

Analysis of the Role of Information Technology in Driving Digital Transformation of UMKM in the Digital Economy Era in Indonesia

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Abstract : This study aims to determine the effectiveness of information technology utilization in driving digital transformation in the Micro, Small, and Medium Enterprises (UMKM) sector, especially in the Bulukumba area. In the midst of the development of the digital economy, technology is a strategic factor to improve operational efficiency, expand market reach, and strengthen business competitiveness. However, the implementation of technology among UMKM is not optimal because it is still faced with various obstacles such as low digital literacy, limited devices, and lack of training. This study uses a descriptive quantitative approach with three main indicators, namely the use of information technology, digital transformation, and UMKM performance and competitiveness. Information technology is considered to help accelerate transactions, improve financial records, expand promotions, and encourage product innovation. Thus, the use of digital technology has proven effective in supporting the transformation of UMKM in a sustainable and competitive manner in the digital economy era.

Keywords : *Information technology; Digital transformation; UMKM; Digital economy.*

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Abstract: This study aims to determine the effectiveness of the use of information technology in driving digital transformation in the Micro, Small, and Medium Enterprises (UMKM) sector, especially in the Bulukumba area. In the midst of the development of the digital economy, technology is a strategic factor to improve operational efficiency, expand market reach, and strengthen business competitiveness. However, the implementation of technology among UMKM is not optimal because it is still faced with various obstacles such as low digital literacy, limited devices, and lack of training. This study uses a descriptive quantitative approach with three main indicators, namely the use of information technology, digital transformation, and the performance and competitiveness of UMKM. Information technology is considered to help accelerate transactions, improve financial records, expand promotions, and encouraging product innovation. Thus, the use of digital technology has proven effective in supporting the transformation of UMKM in a sustainable and competitive manner in the digital economy era.

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Introduction

In today's digital economy era, the use of information technology (IT) is an important element in supporting the growth and transformation of the micro, small, and medium enterprises (UMKM) sector. Information technology plays a role in increasing operational efficiency, expanding market reach, accelerating business processes, and increasing the competitiveness of UMKM. In an ideal context, UMKM actors are able to utilize various digital platforms such as marketplaces, digital cashier systems (Point of Sales), and financial recording applications to support business activities more effectively and adaptively. (Laudon & Laudon, 2020).

The role of UMKM in absorbing labor, increasing community income, and encouraging local economic activity makes them the backbone of the economy, especially in developing areas such as Bulukumba Regency, South Sulawesi. Until early 2024, the Bulukumba Regency Cooperatives, SMEs, Trade and Industry Service recorded more than 45,000 active UMKM units, with the largest distribution in Ujungbulu, Kajang, and Bontobahari Districts. The dominant types of businesses include culinary, handicrafts, retail trade, and home production. Based on official data, the total turnover of UMKM actors in Bulukumba reaches more than IDR 670 billion per year, or an average of IDR 15 million per business unit (Bulukumba UKM Diskop, 2024).

However, the reality on the ground shows that many UMKM in Indonesia are still not fully able to utilize information technology optimally. Limited digital infrastructure, low digital literacy, and minimal access to training and mentoring are the main obstacles in the UMKM digitalization process. (Hisnul et al., 2022).

Several previous studies have proven a positive correlation between the use of information technology and increased performance of UMKM. The use of the internet and e-commerce platforms significantly impacts sales growth and market reach of UMKM. (Rahayu & Day, 2017). That the use of digital features such as paid advertising and product catalogs can drive market expansion and revenue growth. (Pratama, Y., & Anshori, M. (2020)). It also shows that the use of a digital cashier system (POS) increases the efficiency of transaction recording and simplifies the business evaluation process (Utami, S. (2019)).

Based on these conditions, there is a gap between the potential use of information technology and the reality faced by UMKM in the field. Therefore, this study is relevant to be carried out in order to analyze more comprehensively how the role of information technology in driving the digital transformation of UMKM.

This study aims to analyze the role of information technology in driving the digital transformation of UMKM, especially in facing challenges and taking advantage of opportunities in the digital economy era. The results of this study are expected to provide contributions both theoretically and practically, especially in strengthening the digitalization strategy of UMKM in Indonesia. This study also emphasizes the importance of understanding the use of technology, the obstacles faced by UMKM actors, and the impacts on business sustainability and growth.

In addition, this study focuses on the use of digital technology by UMKM who have integrated information systems into their business activities. A comprehensive review is

carried out on the level of technology adoption, the digital transformation process that occurs, and its implications for operational efficiency and business competitiveness. With this approach, the study is expected to be able to broaden the understanding of the dynamics of UMKM digitalization in the context of real practice, as well as being the basis for strategic decision making and the development of relevant policies.

Unlike most previous studies that focus on UMKM in urban areas, this study focuses on the local context in a developing area, namely Bulukumba Regency. This study also integrates three important aspects of the level of technology utilization, the digital transformation process, and its influence on business efficiency and competitiveness, so as to provide a more comprehensive and applicable picture in supporting the implementation of UMKM digitalization.

Method

This study uses a descriptive quantitative method with a field survey approach that aims to evaluate the level of information technology utilization by UMKM actors in the context of digital transformation. This approach is considered relevant to identify general trends, measure perceptions, and explain the relationship between variables numerically. According to Sugiyono, (2015) the quantitative approach is very suitable for answering objective research questions, testing variable relationships, and relying on numerical data. However, he also emphasized the importance of choosing a method that is appropriate to the characteristics of the research problem at hand. Therefore, this approach was chosen to obtain systematic and generalizable data regarding the contribution of information technology to the transformation of UMKM in the digital era.

The main objective of this study is to determine the extent to which the use of information technology affects aspects of operational efficiency, market reach, and competitiveness of UMKM. This study is expected to provide a basis for policy making and digitalization implementation strategies for the UMKM sector more broadly.

Population, Sample, Sampling

The population in this study is the community that runs micro, small, and medium enterprises (UMKM) in Bulukumba Regency, South Sulawesi. Based on data from the Cooperatives, SMEs, Trade and Industry Service of Bulukumba Regency, there are more than 45,000 UMKM actors spread across various sub-districts until 2024 (Diskop UKM Bulukumba, 2024).

However, this study specifically focuses on UMKM who have utilized digital technology in their business operations, such as the use of marketplaces, business social media, digital financial recording applications, or Point of Sale (POS) systems. The inclusion criteria in this study are UMKM in Bulukumba who have used at least one type of digital technology to support their business. The exclusion criteria are UMKM who have never used or do not have access to information technology.

A total of 20 respondents were selected as samples through purposive sampling technique, which is a method of selecting samples intentionally based on certain characteristics that are relevant to the research objectives. This technique was chosen to

ensure that respondents truly represent the group of UMKM that have been involved in the digital transformation process.

Instrument

Research instruments are tools used by researchers to collect data needed to answer the problem formulation and achieve research objectives. In this study, the instrument used was a closed questionnaire based on a 5-point Likert scale, which was arranged in the form of multiple-choice statements ranging from "Strongly Disagree" to "Strongly Agree". (Sugiyono, D, 2015)

The questionnaire was distributed online using the Google Form platform to respondents who were UMKM using information technology. The selection of the questionnaire method was made because it was considered efficient to reach respondents widely and obtain data in a relatively short time. In addition, the use of Google Form also facilitates the process of inputting and recapitulating data and minimizes recording errors. The questionnaire form can be accessed via the following link: <https://forms.gle/MfgzKxkf8dLFGUzy8>

The statements in the questionnaire were developed based on three main research indicators, namely: (1) utilization of information technology, (2) digital transformation, and (3) performance and competitiveness of UMKM. The preparation of indicators is based on the results of modifications from previous studies by Rahayu and Day (2017), and Setiadi (2020), which have been tested for relevance in the context of UMKM.

Table 1 Categorization of Responses (Sugiyono, D, 2015.)

<i>Score Interval (%)</i>	<i>Categorization</i>
<i>81-100</i>	<i>Strongly agree</i>
<i>61-80</i>	<i>Agree</i>
<i>41-60</i>	<i>Neutral</i>
<i>21-40</i>	<i>Don't agree</i>
<i>0-20</i>	<i>Strongly Disagree</i>

Results and Discussion

Results

This study aims to evaluate the extent to which the use of information technology is able to drive the digital transformation of UMKM in the era of the digital economy in Indonesia. The evaluation is carried out based on three main indicators, namely : (1) utilization of information technology, (2) digital transformation, and (3) performance and competitiveness of UMKM.

Utilization of Information Technology

On the indicator First, the analysis results show that all statements on the information technology utilization indicator are categorized as "agree". The "Agree" category is determined based on the calculation results using a five-point Likert scale. The total score obtained from all respondents is added up and divided by the maximum possible score,

then converted into a percentage. Furthermore, the percentage results are classified into assessment categories based on the interval developed by Sugiyono (2015), where the range of 70-79% is included in the "Agree" category.

Based on the calculation results, the information technology utilization indicator obtained an average score in the range of 70–79%, which is in accordance with the "Agree" category. In the first statement, UMKM actors stated that the use of applications for e-commerce sales was in accordance with their business needs, with the majority of respondents agreeing. Based on the survey results, 50% of respondents chose "Agree" and 30% chose "Strongly Agree", so that a total of 80% of respondents gave a positive response to the statement that they use applications for e-commerce sales. Meanwhile, only a small number of respondents answered "Neutral" (15%) and "Disagree" (5%), and no respondents chose "Strongly Disagree". This shows that e-commerce platforms such as Tokopedia and Shopee provide features that are relevant, easily accessible, and support sales operations effectively.

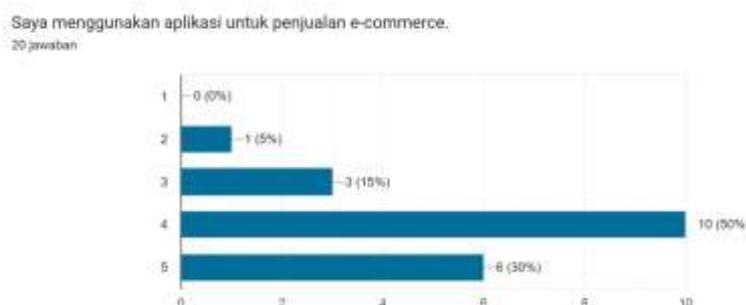


Figure 1. Results of Application Usage Level Survey

The second statement states that UMKM use applications to record business income and expenses, and received an affirmative response. Based on the survey results, 50% of respondents chose "Agree" and 30% chose "Strongly Agree", so that a total of 80% of respondents gave a positive response to the statement that they use applications to record business income and expenses. Meanwhile, only a small number of respondents answered "Neutral" (15%) and "Disagree" (5%), and no respondents chose "Strongly Disagree". This reflects that the financial recording features offered by digital applications such as Buku Warung or similar applications have been adjusted to the needs of small business actors, and are designed practically and easily to use to record transactions periodically and accurately.



Figure 2. Survey Results on the Level of Use of Financial Recording Applications

Meanwhile, the third statement states that digital technology accelerates the transaction process of UMKM, and received an agreeing response from most respondents. The survey results show that the majority of UMKM responded positively to this statement. As many as 45% of respondents chose "Agree" and 40% chose "Strongly Agree", which when combined reached 85% of respondents. Meanwhile, only 15% of respondents answered "Neutral", and there were no respondents who chose the categories "Disagree" or "Strongly Disagree". This shows that digital systems, such as cashier applications (Point of Sale) or e-commerce platforms, are considered capable of increasing transaction efficiency, reducing customer waiting time.

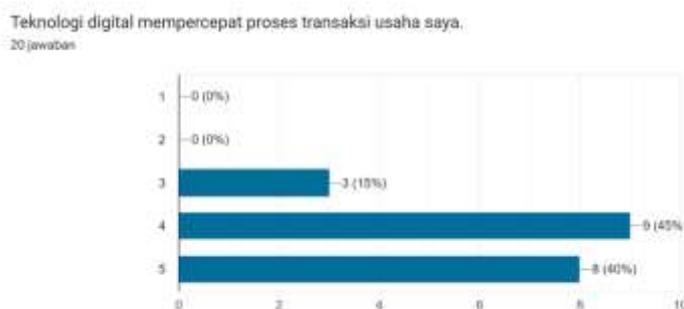


Figure 3. Results of the Survey on Transaction Acceleration Through Digital Technology

The survey results on the information technology utilization indicator show that the majority of UMKM have integrated various forms of digital technology into their business activities. Most respondents chose the categories "Agree" and "Strongly Agree". This finding shows that application technology is considered capable of answering the needs of business actors in reaching a wider market and facilitating the transaction process.

Digital Transformation

Evaluation of the second indicator shows that all statements obtained the agree category based on a high quantitative average score. The "Agree" category is determined based on the calculation results using a five-point Likert scale. The total scores obtained

from all respondents are added up and divided by the maximum possible score, then converted into a percentage. Furthermore, the percentage results are classified into assessment categories based on the interval developed by Sugiyono (2015), where the range of 70-79% is included in the "Agree" category.

Based on the calculation results, the digital transformation indicator obtained an average score in the range of 70–79%, which is in accordance with the "Agree" category. Statements about digital transformation obtained an average score of 3.81, indicating that digital technology directly supports efficiency and effectiveness in business activities.

The first statement is that UMKM have replaced manual systems with digital systems in running their businesses, and received an average score of 4. Based on the survey results graph of 20 respondents, 55% of respondents chose "Agree" and 35% chose "Strongly Agree", so that the total positive response reached 90%. Only 15% of respondents chose "Neutral", and none answered "Disagree" or "Strongly Disagree". This shows that the digital transformation process has taken place in real terms at the UMKM operational level, marked by the shift from manual recording to the use of digital applications in financial management, sales, and inventory.

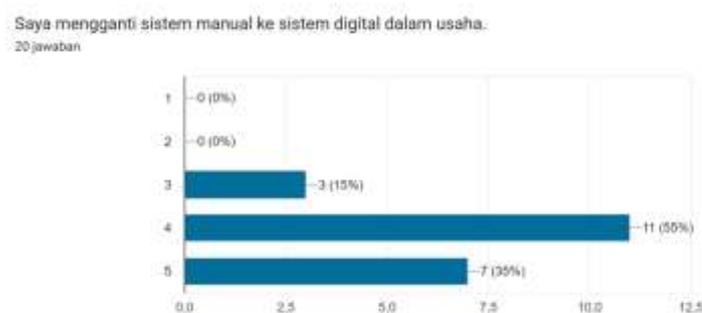


Figure 4. Results of the Digital System Adoption Level Survey

Meanwhile, the statement second stated that UMKM actors feel accustomed and comfortable using technology in running their businesses, and get an average score of 4.1. The survey results show that the majority of UMKM feel accustomed and comfortable using technology in their business. It is known that 50% of respondents chose "Agree" and 40% chose "Strongly Agree", so that the total positive response reached 90%. Meanwhile, only 5% each answered "Neutral" and "Disagree", and no one chose "Strongly Disagree". This shows that the majority of business actors have experienced a good adaptation process to the use of digital applications and platforms in their daily business activities.



Figure 5. Results of the Survey on Adaptation and Comfort of Using Technology

third statement states that UMKM actors have basic skills in operating digital systems, and get an average score of 3.95 . Based on the response graph from 20 respondents, 55% of respondents chose "Agree" and 30% chose "Strongly Agree", so that the total positive response reached 85%. Meanwhile, 15% of respondents answered "Neutral", and none chose "Disagree" or "Strongly Disagree". This shows that most business actors already have basic digital literacy that is sufficient to run various business support applications, such as financial recording applications, marketplaces, business social media, and digital payment systems.



Figure 6. Results of the Survey on the Basic Ability Level of UMKM in Operating Digital Systems

Meanwhile, the fourth statement states that UMKM actors have attended training on digitalization of UMKM and get an average score 3.05. The survey results show that the majority of UMKM actors have participated in training on UMKM digitalization regarding this statement. It is known that 30% of respondents chose "Agree" and 20% "Strongly Agree", while 15% answered "Neutral", and 25% "Disagree", and 10% "Strongly Disagree". This shows the need to improve more inclusive and sustainable digital literacy programs.



Figure 7. Results of the Survey of UMKM Participation in Business Digitalization Training

The fifth statement states that UMKM actors create business innovation with the help of technology and get an average score 3.95. Of the 20 respondents of UMKM actors surveyed, the results obtained were that the majority agreed with the statement. As many as 50% of respondents chose "Agree", and 35% chose "Strongly Agree", which means that 85% of respondents showed a positive attitude towards the use of technology in their business innovation. Meanwhile, 5% of respondents answered "Neutral", and the remaining 10% chose "Disagree". No respondents chose "Strongly Disagree". This shows that UMKM actors have utilized technology not only for operational efficiency, but also as a means to create innovation in products, services, and marketing strategies.



Figure 8. Results of the Technology-Based Business Innovation Survey

The survey results on the digital transformation indicator show that the majority of UMKM responded "Agree" and "Strongly Agree" to statements related to the transition from manual to digital systems, comfort in using technology, and basic skills in operating digital systems. This finding indicates that most respondents have experienced a fairly good digital adaptation process. Although there are respondents who have not received formal training related to digitalization, the dominance of "Agree" answers shows that digital transformation has taken place in real terms and is supported by individual readiness, although it still requires increased support for training and ongoing mentoring.

Performance and Competitiveness of UMKM

And finally, the third indicator, the performance and competitiveness of UMKM, showed very favorable results. The "Strongly Agree" category is determined based on the calculation results using a five-point Likert scale. The total scores obtained from all respondents are added up and divided by the maximum possible score, then converted into a percentage. Furthermore, the percentage results are classified into assessment categories based on the interval developed by Sugiyono (2015), where the range of 81% is included in the "Strongly Agree" category.

Based on the calculation results, the performance and competitiveness indicators of UMKM obtained an average score above 81%, which is in accordance with the category of "Strongly Agree". The survey results show that the majority of UMKM actors felt an increase in sales after adopting technology in their businesses. It is known that 45% of respondents chose "Agree" and 45% "Strongly Agree", while 5% answered "Neutral", and the remaining 5% "Disagree", while no one chose "Strongly Disagree". The first statement regarding business sales increasing since using technology obtained an average score of 4.15.



Figure 9. Results of the UMKM Perception Survey on Sales Increases after Using Technology

The second statement, regarding technology makes UMKM products known to more people and gets an average of 4.35. The survey results show that the majority of UMKM technology makes products known to more people . It is known that 30 % of respondents chose "Agree" and 60 % "Strongly Agree", while 10% answered "Neutral", and there were no respondents who chose the category "Disagree" or "Strongly Disagree".



Figure 10. Results of the Survey of UMKM Perceptions of the Role of Technology in Increasing the Reach of Product Promotion

The third statement, regarding business operations becoming more efficient since digitalization, obtained an average score of 4.4. The survey results show that the majority of UMKM' business operations have become more efficient since digitalization . It is known that 40 % of respondents chose "Agree" and 50 % "Strongly Agree", while 10% answered "Neutral", and there were no respondents who chose the categories "Disagree" or "Strongly Disagree".

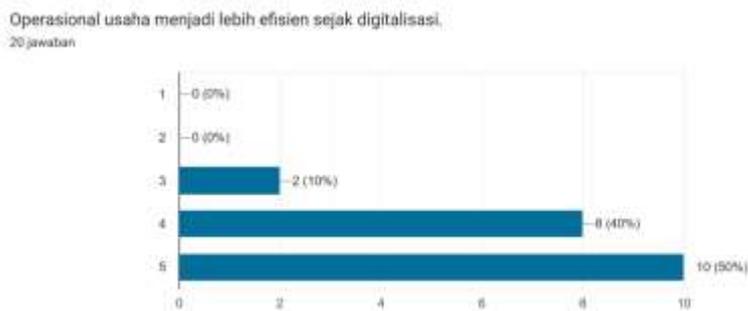


Figure 11. Results of the Survey of UMKM Perceptions of Business Operational Efficiency after Digitalization

The fourth statement, regarding UMKM actors feeling that their business is superior to competitors who are not yet digital, obtained an average of 4.05. The survey results show that the majority of UMKM actors feel that their business is superior to competitors who are not yet digital . It is known that 25 % of respondents chose "Agree" and 45 % "Strongly Agree", while 30% answered "Neutral", and the remaining 5% "Disagree", while no one chose "Strongly Disagree".

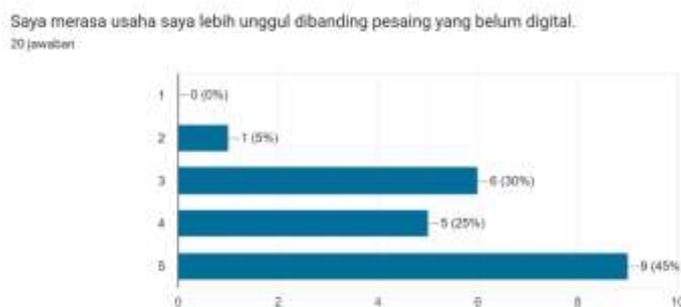


Figure 12. Results of the Survey of UMKM Perceptions of Business Superiority after Digitalization compared to Competitors

As for the last statement, regarding technology making it easier for UMKM to meet customer needs with an average score of 4.5. The survey results show that the majority of UMKM feel that technology makes it easier to meet customer needs . It is known that 40 % of respondents chose "Agree" and 55 % "Strongly Agree", while none chose "Neutral", and the remaining 5% "Disagree", while none chose "Strongly Disagree".

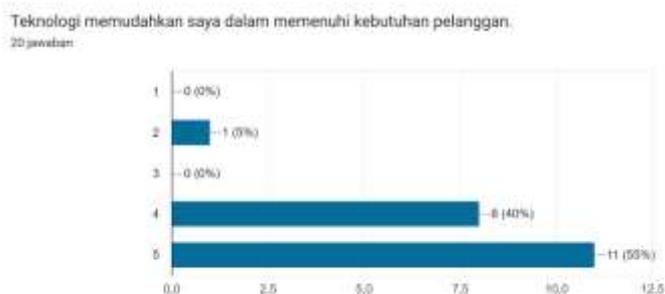


Figure 13. Results of the Survey of UMKM Perceptions on the Ease of Meeting Customer Needs through Technology

The survey results on the performance and competitiveness indicators of UMKM show that most business actors stated "Agree" and "Strongly Agree" that the use of technology has increased operational efficiency, expanded marketing, and encouraged business excellence compared to competitors that have not been digitized. Respondents also stated that technology makes it easier to meet customer needs and contributes to increased sales. This confirms that the use of information technology has a positive impact on the sustainability and growth of UMKM, and is an important factor in maintaining competitiveness amidst increasingly competitive market competition.

Based on the results of research on three main indicators, namely the use of information technology, digital transformation, and the performance and competitiveness of UMKM, an average score was obtained indicating the category of "strongly agree". UMKM actors consider that digital technology is easy to use, relevant to business needs, and makes it easier to record finances, promote products, and process transactions efficiently.

Discussion

The results of the study show that the use of information technology by UMKM in Bulukumba Regency has a positive impact on operational efficiency, business management, and expanding market reach. The majority of respondents stated that the use of technology such as digital financial recording applications, marketplace platforms, business social media, and Point of Sale (POS) systems facilitates the transaction process, increases recording accuracy, and speeds up response to customers.

This finding is in line with the research of Rahayu and Day (2017), which states that the adoption of e-commerce can significantly increase sales and customer reach in UMKM in developing countries. This is also supported by Suryani et al. (2021), who highlighted the role of social media as an effective promotional tool, especially during the pandemic, because it can establish direct interaction with consumers.

In addition, as explained by Utami (2019), the digital cashier system (POS) is considered to help UMKM in recording daily transactions in real time and evaluating business finances. This is in accordance with the results of the survey, where business actors feel helped in recording cash flow and minimizing transaction errors. Pratama and Anshori (2020) also added that advertising features and digital product catalogs have proven to be

able to expand the market and increase turnover, something that was agreed by respondents who had actively marketed products through digital platforms.

However, compared to previous studies that focused on UMKM in urban areas, this study reveals that business actors in areas such as Bulukumba still face obstacles in optimizing technology. Limited devices, lack of training, and uneven digital literacy are the main obstacles in implementing digitalization as a whole.

Setiadi (2020) also emphasized the importance of digital literacy as a primary prerequisite for the success of digital transformation in the small business sector. Therefore, real support is needed from local governments, universities, and UMKM support institutions in providing education, technical training, and ongoing assistance in order to create an equitable, inclusive, and sustainable digital transformation.

Different from most previous studies that generally highlight the adoption of information technology in UMKM on a national scale or in economic centers, this study pays special attention to the context of UMKM that have implemented digital technology independently. This study also combines three important aspects in a structured manner, namely the use of information technology, the digital transformation process, and its impact on business performance and competitiveness. Thus, the results of this study not only explain the relationship between variables, but also present an empirical picture of the readiness and real challenges faced by UMKM actors in the digitalization process.

Overall, this discussion confirms that information technology has a strategic role in driving UMKM performance, but its effectiveness is greatly influenced by the readiness of business actors, the supporting environment, and the quality of available assistance.

Conclusion

The results of the study show that the use of information technology by UMKM is very effective in supporting digital transformation of businesses. All main indicators including the use of information technology, digital transformation, and performance and competitiveness of UMKM received an assessment in the category of "strongly agree" from respondents.

UMKM feel significant benefits from the use of digital applications, ranging from ease of financial recording, acceleration of transaction processes, expansion of product promotions, to increasing overall operational efficiency. In addition, technology also plays a role in encouraging business innovation, increasing competitiveness, and building business actors' self-confidence in facing an increasingly competitive market. Thus, the implementation of information technology has proven to provide a real contribution to the acceleration of the digital transformation of UMKM in Indonesia, as well as being an important adaptive strategy in facing the challenges of the dynamic and technology-based digital economy era.

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