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Do Digitalization and Green Entrepreneurship Affect Firm Value of Micro, Small and Medium Enterprises (MSMEs)?

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Abstract: *This study aims to investigate the potential of digitalization and green entrepreneurship to augment the value of Micro, Small, and Medium Enterprises (MSMEs) in Medan City. The study involved 146 respondents. The objective of this study is to test a hypothesis using a structural equation model, with the SmartPLS 3.2.8 application being utilized to facilitate this process. A structural equation model is being used to test a hypothesis in this study, and the SmartPLS 3.2.8 application is being used to make this possible. Validity and reliability testing must be performed on the data before hypothesis testing can begin. The results of this study suggest that the value of MSMEs could be increased through the adoption of digitalization and green entrepreneurship. Adopting green entrepreneurship will also encourage businesses to embrace digitalization. By using technology and more comprehensive marketing strategies, digitalization and green entrepreneurship will help MSMEs compete and innovate while simultaneously putting environmental protection first.*

Keywords: *Digitalization; Green Entrepreneurship; Firm Value; MSMEs.*

Introduction

Rapid economic growth has become a key objective for countries around the world. The increase in the general population's standard of life is a crucial sign of this expansion, which can be measured by go up in income and reductions in unemployment (Mamani et al., 2022).

Medan City is one of the most significant growth rates of micro, small and medium enterprises (MSMEs), which according to statistical data from 2024, the number of MSMEs in Medan City reached 38,343 (Prokopim, 2023). Nationally, MSMEs contribute significantly to the Indonesian economy, with a total contribution of IDR 8,573.89 trillion in 2021, representing 61.06% of the total (Komwasperpajakan, 2022). Consequently, the government is implementing policies to enhance the number of MSMEs nationally, with a particular focus on Medan City. Conversely, the low value of MSME companies presents a challenge to their ability to compete with larger companies. The results of determining the company's worth based on the monthly MSME revenue are shown in the next section.

Preliminary observations indicate that the majority of revenues from MSMEs are below 100,000,000, with a significant proportion amounting to 78.1%, representing approximately 114 businesses. Meanwhile, revenues between 100,000,000 and 300,000,000 were 13.7% or as many as 20 businesses. Finally, 12 companies, representing 8.2% of the sample, reported revenues in excess of 300,000,000. This finding indicates that the majority of MSMEs have revenues below 100,000,000, with around which suggests that the community is less inclined to engage in transactions with MSMEs. Therefore, in order to increase the value of the firm, other aspects like the use of technology and the adoption of sustainable business practices must be considered.

In order to achieve effective operation, MSMEs require both skilled human resources and quality materials. The quality of resources

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will be determined by the competitiveness of the production process. Furthermore, the intensifying competition in the market necessitates that MSMEs possess a competitive advantage over their rivals to ensure their survival and competitiveness (Avelar et al., 2024). However, this pursuit may have adverse effects on the environment, as the excessive utilization of resources may lead to environmental degradation. Moreover, the waste and pollution generated may have a detrimental effect on the health of the surrounding community and the environment (Chen et al., 2023) and threaten environmental sustainability and socio-economic development (Bekun et al., 2019). It can be observed that the issue of environmental concern is a matter of significant importance for all countries. Based on the data provided by the Central Bureau of Statistics of Medan City, it can be seen that there has been a notable increase in greenhouse gas emissions from 14.34% to 15.98% in 2023 (BPS, 2024) in conjunction with a concurrent rise in the amount of waste generated per day reaching 2,000 tons per day (Sinaga, 2023). According to data from IQAIR on 2 May 2024, the air quality in Medan City is detrimental to human health (IQAIR, 2024).

In the context of business operations, consumers often assess a company's environmental impact, particularly in relation to the production of goods. This assessment is a significant concern for consumers when making purchasing decisions. For MSMEs, demonstrating a commitment to environmental stewardship is an important factor in their ability to compete. One strategy for enhancing corporate value is through environmental care, where MSMEs that prioritize environmental preservation and sustainability are considered to have business sustainability (Rexhepi et al., 2023). Moreover, MSMEs that are committed to sustainability must prioritize the interests of the owner to guarantee that the production process is conducted properly and ethically, thereby enhancing the company's value (Tiep et al., 2022) while minimizing environmental impact.

Innovation based on environmental concerns has been demonstrated to have significant positive impacts. These impacts include enhanced contributions to environmental protection and increased firm value, which ultimately results in the establishment of a competitive advantage for the company (Xue et al., 2024). The problems faced in Medan City, including the continuous increase in waste, dangerous air quality, and increasing greenhouse gas emissions, are important concerns for the government and society in maintaining environmental sustainability and business sustainability. A number of studies have demonstrated that the utilization of technology can have a positive effects on reducing environmental damage and greenhouse gas emissions (Clemente-Almendros et al., 2024). Consequently, the application of green entrepreneurship will result in a competitive advantage for the company and an increase in its value (Mankgele, 2023; Nguyen, 2023).

Furthermore, the utilization of social media for marketing purposes has a positive impact on company sales, enabling the sale of products and services not only within a specific region but also nationally or internationally (Khan et al., 2023). The use of social media also enhances the value of the company, facilitating its wider recognition (Govindan & Hasanagic, 2018). Consequently, technological developments in marketing provide significant benefits in terms of introducing the company to a wider audience. Moreover, the better a company's marketing, the stronger it will be in the market and the greater its potential for increasing its value and facing market competition. Research conducted by Vo Thai et al., (2024) indicates that the implementation of digitalization strategies in processes and products will have a positive impacts on the company's sustainability achievements, particularly in the environmental dimension.

Currently, many businesses focus on developing strategies to enhance company value and performance (Mankgele, 2023). This approach, however, has a detrimental impact on environmental damage and resources. The significance of implementing an effective strategy to ensure business sustainability and

enhance performance cannot be overstated. One such strategy is green entrepreneurship. Companies that adopt this strategy prioritize environmental impacts and the prevention of damage to the environment (Baquero, 2024). This approach ensures that the value and performance of the company are enhanced without causing significant environmental harm (Qin et al., 2024). Research conducted by Hussain, (2023) indicates that MSMEs are encouraged to apply environmentally friendly concepts in order to achieve a positive impact on business performance and sustainability. Nevertheless, the findings of the research study conducted by Yin et al., (2022) indicate that not all of the green entrepreneurship concepts have a significant impact on company performance and value. It is thus imperative to undertake further research into the nexus of digitalization and green entrepreneurship and its impact on the value of MSME companies.

Theoretical Framework and Empirical Studies

The Resource-Based Theory

The Resource-Based View (RBV) of the Firm is "a strategic management theory which emphasizes the importance of a firm's internal resources and capabilities in achieving competitive advantage and superior performance" (Barney, 1991). For SMEs, the RBV provides valuable insights into how these businesses can leverage their unique resources to compete effectively in their markets (El Nemar et al., 2022). Here's a detailed look at the correlation between the RBV and SMEs (Collins & Clark, 2003): (1) Resource Importance: Unique Resources: (2) Capabilities Development: Dynamic Capabilities: (3) Resource Rarity and Value: Competitive Advantage (Tiep et al., 2022): advantage. (4) Resource Management: Strategic Focus (5) Sustainable Competitive Advantage: Long-Term Perspective: (6) External and Internal Environment Interaction: Complementary Resources.

Firm Value

One indicator of a company's sustainability is its firm value. Firm value is defined as the value reflected in the company's market price. It is a concept that is related to the share price required by investors when making informed investment decisions (Tiep et al., 2022). In addition, the concept of firm value can be understood to represent the present value of anticipated future cash inflows (Endri & Fathony, 2020). Consequently, a higher current value of a company is indicative of greater future cash flow. This can be measured in various ways, including through stock prices, assets, equity, or the amount of sales owned by the company (Salihi et al., 2024). A higher company value indicates greater consumer interest in the company's products (Miroshnychenko et al., 2017). The existence of environmental problems can provide companies with an opportunity to increase their value. Companies can achieve this by adopting several methods in terms of processes, products, and marketing (Makhloufi et al., 2022). The utilization of technology in the context of marketing represents a significant factor in the promotion and introduction of businesses on a wider scale, particularly in the case of MSMEs. However, research conducted by K. Singh & Rastogi, (2022) indicates that organizations are unable to directly influence the growth in firm value. External factors, such as market competition, compel companies to innovate and utilize fixed resources in order to enhance their value, with the ultimate arbiter being the market.

Digitalization

Digitalization is a transformation process from manual to the use of technology (Saipidinov et al., 2023). Through digitalization, it will make it easier for MSMEs to manage their business. Another benefit through the use of digitalization is through the use of social media. MSMEs can market their products widely, thereby attracting consumers to purchase their products by e-commerce (Lee et al., 2015). Furthermore, digitalization will create a supply and demand for environmentally friendly products, which will have a positive impact on local entrepreneurs (Peng et al., 2024). According to the RBV, the deployment of technology in MSMEs as a strategic instrument for the creation of competitive advantage through the exploitation of digital resources is characterized

by four key attributes. The aforementioned attributes are defined as value, scarcity, imperfect imitability and non-substitutability (Adeniran & Johnston, 2016). The advent of digitalization will facilitate transactions between entrepreneurs and consumers, thereby gradually transforming consumer behavior from face-to-face to the utilization of technology (Du et al., 2024). The research conducted by (Clemente-Almendros et al., 2024) indicates that digitalization encourages entrepreneurs to leverage new knowledge and capabilities aimed at generating innovation and competitive advantage over other companies. Business sustainability plays a significant role in the implementation of digitalization, as the resulting innovation will have a beneficial effect on business profitability (Wang et al., 2024). Based on the preceding discussion, the following hypothesis can be formulated:

Hypothesis 1: Digitalization has a significant effect on increasing firm value

Hypothesis 2: Digitalization has a significant effect on the application of green entrepreneurship of MSMEs in Medan City.

Hypothesis 3: Digitalization has an effect on increasing company value through the application of green entrepreneurship

Green Entrepreneurship

Green entrepreneurship can be defined as an entrepreneurial attitude in organizational innovation, manifested in the form of products or processes that are designed to generate profit while simultaneously adhering to environmental protection principles (Gao, 2019). In general, entrepreneurship is divided into three categories: conventional economic entrepreneurs, ecological environmental entrepreneurs, and social/cultural entrepreneurs (Richomme-Huet & de Freyman, 2013). This concept involves the process of building an environmentally-based business that preserves the environment and encourages the use of materials that do not damage the environment. The application of this concept is expected to increase the company's market share and sales by applying strong green and social values and protecting the environment from damage caused by its business activities (Mathur, 2016). Green entrepreneurship is related to innovation in both processes and products produced by companies that do not damage the environment. In particular, this is relevant to micro, small and medium-sized enterprises (MSMEs), where individuals are seeking to identify and exploit opportunities in their local area. The positive impact of companies implementing green entrepreneurship is that the public assesses that the company is able to produce environmentally friendly and healthy products, which has the effect of increasing sales and the public image of the company. Research conducted by (Arabatzis et al., 2015) shows that environmentally friendly products resulting from the application of green entrepreneurship will have an impact on the competitive advantage of the company and are in great demand by consumers. Based on the aforementioned explanations, the following hypothesis can be formulated:

Hypothesis 4: green entrepreneurship has a significant effect on firm value

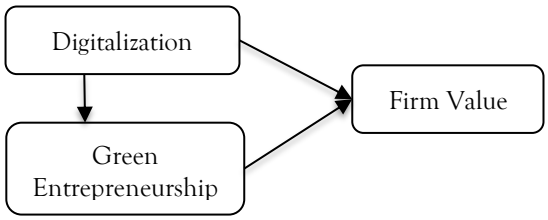

Figure 1. Conceptual Framework

Methods

This study aims to investigate the effect of digitalization and green entrepreneurship on firm value in MSMEs in Medan City. The research employs both qualitative and quantitative analysis, with qualitative data obtained through interviews and observations of respondents, while quantitative data is derived from questionnaires completed by MSMEs in Medan City. The population of this study comprises MSMEs in the city of Medan in 2024, with sampling techniques utilizing simple random sampling. The number of respondents in this study was 146 individuals. The company examined in this study is of the trade and services in SMEs; this is due to the utilization of a greater volume of materials and elevated costs. Consequently, it is predicted that the implementation of technological

innovation and green entrepreneurship applications will promote enhanced company value. Variable measurement utilized a 5-point Likert scale, with 1 indicating strong disagreement and 5 indicating strong agreement. Digitalization was measured by 5 questions (Kohtamäki et al., 2020). A total of 12 questions represent the measurement of the green entrepreneurship variable (Ndubisi & Iftikhar, 2012). Firm value is measured by the natural logarithm of total equity/sales of MSMEs (Vo, 2022). The researchers employed four specific validity and reliability tests: Cronbach's Alpha, rho_A, Composite Reliability and Average Variance Extracted (AVE) tests. Hypothesis testing employed structural equation modelling analysis, with the SmartPLS 3.2.8.

Results and Discussions

The objective of this study is to examine the impact of green entrepreneurship digitalization on the value of MSMEs. The research was conducted at MSMEs in Medan City, employing a simple random sampling technique. A total of 146 individuals were surveyed. Prior to hypothesis testing, researchers conducted descriptive statistics to ascertain the characteristics of respondents.

Results

The indicators observed include the business sector under study, the age of establishment of MSMEs, business ownership status, and the gender of those who manage. The study's descriptive statistical findings are shown in Table 1.

Table 1. The Demographical Backgrounds

Attributes of Sample		Frequency	Percentage
Sectors	Service	8	5.5%
	Trade	138	94.5%
MSME Age	Below 1	23	15.8%
	year	60	41.1%
	1-5 years	63	43.2%
	Above 5 years		
Ownership Status	Self-Ownership	96	65.8%
	Join	50	34.2%
Gender	Male	79	54.1%
	Female	67	45.9%

Source: SmartPLS output (2024)

Prior to hypothesis testing, validity and reliability tests are undertaken.

Table 2. Validity and Reliability Test

	Cron. Alpha	rho_ A	CR	AVE
Digitalization	0.933	0.939	0.947	0.750
Firm Value	1.000	1.000	1.000	1.000
Green Entrepreneurship	0.781	0.861	0.847	0.505

Source: SmartPLS output (2024)
Note: CR= Composite Reliability

In line with the findings of Thorndike, (1995) and Vinzi et al., (2010), As evidenced by the results of this test, the Cronbach's Alpha value is greater than 0.7, thus indicating an effective model. Moreover, an examination of the rho_A value, which Vinzi et al., (2010) also reveals that the results exceed this threshold. In accordance with the criteria set forth by Bagozzi & Yi, (1988) and Chin & Dibbern, (2010) the subsequent model feasibility test is the average variance extracted (AVE) test. In accordance with the criteria set forth by Bagozzi & Yi, (1988) Chin & Dibbern, (2010), and Fornell & Larcker, (1981), the AVE value for all variables exceeds this threshold, substantiating the model's feasibility.

Hypothesis testing is carried out to ascertain the direct and indirect effects of digitalization variables and green entrepreneurship on firm value. The test utilizes a structural equation model. The following presents the results of hypothesis testing.

Table 3. Hypothesis Testing of Direct Effects

	Original Sample	T Statistics	P Values
Digitalization -> Firm Value	0.128	2.240	0.025
Digitalization -> Green Entrepreneurship	0.534	9.612	0.000
Green Entrepreneurship -> Firm Value	0.339	4.484	0.000

Source: SmartPLS output (2024)

Table 3 indicates that the utilisation of digitalization will result in a notable increase in firm value, with a statistically significant level

of 0.025. Additionally, digitalization exerts a pronounced influence on the green entrepreneurship of MSMEs, with a statistically significant level of 0.000. Furthermore, green entrepreneurship also exerts a significant impact on firm value, with a p-value of 0.000. The following section presents an indirect test of digitalization on firm value through green entrepreneurship.

Table 4. Hypothesis Testing of Indirect Effects

	Original Sample	T Statistics	P Values
Digitalization -> Green Entrepreneurship -> Firm Value	0.181	3.939	**0.000**

Source: SmartPLS output (2024)

Table 4 indicates that digitalization exerts a considerable indirect influence on firm value via green entrepreneurship. The obtained level of significance is 0.000.

Discussions

The research results are presented in Table 3. above indicate that digitalization exerts a significant effect on the application of green entrepreneurship. This implies that the use of information technology in conveying information and increasing sales will support the company's goals in reducing pollution and environmental damage. The utilization of social media in the introduction of the company and the expansion of the marketing area has a positive impact on the practice of environmental protection through the reduction of the use of raw materials that damage the environment in product marketing and corporate responsibility for the environment. This encourages the improvement of a positive image in the eyes of consumers and the public with regard to corporate responsibility (Hautala-Kankaanpää, 2022). This is in line with the resource-based theory, which posits that companies that can effectively manage their resources will have a positive impact on their overall value. The capacity to seize opportunities is a key factor in determining the survival of a company in a competitive environment. The ability to innovate is a crucial differentiating factor, enabling companies to gain a competitive advantage and enhance their resilience in the face of market challenges (Adeniran & Johnston, 2016). The utilization of technology, which is a resource owned by the company, has the potential to positively impact the value of the company. Consequently, the application of

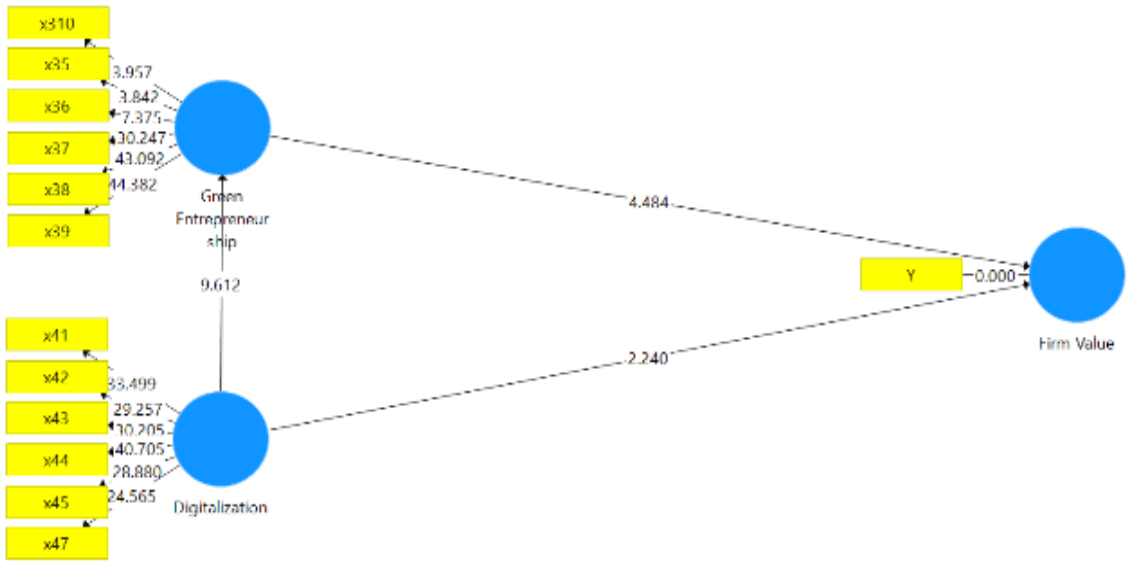

Figure 1. Path Analysis

digitalization will support the application of green entrepreneurship (Zhang, 2024) and will have a direct and indirect impact on the increase of company value (Ancillai et al., 2023). This result is consistent with previous research (Ullah et al., 2024) indicating that digitalization has a positive impact on local businesses. Moreover, the implementation of digitalization has a positive impact on the environment and wider company expansion (Clemente-Almendros et al., 2024), thereby enabling MSMEs to advance sustainable environment-based innovation (Wang et al., 2024). Moreover, digitalization facilitates the accessibility of information pertinent to the company, particularly with regard to the implementation of environmental responsibility. This, in turn, engenders a positive image for the company (Qiao et al., 2024). Ultimately, as company performance and value improve, these developments have a positive impact on the long-term sustainability of the company and the wider environment (Savastano et al., 2022).

The concept of green entrepreneurship signifies a company's cognizance of the imperative to mitigate the ecological implications emanating from its operational practices, thereby demonstrating an alignment between environmental responsibility and commercial endeavor. Furthermore, this concept provides an opportunity for companies to gain a competitive advantage over other companies. Based on the hypothesis testing above, it can be concluded that the application of green entrepreneurship is in the form of corporate responsibility to the environment, the use of environmentally friendly raw materials, effective waste treatment, and efforts to reduce pollution and environmental damage. Ultimately, consumers and society will ascribe a positive value to the company, leading to an increase in the company's value. In the context of resource-based theory, companies, in this case MSMEs, engage in environmentally oriented innovation. This entails a commitment to the integration of environmental considerations into the design, production and delivery of their products and services, with the objective of ensuring long-term environmental sustainability. The implementation of green entrepreneurship will confer an advantage on the company in comparison to its competitors. This will result in consumers becoming more familiar with companies that comply with regulations and demonstrate a commitment to the community. Consequently, the community will hold a more favorable view, which will ultimately provide sustainability for the company and increased value (Qin et al., 2024). Based on these findings, it can be concluded that the hypothesis is accepted. The results of this study are consistent with those of previous research conducted by (Huang & Shen, 2024), which indicates that the implementation of environmental responsibility in terms of processes and products will have a positive impact on company value and sustainability. Moreover, the implementation of green entrepreneurship is expected to have a positive impact on the sustainability of the company, thereby influencing company value in a positive manner (Baquero, 2024). Ultimately, an increase in company value will lead to an enhancement in company performance (Mankgele, 2023). These findings are consistent with the results of previous research conducted by Asad et al., (2023), which demonstrated that the implementation of green entrepreneurship strategies can lead to enhanced company performance and value, subsequently influencing the company's financial performance.

Conclusions, Suggestions, and Limitations

This study's results indicate a positive impact of digitalization implementation on firm value. Moreover, this outcome is enhanced if the company also implements green entrepreneurship. Green entrepreneurship encourages companies to preserve and care for the environment, thereby enhancing firm value. Furthermore, the application of digitalization for companies will encourage corporate responsibility for the environment, thereby facilitating the achievement of green entrepreneurship. Ultimately, the community and consumers will perceive the company's value in a positive light.

However, it should be noted that this study has limitations in terms of the sample size and the region in which it was conducted. It is hoped that in the future, the area and type of company studied can be expanded. It is anticipated that the findings of this study will have a beneficial impact on the development of corporate sustainability strategies and lead to an enhancement in company valuation, while also reducing the environmental impact of MSME production processes.

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