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Digitalization Business and Alleviating Financial Constraints Affecting The Performance Of MSME Mediated By Operational Efficiency

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ABSTRACT

Introduction/Main Objectives: This research aims to analyze the impact of business digitalization, operational efficiency, and easing financial constraints in improving the performance of MSMEs. **Background Problems:** Digitalization is a driving force of the world economy, but many MSME players in Indonesia have not implemented it. **Novelty:** This research introduces a new approach by integrating operational efficiency in establishing the relationship between business digitalization and the performance of SMEs. **Research Methods:** This research is an explanatory study that examines the relationship between variables through a quantitative approach. The population in this research consists of all MSME actors in Kendal Regency totaling 16,508 units. In sampling, this research employs purposive sampling technique. **Finding/Results:** In the direct effect test, operational efficiency was shown to have a significant positive effect with a significance value of 0.035, while other direct relationship hypotheses were rejected. In the mediation effect test, operational efficiency was proven to be able to mediate the relationship between business digitization and the performance of MSMEs with a significance value of 0.036. **Conclusion:** This research shows the role of operational efficiency in mediating the relationship between business digitization and the performance of MSMEs, where in the previous direct test, business digitization did not have an effect on the performance of MSMEs. With this finding, it can be concluded that MSMEs that implement business digitization effectively will be able to achieve operational efficiency, which in turn will enhance their business performance.

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Performance MSME, Digitalization Business, Operational Efficiency, Alleviating Financial Constraints, MSME Kendal

1. Introduction

Digitalization has become a strong catalyst for the economy in today's world (Petroc Taylor, 2023). The era of digital transformation shows fundamental changes that companies must quickly adapt to if they want to survive in their industry; these changes mainly occur in terms of product marketing (Calderon-Monge & Ribeiro-Soriano, 2024). Product marketing changes include the process

of marketing products, defining the offering, and strengthening the relationship between the company and its customers (Santos-Jaén et al., 2023). With digitalization, the market reach will become broader, as it does not have to involve physical marketing. In addition, with optimal digitalization, marketing costs can be reduced, thus resulting in budget efficiency. Digital trends have changed the way companies conduct their business.(Caputo et al., 2021).

The fundamental issue for most MSMEs in Indonesia is that they have not yet harnessed digitalization in their operational processes (Lisnawati, 2023). Most MSMEs in Indonesia, particularly in Kendal, still operate under conventional patterns in their daily activities, including marketing activities. This is attributed to several factors such as a lack of digital knowledge, and many MSME actors do not have a sufficient understanding of how to use technology like digital tools for marketing. Furthermore, there are limitations in technology aspects, as many MSMEs located in remote areas possibly lack internet access (Bisnis et al., 2024). This condition is certainly quite concerning, as it will cause SMEs to lose competitiveness against other companies that have adopted digitalization in their business.

Business digitalization can improve business performance, as the implementation of digitalization in business will encourage good operational efficiency. Operational efficiency can take the form of maximizing company revenue, minimizing the resources used in operational processes, or a combination of both (Agrawal et al., 2022). If operational efficiency is achieved, the company can enhance its business performance. With good efficiency, it will also alleviate the company's financial constraints. As we all know, financial constraints pose a serious threat to MSMEs.

The transition to a digitalization model in business is a necessity that must be undertaken today, considering that the digital era demands ease of access and speed of service, which will be difficult to achieve with conventional business models (Ribeiro-Navarrete et al., 2021). Digitalization condenses lengthy and complex matters into concise and compact forms. However, time is needed for the adaptation process in the transition from conventional business models to digital business models (Erhan et al., 2022).

Although there are variations in previous findings related to the impact of business digitalization on business performance, this study introduces a new approach by integrating operational efficiency to create a relationship between business digitalization and the performance of SMEs. Efficiency can be seen as an approach rooted in the goal of strengthening enterprises that are still classified as micro, small, and medium-sized businesses. This approach has conceptual similarities with business performance (Anwuli Nkemchor Obiki-Osafiele et al., 2024).

In addition, this research also attempts to test the influence of the variable alleviate financial constraints on the performance of MSMEs. This approach has not been studied in previous literature. Previous research conducted by (Liu et al., 2022) only examined the impact of operational efficiency in alleviating financial issues. Meanwhile, research conducted by (Yu et al., 2021) only studied the impact of alleviate financial constraints on business performance.

2. Literature Review

Digitalization Business and SMSE Performance

Business digitalization is the process of integrating digital technology into all operational aspects of a company (Malik et al., 2025). Performing business digitalization requires a shift from analog data to digital data to simplify existing processes and position digitalization as the backbone of the company's operations (Ritter & Pedersen, 2020). However, some studies show that a lack of understanding

regarding business digitalization results in slow performance of a business (Li et al., n.d.). The implementation of digitalization in businesses has been shown to drive business performance, as this expands the company's market share which impacts the sales of the company's products and services, and over a long period will provide efficiency in the company's operations (Wang et al., 2023). SMEs in developing countries have a need to develop dynamic capabilities related to digital transformation and cost efficiency (Al Omoush et al., 2025).

With a good understanding of business digitalization, business performance will also improve based on market expansion and a good approach to customers. Research conducted by (Raeesi Vanani et al., 2025) and (Sestino et al., 2025) shows that business digitalization will support business performance. Hence, we hypothesize:

H1 : Digitalization Business has positive impact on SMSE Performance.

Operational Efficiency and SMSE Performance

Operational efficiency is the company's ability to carry out its operational activities by maximizing outcomes and minimizing the use of resources such as money, time, and labor (Khan et al., 2025). With operational efficiency, companies can improve business performance (Aderamo, 2024).

With optimal operational efficiency, SMEs have proven able to enhance their business performance in the long term. Research conducted by (Riipa et al., 2025) and (Chen et al., 2021) shows that operational efficiency can support business performance. Hence, we hypothesize:
H2: Operational Efficiency has positive impact on SMSE Performance.

Alleviate Financial Constraints and SMSE Performance

Alleviate financial constraints is defined as the alleviation of financial obstacles, referring to strategic actions taken to reduce financial limitations on businesses. This alleviation may involve efforts to seek additional sources of income, to reduce expenses, and to seek external funding (Zhang & Lucey, 2022). Efficiency becomes one of the efforts to reduce financial burdens which will certainly boost business performance, as the focus and goals of the company will be achieved if the financial burdens are addressed (García-Pérez-de-Lema et al., 2021).

By alleviating financial constraints, companies will achieve maximum business performance. Research conducted by (Wu & Huang, 2022) and (Tan & Zhu, 2022) shows that alleviating financial constraints supports business performance. Hence, we hypothesize:
H3: Alleviate Financial Constraints has positive impact on SMSE Performance

Digitalization Business, Operational Efficiency and SMSE Performance

In this study, we try to integrate the relationship between business digitalization and business performance through operational efficiency. When business digitalization is applied, it will create operational efficiency that will ultimately enhance optimal business performance.(Hautala-Kankaanpää, 2022). Hence, we hypothesize:
H4: Operational Efficiency can mediated the relationship between digitalization business and SMSE performance
Referring to the above, the model framework for this research is as follows:

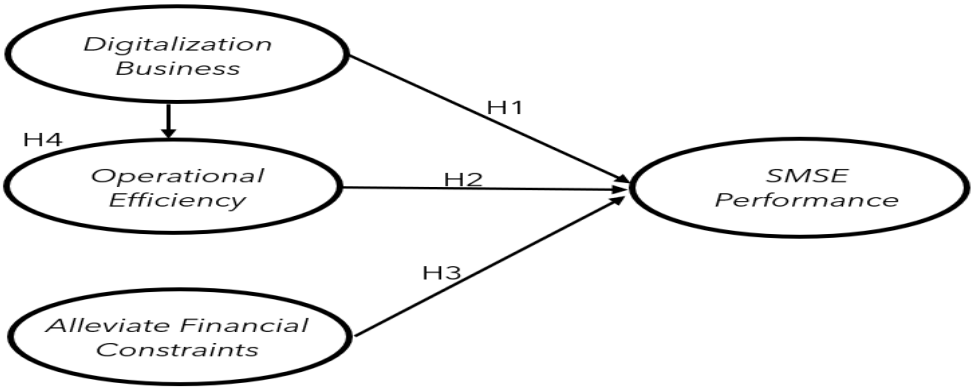

Figure 1. Conceptual Framework Model

3. Method, Data, and Analysis

This research is an explanatory study that examines the relationships between variables through a quantitative approach (Creswell & Creswell, 2018). The population refers to all objects or individuals that have distinctive characteristics that become the focus of the study (Wibisono, 2015). The population in this research consists of all MSME actors in Kendal district totaling 16,508 units (*Jumlah Perusahaan Pada Industri Mikro Kecil Menurut Kabupaten/Kota Di Provinsi Jawa Tengah , 2021-2022*, 2024). In sampling, this study uses purposive sampling technique. The sampling criteria used are as follows:

1. MSMEs that are domiciled in Kendal Regency
2. MSMEs that have been operating for at least 1 year
3. MSMEs that implement digitalization in their business

The sample size in this study is based on the sample size determined to be a minimum of 5 to 10 times the number of indicators used (Roscoe, 1975). From the 4 variables used in this study, there are a total of 19 indicators, therefore the minimum sample size required for this research is 190 respondents. This sample size meets the sample criteria of more than 30 samples and less than 500 samples (Sekaran & Bougie, 2011).

The research data utilizes primary data obtained directly by the researcher (Creswell & Creswell, 2018). Primary data was collected through the distribution of online questionnaires, done via Google Forms. The results of the questionnaire distribution were subsequently classified into a Likert scale that has been engineered to facilitate the processing and analysis of the research data. The variables and measurements of the research variables are as follows.

This research utilizes four main variables that are tested, namely: business digitalization; operational efficiency; alleviate financial constraints; and business performance. The operational definitions of the tested variables are as follows:

Table 1. Operational Definition of Variables

Variable	Code	Measurement	Reference
SMSE Performance	P1	Consumer Satisfaction	(García-Lopera et al., 2022)
	P2	Speed Of Sales Growth	
	P3	Profitability	
	P4	Employee Satisfaction	

Variable	Code	Measurement	Reference
Alleviate Financial Constraints	AFC1	Financial Goals	(García-Lopera et al., 2022)
	AFC2	Effective budget management	
	AFC3	Efficiency	
Operational Efficiency	OE1	Quality of your products	(Pérez-Rave et al., 2023)
	OE2	The efficiency of production processes	
	OE3	Changes or improvements in existing products/services	
	OE4	Changes or improvements in production processes	
Digitalization Business	DB1	We are well aware of the possibilities and advantages of digitalization	(Santos-Jaén et al., 2023)
	DB2	We allocate significant resources to digitize the business	
	DB3	The business model is evaluated and updated in terms of digitalization	
	DB4	Our employees are prepared for the digital development of the company	
	DB5	Our managers are well trained in digitalization	
	DB6	The degree of process automation is high in my company	
	DB7	We use digitalization in the organizational management of the company	
	DB8	Our company regularly organizes training for digital transformation	

The results of the questionnaire distribution were empirically tested using the SMART-PLS program with three stages of testing: Confirmatory Factor Analysis (CFA), Goodness of Fit (GoF) test, and regression analysis. CFA was used to test whether a construct is unidimensional or not and whether the indicators used can confirm a construct or not using three tests: Convergent Validity (ideally ≥ 0.70 or at least ≥ 0.50); Construct Reliability (CR ≥ 0.70); and Average Variance Extracted (AVE) (AVE ≥ 0.50). The Goodness of Fit (GoF) test was used to test the suitability of the research model used. Several GoF methods used include Chi-Square Statistic, Probability, Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Comparative Fit Index (CFI), Tucker Lewis Index (TLI), and The Root Mean Square Error of Approximation (RMSEA) (Chin, 2010).

The third step involved hypothesis testing to analyze the influence between variables tested in the research model. The criteria used were a P-value of ≤ 0.05, indicating a significant influence between research variables.

4. Result and Discussion

Before conducting hypothesis testing, it is necessary to perform confirmatory factor analysis to ensure that the measurement model has good validity and reliability. The criteria for confirmatory factor analysis include: 1) loading factor 2) composite reliability 3) Cronbach's alpha 4) Average Variance Extracted (AVE) 5) discriminant validity 6) goodness of fit.

Based on statistic, there are 8 indicators with values below 0.7, while the other 11 indicators have values above 0.7. Factor loading values are considered good if they are above 0.7. However, factor loading values between 0.6 and 0.7 are still acceptable for exploratory research. For the initial stage of measurement scale development research, factor loading values of 0.5 to 0.6 are considered sufficient (Chin, 2010). Based on this, we consider the data can be proceeded to the next stage.

Table 2. Composite Reliability, Cronbach alpha and AVE

	Composite Reliability	**Cronbach alpha**	**AVE**
AFC	0,868	0,775	0,688
DB	0,914	0,892	0,572
OE	0,882	0,821	0,652
P	0,747	0,632	0,537

Based on Table 2, the composite reliability scores of all variables are above 0.6, indicating good reliability of the indicators for all variables. Furthermore, Cronbach's alpha values, representing the measure of internal consistency of a variable in terms of how closely a set of items hang together as a group, are expected to be above 0.6. Data in Table 2 show that all variables are above 0.6, indicating that the Cronbach's alpha values for all variables are sufficiently good.

The Average Variance Extracted (AVE) provides an overview of the amount of variance and diversity of manifest variables possessed by latent constructs. The expected AVE value is above 0.5. Based on Table 1, the AVE values for all variables are above 0.5. Based on this, we conclude that the data we have can proceed to the next stage.

Based on statistic, the discriminant validity values (HTMT) which represent the mean of all correlations measuring different constructs relative to the mean of the average correlations of indicators measuring the same construct. The expected discriminant validity value is below 0.9. Based on the data, all values are below 0.9, indicating good discriminant validity.

Table 3. Goodness of fit

	Value
Chi Square	757,623
RMSEA	0,078
GFI	0,686
SRMR	0,098
NFI	0,632

Goodness of fit testing is conducted to assess the fit of a set of data to its probability distribution. The Root Mean Square Error of Approximation (RMSEA) is an absolute fit index, which evaluates how far the hypothesized model is from a perfect model. The expected RMSEA value falls within the range of 0.03 to 0.08. Referring to Table 3, the RMSEA value in this study is 0.078, indicating that the model can be accepted. The Goodness of Fit Index (GFI) is used to determine whether the sample follows a normal distribution. An expected GFI value is < 0.90. According to Table 4, the GFI value in this study is 0.686, indicating that the model is appropriate.

The Average Goodness of Fit Index for discriminant validity (HTMT) represents the mean of all correlations measuring different constructs relative to the mean of correlations measuring the same construct indicators. The expected discriminant validity value is < 0.9. Based on the data in Table 3, all values are < 0.9, indicating good discriminant validity. The Normed Fit Index (NFI) compares the proposed model to the null model. NFI values > 0.90 indicate a good fit, while 0.80 < NFI < 0.90 is termed as marginal fit. The NFI value in this study is 0.632. Based on the explanation above, this data is deemed suitable for hypothesis testing.

Table 4. Testing R Square

	R-Square	Adj R-Square
OE	0,296	0,292
P	0,148	0,134

R-Square testing is conducted to measure how well the endogenous variable can be explained by the exogenous variables. The larger the R Square value, the better, as it indicates the accuracy of selecting the independent variables in a study. The R Square value for the Operating Efficiency variable is 0.296, which means that the Digitalization Business variable can influence the Operational Efficiency variable by 29,6%, while 70,4% is influenced by variables other than Digitalization Business. The R Square value for the Performance variable is 0.148, which is a small number, indicating that the Digitalization Business, Operational Efficiency and Alleviate Financial Constraints variable can influence the Performance variable by only 14.8%, with 85.2% influenced by variables other than Digitalization Business, Operational Efficiency and Alleviate Financial Constraints.

Hypothesis testing is the final step in a series of tests conducted. It is performed using the Smart-PLS 4.0 tool to determine direct and mediating effects in this study. A hypothesis is accepted if the T-value is smaller than the T-table value and the P-value is less than 0.05(Creswell & Creswell, 2018).

Table 5. Hypothesis Testing of Direct Effect

	Original Sample	Sample Mean	Standard Deviasi	T-Value	P-Value
DB -> P	0,161	0,166	0,133	1,213	0,226
OE -> P	0,207	0,212	0,098	2,116	0,035
AFC -> P	0,185	0,201	0,122	1,519	0,129

From the Three hypotheses proposed, the statistical results indicate that one hypotheses were accepted because they meet the criteria: the calculated T-value is smaller than the critical T-table value, and the P-value is less than 5% (0.05). Meanwhile, two hypothesis was rejected because it did not meet the specified criteria.

Table five shows that good operational efficiency will support the performance of MSMEs to be maximized (Khan et al., 2025). Meanwhile, business digitalization and relaxation of financial constraints have not been able to drive an improvement in the performance of MSMEs; this result is certainly surprising, as all previous literature has stated that business digitalization and easing financial constraints can improve MSME performance. This result may occur because the research subjects are MSME actors in areas where the infrastructure is not yet ready for digitalization development.

Table 6. Hypothesis Testing of Mediating Effect

	Original Sample	Sample Mean	Standard Deviation	T-Value	P-Value
DB -> OE -> P	0,113	0,115	0,054	2,101	0,036

This research attempts to examine the influence of Operational Efficiency as a mediating variable in the relationship between Digitalization Business and performance MSME. Table 6 shows that Operational Efficiency can mediate the relationship between Digitalization Business and performance with a p-value of 0.036.

These results indicate a new finding regarding the role of operational efficiency in mediating the relationship between business digitization and the performance of MSMEs, where it has been explained in the previous paragraph that business digitization does not directly affect the performance of MSMEs. With this finding, it can be concluded that MSMEs that correctly implement business digitization will be able to achieve operational efficiency, which will also enhance the performance of their business.

Meanwhile, MSMEs that implement business digitization but cannot optimize their operations will find their efforts in business digitization to be in vain, as it will not drive improvements in their business performance. However, it should be noted that this research was conducted in Kendal Regency, which does not have as good digital infrastructure as other cities.

5. Conclusion and Suggestion

This research focuses on two main issues. First, Performance Improvment among MSME actors in Kendal Regency. Second, the role of operational efficiency as a mediator. Several key findings and conclusions emerge from our analysis.

First, no significant direct influence was found between business digitization and performance improvement of MSMEs in Kendal district. This indicates that the implementation of business digitization alone by MSME players in Kendal district, without other supporting aspects and infrastructure, statistically proves unable to boost MSME performance. Furthermore, the alleviation of financial constraints also proved not to have a direct influence on MSME performance. This may be because the majority of MSME players in Kendal do not experience financial constraints, as nearly all of these MSMEs are still at the micro level.

Second, operational efficiency has been proven to mediate the relationship between business digitalization and the performance of MSMEs. This indicates that with good digitalization, MSME actors can improve their operational efficiency and subsequently can enhance the performance of MSMEs. This addresses the failure to demonstrate directly the impact of business digitalization on the performance of MSMEs.

This research provides a deep understanding of the improvement of MSME performance through business digitalization, operational efficiency, and alleviation of financial constraints. This study seeks to integrate business digitalization and efficiency for the enhancement of MSME performance as a solution to the issues concerning the implementation of digitalization among MSME actors in Kendal Regency. This research innovatively offers a comprehensive understanding of the behavior of MSME actors regarding business digitalization, operational efficiency, alleviation of financial constraints, and their impact on MSME performance in Kendal Regency.

This research has limitations. First, a very small r value indicates that future research should add other variables related to digitalization and the performance of MSMEs. Second, this study was conducted on MSME actors in Kendal Regency, which does not yet have adequate infrastructure for the implementation of digitalization.

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