



The Role of IT in Improving Business Efficiency, Innovation, and Competitiveness

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Abstract

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Information Technology has become a strategic factor in driving business transformation in the digital era. The application of Information Technology enhances operational efficiency through automation, supports data-driven decision-making, expands access to global markets, and facilitates product and service innovation. However, these changes also create new challenges, including the need for rapid adaptation to market dynamics, data-driven competition, and cybersecurity risks. This study employs a literature review approach to examine the contribution of Information Technology to organizational performance, competitive strategy, and its influence on relationships with customers and suppliers. The findings reveal that the strategic integration of Information Technology not only generates cost efficiency but also increases organizational flexibility in responding to environmental changes. Furthermore, Information Technology plays a crucial role in supporting business model innovation, strengthening service personalization, and fostering long-term sustainability. This research emphasizes that Information Technology is not merely an operational tool but a primary source of competitive advantage that determines business competitiveness in the digital age.



1. Introduction

The development of Information Technology (IT) has been a key driver of global business transformation, especially in the last two decades. Digitalization does not only bring about technical changes but also creates a fundamental strategic impact on how companies operate, communicate, and create added value for stakeholders. Initially, IT was often seen as a mere administrative tool, but it has now evolved into the foundation of modern business strategy, directly influencing almost all aspects of an organization's operations. Its impact is clearly visible in more efficient supply chain management, more adaptive marketing strategies, accelerated product innovation, and more accurate data-driven decision-making. According to Chege et al. (2020), the effective application of IT is proven to significantly improve company performance as it enables accelerated access to information, optimization of work processes, and encourages the creation of new business models that are more responsive to changes in the external environment.

The current digital era is also marked by an increasingly complex level of business competition. Competition is no longer determined by the ownership of physical assets such as capital, factories, or distribution, but is shifting towards the mastery of information, the ability to process data, and the application of advanced analytical technology. Companies that are able to integrate big data, artificial intelligence (AI), and the Internet of Things (IoT) have a much greater opportunity to create a sustainable competitive advantage. The study by Judijanto et al. (2024) confirms that the use of IoT in the information technology industry in Indonesia not only increases operational efficiency but also strengthens the company's competitive

position by presenting business solutions that are more innovative and efficient in the long term. In addition to the technological aspects, globalization and internet penetration have expanded cross-country market opportunities. E-commerce, marketplaces, and other digital platforms open the way for small and medium-sized enterprises (SMEs) to participate in global trade which was previously dominated by large companies.

However, behind these great opportunities, there are also a number of risks that cannot be ignored. The main challenges arise from data security issues, differences in regulations between countries, and changes in consumer behavior that increasingly demand service speed, business process transparency, and product personalization (Dymitrowski & Mielcarek, 2021). From a business strategy perspective, IT plays an important role in supporting the optimization of the marketing mix. Products are no longer limited to physical forms but can be realized in a digital format that is easily accessible to consumers. Prices can be set dynamically following constantly changing market demand patterns. Distribution does not have to be through conventional channels, but can be done online with a wider reach. Furthermore, data analytics capabilities support the personalization of offers so that relationships with customers become more in-depth and sustainable. This is in line with the findings of Amesho et al. (2021) who highlight that technology and innovation systems play a major role in strengthening competitive advantage while improving public services, as shown by the experience in Taiwan.

However, the integration of IT is also accompanied by a number of serious challenges. First, the threat of cyber security is increasing along with the company's

dependence on sensitive digital data. Second, the very rapid dynamics of technological development require companies to continue to innovate so as not to be left behind. Third, the adoption of IT requires a large investment, both in terms of infrastructure and human resource development, which is often difficult to meet, especially by SMEs. These challenges emphasize the need for a special strategy in managing IT resources so that their benefits can be maximized while minimizing the risks that may arise (Al Mubarak & Hamdan, 2023). Against this background, this study aims to analyze in more depth the role of IT in improving operational efficiency, encouraging sustainable innovation, and building competitive advantage in the digital era. Through a review of the latest literature, this research is expected to provide a comprehensive overview of the contribution of IT to modern business strategies, and offer practical insights into the challenges that companies need to anticipate in order to survive and grow amidst the global current of change.

2. Literature Review

2.1. Information Technology and Operational Efficiency

The Information Technology (IT) plays a very important role in improving a company's operational efficiency through various mechanisms, such as business process automation, integration of systems between departments, and more effective and structured data management. The application of IT allows routine activities that previously required a lot of time and effort to be carried out more quickly, accurately, and with minimal human error. With an integrated system, coordination between company units becomes smoother so that each department can obtain the information

needed in real-time. One of the most prominent aspects is the implementation of IT-based supply chain management systems. This system helps companies reduce logistics costs by optimizing distribution routes, speeding up the process of shipping goods, and increasing the accuracy of information related to stock availability and market demand. According to Waringga et al. (2022), IT supports all activities in the supply chain by accelerating the flow of information from upstream to downstream, which has a direct impact on increasing productivity and strengthening the company's competitive advantage in the midst of increasingly fierce competition.

Recent studies also confirm that IT-based operational efficiency has a significant contribution to business sustainability. Companies that use IT are not only able to reduce operational costs but can also respond to market changes and consumer needs more quickly and adaptively. This reinforces the findings of Chege et al. (2020) which show that IT adoption is able to increase competitiveness while ensuring companies remain relevant in the digital era.

2.2. Information Technology and Business Innovation

Apart from playing a role in increasing operational efficiency, Information Technology (IT) is also a key catalyst in encouraging innovation in products, services, and more adaptive business models. The presence of IT allows companies to explore new ideas that were previously difficult to realize due to limited resources and access to information. Through the use of digital technology, companies can develop application-based services, online platforms, and cloud-based solutions that add value to customers. This type of innovation opens up greater opportunities for companies to win market competition, especially in the digital era which is characterized by rapid

changes in consumer preferences and industry dynamics. According to Dymitrowski and Mielcarek (2021), innovation in technology-based business models makes a significant contribution to increasing a company's competitiveness.

This happens because the use of IT enables the creation of more flexible business processes, more efficient operational costs, and an increasingly personalized customer experience. In this way, companies can build differentiation that is difficult for competitors to imitate. Furthermore, Judijanto et al. (2024) highlight the importance of integrating the Internet of Things (IoT) into modern business processes. This integration not only encourages efficiency through automation and real-time data management but also strengthens the company's ability to adapt to ever-changing market dynamics. Therefore, IT should be viewed not just as a supporting instrument, but as the core of a modern business innovation strategy that determines the company's long-term sustainability and success.

3. Methods

This research uses a literature review method with a qualitative approach that focuses on the collection, analysis, and synthesis of various scientific sources relevant to the role of Information Technology (IT) in business. Literature sources are obtained from indexed international journal articles, academic books, and other scientific publications that specifically discuss the link between IT and modern business strategies. The inclusion criteria used in the selection of literature are quite strict, namely only including articles that have been published, focusing on key issues such as the relationship between IT and efficiency, innovation, competitive advantage,

and data security, and are available in abstract and full-text form to allow for more in-depth analysis. The analysis process begins with the identification of sources using various leading scientific databases from Google Scholar. Literature selection is carried out to filter articles that are truly relevant to the research objectives, until finally the main articles that are considered most representative are selected.

These articles are then examined in more depth to obtain a comprehensive understanding of the contribution of IT in various business aspects. The next stage is theme categorization, where the selected literature is grouped into three main focuses. The first theme is operational efficiency, which highlights the role of IT in accelerating processes, reducing costs, and increasing productivity. The second theme is business innovation, which emphasizes how IT can be a catalyst for the birth of new and more adaptive products, services, and business models. The third theme is competitive advantage, which explains how the application of IT is able to create differentiation, increase competitiveness, and strengthen a company's position in the global market.

The final stage in the analysis is synthesis, which is a comprehensive comparison of the results of previous research to find patterns, research gaps, and the real contribution of IT to modern business strategies. Through this synthesis, a broader picture of the direction of current research developments and its relevance to business practice is obtained. The literature review method was chosen because it is able to provide a more comprehensive analysis without being limited by a single empirical context. This approach also provides added value in the form of identifying global trends related to the role of IT in the business world, so that the research results

are not only descriptive but also able to offer strategic insights for future business development.

4. Results

The results of the literature review show that the application of Information Technology (IT) in business has made a significant contribution to a company's efficiency, innovation, and competitive advantage. IT does not only function as an operational supporter but also as a strategic factor that changes business models, the way companies create value, and how they interact with customers and other stakeholders. As the digital era develops, companies are faced with the need to adapt quickly to a dynamic environment, where IT acts as the main catalyst. This process not only requires investment in technology but also changes in organizational culture, improvement of employee skills, and a clear strategy to ensure all these elements are aligned with bigger business goals. In this way, digital transformation can be a catalyst that changes the way companies operate and interact with the world around them. Digital transformation has become the main driver in changing the way organizations interact with consumers, suppliers and employees (Nova et al., 2024).

First, in the aspect of efficiency, the literature confirms that the automation of business processes through IT-based systems is able to reduce costs, reduce cycle times, and increase the accuracy of decision-making. Technologies such as Enterprise Resource Planning (ERP), Customer Relationship Management (CRM), and Supply Chain Management (SCM) have become the foundation of modern company efficiency. Chege et al. (2020) research shows that IT innovation plays an important

role in increasing company productivity and performance in Kenya, especially through the digitalization of the supply chain and information management. Companies that succeed in integrating information systems not only gain cost efficiency but also have a better response speed to market changes.

Next, efficiency can also be seen in the integration of Internet of Things (IoT)-based systems which allows companies to connect devices, machines, and infrastructure in one digital ecosystem. According to Judijanto et al. (2024), IoT is able to increase the operational efficiency of the technology industry in Indonesia by providing real-time data that can be used for planning, predictive maintenance, and quality control. The data generated from IoT sensors helps companies in making quick decisions while reducing the risk of operational errors. This shows that efficiency is not only about costs, but also the ability to manage information in a smarter and more adaptive way.

Second, in the context of business innovation, IT has opened up opportunities for companies to create new products and services that were previously impossible to realize. Digitalization allows companies to offer application-based products, cloud-based services, and interactive platforms that improve the customer experience. Dymitrowski and Mielcarek (2021) confirm that technology-based business model innovation directly increases a company's competitiveness, especially for companies that are able to utilize big data and artificial intelligence. By using data analytics, companies can understand customer preferences in more depth and provide personalized offers.

In addition, public service innovation is also an important aspect of IT utilization. Amesho et al. (2021) show how the city government of Kaohsiung in Taiwan succeeded in improving the quality of public services through the adoption of a technological innovation system. The result is not only service efficiency but also increased public satisfaction which indirectly strengthens the competitive advantage of public sector organizations. This shows that the application of IT for innovation is not limited to the private sector but also to public and non-profit organizations.

Third, IT integration plays a major role in building a company's competitive advantage. This advantage arises from a combination of operational efficiency and business model innovation. Companies that successfully integrate IT into their business strategies can differentiate themselves from competitors, either through better service quality, more competitive prices, or faster product distribution. Al Mubarak and Hamdan (2023) state that technological innovation is a key pillar in building a sustainable competitive advantage, especially in an era when market dynamics are changing very quickly.

The literature also shows that IT-based competitive advantage does not only depend on the technology itself but also on management's ability to manage organizational change. Chege et al. (2020) emphasize that leadership and organizational culture play an important role in ensuring the success of IT adoption. Without strong management support, IT adoption often fails to produce significant added value. Therefore, the IT implementation strategy must involve all organizational levels, from top management to operational employees.

Although IT offers various advantages, the literature also highlights the serious challenges faced by companies. One of them is data security. As digitalization increases, the threat of cyber attacks, data leaks, and misuse of information becomes more real. According to Dymitrowski and Mielcarek (2021), cyber security violations can damage the business model of innovative companies, because customer trust is the main asset in digital business. Therefore, investment in information security systems is a crucial aspect of IT strategy.

Apart from security, another challenge is the large capital requirement for implementing the latest technology (Akbar et al., 2023). Small and medium-sized companies (SMEs) often face limitations in adopting advanced IT due to financial limitations and human resources. Chege et al. (2020) note that although SMEs have high flexibility in adapting, they still need government policy support and collaboration with external partners to be able to compete in the digital market.

The results of the literature study also show that the success of IT implementation is highly influenced by the context of the business environment, both in developed and developing countries. In developed countries, companies tend to have greater resources to invest in the latest technology, while in developing countries, IT adoption is often hampered by limited digital infrastructure. However, apart from these differences, global trends show that IT remains the main driver of innovation and economic growth. This is confirmed by Rahmadi's (2023) report which shows that business digitalization after the COVID-19 pandemic accelerated IT adoption across sectors, from health services, education, to international trade.

In the context of customer relationships, the results of the literature show that IT supports a more in-depth personalization strategy. Through big data analytics, companies can track consumer behavior, predict preferences, and develop more effective marketing strategies. Judijanto et al. (2024) show that the use of real-time data from IoT allows companies to adjust products and services according to customer needs more quickly. This personalization not only increases customer satisfaction but also strengthens long-term loyalty.

Furthermore, the literature also highlights how IT supports business sustainability in the long term. Al Mubarak and Hamdan (2023) emphasize that sustainable competitive advantage cannot be achieved only with efficiency but also through continuous innovation and adaptation to market changes. In this case, IT is an important tool to monitor global trends, identify new opportunities, and anticipate potential risks. The results of this literature study show that the strategic integration of IT is an urgent need for companies that want to survive and grow in the digital era. IT not only increases efficiency and productivity but also encourages innovation, strengthens relationships with customers, and builds a sustainable competitive advantage. The challenges that arise, such as cyber security and limited resources, must be managed with the right strategy so as not to reduce the benefits offered by IT. Thus, IT is not just an operational tool, but a strategic resource that determines business success in the digital era.

5. Discussion

The results of the literature review show that Information Technology (IT) has a unique dual role in the modern business world: on the one hand, it is the main driver of efficiency and innovation, but on the other hand, it also brings serious challenges that can hinder organizational performance if not managed properly. This discussion emphasizes a critical analysis of how IT is a double-edged sword in business strategy, as well as how different contexts, both between developed and developing countries and between large and small companies, influence the success rate of IT implementation.

One important finding is that IT not only increases efficiency through automation but also redefines the concept of competitive advantage. Companies that successfully integrate IT into their strategies are able to differentiate themselves from competitors through faster services, personalized products, and more effective distribution systems. However, this advantage is often dynamic. According to Al Mubarak and Hamdan (2023), the competitive advantage generated by IT can quickly disappear if the company fails to carry out continuous innovation. This shows that IT is not an absolute guarantee of success, but rather a tool whose value is highly dependent on its management strategy.

In the context of developed countries, IT implementation is more focused on the integration of advanced technologies such as artificial intelligence (AI), big data analytics, and the Internet of Things (IoT). Strong digital infrastructure allows companies to maximize the potential of IT. On the other hand, in developing countries, the main obstacles lie in the limitations of infrastructure, capital, and human

resources. Chege et al. (2020) confirmed that although small companies in Kenya show high flexibility in adopting IT, they still need government policy support and collaboration with external partners to be able to compete in the global market. Thus, although IT offers the same opportunities, the level of benefits obtained is highly dependent on the environmental context. Technological advancements and innovative practices are needed to respond to environmental pressures and achieve sustainability. To summarize, Information Technology is an important factor for organizational sustainability (Mubarok et al., 2024).

Differences are also seen between large companies and SMEs (Mayr et al., 2021). Large companies tend to have adequate financial and technological resources to invest in advanced IT, while SMEs face limitations in capital and skilled labor. However, the literature shows that the flexibility of SMEs allows them to adapt more quickly to market changes compared to larger, more bureaucratic companies. Judijanto et al. (2024) even emphasize that the integration of IoT in technology companies in Indonesia provides benefits not only in efficiency but also in the ability of SMEs to compete with larger companies through digital innovation.

Another no less important challenge is the issue of cyber security. Widespread digitalization increases the risk of data leaks, hacking, and cyber attacks that can damage a company's reputation. Dymitrowski and Mielcarek (2021) warn that an innovative business model can collapse if it is not balanced with an adequate security system. Therefore, investment in data security must be viewed not as an additional cost, but as a strategic element in maintaining the sustainability of a digital business.

This discussion also underlines that IT has a broad social impact. The application of IT not only changes the way companies operate but also changes consumer behavior. By considering these factors, it can be concluded that IT is an important foundation for companies in the digital era, but the success of its implementation requires a combination of technology investment, strategic management, security, and the organization's ability to adapt.

6. Conclusion

This literature study confirms that Information Technology (IT) has become a strategic factor that determines a company's competitiveness in the digital era. The results of the study show that IT plays a role in three main dimensions: improving operational efficiency, encouraging product and business model innovation, and creating a sustainable competitive advantage. The application of digital systems such as IoT, big data analytics, and cloud-based platforms is proven to accelerate business processes, reduce costs, and expand market reach. However, the benefits of IT do not come without challenges. The threat of cyber security, capital limitations, and the digital infrastructure gap, especially in developing countries, are real obstacles to technology optimization.

In addition, the competitive advantage gained through IT is dynamic, so companies are required to continue to innovate and adapt to market changes. The success of IT adoption is also highly influenced by management support, organizational culture, and the right integration strategy. Thus, IT must be viewed not just as an operational tool, but as a strategic resource that is able to change the

direction of business development. Companies that are able to integrate IT with a long-term vision, continuous innovation, and an adequate security system will have a greater opportunity to survive and grow in an increasingly competitive global market. IT is ultimately the key to sustainable and inclusive business growth in the digital era.

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