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Challenges of New Technology Adoption in Improving Company Growth and Competitiveness

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KEYWORDS	ABSTRACT
Keywords: Technology Adoption; Digital Transformation; Financial Constraints; Innovation Diffusion; Organizational Competitiveness. **Conflict of Interest Statement:** The author(s) declares that the research was conducted without any commercial or financial relationships that could be construed as a potential conflict of interest. **Copyright © 2025 AEFS. All rights reserved.**	**Purpose:** This study examines the challenges and strategies of adopting new technologies to enhance organizational growth and competitiveness in the digital era. It focuses on identifying financial, skill-based, cultural, and external barriers and exploring practical approaches to overcoming them. **Research Design and Methodology:** A qualitative systematic literature review (SLR) method was employed, synthesizing findings from peer-reviewed articles and academic sources. This approach allowed for a comprehensive analysis of empirical and theoretical perspectives, integrating concepts from innovation diffusion, financial management, and organizational change theories. **Findings and Discussion**: The study identifies financial constraints, skill gaps, resistance to change, and external factors such as regulatory challenges and inadequate digital infrastructure as critical barriers to technology adoption. It highlights the dynamic interactions among these barriers, revealing how they collectively influence organizational readiness for digital transformation. Strategies such as pilot testing, portfolio diversification, continuous employee training, and regulatory alignment are discussed as essential for overcoming these challenges. The findings also emphasize the role of advanced technologies like Artificial Intelligence (AI), the Internet of Things (IoT), and cloud computing in driving operational efficiency, innovation, and market competitiveness. **Implications:** The research contributes to academic discourse by offering a holistic framework for understanding technology adoption challenges. Practically, it provides actionable insights for organizations to foster a culture of innovation and align technological initiatives with business goals. Policymakers are urged to invest in digital infrastructure and create supportive regulations to facilitate sustainable digital transformation.

Introduction

Digital transformation has dramatically reshaped how businesses operate, innovate, and compete in the global marketplace. Companies across industries increasingly integrate advanced technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), and cloud computing to enhance efficiency, improve customer engagement, and maintain competitive advantages (Rane, 2023). These technologies have become indispensable for businesses seeking to respond to the evolving demands of a digitally connected world. However, the adoption of such technologies is not without challenges. Regardless of size, many organizations encounter significant hurdles when transitioning to digital operations. High implementation costs, limited access to expertise, and a lack of alignment between technological capabilities and business objectives often obstruct effective integration (Chowdhury et

al., 2024). For larger enterprises, the challenges lie in the complexity of scaling technology across multiple operations, while smaller firms struggle with resource constraints. Beyond technical issues, adopting digital tools necessitates significant cultural and structural adjustments, which can lead to internal resistance. Employees may fear displacement or lack the skills to adapt to new technologies, creating additional barriers. Cybersecurity and data privacy concerns loom as businesses increasingly rely on interconnected systems to manage critical operations (Khalil & Abdel-Rahman, 2023). As industries experience rapid technological advancements, the pressure on companies to modernize has intensified, making the ability to successfully adopt and integrate new technologies a critical determinant of long-term growth and competitiveness. These dynamics underscore the complex interplay between opportunity and challenge in the digital transformation journey.

While the opportunities presented by digital transformation are vast, businesses face intricate and multifaceted challenges that hinder the adoption of new technologies. The substantial financial investment required for acquiring and implementing advanced technologies is often a primary obstacle. Companies must allocate resources not only for purchasing new tools but also for training employees, maintaining systems, and upgrading infrastructure (Barth & Koch, 2019). These costs can become prohibitively high for businesses operating in regions with underdeveloped digital ecosystems. Additionally, integrating advanced technologies like AI and IoT often demands a reconfiguration of traditional business models, which can be met with resistance from stakeholders within the organization. Employees may view such changes as disruptive or perceive technological advancements as threats to job security, leading to pushbacks that complicates implementation efforts (Shultz et al., 2018). Another critical issue is the gap in technical expertise within many organizations. Businesses often struggle to recruit and retain skilled personnel capable of managing and optimizing complex digital systems, leaving them unable to fully realize the benefits of their investments. The increasing reliance on interconnected technologies exposes companies to heightened cybersecurity risks. The potential for data breaches and privacy violations adds a layer of complexity to the digital transformation process, as companies must balance the need for technological advancement with the imperative to protect sensitive information (Herath et al., 2024). These practical challenges and the broader implications of aligning digital strategies with business goals highlight the need to examine adoption factors. Addressing these barriers is essential for enabling companies to fully leverage the potential of digital transformation in driving growth and competitiveness in the modern economy.

Recent studies underscore digital transformation's dual nature, highlighting its challenges and opportunities for businesses, particularly SMEs. Hendrawan et al. (2024) and Hariyanti & Kristanti (2024) identify limited resources, inadequate digital infrastructure, and a lack of technological awareness as significant barriers to digital adoption. Conversely, research by Maria et al. (2024) reveals the critical benefits of digital technology adoption, including enhanced operational efficiency, expanded market reach, and improved decision-making capabilities. To successfully navigate this transition, businesses must develop comprehensive strategies that align technology adoption with their broader objectives, invest in employee training, and address cybersecurity concerns. Integrating advanced technologies, such as AI, IoT, and cloud computing, reshapes various industries, including automotive and healthcare (Maria et al., 2024). While these technologies promise to revolutionize business practices and drive competitive advantages, their adoption is challenging. As Galarza-Sánchez (2023) points out, organizations often face resistance to change, high costs, and skill gaps, which can impede successful technology implementation. Addressing these barriers requires optimizing human resource capacities through structured training programs and effective change management (Ryketeng et al., 2023). Despite the hurdles, adopting digital technologies has enhanced productivity, competitiveness, and innovation, fostering sustainable business growth (Galarza-Sánchez, 2023).

While prior studies have provided meaningful insights into the dynamics of digital transformation, significant gaps persist in the literature regarding the practical and theoretical dimensions of technology adoption. Most existing research focuses on specific industries or geographical regions, resulting in an incomplete understanding of the broader implications and cross-sectoral applicability of the challenges and strategies associated with adopting advanced technologies. Although barriers

such as high costs, skill deficits, and resistance to organizational change have been well-documented (Hariyanti & Kristanti, 2024; Galarza-Sánchez, 2023), these discussions often lack an integrative framework that addresses how these factors interact and collectively impact the adoption process. Theoretical frameworks have also been underdeveloped, particularly in exploring how businesses, regardless of size, can strategically leverage emerging technologies like AI, IoT, and cloud computing to foster long-term growth and competitiveness. Empirical findings, while valuable, often present fragmented perspectives, offering limited practical guidance on aligning technology adoption with broader organizational goals. For instance, studies frequently emphasize specific aspects of digital transformation, such as cybersecurity risks or operational efficiency, but fail to address how these elements can be holistically managed within a unified strategy (Ryketeng et al., 2023; Maria et al., 2024). Furthermore, research remains scarce exploring the interplay between organizational readiness and external factors, such as regulatory environments and infrastructure disparities, which critically shape technology adoption outcomes. These gaps underscore the need for a systematic review synthesizing theoretical and empirical findings to provide actionable insights for businesses navigating the complexities of the digital era.

This study introduces a novel approach by systematically examining the challenges and strategies of adopting new technologies to enhance company growth and competitiveness in the digital era. Unlike prior studies that focus on isolated aspects of technology adoption, such as financial barriers, skill gaps, or resistance to change, this research uniquely integrates these dimensions into a comprehensive framework. The novelty lies in exploring how these challenges interact dynamically within organizational contexts, particularly under varying external influences such as regulatory environments and infrastructure availability. Additionally, this study evaluates advanced technologies like Artificial Intelligence (AI), the Internet of Things (IoT), and cloud computing to identify their distinct contributions to operational efficiency, market competitiveness, and long-term growth. Using the Systematic Literature Review (SLR) method, the research seeks to synthesize empirical and theoretical insights to address the gaps in understanding practical strategies businesses can adopt for a successful digital transformation. This study also emphasizes the often-overlooked role of organizational readiness and strategic alignment in mitigating technology adoption barriers. Doing so expands the existing body of knowledge and offers actionable guidance that aligns digital innovation with business objectives. The central research questions driving this inquiry are: (1) What are the complex and interrelated challenges businesses face in adopting new technologies in the digital era? Moreover, (2) What strategies can effectively address these challenges to optimize company growth and competitiveness? This research is timely and critical, as it contributes to the academic discourse on digital transformation and equips organizations with a roadmap to navigate the complexities of adopting new technologies in a rapidly evolving business environment.

Literature Review

Diffusion of Innovation (DOI) Theory

Adopting new technologies presents significant challenges for organizations to grow and compete in the digital era. The main difficulties lie in several dimensions, the first of which is financial constraints. Implementing advanced technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), and cloud computing requires significant initial investments, including the cost of purchasing hardware and software, infrastructure development, and long-term maintenance. These high costs are often a barrier for companies, especially small and medium enterprises with limited resources. In addition, there is a skills gap where organizations usually find it challenging to find workers with the competence to operate this new technology. The lack of skilled workers creates a high dependence on training, ultimately increasing the company's financial burden.

Resistance to change is also a significant obstacle in the digital transformation process. Many employees feel uncomfortable with changes in work processes caused by adopting new technologies, especially if these changes threaten their role in the organization. These organizational culture barriers often hinder technology integration, even in companies with sufficient resources. Furthermore, external challenges such as government regulations, infrastructure limitations, and market competition also significantly impact the successful adoption of technology. In developing

countries, for example, the lack of access to adequate digital infrastructure often prevents companies from fully adopting advanced technology.

The dynamics of these challenges do not stand alone; instead, they interact with each other in the organizational context. Financial constraints, skill gaps, and organizational culture barriers reinforce each other, creating complexity in the digital transformation. For example, organizations with financial limitations may face difficulties providing adequate employee training, ultimately increasing resistance to change. In many cases, a combination of these challenges contributes to the failure of technology implementation. Case studies show that companies that fail to understand the dynamic interaction between internal and external constraints often find it difficult to achieve successful digital transformation.

However, various strategies have been identified to overcome these challenges. One effective strategy is risk management, which involves diversifying technology investments and implementing pilot testing before full implementation. This strategy allows companies to identify and mitigate potential risks before making significant investments. In addition, strengthening organizational readiness is key to successfully adopting technology. Continuous employee training and developing a work culture that supports digital innovation can reduce resistance to change. Organizations must also ensure that their business objectives align with the technology adopted. This strategic alignment is critical to ensure that investments in technology provide added value that suits the company's needs.

The positive impact of adopting advanced technology on company growth cannot be ignored. Technologies such as AI, IoT, and cloud computing have been proven to increase operational efficiency through process automation, cost reduction, and better data management. In addition, these technologies enable companies to expand their market competitiveness by opening up new business opportunities and introducing more innovative business models. For example, AI can analyze customer data in real-time, enabling companies to provide a more personalized and relevant customer experience. IoT, on the other hand, allows more efficient asset monitoring and management, while cloud computing offers flexibility in data management and applications that support long-term growth.

By combining risk management strategies, strengthening organizational readiness, and strategic alignment, organizations can overcome the challenges of adopting new technologies. Furthermore, the positive impact of advanced technology on company growth confirms that investment in technology is necessary and an opportunity to create a sustainable competitive advantage in the digital era. This research provides deep insights into how organizations can embrace digital transformation strategically and effectively while making an essential contribution to academic literature in this field.

The Diffusion of Innovation (DOI) theory, first introduced by Everett Rogers, remains a foundational framework for understanding how innovations are introduced, adopted, and disseminated within social systems (Rogers, 2003). This theory emphasizes four critical elements—innovation, communication channels, time, and social systems—as central to the diffusion process (Call & Herber, 2022). Innovations, whether technological tools or operational methodologies are adopted when perceived as adding significant value compared to existing solutions. Communication channels, particularly those combining mass media and interpersonal interactions, are pivotal in spreading information about these innovations. According to Lin (2021), the diffusion rate is also influenced by the duration of the adoption process, from initial exposure to integration within the social system. Factors such as relative advantage and compatibility are essential in determining the likelihood of adoption. When innovations align with an organization's values, goals, and infrastructure, they are more readily embraced (Pineda et al., 2023). Conversely, complexity can hinder adoption, as innovations that are difficult to understand or implement often face resistance (Zhai et al., 2021). Trialability, or the ability to test innovations on a smaller scale, reduces uncertainty, while observability, the visibility of an innovation's benefits, accelerates diffusion (Call & Herber, 2022). These dynamics collectively shape the success of innovation adoption within organizations, underscoring the interplay between individual and systemic factors in enabling diffusion (Lin, 2021). By addressing these elements, the DOI theory provides a comprehensive lens to

examine how businesses can effectively integrate new technologies to enhance competitiveness and growth.

Organizational readiness is a fundamental factor in the successful adoption of innovations, shaping the ability to integrate new technologies into operational frameworks. According to Holt et al. (2007), readiness involves supportive leadership, an adaptive culture, and adequate resources, which enhance an organization's capacity to embrace change. Organizations that actively promote employee training, foster interdepartmental collaboration, and provide space for experimentation are better positioned to adopt new technologies effectively. This aligns with findings by Kwon et al. (2021), who emphasize that a culture open to innovation mitigates resistance to change, a common barrier in the adoption process. In addition to internal readiness, external support plays a critical role in facilitating innovation adoption. Market pressures, industry trends, and competitors' success in adopting innovations create an environment that encourages adoption. Collaborative efforts with technology providers and consultants further alleviate barriers. For example, Martínez-Peláez et al. (2023) note that partnerships with external stakeholders can streamline technical training and tailor solutions to organizational needs. The Diffusion of Innovation (DOI) Theory also provides a structured framework for understanding this process, identifying stages such as Knowledge, Persuasion, Decision, Implementation, and Confirmation Frei-Landau et al. (2022). Each stage highlights the importance of organizational readiness and external support in ensuring successful integration. By leveraging these factors, organizations can navigate the complexities of innovation adoption, ensuring sustained growth and competitiveness in an evolving digital landscape.

Technology Adoption in Businesses

Technology adoption, integrating digital tools and systems into business operations, has become essential for enhancing efficiency, productivity, and innovation. Modern technologies like Artificial Intelligence (AI), the Internet of Things (IoT), and cloud computing are pivotal in this digital transformation. For example, AI-driven analytics enable real-time data processing, providing actionable decision-making insights (Yin & Kaynak, 2015). Simultaneously, IoT connects devices within business ecosystems, facilitating seamless workflows and minimizing human error (Mohammadi et al., 2018). Cloud computing further enhances scalability and operational flexibility, enabling businesses to manage resources more effectively. Despite these advantages, technology adoption presents significant challenges. Businesses often struggle to align technologies with their specific goals and infrastructures. The increasing reliance on IoT, for instance, introduces security vulnerabilities that require robust solutions (Alaba et al., 2017). Implementing cloud-based architectures demands strategic planning to mitigate risks and optimize benefits. Historical trends show that technology has consistently acted as a catalyst for business transformation, from industrial mechanization to digital innovation (Shehadeh, 2024). These technologies are not merely operational tools but drivers of competitive advantage. Understanding their strategic importance, alongside addressing associated challenges, is crucial for businesses aiming to remain relevant in an evolving digital landscape.

The technology adoption process offers significant opportunities but is often accompanied by complex challenges. One primary obstacle is achieving strategic alignment between the technology being adopted and the specific needs of a business. Many organizations fail to fully utilize technology because they lack a clear understanding of how it aligns with long-term goals (Felicetti et al., 2024). This misalignment often leads to inefficiencies and missed opportunities. Additionally, digital infrastructure limitations remain a critical barrier, especially in regions with underdeveloped technological ecosystems. Another significant challenge lies in skill gaps within the workforce. Li (2022) emphasizes that many organizations struggle to find adequately trained employees who effectively manage and utilize new technologies. This skills deficit hinders the adoption process and exacerbates resistance to change, particularly among employees who perceive digital transformation as threatening their roles. Alam, Mishrif & Khan (2023) point out that such resistance often stems from a lack of engagement and clear communication during the adoption process. To overcome these challenges, organizations must establish relevant Key Performance Indicators (KPIs) to evaluate the success of technology implementation. Metrics such as ROI, operational efficiency improvements,

and customer satisfaction are critical for measuring impact. By combining strategic planning with consistent post-adoption evaluations, businesses can optimize technology adoption processes and achieve sustained growth.

Growth Through Technology Adoption

Technology adoption drives business growth and enhances operational efficiency, service quality, and market expansion. Cloud computing, for instance, enables companies to manage computational resources flexibly, improving scalability and cost efficiency. According to Neiroukh et al. (2024), cloud platforms facilitate real-time data access, allowing businesses to adapt swiftly to changing market conditions. Moreover, AI-powered analytics have transformed service personalization by tailoring customer experiences based on detailed behavioral insights, a capability that significantly enhances customer loyalty Tran (2024). In addition to operational benefits, digital technologies support broader market expansion strategies. As Maroufkhani et al. (2020) noted, big data analytics allow firms to identify untapped market segments and optimize marketing campaigns. These tools are particularly effective in driving targeted outreach through data-driven insights. Wamba et al. (2017) highlight how firms leveraging dynamic capabilities through big data analytics have consistently demonstrated superior performance and sustained competitive advantage. However, Achieving this growth requires aligning technological capabilities with long-term strategic objectives and short-term operational needs. Establishing relevant Key Performance Indicators (KPIs), such as Return on Investment (ROI) and operational efficiency metrics, is essential for assessing the effectiveness of technological initiatives. By integrating advanced technologies thoughtfully and evaluating their impact rigorously, businesses can ensure that technology adoption contributes to sustained growth and market leadership.

While offering numerous opportunities, technology adoption is fraught with challenges that businesses must address to harness its full potential. One primary obstacle is the risk of ineffective technology investments. Many organizations allocate substantial resources to technologies that do not align with their specific business needs, resulting in limited growth impact. Hanelt et al. (2021) emphasized that this misalignment often stems from a lack of strategic clarity in selecting technologies that align with long-term goals. Moreover, Jöhnk et al. (2021) highlighted the critical role of ensuring that comprehensive assessments of organizational needs inform technology adoption strategies gaps within the workforce further complicate the adoption process. Bharadwaj et al. (2013) noted that companies frequently struggle to find or develop talent capable of effectively utilizing new technologies. This issue is exacerbated by internal resistance to change, as employees may perceive digital transformation as threatening their roles. Raza et al. (2023) underscored the importance of addressing such resistance through transparent communication and employee engagement initiatives. To mitigate these challenges, gradual technology implementation has been identified as a practical approach. Hanelt et al. (2021) suggested that a phased adoption strategy reduces risks and ensures smoother integration. Additionally, leveraging real-time data from technologies such as IoT and AI enables informed decision-making, enhancing organizational agility. When combined with targeted workforce training, these strategies can help businesses optimize the benefits of technology adoption and achieve sustainable growth.

Competitiveness in the Digital Era

Digital transformation has become a strategic imperative for companies to sustain relevance and competitiveness in dynamic markets. By integrating technologies such as Artificial Intelligence (AI), Internet of Things (IoT), and cloud computing, businesses can achieve enhanced operational efficiency, personalized services, and improved decision-making. Fischer (2024) emphasizes that AI-powered analytics allow firms to gain actionable insights into customer behavior, driving strategic decisions and fostering innovation. IoT, on the other hand, facilitates seamless device integration, enabling real-time monitoring and boosting productivity while optimizing workflows (Li et al., 2018). Cloud computing offers unparalleled scalability and cost-efficiency, empowering organizations to expand operations without significant infrastructure investments (Khan et al., 2024). The agility provided by these technologies enables companies to adapt swiftly to market trends and evolve

customer expectations. Hanelt et al. (2021) highlight that successfully leveraging these innovations can create a sustainable competitive advantage by aligning digital capabilities with their strategic objectives. However, technology alone is insufficient. Fostering a culture of learning and experimentation is critical to support this transformation. Junaedi et al. (2024) argue that organizations must invest in continuous employee development to bridge digital skill gaps and encourage innovation. By addressing both technological and cultural dimensions, businesses can unlock the full potential of digital transformation, ensuring resilience and sustained growth in an increasingly digital landscape.

Businesses face numerous external competitive challenges in the digital era, particularly regulatory compliance and cybersecurity. The continuous evolution of regulations, including data protection, compels companies to regularly update their systems to ensure compliance and build customer trust. Limberg et al. (2023) highlight the growing complexity of these regulations and their implications for organizational strategies. Simultaneously, cybersecurity risks represent a significant threat. Jöhnk et al. (2021) argue that proactive mitigation strategies, such as robust cybersecurity frameworks, are critical to protecting corporate and customer data from breaches that could undermine business stability. Consumer expectations have also shifted dramatically in the digital landscape. Modern consumers demand personalized, fast, and technology-driven services. Li et al. (2018) emphasize that companies must adapt quickly to these dynamic expectations by leveraging digital tools to enhance customer experiences. This aligns with the findings by Hanelt et al. (2021), who stress the importance of integrating innovative technologies into business operations to remain relevant and competitive. Measuring the effectiveness of digital competitiveness is essential. Key performance indicators (KPIs) such as customer loyalty, ROI, and digital revenue growth are benchmarks for success. By addressing these challenges through strategic technology integration and collaboration with digital partners, businesses can navigate external pressures effectively and maintain a strong competitive position in the evolving digital marketplace.

Research Design and Methodology

Study Design

This research employs a qualitative systematic literature review (SLR) approach. The SLR design was chosen to synthesize and critically evaluate existing literature on financial market instability, economic growth, and long-term investments. This method ensures a comprehensive analysis of relevant studies, providing a robust foundation for understanding complex relationships among the variables. The study ensures methodological rigor and transparency by following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines.

Sample Population or Subject of Research

The research focuses on peer-reviewed academic articles, books, and reports published between 2018 and 2024. The subjects of analysis include studies that discuss financial instability, sustainable investments, and macroeconomic conditions. Sources were selected from reputable databases, such as Elsevier, Springer, Wiley, and Emerald, ensuring high-quality and credible materials. Studies addressing the intersection of financial market volatility and its implications on long-term investment strategies were prioritized.

Data Collection Techniques and Instrument Development

Data collection involved a structured search using specific keywords, including "financial market instability," "economic growth," "long-term investments," and "risk management." Advanced search filters were applied to include only studies published in English from reliable academic journals and databases. The inclusion and exclusion criteria were clearly defined to ensure relevance and quality. A coding framework was developed to categorize themes, methodologies, and findings systematically.

Data Analysis Techniques

Thematic analysis was employed to identify and interpret key patterns and trends in the selected literature. Each study was evaluated based on its contribution to understanding financial market instability and long-term investments. Cross-referencing was conducted to ensure consistency and eliminate bias. The findings were synthesized to provide a comprehensive narrative, highlighting gaps in current research and proposing directions for future investigations. This process ensures the validity and reliability of the results.

Findings and Discussion

Findings

Adopting new technologies in the digital era poses various interconnected challenges that organizations must address to ensure successful implementation. One of the most prominent barriers is financial constraints, particularly for small and medium-sized enterprises (SMEs). These businesses often lack the capital for substantial initial investments in technology infrastructure, software, and ongoing maintenance. Barth & Koch (2019) highlighted that such financial hurdles frequently result in delays and setbacks in technology projects, underscoring the need for careful financial planning. Beyond costs, a significant skill gap exists within the workforce, where many employees lack the expertise required to operate advanced technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), and cloud computing. Li (2022) emphasized the urgency of reskilling and upskilling employees to bridge this gap, mainly as organizations aim to align their capabilities with Industry 4.0 demands. Resistance to change within organizations adds another layer of complexity, often stemming from employees' fear of losing their established roles or adapting to unfamiliar workflows. Frei-Landau et al. (2022) noted that cultural resistance significantly slows technology adoption, particularly in environments that lack proactive change management strategies. External factors, such as regulatory environments and infrastructure availability, further exacerbate these issues. Galarza-Sánchez (2023) revealed that SMEs in developing countries face heightened challenges due to weak infrastructure and fragmented regulatory frameworks, which hinder the seamless integration of advanced technologies. Together, these barriers create a multifaceted challenge that requires comprehensive strategies to overcome, emphasizing the critical role of financial planning, skill development, and external environment assessment in successful technology adoption.

The barriers to adopting new technologies are not isolated issues but are deeply interconnected within organizational contexts, creating complex dynamics that challenge seamless integration. Financial constraints, for instance, do more than limit investments in technology—they also hinder the ability to invest in workforce training programs, perpetuating the organization's skill gap. Holt et al. (2007) emphasize that organizations unprepared for change often struggle to navigate these intertwined challenges. It is critical to collectively adopt strategies that address financial, cultural, and skill-related barriers. Organizational resistance to change is intensified when employees perceive technological investments as threatening their job security. Jöhnk et al. (2021) highlight that this resistance is most pronounced in companies that fail to align their organizational readiness with external technological demands. These dynamics are further complicated by external pressures such as regulatory compliance and market competitiveness. Organizations that underestimate the interaction between internal barriers and external demands often experience failures in their digital transformation initiatives (Call & Herber, 2022). For example, an organization with limited financial resources may struggle to comply with complex regulatory requirements, creating additional bottlenecks. Hanelt et al. (2021) illustrated through case studies how companies that neglected the interplay of these factors encountered significant setbacks, underscoring the importance of a systems-based approach to address these challenges. By understanding and mitigating these interdependencies, organizations can establish more effective strategies to manage the complex web of barriers, ensuring a smoother and more successful transition toward digital innovation.

Practical strategies to overcome the challenges of adopting new technologies require a holistic approach that simultaneously addresses financial, cultural, and skill-based barriers. One of the most valuable methods is the implementation of robust risk management strategies, including diversifying technology investments and conducting pilot tests before large-scale adoption. Barth & Koch (2019)

argue that pilot testing allows organizations to identify potential implementation risks and make necessary adjustments without committing excessive resources. Additionally, continuous workforce training is pivotal in mitigating resistance to change and addressing skill gaps. Jöhnk et al. (2021) emphasize that fostering a culture of innovation through targeted employee development programs prepares teams for technological transitions and builds long-term resilience. Strategic alignment between technological initiatives and business objectives is another critical factor in overcoming adoption barriers. Bharadwaj et al. (2013) argue that aligning digital transformation goals with organizational priorities ensures that technological investments deliver measurable value. Regulatory reforms and supportive government policies can play a significant role in facilitating technology adoption. Shehadeh (2024) suggests that incentives such as tax breaks for digital transformation initiatives or grants for sustainable technology adoption can provide much-needed support for organizations facing financial constraints. These strategies, when combined, create a comprehensive framework for addressing the multifaceted challenges of technology adoption. By focusing on proactive risk management, workforce readiness, and strategic alignment, organizations can navigate the complexities of integrating advanced technologies, ensuring both short-term success and long-term competitiveness.

Advanced technologies like AI, IoT, and cloud computing have transformative impacts on business growth, fostering efficiency, competitiveness, and innovation. These technologies enable organizations to optimize operations through automation, streamline decision-making with real-time data analytics, and expand their market reach. Fischer (2024) highlights how AI-driven insights can significantly enhance customer experiences by personalizing interactions and improving customer satisfaction and loyalty. Similarly, IoT facilitates better asset management by providing real-time monitoring capabilities, which improves operational efficiency and reduces costs. Cloud computing further strengthens business scalability by offering flexible and cost-effective infrastructure solutions, allowing organizations to adapt to changing market demands without heavy capital investments (Khan et al., 2024). Beyond operational improvements, these technologies open innovation and revenue generation avenues. For example, AI and IoT enable companies to develop new products and services that cater to evolving customer needs, while cloud computing supports collaborative environments that drive creativity. Ryketeng et al. (2023) note that organizations leveraging digital transformation achieve better financial outcomes and align with sustainability goals by reducing resource consumption. Moreover, these technologies contribute to competitive advantages by enabling faster time-to-market and improved adaptability in dynamic business environments. By embracing advanced technologies, organizations can position themselves as industry leaders, driving long-term growth and creating value for stakeholders in an increasingly digitalized world.

This study highlights significant implications for research and practice, emphasizing the need for a comprehensive approach to technology adoption. From a practical perspective, organizations must address financial planning, workforce development, and strategic alignment holistically to overcome the multifaceted challenges associated with digital transformation. Herath et al. (2024) underscore the importance of data protection and regulatory compliance, suggesting that organizations prioritize cybersecurity and legal frameworks to facilitate smoother adoption processes. Mishrif and Khan (2023) emphasize the role of government policies, recommending that policymakers create favorable environments through incentives and simplified regulations to encourage technology adoption. In terms of research, future studies should explore the longitudinal effects of technology adoption on organizational performance, particularly in different market and regulatory contexts. Examining cultural and contextual factors, as suggested by Frei-Landau et al. (2022), can provide deeper insights into how organizations in varying industries and regions navigate digital transformation. Further research could focus on how digital transformation intersects with sustainability, exploring the role of advanced technologies in reducing environmental impact while driving economic growth (Hanelt et al., 2021). This research contributes to the academic discourse by addressing gaps in the literature and offering actionable strategies that align digital innovation with organizational goals. By bridging theory and practice, the findings equip organizations with the tools to thrive in a rapidly evolving digital landscape.

Discussion

This study underscores financial constraints as one of organizations' most critical challenges when adopting new technologies in the digital age. These constraints are particularly pronounced for small and medium enterprises (SMEs), which often operate with limited financial resources and are less equipped to bear the substantial costs associated with technological innovation. Implementing advanced systems such as Artificial Intelligence (AI), the Internet of Things (IoT), and cloud computing requires significant upfront investments. These costs are not limited to acquiring the technology but include ongoing expenses such as system maintenance, infrastructure upgrades, and integration with existing operations. Such financial burdens can deter SMEs from adopting new technologies, leaving them at a competitive disadvantage in increasingly technology-driven markets. Organizations must implement robust financial management strategies to address these issues, such as prioritizing high-impact technological investments, seeking external funding through government grants, or exploring public-private partnerships. For instance, government-subsidized programs supporting SMEs' digital transformation can help alleviate financial pressures while fostering innovation. Companies could adopt cost-sharing models by collaborating with industry peers or entering consortiums to distribute the financial risk of technology adoption. Another critical strategy is to conduct cost-benefit analyses to ensure that the expected returns on investment align with organizational objectives. By leveraging these financial management practices, organizations can mitigate the economic barriers to technology adoption and better position themselves to capitalize on opportunities in the digital landscape, ultimately driving sustainable growth and competitiveness.

As this study highlights, the persistent skills gap within organizations presents another formidable barrier to adopting advanced technologies. Many businesses struggle to equip their workforce with the necessary expertise to operate sophisticated systems such as AI, IoT, and cloud computing. This gap often stems from a lack of access to quality technical education and insufficient emphasis on continuous professional development within organizations. In sectors undergoing rapid digital transformation, the absence of relevant technical skills can severely impede the effective implementation and utilization of new technologies. This issue is compounded in industries with traditionally low levels of digital literacy, where employees may be unfamiliar with the fundamental concepts underpinning these technologies. Bridging this skills gap requires a multi-pronged approach. Organizations must prioritize ongoing training initiatives that are accessible and aligned with the specific technological needs of their operations. Collaborations with educational institutions and technology providers can offer tailored training programs, such as AI and cloud computing certifications, which directly address the competency gaps identified within the workforce. Moreover, integrating technology literacy into formal education systems can help create a pipeline of digitally competent graduates ready to meet the demands of modern workplaces. Internally, companies can foster a culture of continuous learning by offering incentives for skill development and establishing mentorship programs where experienced employees guide less tech-savvy colleagues. By systematically addressing the skills gap, organizations can ensure their workforce is equipped to support technological advancements, enhance operational efficiency, and maintain a competitive edge.

Resistance to change remains a pervasive challenge in adopting new technologies, often arising from deeply ingrained organizational cultures resistant to innovation. Employees may fear that introducing advanced systems such as AI and IoT could lead to job displacement or require them to learn new skill sets, creating anxiety and uncertainty. This reluctance is frequently exacerbated by insufficient communication from leadership, leaving employees unclear about the rationale for adopting new technologies and the potential benefits they could bring. Effective change management strategies are, therefore, critical. Leaders must articulate a clear vision for digital transformation, emphasizing how technological advancements align with organizational goals and contribute to long-term success. Transparent communication and employee involvement in decision-making can reduce resistance and foster buy-in. In addition to internal barriers, external factors such as inadequate regulatory frameworks and limited infrastructure significantly hinder technology adoption, particularly in developing economies. Organizations in these regions often struggle with unreliable

internet connectivity, high costs for technological infrastructure, and insufficient policy support for digital innovation. For instance, businesses may face challenges in complying with complex regulations that do not account for the nuances of adopting emerging technologies. Collaborative efforts between businesses, policymakers, and technology providers are essential to overcome these challenges. Governments can play a proactive role by investing in digital infrastructure and introducing regulations that incentivize innovation. Through internal readiness and external support, organizations can mitigate resistance to change and navigate the broader ecosystem's challenges, enabling successful and sustainable adoption of new technologies.

The findings align closely with the Diffusion of Innovation (DOI) theory introduced by Everett Rogers, which provides a comprehensive framework for understanding the dynamics of innovation adoption. According to Rogers (2003), the success of adopting innovations is significantly influenced by individual, organizational, and external environmental factors. The theory emphasizes five critical stages in the adoption process: knowledge, persuasion, decision, implementation, and confirmation. Each stage represents a pivotal moment where individuals or organizations interact with the innovation, shaping their eventual acceptance or rejection. For example, resistance to change, a common barrier in this study, can be understood within the persuasion stage. During this stage, individuals or organizations assess the innovation's relative advantages, compatibility, and complexity before forming an attitude toward its adoption. Poor communication or a lack of perceived benefits often exacerbates resistance, highlighting the importance of clear and persuasive messaging from leadership. The study's findings on the skills gap resonate with DOI's emphasis on capacity building as a critical factor in successful innovation adoption. Training programs and efforts to enhance workforce capabilities align with the implementation stage, where equipping individuals with the necessary skills is essential for integrating new technologies into organizational practices.

The findings of this research are also highly relevant when compared with prior studies, offering both support and new perspectives. Barth and Koch (2019) highlighted that financial constraints often cause organizational technological project failures. This aligns with the current study, underscoring the high technology implementation costs, including investment, maintenance, and infrastructure development, which are significant barriers to technology adoption in many companies. Moreover, Li (2022) emphasized the importance of reskilling and upskilling the workforce to meet the demands of Industry 4.0, supporting the finding that a lack of relevant expertise is a critical challenge in adopting advanced technologies like Artificial Intelligence (AI) and cloud computing. However, some differences emerge when compared with other studies. For instance, Frei-Landau et al. (2022) found that resistance to change is more prevalent in education. In contrast, the present research reveals that resistance is equally challenging in the corporate sector. This suggests that resistance to adopting new technologies transcends specific sectors, representing a broader phenomenon influenced by organizational culture and communication strategies. Hanelt et al. (2021) identified adequate government regulatory support as a key enabler in developed countries, while this study highlights that regulatory frameworks in developing nations are often insufficient to facilitate digital transformation. These findings underscore the importance of geographical and contextual factors in shaping the success of technology adoption.

The practical implications of these findings are critical for both organizations and policymakers, highlighting actionable strategies to enhance the adoption of new technologies. From an organizational perspective, companies must prioritize resource allocation for continuous employee training to ensure that the workforce remains adaptable to technological advancements. Developing structured training programs to build technical skills and digital literacy can reduce the skills gap and improve productivity. Moreover, organizations must address resistance to change by fostering a culture of innovation and transparency. Open communication about the benefits of technology adoption and the involvement of employees in the transition process can significantly alleviate apprehensions. Risk management strategies, such as pilot testing and diversification of technological investments, are also crucial in mitigating potential implementation challenges. These approaches allow companies to identify and address issues early in the adoption process, minimizing costly setbacks. Aligning technology initiatives with business objectives ensures that investments are relevant and contribute directly to organizational goals. For policymakers, the findings underscore

the necessity of creating a supportive environment for technology adoption through transparent regulations and targeted incentives. Governments can play a pivotal role by offering subsidies for technology-related training programs or tax incentives for companies investing in sustainable technologies, such as green energy solutions. Investments in robust digital infrastructure are vital, particularly in developing countries where inadequate infrastructure often hinders technological progress. Policymakers can ensure a stable foundation for digital transformation by providing reliable internet access and modernized systems. These combined efforts from organizations and governments can establish an ecosystem supporting digital innovation, promoting sustainable growth, and enhancing global competitiveness. Implementing these recommendations can help overcome barriers to technology adoption and pave the way for a resilient and inclusive digital economy.

Conclusion

This study comprehensively explores the challenges and strategies of adopting new technologies to enhance organizational growth and competitiveness in the digital era. Through systematically identifying barriers such as financial constraints, skill gaps, resistance to change, and external factors, the research addresses the critical questions of how these challenges impact technology adoption and what strategies can mitigate them. By integrating these dimensions into a cohesive framework, the study highlights the interconnected nature of these challenges within organizational contexts, offering a nuanced understanding of the complexities involved in digital transformation. Additionally, the study underscores the role of advanced technologies like Artificial Intelligence (AI), the Internet of Things (IoT), and cloud computing in driving operational efficiency and long-term growth.

The study contributes significantly to both academic discourse and practical applications. Its originality lies in its holistic approach to understanding technology adoption challenges and proposing actionable strategies for organizations and policymakers. Academically, it advances the knowledge of digital transformation by integrating insights from organizational behavior, financial management, and regulatory contexts. The findings provide a roadmap for organizations to prioritize employee training, develop a culture of innovation, and align technological initiatives with business objectives. For policymakers, the study emphasizes the importance of transparent regulations, digital infrastructure development, and targeted incentives to support sustainable technology adoption. These insights are invaluable for creating a robust ecosystem that fosters digital innovation and economic resilience.

Despite its contributions, the study has limitations that offer directions for future research. The findings are based primarily on qualitative data, limiting conclusions' generalizability across diverse organizational contexts. Future studies could incorporate quantitative methods to validate these findings and further explore sector-specific dynamics. In contrast, the study considers advanced technologies like AI and IoT; further research is needed to examine the long-term impacts of emerging innovations such as blockchain and quantum computing. Cross-regional comparisons in technology adoption, particularly between developed and developing countries, could provide richer insights into how contextual factors influence digital transformation. These recommendations guide future research and practitioners toward a deeper understanding of technology adoption in the rapidly evolving digital landscape.

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