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Digital Transformation and Agility as Drivers of Sustainable Business Performance: The Mediating Role of Legality in Indonesian SMEs

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Abstract
This study investigates how digital transformation and organizational agility influence sustainable business performance in Indonesian Small and Medium-sized Enterprises (SMEs), emphasizing the mediating role of legality. Drawing on dynamic capabilities theory, the research explores how digital technologies and agile practices contribute to resilience and long-term competitiveness. Using a quantitative approach, data were collected from 453 SMEs across Yogyakarta through structured questionnaires administered in hybrid offline-online sessions. Thematic analysis via NVivo revealed a conceptual framework positioning agility as a critical mediator between digital adoption and business sustainability. The findings highlight that SMEs leveraging digital tools demonstrate greater responsiveness, operational flexibility, and innovation capacity. Notably, legal compliance emerged as a foundational enabler: legally registered SMEs were more effective in adopting digital strategies, accessing institutional support, and navigating regulatory environments. This underscore the role of legality not only as a contextual factor but as a strategic asset enhancing digital and agile capabilities. The study contributes to entrepreneurial strategy literature by integrating digital transformation, agility, and legality into a cohesive model for sustainable SME performance. Practical implications suggest that SMEs should prioritize digital investment alongside legal formalization to maximize their strategic agility and long-term success in volatile markets.

Keywords: Digital Transformation, Organizational Agility, Sustainable Business Performance, Legal Compliance, Small and Medium Enterprises (SMEs), Entrepreneurship Strategy

Introduction

In a rapidly evolving business environment, digitalization has become a key factor in improving the agility and performance of small and medium-sized enterprises (SMEs). Radicic & Petković (2023) highlight thatdigitaltechnologies are important tools that help SMEs stay competitive and flexible in response to market shifts. As SMEs face increasing competition, changing market demands, and rising customer expectations, adopting digital tools is no longer optional—it has become essential. Technologies that enable real-time decision-making, data management, and operational efficiency are especially useful for helping SMEs respond quickly and effectively. As a result, digitalization plays a central role in helping SMEs maintain and strengthen both their agility and overall performance in a changing market. This has led SMEs in Yogyakarta to explore new strategies that use digital

tools to improve how they operate. By adopting digitalization, SMEs can not only become more agile but also better position themselves for long-term growth in an increasingly competitive environment.

Digitalization also directly supports operational agility by improving efficiency, lowering costs, and making better use of available resources. Costa Melo et al., (2023) note that SMEs benefit from digital systems through more efficient communication and stronger collaboration within and outside the organization, which speeds up decision-making. These improvements help SMEs monitor their operations more closely and respond to challenges or opportunities as they arise. In addition, digital tools support data collection and analysis, which helps guide strategy based on customer behavior and market trends (Burchardt & Maisch, 2019). This strengthens SMEs' ability to adapt and make informed decisions—an important part of staying competitive and driving innovation.

Despite these advantages, SMEs often face several challenges when trying to implement digitalization. Research by Alcalde-Heras et al., (2019) and Giotopoulos et al., (2017) identifies key barriers such as limited funding, a lack of digital skills, resistance to change, and concerns about cybersecurity. To overcome these issues, SMEs need to make thoughtful investments in digital capabilities, such as training employees, upgrading infrastructure, and building a culture that supports digital transformation (Brunetti et al., 2020). Addressing these challenges is crucial for SMEs to fully benefit from digital tools and achieve long-term integration.

Digitalization can also act as a strategic driver for long-term growth, adaptability, and customer-focused innovation. According to Burchardt & Maisch (2019), adopting a digital mindset helps SMEs stand out in the market and keep pace with new technologies. By continuously adjusting to digital trends and aligning their strategies, SMEs can not only improve their operational resilience but also drive innovation and meet changing customer needs. Ultimately, SMEs that actively pursue digital transformation are in a stronger position to succeed in today's fast-moving, technology-driven business landscape. This study proposes a framework to help SMEs in Yogyakarta navigate their digital transformation and use technology to strengthen their operations and competitiveness

Several studies indicate that SMEs in Indonesia including those in Yogyakarta—are generally open to adopting digital technologies within their operations. However, their ability to fully integrate digital solutions across all business functions remains limited TH. Tambunan & Busnetti, (2024). This gap is largely due to resource constraints, which restrict access to necessary digital tools and lead to uneven implementation, especially in areas like backend operations, social media use, and e-commerce (Laziva & Qoes Atieq, 2024). Although many SMEs have taken initial steps such as using basic computer systems—the broader digital transformation needed to realize the full benefits of digitalization remains a significant hurdle.

Many SMEs in Yogyakarta still rely on traditional sales channels and are hesitant to transition to fully digital transaction models (Sasongko, (2023). This hesitation is also evident in their limited use of digital platforms for communication and marketing. However, staying competitive increasingly requires SMEs to adopt digital practices that can boost productivity and improve operational efficiency. Several factors continue to hinder this shift, including financial constraints, limited digital skills, and restricted access to technology. Furthermore, a

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lack of awareness about available digital solutions and funding options makes the transition even more difficult (Irianto et al., 2023).

Current research suggests that addressing these barriers—particularly those related to mindset, resource availability, and digital literacy—is essential for meaningful digital integration (Barann et al., 2019). By tackling these challenges, SMEs can strengthen their resilience, expand their market presence, and position themselves for long-term growth in an increasingly digital economy.

In today's highly competitive business landscape, achieving long-term profitability is no longer just an option but a strategic priority. Small and Medium-sized Enterprises (SMEs) in Yogyakarta face multiple challenges in maintaining consistent performance across economic, environmental, and social dimensions (Kawung et al., 2022). In this context, sustainable business performance goes beyond financial results—it includes meeting stakeholder expectations and generating positive impacts on both society and the environment (Kumar et al., 2024). It also involves maintaining the ongoing satisfaction of both employees and customers, making it a multidimensional goal rather than a purely financial one (Rafiah et al., 2022).

The economic aspect of sustainability, as explained by Okfalisa et al., (2021), involves focusing on cost efficiency, expanding market presence, maximizing asset use, and improving profitability all in alignment with broader economic goals. Kawung et al., (2022) further note that economic performance can be reflected in reduced operational costs alongside increased output. On the social side, organizations that prioritize sustainable practices tend to gain a long-term competitive advantage. Okfalisa et al., (2021) also emphasize that strengthening sustainability performance can improve environmental outcomes. Additionally, Falentina et al., (2021) highlight how the relationship between economic and environmental progress plays a key role in shaping social outcomes both positively and negatively—underscoring the interconnected nature of the three pillars of sustainability.

Digital transformation refers to the wide-ranging changes that digital technologies bring to an organization's structure, including the development of new products, changes to organizational design, and automation of core processes (I. Costa Melo et al., 2023; Eller et al., 2020). In some cases, this shift can lead to a complete reconfiguration of a company's business model. A key part of this transformation is the strategic use of data-driven insights, which support both day-to-day operations and long-term decision-making. These insights also help organizations develop innovative digital business models that deliver new value to customers (Elsaman et al., 2023).

As businesses move toward more digital operations, they often face significant challenges especially when trying to integrate products, services, and workflows across digital platforms (Rupeika-Apoga & Petrovska, 2022; Yousaf et al., 2021). To navigate these obstacles, organizations need to adopt flexible, creative strategies (Abu Jaish et al., 2023; Philbin et al., 2022). In the digital era, success is shaped not only by technological assets, but also by how well a company aligns its strategy, cultivates a supportive culture, and invests in talent development (Wenzel, 2017).

Digitalization has a transformative impact on core business elements, such as capabilities, processes, strategies, and routines (Cui & Pan, 2015). Among these,

organizational capabilities are especially important—they represent the interconnected routines that enable a firm to carry out essential functions within its business model (Naughtin et al., 2024). Wicaksono et al., (2020) describe the main goal of digital transformation as applying digital capabilities to products, services, and assets to improve efficiency, create more value for customers, manage risk, and uncover new growth opportunities.

As a result, digital transformation has become a top priority for many organizations—especially those aiming to address sustainability goals while adopting new ways to deliver value (Mihardjo et al., 2019). The same authors emphasize that continuous innovation in business models, made possible through digital tools, is essential for staying competitive and financially stable in a rapidly changing market. Key drivers of this transformation include better customer experiences, increased organizational agility, and improved operational performance (Lyaskovskaya, 2022; Pasqualino et al., 2021).

Agility first emerged in software development, particularly within project management methodologies (Falentina et al., 2021), but has since expanded into broader fields such as operations and production management. The term gained wider recognition in the early 1990s when Yuen & Baskaran, (2024) introduced the concept of the "agile organization." In this broader context, agility refers to a firm's ability to quickly adapt to changing conditions in order to meet customer needs effectively. Today, it is widely seen as a critical factor in remaining competitive and achieving sustainable business outcomes (Almaazmi et al., 2020).

Drawing on dynamic capability theory, organizational agility enables firms to adopt competitive strategies within the framework of digital transformation. It is characterized by the ability to anticipate market changes and respond quickly—allowing businesses to adjust their strategies and operations to gain early-mover advantages, particularly in volatile environments (Chakravarty et al., 2013; Microsoft et al., 2016; Vial, 2019). The hypercompetitive aspects of modern business environments have drawn organizational attention toward agility as a strategic capability. Information technologies are expected to be an important competency in the development of organizational agility. This research proposes two distinct roles to understand how information technology competencies shape organizational agility and firm performance. In their ena bling role, IT competencies are expected to directly enhance entrepreneurial and adaptive organizational agility. In their facilitating role , IT competencies should enhance firm performance by helping the imple mentation of requisite entrepreneurial and adaptive actions. Furthermo re, we argue that the effects of the dual roles of IT competencies are moderated by multiple contingencies arising from environmental dynamism and other sources. We test our model and hypotheses through a laten t class regression analysis on data from a sample of 109 business-to-b usiness electronic marketplaces. The results provide support for the e nabling and facilitating roles of IT competencies. Moreover, we find t hat these dual effects vary according to environmental dynamism. The results suggest that managers should account for (multiple) contingencies (observed and unobserved) while assessing the effects of IT compete ncies on organizational agility and firm performance (Chakravarty et al., 2013; Dinesh et al., 2024; Vial, 2019). Agility also supports innovation by helping firms identify emerging opportunities and mobilize resources, expertise, and relationships to respond efficiently (Tallon & Pinsonneault,

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2011). (Lu et al., 2024) adds that agility involves not just reacting to disruption, but turning it into a source of growth and strategic success.

Rupeika-Apoga & Petrovska, (2022) define operational agility as improving value for existing customers through lower costs, higher quality, or faster service. More broadly, agility is viewed as a strategic approach that drives innovation and enables organizations to create value (Dinesh et al., 2024; Teece et al., 2016). According to Yasir et al., (2020), agility helps organizations meet unmet customer needs through three main mechanisms: identifying and responding to customer expectations, quickly deploying new technologies or offerings, and transforming business models to compete in or reshape existing markets (Evans et al., 2017; Victoria & Purwianti, 2022).

Agility operates across three interconnected dimensions: Customer Agility (CA), Partnering Agility (PA), and Operational Agility (OA) (Sambamurthy et al., 2003). These dimensions reflect both internal and external responses to change (Aleksandr Gerasimov & Aleksandr Suglobov, 2022; de Souza et al., 2021). CA and PA focus on external engagement and collaboration, while OA refers to an organization's internal flexibility and responsiveness (Laziva & Qoes Atieq, 2024).

Specifically, Customer Agility involves engaging customers in the idea-generation and implementation phases, allowing for co-creation of new solutions (Radicic & Petković, 2023). Partnering Agility refers to the ability to use the resources, knowledge, and data of external collaborators such as suppliers, logistics providers, and third-party vendors—to support innovation. In contrast, Operational Agility reflects how well a firm can respond to opportunities internally—with speed, accuracy, and efficiency (Mihardjo et al., 2019; Sambamurthy et al., 2003).

The legal and regulatory environment in which Small and Medium-sized Enterprises (SMEs) operate in Indonesia plays a significant role in shaping their business activities, particularly in areas such as legal compliance, strategic planning, and long-term viability. A clear and supportive legal framework can act as both a facilitator and a constraint for SME development. On one hand, legal recognition can enhance credibility, improve access to government support, and open new market opportunities. On the other hand, regulatory requirements may introduce administrative or financial burdens that many SMEs struggle to manage.

Regulatory changes have a direct impact on SME growth and development by influencing the business environment, shaping competitiveness, and determining access to critical resources (Indahsari et al., 2023). The effectiveness of a legal framework often depends on how it is designed and implemented. When structured well, it provides the stability and clarity SMEs need for planning, compliance, and investment (Inshakova et al., 2019). In contrast, vague or frequently changing regulations can create uncertainty, increase costs, and discourage formalization (Kusmanto & Warjio, 2022).

Many SMEs perceive regulations especially those involving licensing, reporting, and taxes—as obstacles to growth. Although not always the most pressing challenge, regulatory compliance often ranks high among SMEs' concerns (Inshakova et al., 2019). For this reason, government policies that aim to support SMEs must go beyond regulation by offering

practical tools for compliance. Key measures include simplifying business registration, providing financial assistance, and ensuring legal protection (Purnawan & Adillah, 2020). Although legal regulations can be a source of difficulty, they also present opportunities when thoughtfully crafted. A balanced legal framework—one that considers the specific needs and limitations of SMEs—can help create an environment that supports innovation and sustainable growth. Legal compliance forms the foundation of SME operations, establishing the rules that guide how businesses operate, compete, and evolve over time (von Alemann, 2016). A strong legal structure not only protects SME rights but also enables them to grow with confidence and resilience (Nguyen & Tsang, 2024).

Method

This study used a quantitative approach to explore the relationship between digital transformation, agility, and business performance among Small and Medium-sized Enterprises (SMEs) in the Special Region of Yogyakarta, Indonesia. The research focused on SMEs that had been in operation for at least five years and were active in sectors such as culinary, crafts, fashion, services, dealerships, and trade. A total of 453 SMEs participated in the study, selected using purposive sampling to ensure alignment with the research objectives. Data collection was conducted in January 2025 through offline interviews, during which participants completed a structured online questionnaire. This hybrid approach allowed for direct interaction with respondents while leveraging the consistency and efficiency of digital survey tools. The questionnaire consisted of closed-ended questions designed to measure key variables using a standardized instrument.

The study focused on four main variables: organizational agility, degree of digitalization, business performance, and the legal status of the SMEs. Data analysis was carried out using NVivo software, which supported the coding, categorization, and interpretation of the responses. This analytical process enabled a systematic examination of the relationships between the variables and provided insights into how digital capabilities shape SME adaptability and long-term sustainability in a competitive environment

Results and Discussion

Based on thematic analysis conducted using NVivo, this study presents a conceptual framework (see Figure 1) that illustrates the relationship between digital business transformation, agility capabilities, and sustainable business performance among SMEs. The coding and clustering of qualitative data from survey responses revealed recurring themes that highlight how digital initiatives enhance SME agility—understood here as the ability to respond swiftly to shifting market conditions—which, in turn, supports improved and sustained business outcomes.

This framework was developed by integrating empirical findings with insights from the literature. It positions agility capabilities as a mediating factor between digital transformation and business sustainability, underscoring agility as a strategic enabler in the digital era. The analysis indicates that SMEs that adopt digital technologies are better equipped to build internal responsiveness, flexibility, and innovation capacity—key elements of agility that contribute to long-term viability.

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An important finding from the NVivo analysis is the foundational role of SME legality within this framework. Legally registered and compliant SMEs demonstrated greater capacity to implement digital solutions, access institutional support, and navigate regulatory systems effectively. This suggests that legal status functions not only as a background condition but as a critical enabler that supports digital transformation and agility. The framework therefore identifies legality as the foundation upon which digital and agility strategies must be built to achieve sustainable business performance. This study proposes a conceptual model (see to Figure 1) that links digital transformation and agility to sustainable performance, grounded in both empirical data and the literature reviewed.

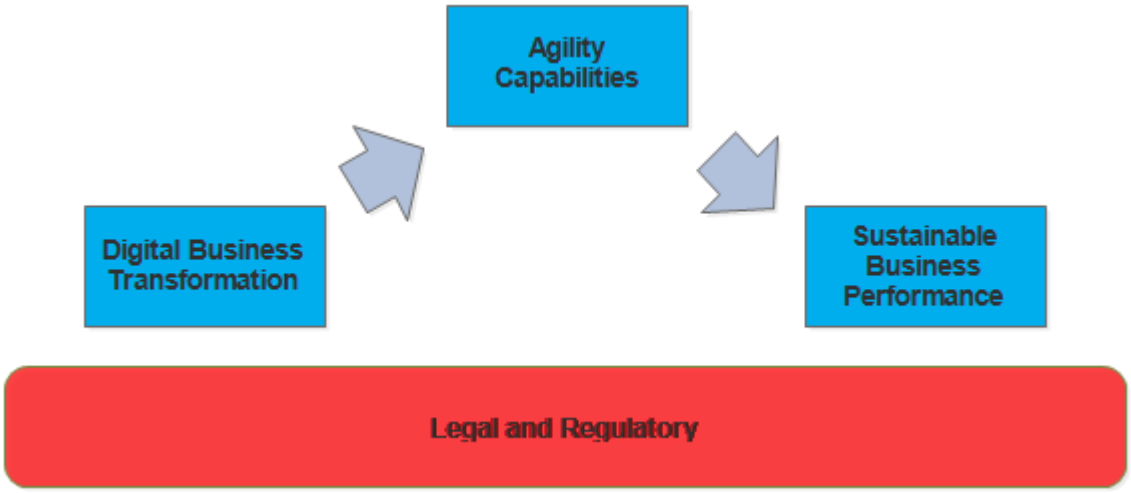

Figure 1. Linking Digital Transformation, Agility, and Sustainable Business Performance with Legal and Regulatory Foundations Conceptual Framework

Conclusion

A substantial body of research has explored the link between organizational agility and business performance, particularly in the context of agile manufacturing, supply chain flexibility, and value chain responsiveness (Hsieh et al., 2024; K. H. E. E. Lee, 2023). Roberts, (2024) found a positive relationship between agility and competitive performance, driven by improved responsiveness across the value chain. Similarly, Martins et al., 2024; Pérez Rave et al., (2024) highlighted how greater supply chain flexibility reduces environmental uncertainty, enhances adaptability, and improves profitability and market share. Ghasemi et al., (2021) further confirmed strong correlations between organizational agility, effectiveness, and learning capabilities. These findings align with H. Lee, (2024), who underscore agility as a vital component of business success in dynamic environments.

Building on these insights, it is clear that agility serves as a dynamic capability (Vial, 2019; von Alemann, 2016) that enables digital transformation and supports the ability to capitalize on new opportunities. This transformation not only enhances short-term

competitiveness (Guo et al., 2024) but also contributes to long-term business sustainability (Haseeb et al., 2019).

In the context of rapidly evolving markets, organizations must continuously update their business models and integrate digital technologies to remain relevant and profitable (Mihardjo et al., 2019). Digital transformation has been linked to improvements in customer experience, agility, and operational efficiency (Barann et al., 2019). It also reshapes processes, assets, and stakeholder engagement strategies. Prior research has identified three critical factors for successful business model innovation: responsiveness to customer needs, the ability to make quick and effective decisions, and adaptability in resource allocation. These capabilities support the development of agile and sustainable strategies in uncertain environments (Rupeika-Apoga & Petrovska, 2022).

Additionally, firms are encouraged to prioritize customer engagement, as strong relationships have been shown to improve brand value and performance—especially when combined with digital innovation (Mihardjo et al., 2019). A key contribution of this study is its emphasis on the enabling role of SME legality. Legally registered SMEs are better positioned to access institutional resources, adopt digital tools, and comply with regulatory requirements—all of which strengthen their agility and support sustainable growth. As such, legal compliance should be recognized as a foundational element in assessing the effectiveness of digital transformation and agility as drivers of long-term business sustainability.

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