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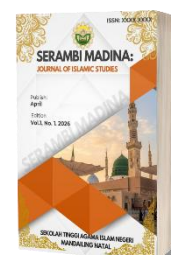
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The Effect of Digital Technology on MSME Performance in North Padang Lawas

ORIGINAL ARTICLE

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Abstract

This study aims to examine the impact of digital technology on the performance of Micro, Small, and Medium Enterprises (MSMEs) in North Padang Lawas. The research employs a quantitative approach using a survey method. Data were collected from 100 MSME owners through structured questionnaires distributed randomly. The variables analyzed include digital technology adoption as the independent variable and MSME performance as the dependent variable, measured through indicators such as sales growth, market expansion, and operational efficiency. Data analysis was conducted using descriptive statistics and simple linear regression. The results indicate that digital technology adoption has a positive and significant effect on MSME performance. MSMEs that utilize digital platforms, such as social media and e-commerce, tend to achieve higher sales and broader market reach compared to those that rely on conventional methods. Furthermore, digital technology also improves efficiency in business operations. These findings suggest that increasing digital literacy and access to technology is essential to enhance MSME competitiveness in the digital era.

Keywords: Digital Technology; MSMEs; Performance

Abstrak

Penelitian ini bertujuan untuk menganalisis pengaruh teknologi digital terhadap kinerja Usaha Mikro, Kecil, dan Menengah (UMKM) di Padang Lawas Utara. Penelitian ini menggunakan pendekatan kuantitatif dengan metode survei. Data dikumpulkan dari 100 pelaku UMKM melalui kuesioner terstruktur yang disebarakan secara acak. Variabel yang dianalisis meliputi adopsi teknologi digital sebagai variabel independen dan kinerja UMKM sebagai variabel dependen, yang diukur melalui indikator pertumbuhan penjualan, perluasan pasar, dan efisiensi operasional. Analisis data dilakukan menggunakan statistik deskriptif dan regresi linear sederhana. Hasil penelitian menunjukkan bahwa adopsi teknologi digital berpengaruh positif dan signifikan terhadap kinerja UMKM. UMKM yang memanfaatkan platform digital seperti media sosial dan e-commerce cenderung memiliki peningkatan penjualan dan jangkauan pasar yang lebih luas dibandingkan dengan yang masih menggunakan metode konvensional. Selain itu, teknologi digital juga meningkatkan efisiensi dalam operasional usaha. Temuan ini menunjukkan pentingnya peningkatan literasi digital dan akses teknologi guna meningkatkan daya saing UMKM di era digital.

Kata Kunci: Teknologi Digital; UMKM; Kinerja

INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) play a crucial role in driving economic growth, particularly in developing countries such as Indonesia. MSMEs contribute significantly to employment generation, poverty reduction, and income distribution. (Utami et al., 2023). In Indonesia, MSMEs dominate the business sector, accounting for more than 90% of total enterprises and absorbing a large proportion of the workforce. Their presence is not only vital in urban areas but also in rural regions, including North Padang Lawas, where MSMEs serve as the backbone of local economic activities. (Hardana et al., 2024).

Despite their significant contributions, MSMEs often face various challenges that hinder their growth and sustainability. These challenges include limited access to capital, low levels of managerial capability, lack of innovation, and limited market access. In addition, many MSMEs still rely on traditional business practices, which reduce their competitiveness in an increasingly dynamic and globalized market environment. (Hardana et al., 2023). Therefore, there is a growing need for MSMEs to adopt modern approaches, particularly through the integration of digital technology, to enhance their performance and competitiveness. (Lismawati et al., 2024; Hasibuan et al., 2025).

The rapid advancement of digital technology has transformed the way businesses operate across the globe. Digital tools such as social media platforms, e-

commerce marketplaces, digital payment systems, and cloud-based applications have enabled businesses to expand their market reach, improve operational efficiency, and enhance customer engagement. For MSMEs, digital technology offers opportunities to overcome traditional barriers, such as geographical limitations and high operational costs. By utilizing digital platforms, MSMEs can access wider markets, communicate directly with customers, and streamline their business processes. (Nasution et al., 2026).

In Indonesia, the government has actively encouraged digital transformation among MSMEs through various programs and policies. (Nasution et al., 2025). Initiatives such as digital literacy training, financial inclusion programs, and support for e-commerce adoption aim to accelerate the integration of MSMEs into the digital economy. However, the level of digital adoption among MSMEs varies significantly across regions. Urban areas tend to exhibit higher levels of digitalization compared to rural regions, where access to infrastructure, education, and technology remains limited. This disparity highlights the importance of examining the impact of digital technology in specific local contexts, such as North Padang Lawas. (Mutiah et al., 2025).

North Padang Lawas is one of the regions where MSMEs play a central role in supporting the local economy. The majority of MSMEs in this area operate in sectors such as agriculture, trade, food processing, and small-scale manufacturing. In recent years, some MSMEs have begun to incorporate digital technologies into their business activities, particularly for marketing, communication, payment, and sales. Commonly used digital tools include smartphones and social media platforms such as WhatsApp, Facebook, and Instagram, which are primarily utilized to communicate with customers, promote products, and receive orders. Some MSMEs also use digital payment services, including QR-based payment systems, to facilitate transactions. In addition, a number of MSMEs have started to explore e-commerce and online marketplaces to expand their customer reach beyond their immediate local markets. However, the adoption of more integrated digital business systems remains relatively limited. Many MSMEs continue to rely on social media and messaging applications rather than dedicated e-commerce platforms, digital inventory systems, accounting software, or customer relationship management systems. This situation is associated with limited digital literacy, inadequate internet infrastructure, limited financial resources, and a lack of awareness regarding the potential benefits of more advanced digital technologies. Consequently, although basic digital tools have begun to support marketing and transactions among MSMEs in North Padang Lawas, the broader

potential of digitalization for improving operational efficiency, market access, financial management, and business competitiveness has not yet been fully realized. (Ajjiah et al., 2022).

The adoption of digital technology is expected to influence MSME performance in several ways. First, digital platforms can enhance marketing effectiveness by enabling businesses to reach a broader audience at a lower cost. (Sri Wanna et al., 2023). Social media platforms, for example, allow MSMEs to promote their products and interact with customers in real time. Second, e-commerce platforms provide opportunities for MSMEs to expand beyond local markets and access national or even international consumers. Third, digital payment systems facilitate faster and more secure transactions, improving customer satisfaction and operational efficiency. Finally, digital tools can support better business management through data collection, analysis, and decision-making processes. (Hardana et al., 2024).

However, the relationship between digital technology adoption and MSME performance is not always straightforward. While digital tools offer numerous benefits, their effectiveness depends on how well they are utilized. MSMEs that lack the necessary skills or resources may not be able to fully leverage digital technology. In some cases, the adoption of technology without proper understanding may even lead to inefficiencies or increased costs. Therefore, it is important to examine not only whether MSMEs adopt digital technology but also how they use it and the extent to which it contributes to their performance. (Hardana et al., 2025).

Previous studies have shown mixed results regarding the impact of digital technology on MSME performance. Some studies indicate a positive and significant relationship, suggesting that digital adoption leads to increased sales, improved efficiency, and enhanced competitiveness. (Hasibuan et al., 2023). Other studies, however, highlight challenges such as digital divide, resistance to change, and limited capabilities, which may reduce the effectiveness of digital technology. These inconsistencies suggest the need for further research, particularly in specific regional contexts where local conditions may influence the outcomes. (Nasution et al., 2023).

This study focuses on MSMEs in North Padang Lawas to provide empirical evidence on the impact of digital technology on business performance. By adopting a quantitative approach, this research aims to measure the relationship between digital technology adoption and MSME performance using statistical analysis. (Utami et al., 2023). The findings of this study are expected to contribute to the existing literature by providing insights into the role of digital technology in rural and semi-urban contexts. (Hardana et al., 2023).

Furthermore, this research has practical implications for policymakers, business practitioners, and other stakeholders. (Hardana et al., 2024). For policymakers, the findings can serve as a basis for designing more effective programs to support digital transformation among MSMEs. (Hardana et al., 2025). For MSME owners, the study provides insights into the potential benefits of digital technology and the importance of enhancing digital capabilities. For researchers, this study contributes to the understanding of how digital technology influences MSME performance in different contexts. (Utami et al., 2023).

In addition, this study addresses the gap in the literature by focusing on a specific region that has received relatively little attention in previous research. Most studies on digital technology and MSMEs in Indonesia tend to focus on major cities or economically developed regions. (Hardana et al., 2026). By examining North Padang Lawas, this research provides a more comprehensive understanding of the challenges and opportunities faced by MSMEs in less developed areas. (Hasibuan et al., 2025).

The main objective of this study is to analyze the impact of digital technology on the performance of MSMEs in North Padang Lawas. (Hardana et al., 2022). Specifically, this study aims to (1) identify the level of digital technology adoption among MSMEs, (2) analyze the effect of digital technology on business performance, and (3) provide recommendations to enhance the effectiveness of digital transformation in the MSME sector. (Utami et al., 2023).

In conclusion, the integration of digital technology into MSME operations is becoming increasingly important in the modern business environment. (Utami et al., 2023). While digital tools offer significant opportunities for growth and development, their successful implementation requires adequate skills, resources, and support. Understanding the impact of digital technology on MSME performance is essential to ensure that MSMEs can fully benefit from the digital economy. Therefore, this study seeks to provide a comprehensive analysis of this relationship in the context of North Padang Lawas, contributing to both academic knowledge and practical applications.

LITERATURE REVIEW

Micro, Small, and Medium Enterprises (MSMEs) are recognized as a vital component of economic development, especially in developing countries. MSMEs contribute significantly to job creation, income generation, and poverty alleviation. In Indonesia, MSMEs dominate the economic structure and play an essential role in strengthening local economies, including in rural areas such as North Padang Lawas.

According to prevailing regulations, MSMEs are categorized based on asset ownership and annual turnover. Micro enterprises are typically small-scale businesses managed individually or by families, while small and medium enterprises have more structured operations and higher levels of capital. Despite their importance, MSMEs often face constraints such as limited access to financing, low technological capability, and weak managerial skills, which hinder their growth and competitiveness.

Digital technology refers to the use of electronic tools, systems, devices, and resources that generate, store, or process data. In the context of MSMEs, digital technology includes social media, e-commerce platforms, digital payment systems, and business management applications. The adoption of digital technology has become increasingly important in enhancing business operations and market competitiveness.

Technology adoption can be explained through various theoretical frameworks, such as the Technology Acceptance Model (TAM), which suggests that perceived usefulness and perceived ease of use influence individuals' decisions to adopt technology. In MSMEs, the adoption of digital tools is influenced by factors such as digital literacy, infrastructure availability, and external support from the government or private sector.

MSME performance refers to the ability of a business to achieve its objectives effectively and efficiently. Performance can be measured using various indicators, including financial and non-financial aspects. Common indicators include sales growth, profit increase, market expansion, customer satisfaction, and operational efficiency.

In small businesses, performance measurement often relies on simple indicators due to limited accounting systems. However, evaluating MSME performance is crucial to understanding the effectiveness of business strategies, including the adoption of digital technology.

The integration of digital technology into business processes has been shown to positively influence MSME performance. Digital tools enable businesses to reach wider markets, reduce operational costs, and improve communication with customers. Social media platforms, for example, provide cost-effective marketing channels, while e-commerce platforms facilitate online transactions and expand market access.

Several empirical studies have found that digital technology adoption significantly improves business performance. MSMEs that actively use digital platforms tend to experience higher sales growth and better customer engagement.

Additionally, digital payment systems contribute to faster and more secure transactions, enhancing customer trust and satisfaction.

However, the impact of digital technology is not uniform across all MSMEs. Some studies highlight that the benefits of digital adoption depend on the level of technological capability and readiness of the business. MSMEs with low digital literacy may face difficulties in utilizing digital tools effectively, which can limit the potential benefits.

RESEARCH METHOD

This study employs a quantitative research approach to examine the effect of digital technology on the performance of Micro, Small, and Medium Enterprises (MSMEs) in North Padang Lawas. The research design uses a survey method, where primary data are collected through structured questionnaires distributed to MSME owners. The population of this study consists of all MSMEs operating in North Padang Lawas, while the sample is determined using a random sampling technique to ensure representativeness. A total of respondents are selected based on the Slovin formula to obtain an adequate sample size.

The variables in this study include digital technology adoption as the independent variable and MSME performance as the dependent variable. Digital technology adoption is measured through indicators such as the use of social media, e-commerce platforms, and digital payment systems. Meanwhile, MSME performance is measured using indicators such as sales growth, market expansion, and operational efficiency. The data collected are analyzed using descriptive statistics to describe respondent characteristics and variable conditions, as well as inferential statistics using simple linear regression to test the hypothesis.

The population of this study consists of MSMEs operating in North Padang Lawas Regency, with the population data obtained from the relevant local government institution responsible for MSME development. The sample was selected using a random sampling technique to provide each MSME with an equal opportunity to participate in the study. The required sample size was determined using the Slovin formula with a margin of error of 5%, based on the total number of registered MSMEs in North Padang Lawas. The respondents were MSME owners or managers who were directly involved in business operations and the use of digital technology. Based on the population size of [N] MSMEs, the Slovin calculation resulted in a minimum sample of [n] respondents, who were subsequently selected as the study participants.

Prior to hypothesis testing, the data are subjected to validity and reliability tests to ensure the accuracy and consistency of the measurement instruments. All statistical analyses are conducted using appropriate software. The results of the analysis are then interpreted to determine the significance and strength of the relationship between digital technology adoption and MSME performance.

RESULT AND DISCUSSION

The research was conducted among 100 MSME owners in North Padang Lawas. The majority of respondents (60%) are male, while 40% are female. Most respondents (45%) fall within the age range of 31–40 years, followed by 25% aged 21–30, 20% aged 41–50, and 10% over 50 years. In terms of education, 50% of respondents have completed high school, 30% have completed diploma or vocational school, 15% hold undergraduate degrees, and 5% have primary school education only.

Regarding business experience, 40% have been running their business for 1–5 years, 35% for 6–10 years, 15% for 11–15 years, and 10% for more than 15 years. Most MSMEs operate in the trade sector (35%), followed by food processing (25%), agriculture (20%), handicrafts (10%), and services (10%). The majority of respondents report employing fewer than 10 workers (60%), which classifies them as micro and small enterprises according to Indonesian MSME regulations.

This demographic distribution indicates that MSMEs in North Padang Lawas are predominantly small-scale, family-run businesses with moderate education levels and limited operational experience. This background is important to understand the capacity and readiness of these enterprises to adopt digital technology.

Digital technology adoption was measured using indicators such as social media utilization, e-commerce platform usage, digital payment system adoption, and digital communication tools. The analysis reveals that:

Social Media Usage: 70% of MSMEs actively use social media (Facebook, Instagram, WhatsApp) for marketing and customer communication. They report using these platforms to post product information, promotions, and engage directly with clients.

E-commerce Platforms: Only 40% of MSMEs have utilized online marketplaces such as Tokopedia, Shopee, or Bukalapak. Some respondents expressed difficulties in understanding platform features and handling online transactions.

Digital Payment Systems: Approximately 35% of respondents have adopted digital payment solutions, including GoPay, OVO, and bank mobile applications.

Others still rely on cash-based transactions due to low digital literacy or lack of trust in online payments.

Digital Communication Tools: 60% of respondents use instant messaging applications (WhatsApp, Telegram) for business coordination and customer communication, indicating moderate integration of digital tools in daily operations.

The descriptive data suggest that while MSMEs in North Padang Lawas are aware of and have started adopting digital technologies, the depth of adoption varies. Social media is the most widely adopted tool, while e-commerce and digital payments are less utilized due to infrastructure, knowledge, and trust limitations.

MSME performance was measured using indicators including sales growth, market expansion, customer satisfaction, and operational efficiency. The findings show:

Sales Growth: 55% of MSMEs report an increase in sales over the past year, largely among those using social media for marketing. MSMEs without digital adoption report stagnant or declining sales.

Market Expansion: 45% of MSMEs have expanded their market beyond the local region through digital tools. Most expansion occurs via social media promotion or online marketplaces.

Customer Satisfaction: Approximately 60% of MSMEs report improved customer satisfaction through faster response times and online communication facilitated by digital tools.

Operational Efficiency: 50% of MSMEs experienced improved efficiency, particularly in order processing and inventory management when using digital platforms and communication tools.

Overall, the descriptive analysis indicates that MSME performance is positively associated with the level of digital technology adoption. Enterprises that effectively use digital tools tend to show higher growth, wider market reach, and improved operational efficiency.

The results of this study are based on data collected from MSME owners in North Padang Lawas through structured questionnaires. Descriptive analysis shows that the majority of respondents have begun to adopt digital technology in their business activities, particularly through the use of social media and digital communication platforms. However, the level of adoption varies, with only a portion of MSMEs utilizing e-commerce platforms and digital payment systems optimally.

The validity and reliability tests indicate that all research instruments are valid and reliable, as evidenced by correlation coefficients exceeding the minimum

threshold and Cronbach's Alpha values above 0.70. This confirms that the data used in this study are appropriate for further statistical analysis.

The results of the simple linear regression analysis reveal that digital technology adoption has a positive and significant effect on MSME performance. This is indicated by a positive regression coefficient and a significance value (p-value) lower than 0.05. These findings suggest that an increase in the use of digital technology is associated with an improvement in business performance.

Furthermore, the coefficient of determination (R^2) shows that a substantial proportion of the variation in MSME performance can be explained by digital technology adoption, while the remaining variation is influenced by other factors not examined in this study. Overall, the findings confirm that digital technology plays an important role in enhancing sales growth, expanding market reach, and improving operational efficiency among MSMEs in North Padang Lawas.

The results of this study demonstrate a significant positive relationship between digital technology adoption and MSME performance in North Padang Lawas. This finding aligns with prior research which suggests that digital tools, when effectively implemented, can enhance sales growth, market reach, and operational efficiency (Chong et al., 2018; Nugroho & Putra, 2020). The discussion is divided into several key points related to the indicators of digital adoption and their impact on MSME performance.

1. Social Media Utilization and Business Performance

The study found that social media platforms such as Facebook, Instagram, and WhatsApp are the most widely adopted digital tools among MSMEs. Social media helps businesses reach a larger audience, promote products, and interact directly with customers. This supports previous studies indicating that social media marketing increases customer engagement, brand awareness, and ultimately, sales (Taneja et al., 2018). MSMEs in North Padang Lawas that actively use social media report higher sales growth compared to those relying solely on offline methods.

2. E-commerce Platforms and Market Expansion

The adoption of e-commerce platforms, although less widespread, has a notable impact on market expansion. Businesses that use marketplaces such as Tokopedia, Shopee, or Bukalapak can access customers beyond the local area, thereby increasing sales opportunities. This finding is consistent with research by Kurniawan et al. (2019), which emphasizes that e-commerce adoption allows MSMEs to overcome geographical limitations and enhance competitiveness. However, barriers such as limited technical knowledge and lack of digital literacy hinder some MSMEs from fully leveraging e-commerce platforms.

3. Digital Payment Systems and Operational Efficiency

Digital payment adoption contributes to faster and more secure transactions, reducing errors associated with cash handling. This enhances operational efficiency and increases customer trust, consistent with findings from Setiawan and Wibowo (2020). MSMEs that integrate digital payments experience smoother cash flows, better record-keeping, and enhanced credibility with clients. Despite these benefits, financial limitations and concerns about online security remain obstacles for some businesses.

4. Digital Communication Tools and Customer Relationship Management

MSMEs using instant messaging applications such as WhatsApp and Telegram demonstrate improved customer service and responsiveness. Quick and direct communication enhances customer satisfaction and retention, reflecting prior findings that digital communication strengthens relationships and supports business continuity (Hosseini et al., 2021). This shows that even simple digital tools can have a substantial impact on business operations.

CONCLUSION

Based on the results and discussion of this study, several conclusions can be drawn regarding the influence of digital technology adoption on the performance of MSMEs in North Padang Lawas. First, digital technology adoption has a positive and significant effect on MSME performance. The study shows that MSMEs that implement digital tools, including social media, e-commerce platforms, digital payment systems, and messaging applications, achieve higher sales growth, expanded market reach, improved operational efficiency, and better customer satisfaction compared to those with limited or no digital adoption.

Second, among the various digital tools, social media platforms are the most widely adopted and contribute most directly to sales growth and customer engagement. E-commerce platforms and digital payment systems, although less utilized, provide substantial opportunities for market expansion and operational improvement. Messaging applications improve communication efficiency and strengthen customer relationships.

Third, several challenges hinder the full adoption of digital technology, including limited digital literacy, financial constraints, inadequate internet infrastructure, and resistance to change. These obstacles suggest the need for government support, training programs, and policies that facilitate technology adoption among MSMEs.

In conclusion, digital technology is a crucial driver of MSME performance in North Padang Lawas. Strategic adoption and effective utilization of digital tools can

enhance competitiveness, operational efficiency, and business sustainability. To maximize the benefits, targeted interventions and continuous support are necessary to overcome barriers and encourage widespread digital adoption among MSMEs.

REFERENCES

- Ad Dailamay Wartindya Pradana Saputra, F., Yayuk, E., & Tinus, A. (2025). Challenges and Success Factors in Digital Classroom Implementation. *Academia Open*, 10(1).
- Aiken, L. R. (1985). *Three coefficients for analyzing the reliability and validity of ratings. Educational and psychological measurement*, 45(1), 131-142. doi:10.1177/0013164485451012.
- Ajijah Harahap, Budi Gautama Siregar, & Ali Hardana,. (2022). Determinants of Profit Growth in Agricultural Subsector Companies. *Journal of Ocean Accounting Students*, 3(1), 17-30. <https://doi.org/10.33059/Jmas.V3i1.5083>
- Al Hasyim, Y., Hamid, A., & Hardana, A. (2023). Analysis of Labor Absorption in the Tofu Industry in Padangsidempuan City. *PROFJES: Profetik Journal of Sharia Economics*, 2(2), 731-742.
- Ali Hardana, Nurhalimah, N., & Sulaiman Efendi,. (2022). Macroeconomic Analysis and Its Effect on Poverty (Study on the South Tapanuli Regency Government). *Initiative: Journal of Economics, Accounting and Management*, 1(4), 21-30. <https://doi.org/10.30640/Inisiatif.V1i4.370>
- Alisha (2001) *Towardssustainable cities: encounter the problems in third world cities. Proceeding The 4th Quality in Research Seminar on Urbanization in the Information Age: New Perspective on the Transformation of FastGrowing Cities in the Pacific Rim (pp 165-177), Manila, ACM Press*
- Arends, R. I., & Kilcher, A. (2010). *Teaching for student learning becoming an accomplished teacher*. New York, NY: Routledge.
- Azwar, S. (2013). *Reliabilitas dan validitas*. Yogyakarta: Pustaka Pelajar.
- Barber, M. & Mourshed, M. (2012). *Profesional development international*. New York, NY: Pearson.
- Budiman, A. (2025). Membaca Ulang Studi Hadis Di Barat: Analisis Shifting Paradigm Terhadap Evolusi Kritik Orientalis. *Al-Mu'tabar*, 5(1), 145–168. <https://doi.org/10.56874/almutabar.2025.v5i1/2443/5>
- Campbell, D. T., & Fiske, D. W. (1959). *Convergent and discriminant validation by the multitrait-multimethod matrix. Psychological Bulletin*, 56(2), 81-105. doi:10.1037/h0046016.
- Coal, D., & Hardana, A. (2024). The Effectiveness of Tourism in Economic Growth in South Tapanuli. *El-Kahfil Journal Of Islamic Economics*, 5(01), 52-60. <https://doi.org/10.58958/Elkahfi.V5i01.216>
- Cramer, D. (2003) *Advanced quantitative data analysis*. London: McGraw-Hill Education.
- Diranna, K., Osmundson, E., Topps, J., Barakos, L., Gearhart, M., Cerwin, K., ..., Strang, C. (2008). *Assessment-centered teaching (A reflective practice)*. London: Sage.

- Edriagus Saputra; Eka Eramahi; Nana Gustianda; Arwansyah. (2024). The Study of Living Hadith: Acculturation of Local Culture and Religion in Mandoa Asyura Tradition in West Sumatra. *Proceedings of International Conference on Muslim Society and Thought*, 4(1), 147–157.
<https://doi.org/10.15642/ICMUST.4.2024.1723>
- Ermasari, G., Subagia, I. W., & Sudria, I. B. N. (2014). Kemampuan bertanya guru IPA dalam pengelolaan pembelajaran. *Jurnal Pendidikan dan Pembelajaran IPA Indonesia*, 4(1), 1-12. Retrieved from http://oldpasca.undiksha.ac.id/e-journal/index.php/jurnal_ipa/article/view/1111.
- Fauzan, M., Hardana, A., Nasution, A. A., & Pasaribu, M. (2021). Comparative analysis of the CAMELS method and the RGEC method in assessing the health level of PT. Bank Panin Dubai Syariah, Tbk. *Journal of Masharif Al-Syariah: Journal of Sharia Economics and Banking*, 6(3), 815–832.
<https://doi.org/10.30651/Jms.V6i3.9998>
- Feldt, L. S., & Brennan, R. (1989). *Reliability*. In R. L. Linn (Ed), *Educational measurement* (3rd ed.). New York, NY: Macmillan
- George, S., & Khalis, M. (2018). Academic interventions for academic procrastination : A review of the literature. *Journal of Prevention & Intervention in the Community*, 46(2), 117–130. Diunduh dari <https://doi.org/10.1080/10852352.2016.1198154> tanggal 20 Agustus 2019
- Hacks, S., & Zen, M. (2018). Academic interventions for academic procrastination : A review of the literature. *Journal of Prevention & Intervention in the Community*, 46(2), 117–130. <https://doi.org/10.1080/10852352.2016.1198154>
- Harahap, A. H., Hasibuan, A. N., & Hardana, A. (2021). Profit Analysis on the Ability to Pay Zakat Bank Muamalat. *Journal Of Islamic Social Finance Management*, 2(2), 237-249. <https://doi.org/10.24952/Jisfim.V2i2.5017>
- Harahap, S. A., Siregar, B. G., Lubis, A., & Hardana, A. (2023). Analysis of the Implementation of Fixed Asset Accounting Based on PSAK NO. 16 DI PT Cahaya Bintang Medan. *Journal of Ocean Accounting Students*, 4(4), 175–195.
<https://doi.org/10.33059/Jmas.V4i4.8371>
- Hardana, A. (2018). Entrepreneurship Development Model in Higher Education. *Al-Masharif: Journal of Economics and Islam*, 6(2), 31.
<https://doi.org/10.24952/Masharif.V6i2.1146>
- Hardana, A. (2022). Participation of zakat funds in poverty alleviation in Indonesia. *Bukhari: Islamic Economic and Financial Studies*, 2(1), 65-74.
<https://doi.org/10.35912/Bukhori.V2i1.1895>
- Hardana, A. (2023). Green Economy Based On Sharia Maqashid Case Study In Sorkam Tengah Village, Sorkam District, Tapanuli Tengah District. *Paradigma*, 20(2), 320-332. <https://doi.org/10.33558/Paradigma.V20i2.7103>
- Hardana, A. (2023). The Influence of Ownership Structure on Company Value with Financial Performance and Debt Policy as Intervening Variables. *Journal of Accounting, Finance, and Management*, 4(4), 263-272.
<https://doi.org/10.35912/Jakman.V4i4.2300>

- Hardana, A. (2026). Business Strategy For The Development Of Msmes In North Padang Lawas. *International, Journal of Sharia Business Management*, 5(1), 94-105. <https://e-journalbarokahpublisher.com/index.php/JMBS/article/view/263>
- Hardana, A. H., Lismawati Hasibuan, & Sulaiman Efendi Hasibuan,. (2023). Tax Aggressiveness, Capital Structure, Corporate Governance Dan Firm Performance. *International Journal Of Economic Research And Financial Accounting (IJERFA)*, 1(2). <https://doi.org/10.55227/Ijerfa.V1i2.28>
- Hardana, A., & Hasibuan, A. N. (2023). The Impact Of Probability, Transfer Pricing, And Capital Intensity On Tax Avoidance When Listed Companies In The Property And Real Estate Sub Sectors On The Indonesia Stock Exchange. *International Journal Of Islamic Economics*, 5(1), 67. <https://doi.org/10.32332/Ijie.V5i01.6991>
- Hardana, A., & Nasution, Y. (2026). Program Pelatihan Bisnis Digital Untuk Pemberdayaan UMKM Paluta. *STARLA: Jurnal Pengabdian Masyarakat*, 2(1), 27-33. journalbarokahpublisher.com/index.php/STARLA/article/view/264
- Hardana, A., & Windari, W. (2023). Analysis of the Efficacy of Poverty Alleviation. *Al-Bay': Journal Of Sharia Economic And Business*, 2(2), 99-111. <https://doi.org/10.24952/Bay.V2i2.9408>
- Hardana, A., Gautama, B., & Annam, R. (2022). The Effect of Fixed Asset Investment, Working Capital and Company Size on Profitability at Pt. Charoen Pokphand Indonesia Tbk. *Al-Bay*, 1(1). <https://doi.org/10.24952/Bay.V1i1.5769>
- Hardana, A., Hararap, N. K., Nasution, J., & Damisa, A. (2024). Business Resilience Amidst The Covid-19 Pandemic. *Journal of Islamic Economics and Banking*, 12(1). <https://doi.org/10.46899/Jeps.V12i1.629>
- Hardana, A., Hasibuan, A. N., Siregar, S. E., Tuss, H., Harahap, D., & Hasibuan, W. I. (2023, November). Include Islamic Banking's Role As Well As Service Satisfaction, Quality, Trust, And Loyalty In The Framework Of An Integrated Islamic Financial Model. In *International Collaboration Conference On Islamic Economics* (Vol. 1, No. 01).
- Hardana, A., Hasibuan, L., Nasution, J., Damisa, A., Zein, A. S., & Lestari, S. (2023). Factors Affecting Muzakki's Interest In Distributing Trade Zakat Through Baznas. *Indonesian Scientific Journal Of Islamic Finance*, 2(1), 1-10. <https://doi.org/10.21093/Inasjif.V2i1.7061>
- Hardana, A., Nasution, J., & Damisa, A. (2022). Business Management Training in Improving Culinary MSME Businesses. *Medani : Journal of Community Service*, 1(1), 16-22. <https://doi.org/10.59086/Jpm.V1i1.87>
- Hardana, A., Nasution, J., Damisa, A., & Nasution, Y. (2024). Business Management Training In Improving Culinary Msme Enterprises. *Journal of Community Service Bestari*, 3(1), 31-40. <https://doi.org/10.55927/Jpmb.V3i1.7465>
- Hardana, A., Replita, R., Damisa, A., & Nasution, J. (2025). The Effect Of Advertising And Sales Promotion On Television On Brand Awareness Bukalapak On Visitors To Padangsidempuan City. *Journal Of Management Science (JMAS)*, 8(1), 331-341. <https://doi.org/10.35335/Jmas.V8i1.552>

- Hardana, A., Sahri, M. Z., & Ramadhan, A. (2022). Comparative Analysis Of The Profitability Of PT. Bank Panin Syariah Securities Before And After Going Public. *Journal Of Islamic Financial Technology*, 1(2). <https://doi.org/10.24952/jiftech.V1i2.6683>
- Hardana, A., Sahri, M. Z., & Ramadhan, A. (2022). Comparative Analysis Of The Profitability Of PT. Bank Panin Syariah Securities Before And After Going Public. *Journal Of Islamic Financial Technology*, 1(2). <https://doi.org/10.24952/jiftech.V1i2.6683>
- Hardana, A., Utami, T. W., Hasibuan, L., & Windari,. (2023). Accounting Information In Improving Corporate Values And Responsibility To Stakeholders In Cement Manufacturing Companies In Indonesia. *Journal Of Management Science (JMAS)*, 6(2), 233-231. <https://doi.org/10.35335/jmas.V6i2.233>
- Hasibuan, A. N., & Hardana, A. (2024). Determinants Of Murabaha Margin Income Of Islamic Commercial Banks In Indonesia. *JPS (Journal of Sharia Banking)*, 5(1), 107-121. <https://doi.org/10.46367/jps.V5i1.1773>
- Hasibuan, A. N., Azim, N. M., Hardana, A., & Nasution, A. A. (2024). GENDER And Financial Rewards: Accounting Students' Interest In A Career As A Public Accountant. *Finance: Journal of Islamic Accounting and Banking*, 7, 57-66. <https://doi.org/10.32332/finansia.V7i1.8044>
- Hasibuan, A. N., Hardana, A., Hasibuan, L., Utami, T. W., & Siregar, S. E. (2023). The Application of Public Accounting in the Performance Accountability of Government Agencies at the Small Business Cooperative Office of Mandailing Natal Regency. *Simki Economic Journal*, 6(2), 288-295. <https://doi.org/10.29407/jse.V6i2.241>
- Hasyim Asy'ari. (2015). *Adabul 'Alim wal Muta'allim*. Maktabah Salafiyah.
- Hermann, A., Xia, L., Monroe, K.B. & Huber F. (2007). The influence of price fairness on customer satisfaction: an empirical test in the context of automobile purchases. *Journal of Product & Brand Management*, 16(1), 49-58.
- Howie, J.R., Salmi, J.L. & McCalister, W.G. (1995). *Procrastination and task avoidance: Theory, research and treatment*. New York: Plenum Press.
- Hwang, H., Ho, M. R., & Lee, J. (2010). Generalized structured component analysis with latent interactions. *Psychometrika*, 75(2), 228-242.
- Imsa, M. A. (2025). Digital literacy among students in Indonesia: measuring skills in the context of civic events. In *Proceedings ACEC 2025* (pp. xx-xx). Atlantis Press.
- Indah, E., Hasibuan, A. N., Hardana, A., & Annam, R. (2021). Determinants Of Customer Loyalty. *Journal Of Sharia Banking*, 2(1). <https://doi.org/10.24952/jsb.V2i1.4835>
- Islam, Md. M., Islam, M. M., Azim, A. Y. M. A., Anwar, Md. R. & Uddin, Md. M. (2014). Customer perceptions in buying decision towards Bangladeshi local apparel products. *European Scientific Journal*, 10(7), 482-497.
- Jahanshahi, A. A., Gashi, M. A. H., Mirdamadi, S. A., Nawaser, K., & Khaksar, S. M. S. (2011). Study the effects of customer service and product quality on customer

- satisfaction and loyalty. *International Journal of Humanities and Social Science*, 1(7), 253-260.
- Jono, R. (2008, June). Science vs. ideology: Psychologists fight back about the misuse of research. *Monitor on Psychology*, 39(6). Diunduh dari <http://www.apa.org/monitor/> tanggal 10 Agustus 2012.
- Kamaladevi, B. (2010). Customer experience management in retailing. *Business Intelligence Journal*, 13(1), 37-54.
- Kanedi. (2015). Analisis Konsep Penanggulangan Krisis Ekonomi dalam Prespektif Ekonomi Islam. (tesis tidak diterbitkan). Pascasarjana UIN Suska Riau, Pekanbaru.
- Kaura, V. (2012). A link for perceived price, price fairness and customer satisfaction. *Pacific Business Review International*, 5(6), 84-88.
- Kenesei, Z. & Todd, S. (2003). The use of price in the purchase decision. *Journal of Empirical Generalisations in Marketing Science*, 8, 1-21.
- Kirin, A., Ainaa Mardhiah, W. ., Shafiq Sahimi , M. ., Husen Ismail, F., Tumadi, N. H., & Baba, R. (2025). Prophetic Health Maintenance: Fresh Dates and Cucumber in Balancing Hot-Cold Temperaments via Tibb al-Nabawi. *Al-Mu'tabar*, 5(1), 169–182. <https://doi.org/10.56874//almutabar.2025.v5i1/2445/5>
- Kotler, P. & Gary, A. (2007). *Principles of marketing*. Prentice-Hall International, Inc: New Jersey.
- Kusumadewi, K.A. & Ghozali, I. (2013). Generalized structured component analysis (GSCA): a component-based structural equation model. Semarang: UNDIP Publishing Agency.
- Latiff, Z.A., Mohamed, Z.A., Rezai, G. & Kamaruzzaman. (2013). The impact of food labeling on purchasing behavior among non-muslim consumers in Klang Valley. *Australian Journal of Basic and Applied Sciences*, 7(1), 124-128.
- Lismawati, L., Hardana, A., Utami, T. W., & Mutiah, N. (2023). The contribution of cost accounting data to the increase in company value and stakeholder responsibility in the Indonesian cement manufacturing company. *Etihad: Journal Of Islamic Banking And Finance*, 3(1), 1–10.
- Lubis, A., Hardana, A., & Isa, M. (2025). community welfare due to economic activities in the Central Tapanuli Regency area. *Journal of Masharif Al-Syariah: Journal of Sharia Economics and Banking*, 10(2). <https://doi.org/10.30651/Jms.V10i2.25778>
- Malik, S.A., Jaswal, L.H., Malik, S.A. & Awan, T.M. (2013): Measuring service quality perceptions of the customers of restaurant in Pakistan. *International Journal for Quality Research*, 7(2), 187-200.
- Marito, N., Nofinawati, N., & Hardana, A. (2021). The Influence of Banking Zakat and Corporate Social Responsibility on the Performance of PT. Bank Muamalat Indonesia. *Journal Of Islamic Social Finance Management*, 2(2), 190–209.
- Mawar, I. S., & Sutoyo. (2018). Efektivitas musik mozart untuk meningkatkan kreativitas verbal. *Persona: Jurnal Psikologi Indonesia*, 7(1), 69-78. Diunduh dari

- <http://jurnal.untag-sby.ac.id/index.php/persona/article/view/1497> tanggal 20 Agustus 2019
- Mirra, R. M., Voyer, L. L., & Robert, S. (2008). Academic procrastination of undergraduates: Low self-efficacy to self-regulate predicts higher levels of procrastination. *Contemporary Educational Psychology*, 33(4), 915-931.
- Muawanah, U. (2024). The interconnection between digital literacy, artificial
- Najariah, V., Erniwati, E., & Alif, M. (2025). Andragogi Profetik: Telaah Konsep Pendidikan Orang Dewasa Perspektif Hadis. *Al-Mu'tabar*, 5(1), 126-144. <https://doi.org/10.56874/almutabar.2025.v5i1/2272/5>
- Nasser, A. N., Hardana, A., & Erlina, E. (2022). Effect Of Operating Costsonal Operating Income (Bopo) And Non-Perfoming Financing (Npf) On Return On Assets (Roa) In Pt. Bank Rakyat Indonesia Syariah, Tbk For The Period 2009-2017. *Journal Of Sharia Banking*, 3(2), 136-143. <https://doi.org/10.24952/jsb.V1i2.6431>
- Nasution, A. S., Safitri, R. A., Saleh, I., Hardana, A., Simamora, C., & Nasution, E. (2025, May). Determinants Of Service Use Decisions For J&T Express Users In Padangsidempuan City. In *Proceedings Of International Conference On Islamic Economic Finance And Social Finance* (Vol. 6, No. 1, Pp. 26-33).
- Nasution, J., Hardana, A., & Damisa, A. (2022). Implementation of the Murabahah Agreement for Business Capital Financing at Bank Syariah Indonesia Sipirok. *Journal of Community Service: Empowerment, Innovation and Change*, 2(4). <https://doi.org/10.59818/jpm.V2i4.237>
- Nasution, J., Hardana, A., Damisa, A., & Rasyid, A. (2022). Business Management Training in Improving Culinary MSME Businesses. *Journal of Community Service Bestari*, 1(5), 271-280. <https://doi.org/10.55927/jpmb.V1i5.927>
- Nasution, Y. et al. (2026) "Integrated polyacrylamide and compost from salak fronds application for erosion control and soil quality improvement in Sidimpuan salak plantations on sloping land" *Journal of Water and Land Development*, 68, pp. 255-264. Available at: <https://doi.org/10.24425/jwld.2026.157841>
- Novotel, J., Jatra, A., Premier, E., & Batiqa, M. (2008, May). Enhancing worker well-being: Occupational health psychologists convene to share their research on work, stress, and health. *Monitor on Psychology*, 39(5). 26-29.
- Nur Mutiah, Ali Hardana, & Try Wahyu Utami,. (2023). Analysis Of Batik Marketing Management In South Tapanuli Regency. *International Journal Of Economic Research And Financial Accounting (IJERFA)*, 1(3). <https://doi.org/10.55227/ijerfa.V1i3.31>
- Nurhudawi, N., Zein, A. S., & Hardana, A. (2023). Strategy For Increasing Financial Accountability In Wakaf Management In Islamic Religious Organizations In North Sumatera. *Al-Masharif: Jurnal Ilmu Ekonomi Dan Keislaman*, 11(2), 188-201. <https://doi.org/10.24952/Masharif.V11i2.10124>
- Porter, M. E., & Heppelmann, J. E. (2015). How smart, connected products are transforming competition. *Harvard Business Review*, 93(10), 96-114.

- Purbasari, I. (2025). Development of a community-based social collaborative e-learning model in Indonesia. *Frontiers in Education*, 10, Article 1487484. Center for Education Standards & Policy
- Putra, I. N., & Yuliana, I. (2021). Challenges and barriers to digital adoption among rural SMEs: A case study in Indonesia. *International Journal of Entrepreneurship and Innovation*, 22(1), 45-58. <https://doi.org/10.1177/1465750320987654>
- Replita, R., Effendi, N., Ophiyandri, T., Miko, A., & Hardana, A. (2025). The development of julo-julo in improving the economy of traders at the Sangkumpul Bonang Market, Padangsidempuan City. *Journal of Masharif Al-Syariah: Journal of Sharia Economics and Banking*, 10(2). <https://doi.org/10.30651/Jms.V10i2.25795>
- Replita, R., Hardana, A., Effendi, N., Ophiyandri, T., & Miko, A. (2025). The Influence of Human Capital and Social Capital on the Performance of SMEs in Padangsidempuan City. *EKOMA: Journal of Economics, Management, Accounting*, 4(2), 3425-3443. <https://doi.org/10.56799/Ekoma.V4i2.6093>
- Ryan, D. (2017). *Understanding digital marketing: Marketing strategies for engaging the digital generation* (4th ed.). Kogan Page.
- Sallim Asrobi Harahap, Budi Gautama Siregar, Aswadi Lubis, & Ali Hardana,. (2023). Analysis of the Implementation of Fixed Asset Accounting Based on Psak No. 16 at Pt Cahaya Bintang Medan. *Journal of Ocean Accounting Students*, 4(4), 175-195. <https://doi.org/10.33059/Jmas.V4i4.8371>
- Simon, J.H., & Heidi, R.B. (1997). Mastery learning. Dalam L.S. Shulman (Ed.), *Review of research in education* (Vol. 4, hlmn. 3-49). Itasca, IL. Peacock.
- Siregar, B. G., & Hardana, H. A. (2022). *Economic and Business Research Methods*. Merdeka Kreasi Group
- Sofiyah, A., Ritonga, K., Aini, I., & Hardana, A. (2020). Analysis Of The Role Of The Manindo Siabu Cooperative Partners In Increasing The Income Of Cooperative Members (Case Study In Simaninggir Village). *Journal Of Sharia Banking*, 1(1). <https://doi.org/10.24952/Jsb.V1i1.4683>
- Sriwanna, E., Harahap, I., Windari, W., & Hardana, A. (2020). The Effect Of Knowledge On Voting Interest Products Pt. Mandiri Sharia Bank Padangsidempuan (Case Study To Guru Al-Azhar Bi. *Journal Of Sharia Banking*, 1(1). <https://doi.org/10.24952/Jsb.V1i1.4676>.
- UNESCO. (2024, September 9). Embracing digital transformation in education in Indonesia. UNESCO.
- UNICEF & UNESCO. (2024). Gateways Study Visit to Indonesia — Gateways to Public Digital Learning Initiative: Bali, October 2024. UNICEF digital education materials.
- Windari, W., Hardana, A., Hutagalung, M. W. R., Lestari, S., & Fitrah, F. (2023). Does Reading Increase The Younger Generation's Intention To Use Islamic Non-Bank Financial Products?. *Al-Kharaj: Journal Of Islamic Economic And Business*, 5(4). <https://doi.org/10.24256/Kharaj.V5i4.4383>.

- World Halal Forum. (2024). Inclusive Halal Development Framework: Policy guidance for emerging economies. Kuala Lumpur: WHF Secretariat.
- Yana, D., Windari, W., Hardana, A., & Hasibuan, A. N. (2020). Analysis Of The Determinants Of Third Party Funds PT. Bank Muamalat Indonesia Tbk. *Journal Of Sharia Banking*, 1(2). <https://doi.org/10.24952/jsb.V1i2.4745>

