

ADAPTIVE MANAGEMENT AND DIGITAL TRANSFORMATION IN STRENGTHENING SUSTAINABLE RURAL ECONOMIES: EVIDENCE FROM LOCAL BUSINESSES

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Abstract

This study aims to examine how local businesses implement adaptive management and digital transformation in response to the dynamics of the business environment, as well as their implications for strengthening sustainable rural economies within the context of global sustainable development. This study employs a qualitative case study approach, utilizing data collection techniques such as in-depth interviews and field observations to explore adaptive strategies, digital practices, and the operational challenges faced by business actors. The findings reveal that business actors actively implement adaptive strategies, such as price adjustments, product diversification, and service quality improvements in response to market changes. Furthermore, the use of digital platforms enables expanded market access, improved operational efficiency, and the utilization of customer feedback as a basis for continuous evaluation. However, this study also identifies challenges, such as increased competition on digital platforms, dependence on platform systems, and operational cost pressures. These findings indicate that the integration of adaptive management and digital transformation can strengthen business resilience and sustainability, while contributing to the development of more inclusive and competitive rural economic systems. This study contributes by presenting an integrative perspective that links micro-level business adaptation with digital transformation in supporting sustainable rural economic development.

Keywords: Adaptive Management, Digital Transformation, Local Business, Rural Economy, Sustainable Development

INTRODUCTION

In recent decades, the role of local economic actors has garnered increasing attention in promoting sustainable rural economies, particularly in developing countries where community-based economic activities contribute significantly to inclusive growth. Local businesses, especially small-scale and emerging enterprises, play a vital role in creating employment opportunities, supporting community livelihoods, and strengthening economic resilience at the rural level. As part of the informal economy, these businesses typically exhibit flexibility, low barriers to entry, and the ability to respond quickly to market changes.

In an empirical context, Asahan Regency, North Sumatra, as one of the regions with a thriving local economy, demonstrates significant dynamics. Data indicates that the number of small industries in this region increased from 840 units in 2021 to 1,684 units in 2025 (Badan Pusat Statistik Kabupaten Asahan, 2026). This increase reflects rapid growth in local economic activity while underscoring the vital role of small businesses in supporting the regional economic structure. In addition, this trend also indicates an expansion of business opportunities as well as increased community participation in productive economic activities at the local level.

However, the growth of globalization, digitalization, and changes in consumer behavior have significantly transformed the local economic landscape. The increasing use of digital platforms,

data-driven decision-making, and on-demand services has redefined how businesses operate and compete (Bouwman et al., 2019). In this context, digital transformation has become a key factor enabling local businesses to expand market access, improve operational efficiency, and strengthen interactions with consumers (Li et al., 2018).

Digital transformation also presents new challenges, such as increased competition, reliance on digital platforms, limitations in technological capabilities, and resource constraints. These conditions indicate that businesses are not only required to adopt technology but must also be able to dynamically adapt to changes in the business environment. In this context, the concept of Adaptive Management becomes relevant, as it emphasizes the importance of continuous learning, strategic experimentation, and flexible decision-making in the face of uncertainty (Teece, 2018). In practice, this adaptive capability is reflected in product adjustments, pricing strategies, diversification of distribution channels, and the effective utilization of digital technology.

Although research on digital transformation and the performance of small businesses has grown rapidly, most studies still focus on aspects of technology adoption or general performance outcomes, and thus have not extensively explored the dynamic adaptation processes occurring at the micro level (Dwivedi et al., 2021). There are also limitations in linking local economic adaptation practices to their contributions to sustainable global development (Wirtz & Lovelock, 2022). This highlights a research gap in understanding how local businesses manage digital transformation while contributing to the broader economic system.

Given these conditions, this study aims to explore how emerging local businesses implement adaptive strategies and digital transformation in response to the dynamics of the economic environment. This study specifically examines adaptation mechanisms, identifies challenges and enabling factors, and analyzes the contribution of these practices in reimagining the local economy within the framework of sustainable global development. Using a qualitative case study approach, this research is expected to provide a deeper understanding of the interactions between adaptation, digitalization, and local economic transformation.

The novelty of this study lies in its integrative approach, which combines the concepts of adaptive management and digital transformation in the context of local businesses and links them to a global development perspective. Unlike previous studies, which tended to address these aspects separately, this study offers a more holistic perspective by emphasizing the dynamics of adaptation at the micro level and its implications for the broader economic system.

Based on the discussion above, this study proposes a conceptual framework that integrates adaptive management and digital transformation in shaping resilient local enterprises and strengthening local economies, as illustrated in Figure 1.

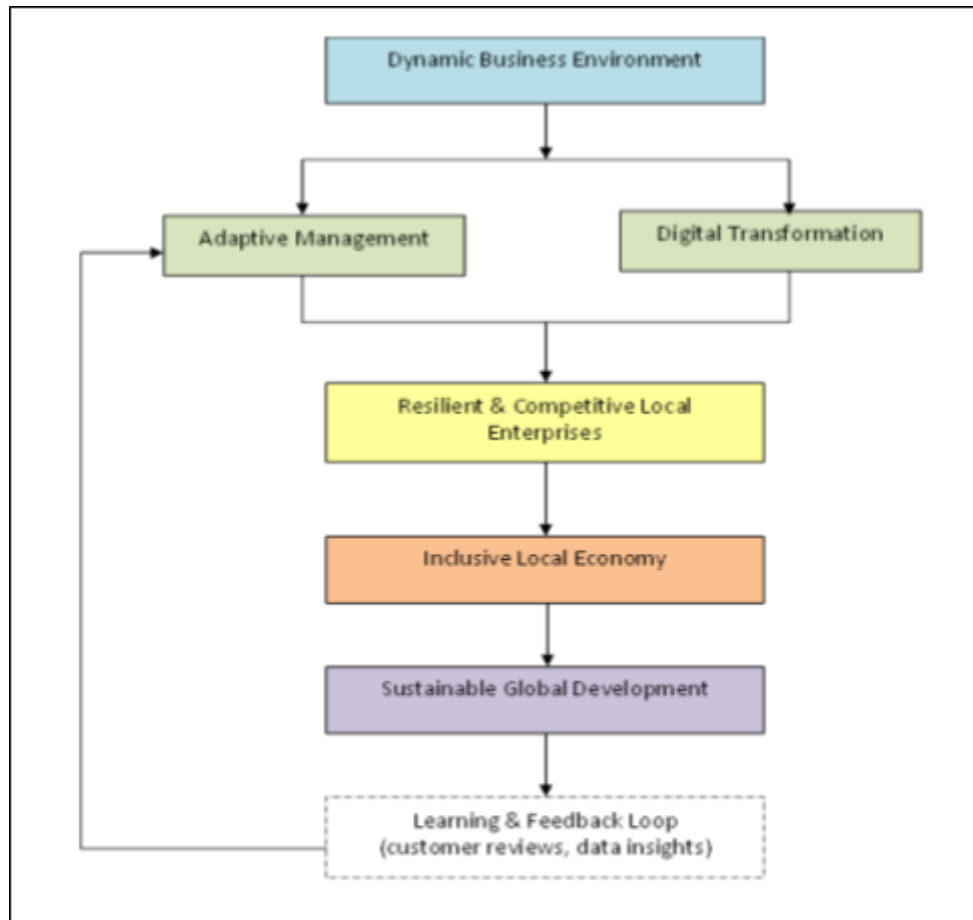


Figure 1. Proposed Conceptual Framework Developed in this Study

Figure 1 illustrates the relationship between dynamic business environments, adaptive management, and digital transformation in shaping resilient and competitive local enterprises. The framework highlights how these enterprises contribute to inclusive local economies and ultimately support sustainable global development. In addition, the model incorporates a feedback loop mechanism, representing continuous learning from market responses and digital interactions, which informs ongoing adaptive strategies.

LITERATURE REVIEW AND HYPOTHESIS FORMULATION

The Local Economy and the Role of SMEs

The local economy serves as a vital foundation for fostering inclusive and sustainable growth. Community-based economic activities play a key role in creating jobs, improving community well-being, and strengthening economic resilience at the local level. In this context, small and medium-sized enterprises (SMEs) have become key players in the dynamics of the local economy, particularly in developing countries.

As part of the informal economy, small businesses are characterized by flexibility and adaptability to market changes. This flexibility enables business owners to survive in conditions of uncertainty and respond quickly to economic dynamics (Sutter et al., 2019). Additionally, local businesses play a role in supporting the Sustainable Development Agenda through the creation of an inclusive and sustainable economy (Rosca et al., 2020).

Recent studies also indicate that small businesses make a significant contribution to enhancing local economic resilience following global disruptions, particularly through operational

flexibility and the ability to adapt to market changes (Bai et al., 2021). This reinforces the position of small businesses as key actors in sustainable local economic transformation.

Digital Transformation in the Local Economy

Digital transformation has become a key driver of change in local economic practices. Digitalization enables businesses to improve operational efficiency, expand market access, and develop more innovative and technology-driven business models.

Verhoef et al. (2021) explain that digital transformation is a strategic change that encompasses the integration of technology, business processes, and customer experience. Meanwhile, (Kraus et al., 2020) demonstrate that digitalization offers significant opportunities for small businesses to enhance their competitiveness through the use of digital platforms and e-commerce.

More recent research indicates that the adoption of digital technologies, including app-based platforms and e-commerce, can significantly improve SME performance, particularly regarding market access and operational efficiency (Nambisan et al., 2019). However, (Rachinger et al., 2019) emphasize that digital transformation also requires complex changes to business models. This indicates that the success of digitalization is highly dependent on organizational readiness as well as the ability of business actors to manage change effectively.

Adaptive Management and Capabilities

In the dynamic and complex business environment, organizations require a flexible and responsive management approach. The concept of Adaptive Management emphasizes the importance of continuous learning, strategic experimentation, and iterative decision-making in the face of uncertainty. From a strategic management perspective, this concept relates to dynamic capabilities, which refer to an organization's ability to integrate and reconfigure resources in response to environmental changes (Teece, 2018). Adaptive capabilities are a key factor in enhancing business resilience and sustainability. Recent research indicates that adaptive capabilities are becoming increasingly vital in addressing digital disruption and market uncertainty (Rosly et al., 2025). Businesses with high adaptive capabilities tend to be better equipped to integrate digital technologies into their business models (Matarazzo et al., 2021). Consequently, Adaptive Management serves as a critical foundation for the success of digital transformation in small businesses.

Literature Gap and Research Position

Although the literature on digital transformation and small businesses has grown rapidly, most research still focuses on aspects of technology adoption or general business performance. Studies that specifically explore dynamic adaptation processes at the micro level remain relatively limited (Verhoef et al., 2021).

Furthermore, research integrating digital transformation with adaptive management within the context of the local economy remains scarce. Many studies address these two concepts separately, without examining their interaction in shaping local economic dynamics.

Recent research also highlights the importance of linking digital transformation to local social and economic contexts, yet it remains limited to in-depth micro-level case study approaches (Bai et al., 2021). Furthermore, there are still limitations in linking local economic practices to global development perspectives. In fact, transformations at the micro level have great potential to support sustainable economic systems (Rosca et al., 2020).

Based on this gap, this study positions itself at the intersection of digital transformation, adaptive management, and the local economy. Using a case study approach, this research aims to provide a more contextual understanding of how local businesses manage digital adaptation and transformation, as well as their contribution to reimagining the local economy within the framework of global sustainable development.

Research Propositions

Based on the literature review, this study proposes the following:

1. Digital transformation drives market access expansion and improved performance of local businesses.
2. Adaptive capabilities play a crucial role in supporting the success of digital transformation in small businesses.
3. The integration of adaptive management and digital transformation contributes to the strengthening of a sustainable local economy.

RESEARCH METHODS

This study uses a qualitative approach with a case study design to gain an in-depth understanding of how local business owners implement adaptive strategies and digital transformation in response to the dynamics of the business environment. This approach was chosen because it allows for a contextual exploration of the phenomenon and provides a comprehensive understanding of the adaptation processes occurring at the micro level.

The research subjects are local business owners categorized as small, growing businesses, with a focus on one business unit as the primary case study: Warung Eko, a street food vendor selling burgers and kebabs. Subject selection was conducted using a purposive approach, considering that the business has adopted digital platforms and demonstrates adaptive practices in its operations. Thus, the research subject is considered representative of the phenomenon of digital-based local economic transformation.

Data collection methods included in-depth interviews, direct observation, and documentation. Interviews were conducted with business owners to gather information regarding adaptation strategies, experiences in dealing with market changes, and the challenges they faced. Observations were conducted to understand business operations, including production processes, customer service, and patterns of interaction with consumers. Additionally, documentation was used to supplement the data, such as sales records, digital platform usage, and other evidence of business activities. The primary instrument in this study was the researcher, who utilized a semi-structured interview guide to ensure consistency in data collection.

Data analysis was conducted using a thematic analysis approach. This process began by transcribing interview results and observation notes, followed by identifying key sections of the data relevant to the research objectives. Next, this information was grouped into categories with similar meanings, resulting in key themes that describe the patterns of digital adaptation and transformation undertaken by business actors. This analysis process was conducted in stages and iteratively, allowing the researcher to ensure that the resulting interpretations truly reflect the conditions observed in the field and align with the theoretical framework employed.

To ensure the validity of the data, this study employed a triangulation technique, which involves comparing information obtained from various sources and methods, such as interviews, observations, and documentation. Additionally, member checking was conducted, which involves reconfirming the findings with informants to ensure they align with their actual experiences and circumstances. The researcher also systematically documented the entire research process as a form of transparency, ensuring that the research results are traceable and accountable. This approach aims to ensure that the research findings have a high level of reliability and can make a valid academic contribution.

RESULTS AND DISCUSSION

Adaptive Strategies in Local Business Practices

Research findings indicate that local business owners develop adaptive strategies in response to constantly changing market dynamics. These adaptations are reflected in price adjustments, product variations, and improvements in service quality to meet increasingly dynamic consumer needs. Additionally, operational flexibility is a key factor, such as adjusting operating hours and responding quickly to customer requests.

Based on interviews with business owners (2026), it was found that adaptation strategies are actively implemented through adjustments to market conditions. Business owners stated that *“we adjust our menu and prices in line with market conditions and customer demand.”*

This finding reflects the application of the Adaptive Management concept, in which learning and adjustment processes are carried out continuously (Teece, 2018). Thus, adaptive strategies are a key factor in maintaining business sustainability amid the uncertainty of the business environment.

Digital Transformation and Market Expansion

Research findings indicate that digital transformation plays a significant role in improving business performance. Business owners have leveraged digital platforms such as GrabFood, GoFood, Maxim Food, and ShopeeFood as additional distribution channels alongside direct sales. As stated by a business owner, *“Warung Eko Burger has been using GrabFood, GoFood, and Maxim Food. Sales have increased since using these platforms, as transactions are conducted both offline and online.”*

These findings show that digitalization enables expanded market access and increased sales volume, which is consistent with Verhoef et al (2021) and Kraus et al. (2020). Furthermore, business owners noted that customer reviews on these platforms serve as a basis for evaluating menu, pricing, and service. This indicates that digitalization also functions as a data-driven learning mechanism that supports continuous improvement and informed decision-making.

Based on these findings, the empirical process of digital transformation and adaptive strategy in local businesses can be illustrated as follows.

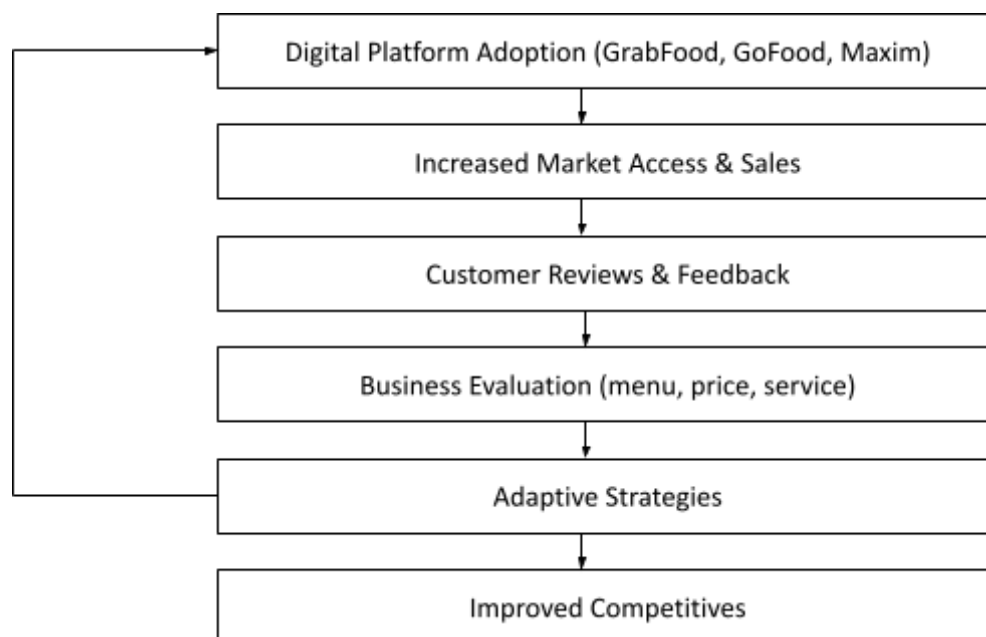


Figure 2. Empirical Process of Digital Transformation and Adaptive Strategy in Local Business

Figure 2 illustrates how the adoption of digital platforms leads to increased market access and sales, which subsequently generate customer feedback through online reviews. This feedback serves as a basis for business evaluation, leading to adaptive strategies such as adjustments in menu, pricing, and service. These strategies ultimately enhance business competitiveness. The feedback loop highlights continuous learning and adaptation in response to market dynamics.

To further clarify the empirical findings, Table 1 summarizes key themes, supporting evidence, and their interpretations derived from the interviews.

Table 1. Summary of Interview Findings on Digital Transformation and Adaptive Strategies

Theme	Empirical Evidence (Interview Quotes)	Interpretation
Digital Platform Adoption	"Warung Eko Burger has been using GrabFood, GoFood, and Maxim Food."	Adoption of digital platforms expands business channels beyond offline sales
Market Expansion	"Sales have increased since using these platforms."	Digitalization enhances market reach and sales performance
Customer Feedback	"We can view customer reviews as a basis for evaluation."	Digital platforms provide real-time feedback for business improvement
Business Evaluation	"We evaluate menu, price, and service based on reviews."	Customer feedback supports data-driven decision-making
Adaptive Strategies	"We adjust our menu and prices according to demand."	Businesses implement adaptive strategies in response to market conditions
Competitive Pressure	"Competition on apps is quite high."	Digital platforms increase competition among businesses
Cost Challenges	"There are service fees from the platforms."	Platform dependency creates cost-related challenges

Source: Interview data (2026)

The table reinforces that digital transformation not only enhances business performance but also drives continuous learning and adaptation through feedback mechanisms and competitive pressures.

Challenges in Digital and Adaptive Implementation

Although digital transformation offers numerous benefits, research findings indicate that businesses face a number of challenges. One of the main challenges is increasing competition on digital platforms, where businesses must compete on price, product quality, and customer ratings.

Business owners state that "competition on apps is quite high, so we have to adjust prices and maintain service quality to remain the buyers' choice." Additionally, service fees or platform commissions also pose a challenge in maintaining business profit margins.

This situation indicates that businesses need to balance the opportunities offered by digitalization with the risks that arise (Rosly et al., 2025). This finding aligns with Kraus et al. (2020), who state that digitalization in small businesses not only opens market opportunities but also increases competitive pressure and operational complexity. Furthermore, Rachinger et al. (2019) emphasize that digital transformation demands significant changes to business models, thereby requiring a high level of adaptability from business owners.

Thus, adaptive capabilities are a critical factor in effectively managing the challenges of digitalization.

Implications for Reimagining Local Economies

The results of this study indicate that digital adaptation and transformation practices at the micro level have broader implications for strengthening the local economy. The strategies implemented by business actors not only improve business performance but also contribute to the creation of a more flexible and inclusive economic system.

In the context of Sustainable Development, these findings suggest that economic transformation can begin at the local level through adaptive practices carried out by small business owners. This supports the argument that sustainable economic development relies not only on macro-level policies but also on micro-level initiatives rooted in innovation and adaptation.

Furthermore, this study demonstrates that the integration of adaptive management and digital transformation can serve as a strategic approach to understanding local economic dynamics. These findings not only confirm existing theories but also contribute to developing a more contextual perspective on the relationship between adaptation, digitalization, and sustainable economic development.

CONCLUSION

This study concludes that local businesses play a crucial role in responding to the dynamics of the business environment through the implementation of adaptive strategies and digital transformation. The findings indicate that adaptive practices, such as adjustments to products, prices, and services, as well as operational flexibility, are key factors in ensuring business sustainability. In addition, the use of digital technology and online platforms enables expanded market access, improved operational efficiency, and strengthened interactions with consumers. The integration of Adaptive Management and digital transformation has also been shown to support continuous learning processes and decision-making that is more responsive to change. More broadly, these practices contribute to strengthening a local economy that is more flexible, inclusive, and competitive in facing global challenges. In the context of Sustainable Development, these findings underscore that economic transformation can begin at the micro level through adaptive practices implemented by local businesses. The practical implications of this research indicate that strengthening adaptive capabilities and digital literacy are essential for local businesses in navigating market uncertainty. The use of digital platforms and digital tools can significantly enhance operational efficiency and improve customer engagement. Furthermore, the integration of Adaptive Management with digital transformation can foster a culture of continuous learning and enable businesses to respond more effectively to market dynamics.

The practical implications of this study indicate that strengthening adaptive capabilities and digital literacy are essential for local businesses in navigating market uncertainty. The utilization of digital platforms not only as a means of distribution and marketing but also as a source of strategic information based on consumer feedback is a crucial element in improving service quality and business competitiveness. Furthermore, for policymakers, the findings of this study indicate the importance of supporting the development of an inclusive digital ecosystem through enhanced access to technology, digital training, and regulations that foster the sustainability of small businesses in the digital age.

This study has several limitations. First, the case study approach used limits the generalizability of the findings to a broader context. Second, the use of qualitative data focused on the perspectives of business owners may introduce subjectivity. Third, this study has not quantitatively measured the impact of digital transformation on business performance, thus failing to provide a statistically measurable empirical illustration.

Based on these limitations, future research is recommended to broaden the scope of the study by involving more business actors from various sectors and regions to enhance the generalizability of the findings. Additionally, the use of a mixed-methods approach can provide a more comprehensive understanding of the relationship between adaptive strategies, digital transformation, and business performance. Further research could also explore the role of external factors, such as government policies, the digital ecosystem, and institutional support, in strengthening the contribution of the local economy to sustainable global development.

BIBLIOGRAPHY

- Badan Pusat Statistik Kabupaten Asahan. (2026). *Kabupaten Asahan Dalam Angka 2026*. 49.
- Bai, C., Quayson, M., & Sarkis, J. (2021). COVID-19 pandemic digitization lessons for sustainable development of micro-and small- enterprises. *Sustain Prod Consum*, 27, 1989–2001.
- Bouwman, H., Nikou, S., & Reuver, M. de. (2019). Digitalization, business models, and SMEs: How do business model innovation practices improve performance of digitalizing SMEs? *Telecommunications Policy*, 43(9).
- Dwivedi, Y. K., Ismagilova, E., Hughes, D. L., Carlson, J., Filieri, R., Jacobson, J., Jain, V., Karjaluoto, H., Kefi, H., Krishen, A. S., Kumar, V., Rahman, M. M., Raman, R., Rauschnabel, P. A., Rowley, J., Salo, J., Tran, G. A., & Wang, Y. (2021). International Journal of Information Management Setting the future of digital and social media marketing research : Perspectives and research propositions. *International Journal of Information Management*, 59, 1–37. <https://doi.org/10.1016/j.ijinfomgt.2020.102168>
- Kraus, S., Clauss, T., Breier, M., Gast, J., Zardini, A., & Tiberius, V. (2020). The economics of COVID-19: Initial empirical evidence on how family firms in five European countries cope with the corona crisis. *International Journal of Entrepreneurial Behavior and Research*, 26(5), 1067–1092.
- Li, L., Su, F., Zhang, W., & Mao, J. (2018). Digital transformation by SME entrepreneurs : A capability perspective. *Information Systems Journal*, 28(6), 1129–1157. <https://doi.org/10.1111/isj.12153>
- Matarazzo, M., Penco, L., Profumo, G., & Quaglia, R. (2021). Digital transformation and customer value creation in Made in Italy SMEs: A dynamic capabilities perspective. *Journal of Business Research*, 123, 642–656.
- Nambisan, S., Wright, M., & Feldman, M. (2019). The digital transformation of innovation and entrepreneurship: Progress, challenges and key themes. *Research Policy*, 48(8).
- Rachinger, M., Müller, C., Vorraber, W., & Schirgi, E. (2019). Digitalization and its influence on business model innovation. *Journal of Manufacturing Technology Management*, 30(8), 1143–1160. <https://doi.org/10.1108/JMTM-01-2018-0020>
- Rosca, E., Agarwal, N., & Brem, A. (2020). Technological Forecasting & Social Change Women entrepreneurs as agents of change : A comparative analysis of social entrepreneurship processes in emerging markets. *Technological Forecasting & Social Change*, 157, 1–12.
- Rosly, H. E., Ibrahim, I., Nakamura, Y., Halin, I. A., & Ibrahim, I. (2025). The Role of Digital Transformation in Shaping Entrepreneurial Success in the Post-Pandemic Era : A Data-Driven Analysis. *Internatioanl Journal of Research and Innovation in Social Science (IJRISS)*, 9(14), 35–49. <https://doi.org/10.47772/IJRISS>
- Sutter, C., Bruton, G. D., & Chen, J. (2019). Entrepreneurship as a solution to extreme poverty : A review and future research directions. *Journal of Business Venturing*, 34(1), 197–214. <https://doi.org/10.1016/j.jbusvent.2018.06.003>

- Teece, D. J. (2018). Business models and dynamic capabilities. *Long Range Planning*, 51(1), 40–49. <https://doi.org/10.1016/j.lrp.2017.06.007>
- Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Dong, J. Q., Fabian, N., & Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research*, 122, 889–901. <https://doi.org/10.1016/j.jbusres.2019.09.022>
- Wirtz, J., & Lovelock, C. (2022). *Service Marketing: People, Technology, Strategy*. World Scientific Publishing Co. Inc.