Journal of Information System Exploration and Research

https://shmpublisher.com/index.php/joiser

p-ISSN 2964-1160 | e-ISSN 2963-6361

# The Effect of Digitalization on Business Performance in the MSME Industry Context

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DOI: https://doi.org/10.52465/joiser.v2i1.199

Received 27 August 2023; Accepted 22 December 2023; Available online xx December 2023

**Article Info**

***Keywords:***

Digitalization;
Competitive advantage;
Business performance;
MSMEs

**Abstract**

The current digital era is increasingly developing in the use of new technology that creates value for companies and offers benefits. Digitalization is useful for increasing competitive advantage to improve business performance. The purpose of this study is to find out whether digitalization affects business performance and to find out whether competitive advantage can mediate digitalization on business performance. The sample of this research is 115 SMEs in Semarang. data were analyzed using the SEM approach with the smartPLS tool. The results of the study show that the digitalization variable has an influence on business performance, furthermore, competitive advantage also has a positive and significant effect on business performance. The results of the indirect effect test also show that competitive advantage can mediate the relationship between digitalization and business performance. The better the implementation of digitalization, the higher the competitive advantage MSMEs, consequently leading to an increase the business performance.



## 1. Introduction

Micro, Small, And Medium Enterprises (MSMEs) are important assets for economic sustainability in Indonesia. The sector has an important role in encouraging economic growth and supporting the creation of new jobs for the Indonesian population [1]. based on data in March 2021, the number of MSMEs reached 64.2 million with a contribution to the Gross Domestic Product of 61.07 percent or a value of IDR 8,573.89 trillion. MSMEs can absorb 97 percent of the total existing workforce and can collect up to 60.42 percent of total investment in Indonesia [2].

Small, And Medium Enterprises (SMEs) deal with challenges from intensified competition, the strength to adjust to fast-changing market searches, technological shifts, and capacity limitations

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associated with information, novelty, and creativity [3]. The existence of this competition makes companies faced with various opportunities as well as threats. Competitive advantage needs to be considered when compared with the main competitors, obvious competitive advantage can create a better reputation and higher customer satisfaction that will increase repeat purchases, attract new customers, improve firms' sales, and then enhance business performance so consumers can survive and make the company the choice of consumers in their purchasing decisions [4].

One way to judge whether a business has good progress or not is to look at the performance of the business. Business performance is the result of management activities. Organizational performance can be measured by how satisfied consumers are with the products or services offered as a result of their subscriptions [5]. Business performance can also be measured from the company's internal factors by looking at financial information, or other reports related to the company's production activities. Performance appraisal aims to monitor how effective the company's operations are. For companies, knowing their performance is very profitable. If the performance in a period is not satisfactory, it will be evaluated at the end of the period, so that the next period can be run better.

The increasing number of MSMEs that are developing in Indonesia, makes MSME owners also have to develop the strengths of their companies so that they can survive in increasingly fierce competition. Especially in this modern era, many small and medium businesses use technology as a force to develop their business either through product promotion, production, or marketing. Now more and more MSMEs do not have a physical place to sell, instead, they use digital technology to trade.

Martín-Peña et al in their research revealed that servitization and digitalization have a positive effect on firm performance [6]. However, different things were conveyed by Sanchez-Riofrio et al where in his research stated that market digitalization is negatively related to business performance [7]. Furthermore, Shehadeh et al. in their research stated that the adoption of digital marketing influences competitive advantage [8]. However, Lee & Falahat states that digitization does not have a direct effect on competitive advantage [9].

The implementation of the above strategy aims to achieve superior company conditions in the competition which will then lead to increased business performance. Competitive advantage itself is an advantage to exceed competitors obtained by offering greater value to consumers than competitors [10]. A firm with a stronger competitive advantage can earn better business performance than its competitors in the same market [4]. Ratnawati in his research found that the competitive advantage pushes a company to survive and make a profit [11]. However, in contrast to the research conducted by Laksana et al. where in his research stated that a competitive advantage does not have a significant effect on company performance [12].

Semarang is one of the cities with a large number of MSMEs that contribute greatly to the city's economy. MSMEs performance data as seen from three indicators, namely the number of MSMEs, the number of workers, and turnover of MSMEs in Semarang in 2015 and 2016 which are listed in the LKPJ of Dinas Koperasi dan UMKM in 2016 and 2018. The data states that the performance of MSMEs in the City of Semarang in 2016 decreased dramatically from the previous year. The data also conveys that one of the problems faced at that time was MSMEs that had not been able to optimize information technology to develop their businesses. However, in 2017, in addition to the increasing number of MSMEs, MSMEs in Semarang began to show positive things by absorbing more workers and increasing overall turnover. This increase continued in 2018, as indicated by an increase in overall data. Starting from 2017, MSMEs are considered to be more able to optimize information technology that has developed.

Research about the effects of digitalization, and competitive advantage on company performance is urgent and relevant to be explored based on several considerations concerning the empirical gap and the phenomenon gap as provided in the preceding paragraph. To determine whether the aforementioned variables have an impact on the performance of MSMEs in Semarang, researchers are interested in developing this research.

## 2. Literature Review

### Business Performance

MSME's performance can be seen and measured using financial and non-financial measures, but financial measures are the most frequently used in practice and theory [13]. Measuring business performance allows companies to focus on areas that need improvement by assessing how well the work

is being done in terms of cost, quality, quantity, and time [14]. Performance is the quantity and quality of task accomplishment, by individuals, groups, or organizations. As a result, organizational performance and improvement are considered to be at the core of corporate strategic management, and thus most of their efforts are poured into this area [15].

**Competitive advantage**

Competitive advantage can be defined as the aggregation of various items that differentiate MSMEs from their competitors and provide a unique and superior position in the market [16]. Competitive advantage encourages MSMEs to survive and benefit. Competitive advantage also encourages the performance of MSMEs through achieving profits, developing sales, and increasing the number of consumers [11]. Several studies on the effect of competitive advantage on business performance say that there is a positive influence between competitive advantage and business performance, as research conducted by Udriyah et al. explained that competitive advantage can improve the performance of an MSME [16]. Other studies have also found the same thing competitive advantage has a positive effect on business performance [17]–[20]. So, the hypothesis can be drawn as follows:

**$H_1$: Competitive advantage has a positive effect on the performance of MSMEs.**

**Digitalization**

Bloching et al. describe digital transformation as the continuous interconnection of all business sectors which is a requirement for adaptation to the digital economy [21]. Companies that have a strong ability to implement digitization can easily reach the market. In the long term, such conditions will be beneficial in increasing the number of markets characterized by a sustainable competitive advantage [22]. Several studies regarding the effect of digitalization on competitive advantage say that there is a positive influence between digitalization and competitive advantage, as research conducted by Knudsen et al. explained that the increased pace of digitalization affects the dynamics of competition and competitive outcomes [22]. Other studies have also found the same thing that digitalization has a positive effect on competitive advantage [8], [23], [24] that the hypothesis can be drawn as follows:

**$H_2$: Digitalization has a positive effect on the competitive advantage of MSMEs.**

Digitalization is used to describe the application of digital technologies and infrastructures in business, economy, and society [25]. Digitalization and digital transformation are some of the main drivers for change in the business world, as companies can develop new technologies based on the Internet with implications for society as a whole [26]. Several studies regarding the effect of digitalization on business performance say that there is a positive effect between digitalization and business performance, as research conducted by Martín-Peña et al. explained that digitization can improve the performance of MSMEs [6]. Other studies have also found the same thing that digitalization has a positive effect on business performance [17], [27], [28] the hypothesis can be drawn as follows:

**$H_3$: Digitalization has a positive effect on the performance of MSMEs.**

Several studies on the effect of digitalization on business performance through competitive advantage say that there is a mediating role for competitive advantage in the positive relationship between digitalization and business performance, as research conducted by Yuliantari & Pramuki explained that competitive advantage has a mediating role in the effect of digitalization on the performance of an MSME [23]. Other studies conducted by Indriastuti & Kartika have also found the same thing that competitive advantage has a mediating role in the effect of digitalization on business performance [29] the hypothesis can be drawn as follows:

**$H_4$: Digitalization affects the business performance of MSMEs through competitive advantage.**

Based on our review of the literature, the following conceptual framework was developed and can be shown in Figure 1.

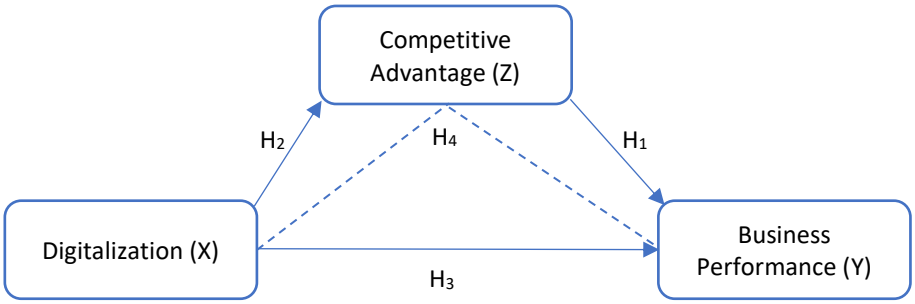


Figure 1. Conceptual model

## 3. Method

To test the hypothesis, the designed questionnaire contains several items that have been used in previous studies and from the researcher's elaboration. Construct measurement items for variables included in the causal model have been adapted from previous studies; performance [14], digitalization [7], and competitive advantage [30]. The items are measured using a five-point Likert scale in the questionnaire. Additionally, the questionnaire includes questions about demographic factors such as gender and age, and also questions about how long the business has been established. The population of this study consists of MSME owners in Semarang, Indonesia. The population size is not known with certainty, so an iteration formula was used to determine the number of samples to be studied [31], and a total of 115 respondents were found as samples in this study.

The research was conducted between June and July 2023. Structural Equation Modelling (SEM) was employed as the data analysis method in this study. To analyze the research data, Partial Least Squares (PLS) was utilized as a tool. Data were analyzed through the outer model, inner model, and then the hypothesis test

## 4. Results and Discussion

The total number of questionnaires distributed is 115 questionnaires. The study found three characteristics of the respondents: gender, age, and established. Table 1 summarizes the grouping of respondents' characteristics.

Table 1. Respondents' characteristics

| Gender | Frequency | Percentage |
|---|---|---|
| Men | 74 | 64% |
| Women | 41 | 36% |
| | 150 | 100% |
| Age | | |
| 23-27 | 6 | 5.2% |
| 28-32 | 9 | 7.8% |
| 33-37 | 23 | 20% |
| 38-42 | 36 | 31.3% |
| 43-47 | 14 | 12.1% |
| 48-53 | 11 | 9.5% |
| 54-57 | 9 | 7.8% |
| 58-62 | 7 | 6.3% |
| | 115 | 100% |
| Established | | |
| 2-3 years | 34 | 30% |
| 4-5 years | 57 | 50% |
| >6 years | 24 | 20% |
| | 115 | 100% |

Source: Data processed (2023)

Before processing the analysis of the proposed structural models, it is important to evaluate the measurement model. Items that do not meet the criteria in both models should be removed to ensure consistent measurement scales and to avoid errors when making comparisons. Additionally, the usual analysis applied to the measurement scale should be complemented with an invariance analysis to ensure the stability of measurement across different groups or conditions.

### 3.1. Outer Model Analysis

An outer model is a measurement model that evaluates how well the indicators (observable variables) are linked to the latent variables in the research model. It focuses on assessing the validity and reliability of the measurement indicators used in the study. By examining the outer model, researchers can determine the extent to which the chosen indicators accurately represent the underlying constructs and provide reliable and valid measurements. This evaluation is crucial for ensuring the quality and integrity of the research model.

#### 3.1.1. Convergent Validity

To assess convergence validity, researchers often examine the outer loading values and Average Variance Extracted (AVE) values. In the case of outer loading values, indicators are considered valid if their values exceed 0.7 [32]. Based on Figure 2, it can be observed that each statement item has obtained an outer loading value greater than 0.7, indicating that the indicators are valid and demonstrate convergence validity.

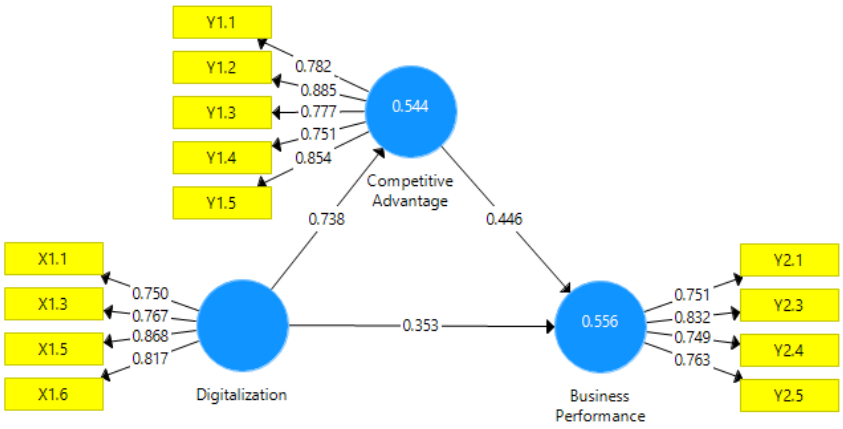


Figure 2. Validation model
Source: Data processed through Smart PLS 3 (2023)

However, it can also be seen that all variables have an incomplete statement. The statement indicator is eliminated from the data processing process, and repeated testing is carried out because it is invalid or has an outer loading value of <0.7.

Table 3. Construct reliability and validity

| | Cronbach's Alpha | rho_A | Composite Reliability | Average Variance Extracted (AVE) |
|---|---|---|---|---|
| Business Performance | 0,778 | 0,787 | 0,857 | 0,600 |
| Competitive Advantage | 0,869 | 0,870 | 0,906 | 0,658 |
| Digitalization | 0,813 | 0,816 | 0,877 | 0,642 |

Source: Data processed through Smart PLS 3 (2023)

Furthermore, data is considered valid if it meets the AVE criterion. The AVE value should ideally be equal to or greater than 0.5. This criterion ensures that the variance captured by the indicators is higher than the variance due to measurement error, indicating a satisfactory level of convergent validity [32]. Table 3 represents that each variable's AVE value has met the rule of thumb requirements, namely

having an AVE value > 0.5. Based on the analysis of the outer loading values and the AVE values, the indicators used in this study are deemed valid and meet the criteria for convergent validity. The outer loading values exceed the threshold of 0.7, indicating a strong relationship between the indicators and their respective latent variables. Additionally, the AVE values are above the recommended threshold of 0.5, suggesting that the indicators capture a significant proportion of the variance in their corresponding constructs. Therefore, the indicators in this study demonstrate satisfactory convergent validity.

3.1.2. Discriminant Validity

Discriminant validity refers to the degree to which a construct is distinct and captures unique phenomena that are not represented by other constructs in the model. It is a measure of the extent to which a construct is empirically separate from other constructs. Establishing discriminant validity is important because it ensures that each construct in the model captures unique aspects of the phenomenon under study and is not overlapping or redundant with other constructs. This distinction allows for a more accurate and meaningful interpretation of the relationships between variables in the model [32]. To establish discriminant validity, an indicator's outer loading on its associated construct should be higher than its cross-loadings or correlations with other constructs [32]. This means that the indicator should have a stronger relationship with its intended construct compared to its relationships with other constructs in the model. By ensuring that the indicator's loading on its construct is higher than its cross-loadings on other constructs, we can demonstrate that the construct is distinct and unique, capturing specific aspects of the phenomenon under investigation. This helps establish discriminant validity and supports the validity of the measurement model.

Table 4. Cross loading's

| | Business Performance | Competitive Advantage | Digitalization |
|---|---|---|---|
| X1.1 | 0,635 | 0,491 | 0,750 |
| X1.3 | 0,542 | 0,608 | 0,767 |
| X1.5 | 0,559 | 0,669 | 0,868 |
| X1.6 | 0,441 | 0,587 | 0,817 |
| Y1.1 | 0,533 | 0,782 | 0,568 |
| Y1.2 | 0,597 | 0,885 | 0,611 |
| Y1.3 | 0,609 | 0,777 | 0,615 |
| Y1.4 | 0,605 | 0,751 | 0,564 |
| Y1.5 | 0,512 | 0,854 | 0,628 |
| Y2.1 | 0,751 | 0,429 | 0,461 |
| Y2.3 | 0,832 | 0,632 | 0,588 |
| Y2.4 | 0,749 | 0,571 | 0,568 |
| Y2.5 | 0,763 | 0,528 | 0,476 |

Source: Data processed through Smart PLS 3 (2023)

Based on the information provided in Table 4, it can be observed that the correlation values between the constructs and their respective indicators are higher compared to the correlation values with other constructs. This indicates that each indicator is more strongly related to its corresponding construct than to other constructs in the model. Consequently, all indicators in this study can be considered to have good discriminant validity, as they demonstrate distinctiveness from other constructs and capture unique aspects of the phenomena being measured.

3.1.3. Reliability Test

Two methods, namely Cronbach's alpha and composite reliability, are employed in the reliability test of PLS (Partial Least Squares). For a questionnaire to be considered reliable, its internal consistency value should typically fall within the range of 0.6 to 0.7 [32]. This range serves as an indicator of the questionnaire's ability to consistently measure the intended construct [32]. Table 3 shows that

Cronbach's alpha and composite reliability are more significant than 0.6. It is proven that the instrument of a variable used has met the basic requirements (rule of thumb). So that this research instrument is declared reliable and valid.

### 3.2. Inner Model Analysis

The inner model test examines the structural framework of the data. This test aims to determine how variations in the contribution of exogenous variables affect endogenous variables. The higher the percentage, the more precise the data test will be.

Table 5. Analysis of R square

| | R Square | R Square Adjusted |
|---|---|---|
| Business Performance | 0,556 | 0,548 |
| Competitive Advantage | 0,544 | 0,540 |

Source: Data processed through Smart PLS 3 (2023)

According to Table 5, the business performance variable has an R-Square value of (0.556), implying that it receives a 55,6% contribution from digitalization and competitive advantage, also the other factors influence the rest. Furthermore, the competitive advantage variable has an R-squared value of (0.544), implying that digitalization contributes up to 54.4% of the total, with the remainder influenced by other factors.

### 3.3. Hypothesis Test

This hypothesis test employs the bootstrapping method, as evidenced by the significance test > 0.05 and a t-statistic value > 1.658 (t-table for n: 115) for the one-tailed hypothesis [32]. This test is carried out using two tests, which are direct and indirect effects.

#### 3.3.1. Direct Effect Hypothesis

The following can be seen from the results of hypothesis testing using the bootstrapping method, namely path analysis or path coefficients with direct effects.

Table 6. Direct effect

| | Original Sample (O) | Sample Mean (M) | Standard Deviation (STDEV) | T Statistics (\|O/STDEV\|) | P Values |
|---|---|---|---|---|---|
| Competitive Advantage -> Business Performance | 0,446 | 0,457 | 0,115 | 3,878 | 0,000 |
| Digitalization -> Business Performance | 0,353 | 0,348 | 0,116 | 3,052 | 0,002 |
| Digitalization -> Competitive Advantage | 0,738 | 0,740 | 0,044 | 16,863 | 0,000 |

Source: Data processed through Smart PLS 3 (2023)

According to the direct effect hypothesis test results, the concept of digitalization and competitive advantage is positively related to business performance (see Table 6). These results accept H1, H2, and H3, with t-statistic values more significant than the t-table (1.658) and p-values below 0.05. Digitalization can positively increase business performance, with an original sample value of 0.353 a T-Statistic of 3.052 > 1.658, and a P-Value of 0.002 <0.050. These results mean that the more massive the digitalization is carried out, the higher the business performance will be. Based on these results it can be concluded that digitalization has a positive and significant effect on business performance. Digitalization can positively increase competitive advantage, with an original sample value of 0.738 a T-Statistic of 16.863 > 1.658, and a P-Value of 0.000 <0.050. These results mean that the more massive the digitalization is carried out, the better the competitive advantage will be. Based on these results it can be concluded that digitalization has a positive and significant effect on competitive advantage.

Competitive advantage can positively increase business performance, with an original sample value of 0.446 a T-Statistic of 3.878 > 1.658, and a P-Value of 0.000 <0.050. These results mean that the better the competitive advantage is carried out, the higher the business performance will be. Based on

these results it can be concluded that competitive advantage has a positive and significant effect on business performance.

3.3.2. Indirect Effect Hypothesis

The following can be seen from the results of hypothesis testing using the bootstrapping method, namely path analysis or path coefficients with an indirect effect. The outcomes of the indirect effect hypothesis test are illustrated in Table 7 the statistical relationship that competitive advantage can mediate the effect of digitalization on business performance. These results accept H4, with t-statistic values more significant than the t-table (1.658) and p-values below 0.05.

Table 7. Indirect Effect

| | Original Sample (O) | Sample Mean (M) | Standard Deviation (STDEV) | T Statistics (\|O/STDEV\|) | P Values |
|---|---|---|---|---|---|
| Digitalization -> Competitive Advantage -> Business Performance | 0,329 | 0,340 | 0,094 | 3,505 | 0,000 |

Source: Data processed through Smart PLS 3 (2023)

Digitalization can positively increase business performance through competitive advantage with an original sample value of 0.329 a T-Statistic of 3.505 > 1.658 and a P-Value of 0.000 < 0.050, this means that when digitalization is good and reinforced by competitive advantage will increase business performance. That is, competitive advantage can mediate digitalization relationships on business performance.

MSMEs in Semarang have implemented digitization well. The way to do this is to use, namely using digital platforms, especially in marketing their products, and expanding their market by entering the marketplace, MSME owners also apply access where MSME players begin to increase their access to digital platforms, especially the Internet to get a lot of information that can they apply in their business, the skills of MSME owners are also increasing so that MSME owners can take advantage of digitalization to excel in competition and will improve their business performance.

Based on the application of digitalization, can encourage MSME owners to always excel in competition, in this case, competitive advantage will further increase the influence of digitalization applied by MSME owners to be able to improve their business performance, such as marketing products more broadly in the marketplace, getting more information they can apply it in their business based on the access they have, and are increasingly able to apply digitization in various business lines to be ahead of the competition so that in the end it will improve business performance.

## 5. Conclusion

Based on the research findings and discussion, it can be concluded that competitive advantage mediates the positive influence of digitalization on business performance. Competitive advantage was found to mediate the relationship between digitalization and business performance. The better the implementation of digitalization, the higher the competitive advantage MSMEs, consequently leading to an increase the business performance. This research has limitations based on the research that has been done. This limitation is that only examines a simple framework without examining other factors that influence business performance. Future research is expected to be able to include other influential factors such as entrepreneurial marketing or capital, because from the observations it was found that MSMEs in Semarang have similar problems with their initial capital.

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