capital, customer capital, and organizational capital.

This study hypothesized that human capital (HC), customer capital (CC), and organizational capital (OC) have positive and significant influence on SMEs' performance (EP). Through technology usage, human capital, customer capital, and organizational capital have a positive and significant effect on SMEs' performance, and technology usage has a positive and significant effect on SMEs' performance. Table 5 shows the finding of this research.

Finding revealed that human capital directly has a positive and significant influence on SMEs' performance ($\beta = 0.375$; p-value = 0.000), customer capital does not significantly influence on SMEs' performance ($\beta = 0.136$; p-value = 0.167), organizational capital directly does not significantly influence on SMEs' performance ($\beta = -0.007$; p-value = 0.945), technology usage has a positive and significant influence on SMEs' performance ($\beta = 0.246$; p-value = 0.025). These findings confirm that hypothesis H_{1a} , H_4 are supported by the collected data, while hypothesis H_{2a} , H_{3a} are not supported by the collected data.

Table 5. Hypothesis testing

Category	β	Mean	SD	T statistics	P-Values	H-Results
HC = > EP	0.375	0.385	0.096	3.903	0.000	Accepted
CC = > EP	0.136	0.154	0.098	1.385	0.167	Rejected
OC = > EP	-0.007	-0.005	0.103	0.068	0.945	Rejected
TU = > EP	0.246	0.241	0.099	2.479	0.014	Accepted
HC = > TU = > EP	0.120	0.121	0.053	2.265	0.024	Accepted
CC = > TU = > EP	0.000	-0.003	0.031	0.007	0.994	Rejected
OC = > TU = > EP	0.049	0.052	0.035	1.409	0.164	Rejected

The study also hypothesized that technology usage, human capital, customer capital, and organizational capital influence SMEs' performance. Findings from this study informed that human capital mediated by technology usage has a positive and significant influence on SMEs' performance ($\beta = 0.120$, p-value 0.024). However, customer capital dan organizational through technology usage does not significantly influence on SMEs' performance ($\beta = 0.000$; p-value 0.994); ($\beta = 0.049$; p-value = 0.164). Hence, hypothesis H_{1b} is accepted. As such, hypotheses H_{2b} and H_{3b} are not supported.

The primary purpose of this study is to apply the component based on the structural equation modeling technique to make sure the technology used as a mediator for intellectual capability included human capital, customer capital, and organizational capital to build the sustainability of SMEs' performance. According to Intellectual Capital Theory (Becker, 1962; Khalique & Shaari, 2013a), the primary function of intellectual capital is to create value-added products and services through proactive management of intangible resources like technology usage, which positively influence organizational performance (Tronconi & Marzetti, 2011; Khalique et al., 2013c; Hashim et al., 2015; Xu & Li, 2019).

The analysis results show that human capital directly has a significant positive effect on the sustainability of SME performance. Statistically, this result is evidenced by the p-value = 0.000 and $\beta = 0.375$. This result means that if there is an increase in human capital, it will encourage the sustainability of SMEs. This illustrates that in the Covid 19 era, human capital owned by SMEs was still able to increase their capacity, for example, related to skills, knowledge, expertise, and intellectual agility. This increase has resulted in increased business process activities and has stimulated the performance of SMEs to be better. This finding supports that of investigated human capital and small and medium enterprises (Mubarik et al., 2020; Ahmed et al., 2020).

These results indicate that when SME actors increase their capacity in the fields of skills, knowledge, expertise, and attitude in business, it will be easier to utilize knowledge on the use of technology in their business, thereby creating and producing added value in production, which means that the performance of SMEs will be positive. The results also inform that technology can mediate the relationship between human capital and SMEs' performance, which statistically equates to a p-value = 0.024 and b = 0.120. This

result is in line with the intellectual capital theory, which states that human capital is one of the main components of intellectual capital is to create value-added products and services through proactive management of intangible resources which positively influence organizational performance. This finding also supports the previous studies such as Farace & Mazzotta (2015), Suroso et al. (2017), and Muda & Rahman (2016) stated the contribution of human resources to business performance, followed by the role of human capital in various stages of the SME life cycle.

Furthermore, customer capital and organizational capital are components of intellectual capital. It is generally believed that customer capital consists of brand value, a strong network with customers, customer loyalty, and customer satisfaction. It has a positive relationship to organizational performance (Tai-ning et al., 2011; Khaliq et al., 2013c). Then, organizational capital is firms' intangible resources to achieve sustained competitive advantage (Tronconi & Marzetti, 2011). In general, it can also be believed that organizational capital is a collective, firm-specific and idiosyncratic factor, is one of the main determinants of firm performance. However, the results are not under what is explained in theory, that the findings of this study also show that directly customer capital and organizational capital do not affect the sustainability of SMEs. These findings illustrate that the field of customer capital and organizational capital owned by MSMEs has not been able to utilize their capacity to encourage the performance of SMEs. These results describe in Covid 19 era, SMEs operated in small industry clusters providing empirical results demonstrating that customer capital and organizational capital directly have no significant effect on firm performance. The data also reveal that technology usage cannot mediate the relationship between customer capital, organizational capital, and firm performance. By taking various clusters in East Java, this research provides different points of view to understand the dynamics of the SME cluster. Understanding these dynamics makes it known that customer and organizational capital do not directly affect SMEs' performance. It is contrarily with a standard view on this effect, SMEs operating in clusters probably cannot utilize something related to customer capital and organizational capital like loyalty and relationship between firms. Consequently, this condition does not stimulate firm performance. This finding indicates the tendency of the covid 19 Era can be one of the possibilities that hamper to utilize the relationship, networking, taking the policy, procedure on firm performance (Liu et al., 2020; Sheth, 2020; Shafi et al., 2020).

Conclusion

This research aimed to convince the role of technology as a mediating aspect for intellectual capital such as; human capital, customer capital, and organizational capital on the sustainability of small and medium enterprises operating in small industrial clusters in the Covid 19 era. In particular, attention is given to examining the role of using technology in mediating this interaction. The results reveal that human capital and technology usage directly affect SMEs' performance. Furthermore, the results showed a significant relationship between human capital and firms' performance mediated by technology. According to the literature review, the intellectual capital involved in human

capital, customer capital, and organizations significantly influences firm performance. Further, many literature reviews showed that technology is a driver for intellectual capital to sustainable SMEs. Also, the choice of technology could be related to SME's existing equipment, and essential digital competencies can be used in the business activities like communication channels with customers. They recommended that the business model that can be applied to SMEs is a business that is supported by digital transformation. Digital transformation exists when digital skills emerge, and digital tools are adopted.

This study indicates that supporting the development of human capital orientation is the main factor influencing creativity, organizational innovation ability, and outstanding company performance where SMEs companies accelerate recovery, and executives can apply information to benefit the development of human resources in companies. The company encourages employees to think of joint initiatives and create something new that is ready to face organizational changes related to innovation and new information technology to lead the organization to survive and gain a competitive advantage.

The result of this research should be very beneficial to both academics and practitioners. Academics in the policy and management areas would be very interested in how technology usage mediated the relationship between intangible assets toward the performance of firms. This study has shown a significant positive relationship between the intellectual component and firms' performance mediated by the use of technology. Future research may show that this link can be generalized to other regions and virtually all industries. This study provides implications for using technology for practice and using a socio-technical approach by SMEs to face challenges related to their work organization in response to COVID-19 to maintain their activities. We hope that this reflection will be a source of thought for scholars and practitioners to explore further using technology for SMEs to secure business continuity during COVID-19.

Acknowledgment

This research was supported in the research stimulus program in 2021 by the Institute for Research and Community Service, Universitas Nusantara PGRI Kediri. We would like to thank Dr. Rr. Forijati, MM, Chairperson of LPPM UN PGRI Kediri, their contribution and participation in this research.

References

- Absah, Y., Muchtar, C. Y., & Qamariah, I. (2018). The Effect of Intellectual Capital on Business Performance in Micro-, Small-, and Medium Enterprise (MSME) in Medan City. *KnE Social Sciences*, 3(10), 177–186. <https://doi.org/10.18502/kss.v3i10.3371>.
- Adam, N. A. (2021). Innovation Practices for The Survival of Small and Medium Enterprises (SMEs) in The COVID-19 Times: The Role of External Support. *Journal of Innovation and Entrepreneurship*, 10, 15. <https://doi.org/10.1186/s13731-021-00156-6>.

- Ahmed, S. S., Guozhu, J., Mubarik, S., Khan, M., & Khan, E. (2020). Intellectual Capital and Business Performance: The Role of Dimensions of Absorptive Capacity. *Journal of Intellectual Capital*, 21(1), 23–39. <https://doi.org/10.1108/JIC-11-2018-0199>.
- Anderson, J. C., & Gerbing, D. W. (1991). Predicting the Performance of Measures in a Confirmatory Factor Analysis With a Pretest Assessment of Their Substantive Validities. *Journal of Applied Psychology*, 76(5), 732–740.
- Appelbaum, S. H., Keller, S., & Alvarez, H. (2012). Organizational Crisis: Lessons from Lehman Brothers. *International Journal of Commerce and Management*, 22(4), 286–305. <https://doi.org/10.1108/10569211211284494>.
- Azlis-sani, J., & Dawal, S. (2013). Validity and Reliability Testing on Train Driver Performance Model Using A PLS Approach. *Advanced Engineering Forum*, 10, 361–366. <https://doi.org/10.4028/www.scientific.net/AEF.10.361>.
- Bakhr, K. M. (2019). Importance of Intellectual Capital in The Ranking of Business School of India. *International Journal of Business and Globalisation*, 22(2), 258–278.
- Bartelsman, E. J., Falk, M., Hagsten, E., & Polder, M. (2018). Productivity, Technological Innovations, and Broadband Connectivity : Firm-level Evidence for Ten European Countries. *Eurasian Business Review*, 9, 25-48. <https://doi.org/10.1007/s40821-018-0113-0>.
- Becker, G. S. (1962). Investment in Human Capital: A Theoretical Analysis. *Journal of Political Economy*, 70(5), 9–49.
- Beglaryan, M., & Shakhmuradyan, G. (2020). The Impact of COVID-19 on Small and Medium-sized Enterprises in Armenia: Evidence from a Labor Force Survey. *Small Business International Review*, 4(2), 1-11. <https://doi.org/10.26784/sbir.v4i2.298>.
- Bruque, S., & Moyano. (2007). Organizational Determinants of Information Technology Adoption and Implementation in SMEs : The Case of Family and Cooperative firms. *Technovation*, 27, 241–253. <https://doi.org/10.1016/j.technovation.2006.12.003>.
- Bundy, J., Pfarrer, M. D., Short, C. E., & Coombs, W. T. (2016). Crises and Crisis Management : Integration, Interpretation, and Research Development. *Journal of Management*, 43(6), 1661-1692. <https://doi.org/10.1177/0149206316680030>.
- Chan, C. M. L., Yeow, A., & Pan, G. (2018). Agility in Responding to Disruptive Digital Innovation: A Case Study of an SME. *Information Systems Journal*, 29(2), 436-455.
- Chin, W. W. (2010). *How to Write Up and Report PLS Analysis*. Springer. Berlin Heidelberg.
- Cucculelli, M., & Peruzzi, V. (2020). Innovation Over The Industry Life-cycle. Does Ownership Matter? *Research Policy*, 49(1), 1-20.
- Davidsson, P. (2015). Entrepreneurial Opportunities and The Entrepreneurship Nexus: A Re-conceptualization. *Journal of Business Venturing*, 30(5), 674–695.
- Doern, R., Williams, N., & Vorley, T. (2019). Special Issue on Entrepreneurship and Crises: Business as usual? An Introduction and Review of The Literature. *Entrepreneurship and Regional Development*, 31(6), 400–412.

- Eggers, F. (2020). Masters of Disasters? Challenges and Opportunities for SMEs in Times of Crisis. *Journal of Business Research*, 116(5), 199–208.
- Faisol, F. (2017). Islamic Bank Financing and Its Impact on Small Medium Enterprise's Performance. *Etikonomi*, 16(1), 13–24. <https://doi.org/10.15408/etk.v16i1.4404>.
- Farace, S., & Mazzotta, F. (2015). The Effect of Human Capital and Networks on Knowledge and Innovation in SMEs. *Journal of Innovation Economics*, 16(1), 39–71. <https://doi.org/10.3917/jie.016.0039>.
- Fernandes, A. M., Mattoo, A., Nguyen, H., & Schiffbauer, M. (2019). The Internet and Chinese Exports in The Pre-Ali baba Era. *Journal of Development Economics*, 138(11), 57–76. <https://doi.org/10.1016/j.jdeveco.2018.11.003>.
- Ghasemaghaei, M., & Calic, G. (2019). Does Big Data Enhance Strong Innovation Competency? The Mediating Role of Data-driven Insights. *Journal of Business Research*, 104(7), 69–84. <https://doi.org/10.1016/j.jbusres.2019.07.006>.
- Hashim, M. J., Osman, I., & Alhabshi, S. M. (2015). Effect of Intellectual Capital on Organizational Performance. *Procedia - Social and Behavioral Sciences*, 211(9), 207–214. <https://doi.org/10.1016/j.sbspro.2015.11.085>.
- Jämsä, P., Tähtinen, J., Ryan, A., & Pallari, M. (2011). Sustainable SMEs Network Utilization: The Case of Food Enterprises. *Journal of Small Business and Enterprise Development*, 18(1), 141–156. <https://doi.org/10.1108/14626001111106479>.
- Jovanović, J. Š., Vujadinovic, R., Mitreva, E., Fragassa, C., & Vujovic, A. (2020). The Relationship Between E-commerce and Firm Performance: The Mediating Role of Internet Sales Channels. *Sustainability*, 12(17), 1–17. <https://doi.org/10.3390/su12176993>.
- Kane, G. C., Palmer, D., & Philips, A. N. (2015). Strategy, not Technology, Drives Digital Transformation: Becoming a Digitally Mature Enterprise. *MIT Sloan Management Review*, 159(9), 1620–1621. <https://doi.org/10.1176/appi.ajp.159.9.1620>.
- Khalique, M., Isa, A. H., & Abdul, J. (2013a). Predicting the Impact of Intellectual Capital Management on the Performance of SMEs in Electronics Industry in Kuching, Sarawak. *IUP Journal of Knowledge Management*, 11(4), 53-61.
- Khalique, M., Shaari, J. A. N., & Isa, A. H. M. (2013). The Road to The Development of Intellectual Capital Theory. *International Journal of Learning and Intellectual Capital*, 10(2), 122–136. <https://doi.org/10.1504/IJLIC.2013.052953>.
- Khalique, M., Shaari, J. A. N. bin, Isa, A. H. bin M., & Samad, N. B. (2013). Impact of Intellectual Capital on the Organizational Performance of Islamic Banking Sector in Malaysia. *Asian Journal of Finance & Accounting*, 5(2), 75-83.
- Kim, Y., & Orazem, P. F. (2017). Broadband Internet and New Firm Location Decisions in Rural Areas. *American Journal of Agricultural Economics*, 99(1), 1-18.
- Kleis, L., Chwelos, P., Ramirez, R. V., & Cockburn, I. (2012). Information Technology and Intangible Output: The Impact of IT Investment on Innovation Productivity. *Information Systems Research*, 23(1), 42–59. <https://doi.org/10.1287/isre.1100.0338>.

- Kunc, M., & Bandahari, R. (2011). Strategic Development Processes During The Economic and Financial Crisis. *Management Decision*, 49(8), 1343–1353.
- Lee, L., Petter, S., Fayard, D., & Robinson, S. (2011). On The Use of Partial Least Squares Path Modeling in Accounting Research. *International Journal of Accounting Information Systems*, 12(4), 305–328. <https://doi.org/10.1016/j.accinf.2011.05.002>.
- Liu, F., Meng, L., Zhao, Y., & Duan, S. (2020). The Influence of The Corporate Social Responsibility Disclosures on Consumer Brand Attitudes under The Impact of COVID-19. *Frontiers of Business Research in China*, 14(1), 1-22. <https://doi.org/10.1186/s11782-020-00096-0>.
- Maharani, T., & Fuad, K. (2020). The Effect of Human Capital, Structural Capital, Customer Capital, Managerial Ownership, and Leverage Toward The Profitability of The Company. *Journal of Advanced Multidisciplinary Research*, 1(1), 46-62.
- Mayr, S., Mitter, C., & Aichmayr, A. (2017). Corporate Crisis and Sustainable Reorganization: Evidence from Bankrupt Austrian SMEs. *Journal of Small Business Management*, 55(1), 108–127. <https://doi.org/10.1111/jsbm.12248>.
- McDowell, W. C., Peake, W. O., Coder, L. A., & Harris, M. L. (2018). Building Small Firm Performance Through Intellectual Capital Development: Exploring Innovation as The “Black Box.” *Journal of Business Research*, 88(1), 321–327.
- Mourad, S., & Valette-Florence, P. (2016). Improving Prediction with POS and PLS Consistent Estimations: An Illustration. *Journal of Business Research*, 69(10), 4675–4684. <https://doi.org/10.1016/j.jbusres.2016.03.057>.
- Mubarik, M. S., Devadason, E. S., & Govindaraju, C. (2020). Human Capital and Export Performance of Small and Medium Enterprises in Pakistan. *International Journal of Social Economics*, 47(5), 643–662. <https://doi.org/10.1108/IJSE-03-2019-0198>.
- Muda, S., & Rahman, M. R. C. A. (2016). Human Capital in SMEs Life Cycle Perspective. *Procedia Economics and Finance*, 35, 683–689. [https://doi.org/10.1016/s2212-5671\(16\)00084-8](https://doi.org/10.1016/s2212-5671(16)00084-8).
- Nhon, H. T., Thong, B. Q., & Phuong, N. Van. (2018). The Impact of Intellectual Capital Dimensions on Vietnamese Information Communication Technology Firm Performance: A Mediation Analysis of Human and Social Capital. *Academy of Strategic Management Journal*, 17(1), 1–15.
- OECD. (2020). Covid-19: SME Policy Responses. *Oecd 2020*, (March), 1–55. Retrieved from https://oecd.dam-broadcast.com/pm_7379_119_119680-di6h3qgi4x.pdf.
- Ogawa, K., & Tanaka, T. (2013). The Global Financial Crisis and Small- and Medium-sized Enterprises in Japan: How Did They Cope with The Crisis? *Small Business Economics*, 41(2), 401–417. <https://doi.org/10.1007/s11187-012-9434-z>.
- Randall, W. (2018). Leadership, Strategy, and Management: A Qualitative Study of Crisis Survival. (*Unpublished Dissertation*). Capella University.
- Reuber, A. R., & Fischer, E. (2011). International Entrepreneurship in Internet-enabled Markets. *Journal of Business Venturing*, 26(6), 660–679.

- Ribau, C. P., Moreira, A. C., & Raposo, M. (2017). SMEs Innovation Capabilities and Export Performance: an Entrepreneurial Orientation View. *Journal of Business Economics and Management*, 18(5), 920–934.
- Sahoo, P., & Ashwani. (2020). COVID-19 and Indian Economy: Impact on Growth, Manufacturing, Trade and MSME Sector. *Global Business Review*, 21(5), 1159–1183.
- Saturwa, H. N., Suharno, S., & Ahmad, A. A. (2021). The Impact of Covid-19 Pandemic on MSMEs. *Jurnal Ekonomi Dan Bisnis*, 24(1), 65–82.
- Shafi, M., Liu, J., & Ren, W. (2020). Impact of COVID-19 Pandemic on Micro, Small, and Medium-sized Enterprises Operating in Pakistan. *Research in Globalization*, 2, 1-14.
- Shane, S. (2011). The Great Recession's Effect on Entrepreneurship. *Economic Commentary (Federal Reserve Bank of Cleveland)*, 24, 1–4. <https://doi.org/10.26509/frbc-ec-201104>.
- Sheth, J. (2020). Impact of Covid-19 on Consumer Behavior: Will The Old Habits Return or Die? *Journal of Business Research*, 117, 280–283. <https://doi.org/10.1016/j.jbusres.2020.05.059>.
- Suroso, A., Anggraeni, A. I., & Andriyansah. (2017). Optimizing SMEs' Business Performance Through Human Capital Management. *European Research Studies Journal*, 20(4), 588–599. <https://doi.org/10.35808/ersj/913>.
- Tai-ning, Y., Hsiao-chen, C., Shou-yen, L., & Chiao-lun, T. (2011). Knowledge Creation and Intellectual Capital on Securities Investment Services. *African Journal of Business Management*, 5(3), 924–933. <https://doi.org/10.5897/AJBM10.754>.
- Terziu, H., Ass, P., & Hoti, U. (2020). The Role of the Internet in the Development of Marketing and Electronic Services in Business. *European Journal of Economics and Business Studies*, 9(8), 1–12.
- Tronconi, C., & Marzetti, G. V. (2011). Organization Capital and Firm Performance. Empirical Evidence for European Firms. *Economics Letters*, 112(2), 141–143. <https://doi.org/10.1016/j.econlet.2011.04.004>.
- Williams, R. I., Smith, A., Aaron, J. R., Manley, S. C., & McDowell, W. C. (2019). Small Business Strategic Management Practices and Performance: A Configurational Approach. *Economic Research-Ekonomiska Istrazivanja*, 33(1), 2378–2396.
- Xu, J., & Li, J. (2019). The Impact of Intellectual Capital on SMEs' Performance in China: Empirical Evidence from Non-high-tech vs. High-tech SMEs. *Journal of Intellectual Capital*, 20(4), 488–509. <https://doi.org/10.1108/JIC-04-2018-0074>.
- Zhong, S., Qiu, L., & Sun, B. (2020). Internet and Firm Development. *International Journal of Crowd Science*, 4(2), 171–187. <https://doi.org/10.1108/ijcs-11-2019-0032>.
- Zuhir, N. N., Surin, E. F. H., & Rahim, L. (2019). Human Capital, Self-Efficacy and Firm Performance: A Study of Bumiputera SMEs in Malaysia. *International Journal of Financial Research*, 10(6), 218–231. <https://doi.org/10.5430/ijfr.v10n6p218>.

The Role of Technology Usage in Mediating Intellectual Capital on SMEs Performance During the Covid-19 Era

ORIGINALITY REPORT

15%

SIMILARITY INDEX

10%

INTERNET SOURCES

8%

PUBLICATIONS

7%

STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to Anatolia College Student Paper	1%
2	doi.org Internet Source	1%
3	ejournal.umm.ac.id Internet Source	1%
4	Submitted to University of Bedfordshire Student Paper	<1%
5	Shunbin Zhong, Leiju Qiu, Baowen Sun. "Internet and firm development", International Journal of Crowd Science, 2020 Publication	<1%
6	www.theijm.com Internet Source	<1%
7	Submitted to North West University Student Paper	<1%
8	Submitted to University of Hertfordshire Student Paper	<1%

9	Submitted to School of Business and Management ITB Student Paper	<1 %
10	Submitted to University of Northumbria at Newcastle Student Paper	<1 %
11	Submitted to Anglia Ruskin University Student Paper	<1 %
12	santenumerique.umontreal.ca Internet Source	<1 %
13	ejournal.aibpm.org Internet Source	<1 %
14	jhmi.sums.ac.ir Internet Source	<1 %
15	www.sijm.it Internet Source	<1 %
16	Tronconi, C.. "Organization capital and firm performance. Empirical evidence for European firms", Economics Letters, 201108 Publication	<1 %
17	www.scientific.net Internet Source	<1 %
18	Submitted to Nazarbayev University Student Paper	<1 %

19	"Call for Papers", International Small Business Journal: Researching Entrepreneurship, 2020 Publication	<1 %
20	arizona.openrepository.com Internet Source	<1 %
21	www.coursehero.com Internet Source	<1 %
22	Submitted to Asia Pacific University College of Technology and Innovation (UCTI) Student Paper	<1 %
23	www.vdu.lt Internet Source	<1 %
24	Submitted to Asian Institute of Technology Student Paper	<1 %
25	Submitted to Universiti Kebangsaan Malaysia Student Paper	<1 %
26	puntoorginternationaljournal.org Internet Source	<1 %
27	www.carnegieng.com.au Internet Source	<1 %
28	www.jem.journals.umz.ac.ir Internet Source	<1 %
29	Jiaping Zhang, Mingwang Cheng, Ning Yu. "Internet Use and Lower Life Satisfaction: The	<1 %

Mediating Effect of Environmental Quality Perception", Ecological Economics, 2020

Publication

30

Submitted to University of Westminster

Student Paper

<1 %

31

bura.brunel.ac.uk

Internet Source

<1 %

32

educationaltechnologyjournal.springeropen.com

Internet Source

<1 %

33

ir.unimas.my

Internet Source

<1 %

34

www.ijsrp.org

Internet Source

<1 %

35

I Gusti Bagus Rai Utama, Ni Made Diana Erfiani, Dermawan Wuruwu, Putu Chris Susanto et al. "Innovation of Herbal Tourism Village Concepts as Alternative for Tourism in the Post-Pandemic New Normal Era", Research Square Platform LLC, 2021

Publication

<1 %

36

Ludvík Eger, Lenka Komárková, Dana Egerová, Michal Mičík. "The effect of COVID-19 on consumer shopping behaviour: Generational cohort perspective", Journal of Retailing and Consumer Services, 2021

Publication

<1 %

37	derby.openrepository.com Internet Source	<1 %
38	fbr.springeropen.com Internet Source	<1 %
39	jdiis.de Internet Source	<1 %
40	jemi.edu.pl Internet Source	<1 %
41	jurnal.widyagama.ac.id Internet Source	<1 %
42	m.growingscience.com Internet Source	<1 %
43	res.mdpi.com Internet Source	<1 %
44	revistas.unisinos.br Internet Source	<1 %
45	tind-customer-agecon.s3.amazonaws.com Internet Source	<1 %
46	www.internationaljournalsrg.org Internet Source	<1 %
47	www.jmir.org Internet Source	<1 %
48	Farhad Shahveisi, Farshid Khairollahi, Mohammad Alipour. "Does ownership	<1 %

structure matter for corporate intellectual capital performance? An empirical test in the Iranian context", Eurasian Business Review, 2016

Publication

49

Francisca Castilla-Polo, Consuelo Ruiz-Rodríguez. "Content analysis within intangible assets disclosure: a structured literature review", Journal of Intellectual Capital, 2017

Publication

<1 %

50

Stéphane Salgado, Aurelie Hemonnet-Goujot, David H. Henard, Virginie de Barnier. "The dynamics of innovation contest experience: An integrated framework from the customer's perspective", Journal of Business Research, 2020

Publication

<1 %

51

arodes.hes-so.ch

Internet Source

<1 %

52

ent.aom.org

Internet Source

<1 %

53

orsociety.tandfonline.com

Internet Source

<1 %

54

pubhtml5.com

Internet Source

<1 %

55

ven.chdtu.edu.ua

Internet Source

<1 %

56

www.researchsquare.com

Internet Source

<1 %

57

Asit Bhattacharyya, Kumar Biswas. "Core Attributes of Pro-Environmental Managers and Dynamics of Environmental Management", Australian Journal of Environmental Education, 2020

Publication

<1 %

58

Salma S. Abed. "A literature review exploring the role of technology in business survival during the Covid-19 lockdowns", International Journal of Organizational Analysis, 2021

Publication

<1 %

59

José Maria Viedma Marti, Maria do Rosário Cabrita. "Entrepreneurial Excellence in the Knowledge Economy", Springer Science and Business Media LLC, 2012

Publication

<1 %

60

Muafi Muafi, Tomasz Norek, Yuni Siswanti. "Chapter 102 The Influence of Green Human Capital on Business Performance: The Mediation Role of Innovation Activity", Springer Science and Business Media LLC, 2021

Publication

<1 %

61

Mufaro Dzingirai, Noah Tshuma, Shingirai Sikomwe. "chapter 22 Post-Pandemic

<1 %

Sustainability Strategies for Zimbabwean SMEs", IGI Global, 2021

Publication

62

Ngoc Phu Tran, Loan Thi-Hong Van, Duc Hong Vo. "The nexus between corporate governance and intellectual capital in Vietnam", Journal of Asia Business Studies, 2020

Publication

<1 %

Exclude quotes On

Exclude matches Off

Exclude bibliography On