Journal on Economics, Management and Business Technology
Vol. 3 No. 2, Marc (2025), pp. 41-45

ISSN 2962-0694 (Online)
Published by IHSA Institute

Digital Transformation: The Role of Information Systems in Enhancing Efficiency

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A R T I C L E I N F O

Article history:

Received Jan 03, 2024
Revised Jan 28, 2024
Accepted Fe 11, 2024

Keywords:

Digital transformation;
Information systems;
Efficiency.

ABSTRACT

This research aims to understand and analyze how the digital transformation process can enhance relevant information systems, as well as how these digital information systems can improve operational efficiency in manufacturing companies in Indonesia. The research method uses a qualitative descriptive approach with purposive sampling for data collection, and the data is gathered through documentation study. Based on the research results, it can be concluded that information systems can become more relevant through the digital transformation process by analyzing organizational needs, modernizing technology infrastructure, digitizing business processes, integrating new technologies, building system integration, and implementing monitoring and analytics. Additionally, it can be concluded that digital information systems can improve business operational efficiency by automating operational processes, integrating data and systems, enabling faster and more accurate decision-making, reducing operational costs, and facilitating overall digital transformation.

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1. INTRODUCTION

Information systems are a group of interconnected parts that collect, organize, store, and distribute data to assist in coordination, analysis, control, and decision-making within an organization (Kwilinski, Aleksy, 2024). Existing information systems are still used manually, where the information needed comes from manual data that is used for decision-making in various fields (Gebremeskel, Bemenet Kasahun, Jonathan & Yalew, 2023).

Information systems are crucial in creating systematic activities to obtain up-to-date information based on data that ultimately allows management to make decisions based on existing data. This helps ensure that operational decisions are both effective and efficient (Shi & Yang, 2024). The efficiency of information systems can be seen in the components used, such as software and other devices that store large amounts of data, ensuring the accuracy of the information presented for decision-making (Yang, Cunyi, Gu & Albitar, 2024). Information systems required by management need supporting devices for decision-making. Decisions should be accountable and derived from data that ensures quick, accurate, effective, and efficient decision-making (Olalere, I. O. & Ramdass, 2024). Today, information systems save time and effort by replacing manual tasks with automated processes. Through digital audits, automatic data validation, and methodical monitoring, information systems reduce human errors. Management and access to information can be facilitated by centralizing all departmental data into a single system (Xu, Minghao, 2024).

Managers can make quicker decisions using data dashboards and decision support systems (DSS) to review real-time information. Through improved management and resource optimization, information systems help businesses lower operational costs, maintaining the efficiency of company

operations (Afzal, Muhammad & Panagiotopoulos, 2024). Additionally, through collaboration platforms, information technology facilitates more efficient communication within the company. Efficient communication helps management make the necessary decisions to ensure operational efficiency, which in turn has a real impact on the company by creating decisions that align with future operational activities (Bist, Namrata, 2024).

In today's digital age, information systems leverage advanced technologies such as cloud computing, artificial intelligence, big data, IoT (Internet of Things), and others. Information systems have evolved rapidly in the digital era and have become integral to an organization's strategy for staying relevant and competitive, rather than just an additional tool (Ivanišević, 2023). Cloud computing enables modern information systems to provide access from anywhere at any time. Data is a valuable resource, and vast amounts of it are managed and analyzed by contemporary information systems to generate strategic insights. Today, advanced information systems can automate processes, predict trends, and make suggestions based on data (Ebhota, Oziegbe Simeon, Hongxing, Yaoa, and Sampene, 2024).

User experience (UX) is prioritized by designing intuitive, easy-to-use, and flexible interfaces. Advanced security measures, including cyber risk management, biometric authentication, and data encryption, are incorporated. IoT devices are connected to information systems to collect real-time data from multiple sources (Huy & Phuc, 2024). In Indonesia, many manufacturing companies, totaling 32,193 units, have 80% still not utilizing digital information systems through cloud and IoT applications. This impacts operational efficiency, as operational costs increase and decisions are not based on valid, relevant data. Manual information systems result in a higher error rate, reducing the efficiency and effectiveness of decision-making.

Digital transformation involves the integration of digital technology into every aspect of a company or organization, fundamentally altering how work is done and how value is delivered to clients. The role of information systems in this transformation is crucial, as they facilitate, connect, and drive change (Zuern, Siegfried Georg, Rajagopal, Rohini, & Hettiarachchi, 2022). Information systems play several key roles in enabling digital transformation.

One significant role is business process automation, where information systems replace manual procedures with more accurate, faster, and efficient workflows. Additionally, information systems are essential in collecting, storing, and analyzing vast amounts of data, helping organizations generate strategic insights. They also enhance customer experiences by leveraging digital technologies and client data, providing individualized solutions. Furthermore, information systems support collaboration and connectivity by enabling real-time collaboration across teams, departments, or even different countries. They also foster innovation by aiding in the development of new products and services supported by technology and data. Lastly, information systems assist in strategic decision-making by offering analytics, reports, and real-time dashboards to management (Tian, Shuang, 2024).

By implementing digital transformation, organizations can significantly enhance operational efficiency and create more value. Information systems play a pivotal role in this process by accelerating decision-making, reducing costs, and optimizing business processes (Ratna et al., 2024). One of the primary ways this is achieved is through business process automation, where repetitive manual tasks are automated for improved accuracy and speed. Information systems also enable efficient data management by providing ease of organizing and real-time access to large volumes of data. They help reduce operational costs through the digitalization of processes and the use of cloud-based solutions. Furthermore, information systems support fast and accurate decision-making by providing access to big data and advanced analytics. In supply chain management, information systems integrate various systems to enhance procurement and logistics effectiveness. Finally, information systems contribute to the digitalization of customer service, offering digital-based solutions that improve the customer experience (Fariq et al., 2022). This research aims to analyze how the process of digital transformation can enhance relevant information systems and how digital information systems can improve operational efficiency in manufacturing companies in Indonesia.

2. RESEARCH METHOD

This research uses a qualitative descriptive method, where according to (Fariq et al., 2022), qualitative descriptive analysis is a research method that aims to describe data through the phenomenon of issues that occur in the background of the problem, which are then analyzed and developed into a qualitative-based study. The population in this study consists of 32,193 manufacturing business units in Indonesia, and the sampling method is purposive sampling.

According to (Fariq et al., 2022). The specific criteria for the sample data in this study are manufacturing companies that have implemented digitalization in their production information systems, which account for 25,754 manufacturing business units in Indonesia. The data collection technique used is literature study.

3. RESULTS AND DISCUSSIONS

3.1 The Role of Digital Transformation in Enhancing Relevant Information Systems

The digital transformation process is essential to ensure that information systems remain relevant to the ever-evolving business demands and technological advancements. By integrating digital technologies, organizations can enhance the capacity of their information systems to boost productivity, creativity, and competitiveness. The digital transformation process that can enhance the relevance of information systems includes several steps. First, organizational needs analysis is conducted by recognizing business opportunities and challenges to identify the required information systems. Second, modernization of technology infrastructure is carried out by transitioning from outdated information systems to more contemporary and adaptable technology platforms. Third, business process digitalization is performed by converting manual procedures into computerized procedures. Fourth, integration of new technologies is implemented by utilizing technologies such as big data, IoT, and artificial intelligence (AI) to enhance the functionality of information systems. Fifth, building system integration is done to create a smoother workflow by integrating various information platforms within the company. Finally, the implementation of monitoring and analytics is carried out to assess the performance of information systems using appropriate analytical mechanisms (Ratna et al., 2024).

3.2 How Digital Information Systems Can Improve Operational Efficiency

Digital information systems can have a positive impact on enhancing business operational efficiency in several ways. First, automating operational processes reduces the time required to complete daily tasks and minimizes human errors. Second, data and system integration across departments eliminates data silos, thereby improving collaboration and decision-making. Third, digital information systems support faster and more accurate decision-making by providing real-time data and analytics. Fourth, operational cost reduction is achieved through automation that reduces labor costs and data-driven planning that reduces supply chain waste. Finally, digital information systems support sustainable business transformation, enabling the adoption of new technologies in the future and fostering innovation in company operations (Ebhota et al., 2024).

Based on the research results, the digital transformation process proves to play a crucial role in maintaining and enhancing the relevance of information systems in modern business. By conducting organizational needs analysis and modernizing technology infrastructure, companies can ensure that the information systems they use remain aligned with market developments and business requirements. The integration of new technologies such as AI, big data, and IoT has also proven to enhance the ability of information systems to support faster and more accurate decision-making.

In addition, business process digitalization brings a positive impact on operational efficiency by reducing time and errors caused by manual processes. Data integration across departments optimizes the flow of information and communication, which in turn facilitates management in making data-driven decisions in real-time. The reduction of operational costs through automation is also significant, particularly in managing human resources and supply chains. Overall, the proper implementation of digital information systems can provide significant efficiency improvements while opening opportunities for companies to adapt to rapidly changing technologies. This helps companies stay competitive and ready to face future challenges.

3.3 Discussion

Based on the research results, it can be concluded that information systems can become more relevant through the process of digital transformation by analyzing organizational needs, modernizing technology infrastructure, digitalizing business processes, integrating new technologies, building system integration, and implementing monitoring and analytics. This is in line with research by Shi & Yang (2024), who state that the usefulness of information systems through digital transformation leads to improved data quality and the creation of relevant and accurate data for decision-making processes.

Furthermore, the study concludes that digital information systems can improve business operational efficiency through several mechanisms, such as automating operational processes, integrating data and systems, enabling faster and more accurate decision-making, reducing operational costs, and facilitating overall digital transformation. This aligns with the research of

Kwilinski and Aleksy (2024), which asserts that digital information systems are capable of creating efficiencies, thereby enabling the development of effective and efficient systems aimed at reducing operational costs for companies.

In the context of digital transformation, the process of automating operational tasks reduces the need for manual intervention and minimizes errors, which directly improves productivity. As systems become integrated across different departments, the barriers to communication and data flow are eliminated, ensuring that decisions are made based on real-time, consolidated information. This seamless integration leads to faster decision-making, better resource allocation, and improved operational control. Additionally, by leveraging new technologies such as artificial intelligence (AI), big data, and the Internet of Things (IoT), companies can innovate and enhance their operations further. These technologies empower organizations to predict market trends, optimize supply chains, and personalize customer experiences. For example, AI can be used to automate customer service processes, big data can inform personalized marketing strategies, and IoT devices can track product performance and customer preferences in real-time.

Moreover, the reduction of operational costs is another key outcome of adopting digital information systems. Through automation, businesses can cut down on labor costs and reduce human errors. Data-driven planning and forecasting allow businesses to optimize their resource allocation, minimizing waste and ensuring that inventory and procurement processes are streamlined. This results in lower overhead costs, better cash flow, and the ability to reinvest savings into further innovation. In conclusion, the implementation of digital information systems significantly contributes to operational efficiency, enhances decision-making, and supports the overall digital transformation of organizations. The integration of advanced technologies and continuous monitoring and analytics ensures that companies remain agile and competitive in an increasingly digital world. By embracing these changes, companies can create more value, improve customer satisfaction, and secure long-term sustainability in their operations. This makes digital transformation not just a tool for efficiency but a strategic enabler for future growth and competitiveness.

4. CONCLUSION

Based on the research findings, it can be concluded that information systems can become more relevant through the process of digital transformation by analyzing organizational needs, modernizing technology infrastructure, digitalizing business processes, integrating new technologies, building system integration, and implementing monitoring and analytics. Additionally, it can be concluded that digital information systems can improve business operational efficiency through automation of operational processes, integration of data and systems, faster and more accurate decision-making, reduction of operational costs, and facilitating overall digital transformation.

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