International Journal of Business, Law, and Education
Volume 4, Number 2, 2023

Strategy Flexibility and Sustainable Digital Innovation

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Abstract
This study aims to examine the effect of strategy flexibility on sustainable digital innovation. This research was conducted in Ternate City. The population in this study are all businesses in the city of Ternate. The sample in this study was determined based on a purposive sampling approach with total number of respondents of 115 people. Testing the hypothesis in this study using simple linear regression. The results of hypothesis testing indicate that the hypothesis in this study is supported. Next, recommendations for future research are discussed.

Keywords:
Strategy Flexibility, Sustainable Digital Innovation, Small Business, Ternate City, Simple Linear Regression

INTRODUCTION

The emergence of new digital technologies is causing a paradigm shift in many industries and changing the logic of competence among companies (Tushman & Anderson, 2018). To maintain profitability in a constantly changing environment, companies can use digital transformation development to stay competitive in their respective markets (Akgün, Byrne, Lynn, & Keskin, 2007; Verhoef et al., 2021). Digital transformation processes can provide access and a means of sharing knowledge that is created and transferred (Urbinati, Ünal, & Chiaroni, 2018), and embracing digital technologies is becoming more relevant and recognized as a new strategic imperative that is changing the basis of a company's sustainable advantage (Fitzgerald, Kruschwitz, Bonnet, & Welch, 2014). Even though companies are well aware of the important role of digital transformation, many companies remain cautious about adopting digital transformation solutions or do not know how to carry out digital transformation (Schröder, 2016) due to resource constraints and lack of digital technology knowledge.

As a means of integrating resources, it is essential for companies to implement business strategies and gain a sustainable competitive advantage. From an organizational learning perspective, digital transformation is a learning process directed at using digital technology and automated production to realize desired business goals (Lasi, Fettke, Kemper, Feld, & Hoffmann, 2014; Gupta & Bose, 2022). Furthermore, it becomes necessary for companies to systematically abandon the obsolete, outdated, and old to free up resources and forget about the routines that can hinder their innovation (Mattila, Yrjölä, & Hautamäki, 2021; Burt & Nair, 2020).

In addition, the focus on the sustainable competitiveness of organizations in a digital context is transformed into digital innovation, resulting from “new combinations of digital and physical components made possible by digital technologies” (Liu, Dong, Mei, & Shen, 2023). Digital innovation has become an important index of sustainable competitiveness (Fichman, Dos Santos, & Zheng, 2014; Yousaf, Radulescu, Sinisi, Serbanescu, & Păunescu, 2021). Scholars and managers have found common ground based on the fact that manufacturing companies must adopt digital innovations in a sustainable and organic manner. Although previous studies support the notion that sustainable digital transformation must be built upon innovative companies and their business ecosystems (Rupeika-Apoga & Petrovska, 2022), existing studies on digital

innovation have not clearly distinguished their formation processes and potential outcomes (Mendling, Pentland, & Recker, 2020; Bican & Brem, 2020). As such, the means by which manufacturing companies repeat and adapt their traditional processes, structures and norms in innovation, as well as the latent mechanisms that explain how sustainable digital innovation can be achieved, have yet to be explored. In addition, there is a clear research gap in explaining why some manufacturing companies are better suited to digital innovation. Although digital skills and competencies are important resources for digital innovation, the existing literature pays close attention to critical capabilities (Teece, 2017; Warner & Wäger, 2019; Tortora, Chierici, Briamonte, & Tiscini, 2021). Studies that examine the process of how organizations build capabilities for sustainable digital innovation are still few, especially in the small business context. It is still ambiguous how and why small businesses adopting the same digital artifact, digital platform or digital infrastructure can provide different innovations, and how we can make this digital innovation sustainable instead of a one-time transformation project. This research itself is to examine the relationship between strategy flexibility and sustainable digital innovation in small businesses in Ternate City.

Strategic flexibility—as the set of the firms' capability to be proactive and handle the discontinuities in the dynamic environment (Hitt, Ireland, & Hoskisson, 2020; Volberda, 1996; Wright & Snell, 1998) — has been highlighted as crucial to thriving in uncertain marketplaces (Brozovic, 2018; Herhausen, Morgan, Brozović, & Volberda, 2021). Strategic flexibility is a prominent feature of SMEs as this allows resource-constrained firms to quickly change and reconfigure their strategic direction (Lahiri, Mukherjee, & Peng, 2020; Miroshnychenko, Strobl, Matzler, & De Massis, 2021). Particularly, in the case of ESMEs, the weak institutional environments and the absence of proprietary advantages in emerging markets make them more flexible due to adaptation to changing conditions (Bai, Johanson, Oliveira, & Ratajczak-Mrozek, 2021; Xiao, Lew, & Park, 2021). Strategic flexibility allows ESMEs to proactively sense and adapt their business plans to changing market conditions in order to attain competitive advantage in the turbulent environment (Brozovic, 2018; Miroshnychenko et al., 2021). Similarly, strategic flexibility in crises can be an important vehicle for rent-enhancing opportunities beyond domestic market contexts (Kuckertz et al., 2020; Oh & Oetzel, 2022). To overcome resource constraints and the relatively weak competencies of ESMEs in crises, they can utilize their flexibility to anticipate unexpected adverse changes in foreign markets and reconfigure their operations to attain international gains (Kano & Hoon Oh, 2020).

In the digital context, innovation is no longer a simple technological innovation behaviour that mainly relies on the international resources of companies, but rather the result of the interaction and action between multiple innovation entities and the innovation ecosystem (Liang, Luo, Shao, & Shi, 2022). The innovation process involves not only the creation and commercialization of new technologies, but also the transformation of resource allocation routines, production routines, and institutional arrangements following the digital technology paradigm (Liu et al., 2023; Mendling et al., 2020). Thus, digital innovation is defined as the use of digital technologies, such as 3D printing, cloud computing, etc., to develop new business models or invent new products (Nambisan, Lyytinen, Majchrzak, & Song, 2017). The convergence between digital technology and industrial technology helps manufacturing firms to achieve new strategic purposes (Liu et al., 2023; Yoo, Henfridsson, & Lyytinen, 2010), while the

generativity of digital technology fosters real-time iteration and innovation according to the changes in users' demand and feedback (Nambisan et al., 2017). Sustainable digital innovation is not just about developing new digital products or developing new products digitally; it is a self-referential and scalable process of continuous iteration and improvement (Yousaf et al., 2021; Bican & Brem, 2020). Therefore, sustainable digital innovation is not only the result of the convergence of digital technologies or digital platforms with traditional technologies, but is also influenced by the digital orientation of companies that have long been committed to digital innovation (Nylén & Holmström, 2015).

Although strategic flexibility generates consequential pressure, high cost, and lack of strategic focus, which lead to negative results for enterprises, especially in slow-pace industries (Das, 1995; Nadkarni & Narayanan, 2007), strategic flexibility certainly has more positive impacts on innovation activities in terms of innovation performance (Kamasak, Yavuz, & Altuntas, 2016), new product performance (Grewal & Tansuhaj, 2001), and the growth performance of SMEs (Fachrunnisa, Adhiatma, Lukman, & Ab Majid, 2020), especially in a fast-paced digital context. It enables a preemptive maneuver for firms to start technological transformation and gain sustainable competitive advantages for the long term (Zhao & Yan, 2023).

Previous studies have concluded that the relationships between strategic flexibility and innovation performance could escalate firms' technological innovation and managerial innovation during the development and production of products (Sanchez, 1995). This is a necessary capability in the transformation of technological paradigms and firms' matching strategies. Beyond exploring new opportunities, strategic flexibility provides firms with the capability to dis- cover product and technological innovations (Wei, Yi, & Guo, 2014), and influences the implementation of new business models on an open innovation basis (Rajala, Westerlund, & Möller, 2012). In the digital context, strategic flexibility first allows proactive manufacturing firms to adapt to a changing environment with new competing logic and pre-emptively utilize new digital technologies; thus, manufacturing companies can survive and continue to evolve with the digital paradigm. Moreover, companies would be able to absorb knowledge, assimilate prior knowledge flexibly, and create derivative digital products or digital new services or deploy digital-enabled business models. For manufacturing firms, strategic flexibility means a higher processing capacity to integrate digital technology and new product development, trigger managerial innovations, and implement digital business models. Thus, strategic flexibility pushes manufacturing firms to be more effective and flexible through utilizing new digital technologies in aspects of developing, producing, and marketing products. Therefore, the author hypothesizes that:Strategic flexibility is positively associated with small business sustainable digital innovation**.**

METHOD

The population of this research is all businesses in Ternate City. Sampling was carried out using the purposive probability sampling method, which met the criteria only for small business leaders who had sold their products online and had total assets of no more than 500 million rupiah. The questionnaire was distributed in June 2023 with a total sample of 115 respondents. Validity was tested using factor analysis with a loading factor value ≥ 0.5 (Hair, Black, Babin, & Anderson, 2010), and reliability was tested with Cronbach's Alpha value ≥ 0.7 (Hair, Black, Babin, & Anderson, 2009). The hypothesis was tested by simple regression analysis (Hair, Wolfinbarger, Money,

Samouel, & Page, 2015). The measurement flexibility strategy was measured using a questionnaire developed by (Wang, Lu, Zhao, Gong, & Li, 2013), while digital innovation sustainability was adopted from a questionnaire developed by (Khin & Ho, 2020). These two variables use a 5-point Likert scale (strongly disagree-strongly agree).

RESULTS AND DISCUSSION

The results of distributing questionnaires indicated that of the 130 questionnaires distributed, only 121 questionnaires or 93.08% of the questionnaires were returned. Based on this number, 115 questionnaires or 88.46% of the questionnaires were declared eligible for testing. Therefore, the response rate in this study was 93.08%. The characteristics of the respondents in this study were gender, age, and business category. For gender, it was dominated by women than men (101 people or 87.83% and 14 people and 12.17%) and most were under the age of 25 compared to more than 25 years (97 people or 84.35% and 18 people or 15.65%). This is in accordance with the research results of Arilaha, Fahri, & Buamonabot, (2021). Furthermore, for the category of fashion businesses involved in this study as many as 93 people or 80.87% and care and health as many as 22 people or 19.13%. These results also confirm the research by Bailusy, Buamonabot, Fahri, & Arilaha, (2022) that the largest number of businesses in Indonesia are fashion and care and health.

Table 1 presents the results of factor analysis to test the validity and reliability of statement items that measure strategic flexibility and digital innovation sustainability. The results of the validity test for the strategic flexibility variable were carried out twice. For the first test, it turned out that there was one question item that did not meet the loading factor above 0.5, namely Strat-Flexty1, so it had to be excluded. Furthermore, after the second test, there are no items that must be removed because they meet the factor loading above 0.5. For this reason, of the four question items that measure strategic flexibility, only 3 items met the rules in the factor analysis test, namely Strat-Flexty2 (0.833), Strat-Flexty3 (0.733), and Strat-Flexty4 (0.893).

Furthermore, for the digital innovation sustainability variable, validity was only tested once with factor analysis. The results show that the 4 items that measure the sustainability of digital innovation meet the requirements because they have a factor loading value of more than 0.5, namely Sustain-Digt-Innovt1 (0.881), Sustain-Digt-Innovt2 (0.882), Sustain-Digt-Innovt3 (0.733) and Sustain-Digt-Innovt4 (0.648). Finally, testing the reliability of the variable strategy flexibility and digital innovation sustainability. First, for the strategy flexibility variable with three question items it was found that the Cronbach alpha value was more than 0.7 (0.748). Second, for the digital innovation sustainability variable with 4 question items. The test results indicated that it met the minimum requirements for a Cronbach alpha value above 0.7 (0.800).

Table 1: Validity and Reliability Testing Results

Factor and Scale	Factor-1	Factor-2
Strat-Flexty2	0,833	
Strat-Flexty3	0,733	
Strat-Flexty4	0,893	
Strategy Flexibility (Strat-Flexty) = Cronbach α 0.748		
Sustain-Digt-Innovt1		0,881
Sustain-Digt-Innovt2		0,882
Sustain-Digt-Innovt3		0,733
Sustain-Digt-Innovt4		0,648
Sustainability Digital Innovation (Sustain-Digt-Innovt = Cronbach α 0.800		

Source: data processed

Table 2 shows that the majority of respondents agree that their businesses are flexible in reconfiguring internal resources, making strategic plans for new products or services and quickly adapting to digital strategic adjustments compared to other businesses. In addition, the majority of respondents also agreed with regard to sustainability digital innovation, namely digital solutions that are different, lower costs, create new value for old businesses and are able to produce a larger portfolio of products and services.

Table 2: Respondents Perception

Variables	(%) Strongly Disagree	(%) Disagree	(%) Neutral	(%) Agree	(%) Strongly Agree	Mode
Strategy Flexibility	1,74	6,09	36,52	52,17	3,48	Agree
Sustainability Digital Innovation	1,74	3,48	27,83	47,83	19,13	Agree

Source: data processed

Based on the results of hypothesis testing in table 3, it shows that the sustainability of digital innovation is influenced by strategy flexibility ($\beta = 0.576$, $t = 7.017$, $P < 0.05$). This means that the proposed hypothesis is declared accepted in this study.

Table 3: Hypotheses Testing

Independent Variable	Sustainability Digital Innovation		
	β	t	Sig
Strategy Flexibility	0,576	7,017	0,000

Source: data processed

The results of this study confirm the theory put forward by Zhou & Wu, (2010) and Zhao & Yan, (2023) that strategic flexibility is the company's ability to flexibly disseminate knowledge and reconfigure the learning process to deal with a volatile and conflicting environment and this guide enterprise innovation towards sustainable digital innovation. This result is also supported by the results of research conducted by Sanchez, (1995) and Zhao & Yan, (2023) where there is a link between strategic flexibility and sustainable digital innovation in small businesses in Ternate City.

CONCLUSION

Based on the results of the research above, the conclusion of this study is that strategic flexibility affects the sustainability of digital innovation, especially in the small business context. This study has limitations, namely this study uses a non-probability sampling technique so that not all samples have the same opportunity to be selected as samples. Common method bias. This research is very possible for the occurrence of common method bias, namely respondents answering questions with self-reporting. Some suggestions that researchers can submit for future research are that this study uses a homogeneous sample. This research is limited to small business samples and settings, therefore in future research generalizations to different subjects must be given more attention, so that future research is externally valid in different settings and the addition of other variables. Such as antecedent and consequence variables. Antecedent variables that can be considered are entrepreneurial orientation, while consequential variables such as digital innovation and performance.

Acknowledgment

This research was funded by the University of Khairun. The authors also thank the University of Khairun for their support in this research.

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