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The Role of Information Technologies in Organizations: Impacts on Management, Decision-Making, and Organizational Efficiency

Abstract

In the competitive environment of the digital era, information has become a strategic asset that must be continuously produced, managed, and transformed into organizational value. This study examines the use of information technologies (IT) in organizations, and analyzes their effects on organizational structures, business management, decision-making processes, and operational efficiency. Drawing on the evolution of information systems from basic record-keeping to management information systems and decision support systems, the research highlights how IT enables faster and more accurate decisions, improved communication and collaboration, and the removal of geographical limitations through digital and networked operations. The study also emphasizes that successful digital transformation is not solely technological; it requires strategic leadership, cultural adaptation, and the development of employee competencies to reduce resistance and enhance performance outcomes. Furthermore, the paper discusses IT's role in productivity gains, cost reduction, innovation, and competitive advantage, while addressing the workforce implications of automation, artificial intelligence, and emerging digital professions. Overall, the findings suggest that organizations integrating IT effectively across all levels are better positioned to increase efficiency, respond to customer demands, and sustain competitiveness in rapidly changing markets.

Keywords: *information technologies, digital transformation, decision-making, business efficiency*

Introduction

In the competitive conditions of the digital era, information has evolved from being merely a supportive element to a strategic asset for organizations. The continuously changing and renewable nature of information necessitates that organizations generate new knowledge daily, enhance their learning capacities, and translate this learning into actionable behavior. Therefore, contemporary businesses are compelled to address learning and knowledge management at the organizational level with the aim of creating a more agile, productive, and capable workforce.

The successful integration and effective operation of knowledge management within organizations largely depend on the presence of an appropriate technological infrastructure. Information technologies accelerate the collection, processing, storage, distribution, access, and control of information, thereby strengthening decision-making processes, enhancing operational efficiency, and enabling faster responses to customer demands. Historically, the role of information systems in organizations has expanded from fundamental functions such as record-keeping and accounting to management information systems, decision support systems, and internet-based business models. This evolution has facilitated significant transformations in communication, collaboration, innovation, and overall organizational performance.

This study aims to examine the use of information technologies in organizations and their impact on organizational structures and management processes. The research emphasizes the contribution of information technologies to decision-making, their role in enhancing business efficiency and competitive advantage, and the importance of considering digital transformation not only as a technological shift but also in terms of human resources and organizational culture.

Research

The Use of Information Technologies in Organizations. In the competitive conditions of the digital era, the value of information as a strategic instrument is highlighted by its constantly evolving nature and the necessity for continuous production. In this context, organizations are expected to possess the capability to generate new knowledge daily, alongside mechanisms for learning and developing new behaviors. The strategic significance of learning stems from the need for a workforce that is smarter, more agile, and more productive. While in the traditional economy the attributes of industrial workers showed little variation, in the new economy the learning coefficient of tasks has increased rapidly (İnce, 2023).

Integrating and operationalizing knowledge management within organizations is only possible through the establishment of the appropriate technological infrastructure. Hence, the necessity of information technologies that automatically facilitate the collection, processing, distribution, access, and control of information cannot be denied (Ceyhun & Çağlayan, 1997).

Since the 1950s, when information technologies began to be integrated into organizations, numerous studies have been conducted by academics and industry representatives to evaluate their potential impacts. While the opportunities that information and information technologies offer to organizations are widely acknowledged in the global literature, their effects on organizational performance remain a subject of debate, with limited empirical investigation. Today, organizations that implement information and information technologies across all levels, ensuring their adoption and active use, are better positioned to compete and achieve success. The time-saving benefits of using information technologies in organizations are universally recognized (Turunç, 2016).

Until the 1960s, the use of information systems in organizations was limited to processing accounts, maintaining records, and bookkeeping. With the development of Management Information Systems (MIS) in the 1960s, a new role was introduced, providing managerial-level users with pre-defined reports necessary for decision-making. By the 1970s, it became apparent that this MIS role was insufficient for addressing managerial decision-making needs, leading to the development of Decision Support Systems (DSS) for managers. These systems function by “transforming specific problems encountered by managers in the workplace into fundamental decision-making techniques used by managers” (Ünüvar, 2006).

In the 1980s, new roles for information systems were established, including microprocessor application software, telecommunications, executive information systems, and expert systems. These applications enabled managers to generate or access the information they required directly, rather than relying solely on different organizational units, and to store critical information necessary for operational activities in the desired format and content. The growth of internet use in the 1990s led to significant changes in global ventures and business operations, particularly in communication and collaboration. The adoption of innovations in information technologies within organizations enhanced inter-organizational communication and collaboration, improved the efficient use of time, overcame geographical limitations, and facilitated substantial progress in effectiveness, productivity, and innovation (Ünüvar, 2006).

Information Technologies and Changing Organizational Structures. Since humans began inventing, discussions about technology and its impact on the future have persisted. By the late 19th century, debates on the positive and negative effects of technology became more pronounced. In the 21st century, these discussions focus on the idea that rapid technological progress is driving humanity toward a “post-human” era, with both utopian and dystopian perspectives (Vural, 2013).

Utopians view information technologies as beneficial, predicting the rise of an information society that will transform social relations, work life, education, political structures, and daily life. Global communities, remote work, smart machines, and digital commerce are among the envisioned changes. From an organizational perspective, the role and importance of information technologies have evolved over time. Initially focused on record-keeping and accounting, by the 1970s organizations required decision support systems, and by the 1980s, users could access needed information directly (Özden, 2015). Organizations now rely on continuously updated technologies and information

management systems to operate efficiently. Information promotes openness and transparency, transforming individuals and organizations into active, networked units rather than isolated points (Erkan, 1998).

The Impact of Information Technologies on Business Management. Businesses are increasingly compelled to adopt information and communication technologies (ICT) due to competitive pressures in the global market. This adoption can lead to cost savings, improved service quality, and enhanced competitive advantage. ICT usage allows organizational units, such as human resources and finance, to operate digitally, simplifying workflow and monitoring (Evans, 2007).

Managing change is closely linked to human resources. For technological transformations to contribute effectively, employees must develop the necessary knowledge, skills, and work approaches. Without enhancing employee competencies, technological changes alone are unlikely to improve organizational performance. In other words, employees' productivity and innovative ideas directly influence organizational outcomes, making human resource adaptation as critical as technological implementation (Berisha-Shaqiri, 2014).

According to Rogers, digital transformation is more strategic than purely technological. While infrastructure updates are important, strategic thinking and digital leadership are central to successful transformation. Managers who embrace this wave of change and guide their organizations toward innovation are more likely to succeed in technology management (Rogers, 2016; Çoruh, 2019).

Some developments that have forced business management to change through information technologies are as follows (İraz & Şimşek, 2004):

- The increasing pace of technological change making existing systems quickly obsolete,
- Changes in competition styles, intensified competition, and the pressure on companies to meet cost and quality standards in order to achieve competitive advantage in the industry,
- Customer dissatisfaction with poor service and low quality, along with evolving and increasing customer demands,
- Organizations' desire to adapt to multicultural environments, necessitating changes in human resources policies and practices to attract and employ diverse talent due to workforce transformations,
- Demographic and social changes in developed countries, including the decreasing proportion of young people in the population, which places continuous pressure on businesses.

Digital transformation in businesses is not limited to technology; it primarily concerns organizational culture and workforce. Technological transformation encompasses not only infrastructure but also organizational culture and human resources. Existing employees may often resist acquiring new skills. Anticipating this resistance and planning measures during the decision-making process allows managers to implement the transformation more effectively (Banger, 2017).

The Impact of Information Technologies on Decision-Making. Effective decision-making requires the use of reliable, accurate, and complete information. To make sound decisions, organizations must first identify the elements of the decision-making process and the factors that influence decision behavior. Within the organization, the following steps should be followed: the situation requiring a decision must be determined, all necessary data should be collected, the available information must be analyzed, alternative solutions researched, their probabilities assessed, compared, and finally, the most suitable option selected and implemented (Çavuş, 2008).

Today's managers make a wide variety of decisions in dynamic and rapidly changing environments. The rationality and accuracy of these decisions largely depend on the diversity and reliability of the information available to decision-makers.

Modern organizations must consider multiple variables and parameters that can affect ongoing activities in their decision-making processes. Otherwise, decisions based solely on an individual manager's knowledge and experience can lead to significant organizational losses (Emhan, 2007).

The inclusion of management information systems (MIS) in organizational decision-making processes provides several benefits (Sarihan, 1998):

- Increases operational efficiency by making routine tasks faster and less costly.
- Shortens processes in sectors such as banking and tourism, enabling better customer service through computerized systems.
- Supports the development of information-based product lines, as information itself is both an input and a product.
- Provides a competitive advantage for organizations where information is effectively processed and utilized in production.
- Facilitates the identification and exploitation of new market opportunities.
- Saves time and labor within the organization, promoting standardization and institutionalization.

The Impact of Information Technologies on Business Efficiency. In the knowledge economy, information and technology applications are among the most important production resources for both businesses and national economies. Labor, as a production factor, is no longer based solely on physical strength and skills, as in industrial economies, but also on the knowledge it contributes to production. Businesses require this knowledge-based labor to strengthen their operations (Yıldırım, 2004). Productivity increases are achieved through higher quality and lower-cost production, with information technologies and their proper use being primary factors influencing efficiency (Alkadi et.al., 2012).

The active use of information technologies in businesses is essential for focusing on the knowledge economy, increasing added value, and creating new business areas (Shahin & Topal, 2016). The development of information technologies continuously influences production, quality, service, and time factors, compelling organizations to adapt. Their use has led to structural changes within organizations, enabled entry into new markets, created new methods for product and service delivery, and enhanced process efficiency (Albadvi et.al., 2007).

Research indicates that businesses actively utilizing information technologies adapt more easily to market changes, achieve higher value and benefits compared to competitors, and gain a significant competitive advantage (Çoruh, 2019).

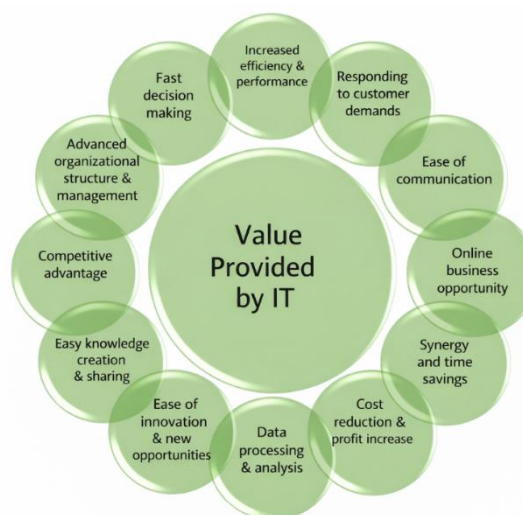


Figure 1: Values Provided by Information Technologies

Information technologies (IT) tend to dominate production and business processes by using tools such as computer-aided design and manufacturing, telecommunications networks, expert systems, distributed knowledge-based organizations, inter-organizational information systems, and multimedia systems. Companies adopting new IT systems are more likely to sustain their operations (Dulkadir & Akkoyun, 2013).

Regarding human resources, the rise of robotics and artificial intelligence is expected to shift individuals toward roles demanding greater creativity and innovation. Education systems must equip future generations with 4C skills critical thinking, collaboration, communication, and creativity to prepare them for this evolving workforce, aligning with the demands of Industry 4.0 (Cengiz, 2019).

Research in the United States highlights the economic benefits of IT investments: for every \$1 invested in IT, companies can expect a \$2 return, with productivity increases reaching up to 80%. The World Economic Forum's Future of Jobs Report (2020) indicates that nearly 50% of surveyed companies planned workforce reductions in automated roles by 2022, 38% planned to increase staff based on productivity gains, and over 25% anticipated new job openings due to automation growth (Erdoğan et.al., 2021).

Although the demand for existing professions such as electronic engineering, software development, and technology engineering is expected to continue in the coming years, it is also anticipated that new job roles will emerge, including (Ertürk, 2021):

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| – <i>Industrial Solution Architect</i> | – <i>Data Analytics Specialist</i> |
| – <i>Cloud Computing Specialist</i> | – <i>Application Software Developer</i> |
| – <i>3D Printing Engineer</i> | – <i>Market Research Analyst</i> |
| – <i>Wearable Technology Specialist</i> | – <i>Blockchain Specialist</i> |
| – <i>Solar Energy Engineer</i> | – <i>IT/IoT Solution Architect</i> |
| – <i>Cybersecurity Specialist</i> | – <i>Network Engineer</i> |
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Alongside these emerging professions, it is also projected that certain jobs may decline or even disappear due to the impact of information technologies. According to the World Economic Forum (2018), while 71% of current jobs existed in 2018, this figure is expected to decrease to 52% by 2022, with 48% of roles being integrated into automation processes (Erdoğan et.al., 2021). The professions anticipated to decline or vanish as a result of digital transformation include (Gökalp et al., 2019):

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| – <i>Secretary/Administrative Assistant</i> | – <i>Cashier</i> |
| – <i>Assembly Line Worker</i> | – <i>Driver</i> |
| – <i>Machine Operator</i> | – <i>Personal Financial Advisor</i> |
| – <i>Logistics, Cargo, and Shipping Agent</i> | – <i>Courier</i> |
| – <i>Travel Agent</i> | – <i>Farmer</i> |
| – <i>Tour Guide</i> | – <i>Security Guard</i> |
| – <i>Accountant</i> | – <i>Call Center Operator</i> |
| – <i>Bank Clerk</i> | – <i>Laboratory Technician</i> |
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Developments in information technologies not only offer organizations new opportunities to enhance their competitive positioning in the market, but also reduce costs associated with system licensing and the lack of qualified workforce or technological infrastructure. In this context, organizations that effectively utilize information technologies can achieve increased productivity, reduce costs, develop new products, services, and processes, and gain a competitive advantage over their rivals (Karahan & Bürkek, 2022).

Conclusion

This study demonstrates that information technologies (IT) in organizations are not merely tools for accelerating operational processes, but have become strategic assets that directly impact decision-making, efficiency, innovation, and competitive advantage. An examination of the historical development of information systems reveals a transformation from basic functions such as record-keeping and accounting to management information systems and decision support systems. This evolution enables managers to access accurate information more quickly, rendering processes more

rational and measurable. Consequently, organizations benefit from time and labor savings, cost reductions, improved service quality, and strengthened institutional standardization.

The findings indicate that the success of digital transformation is not solely dependent on technological infrastructure investments; human resources, organizational culture, and leadership are equally critical determinants. Developing employees' competencies to adapt to new systems, anticipating potential resistance, and implementing planned change management processes are essential. Otherwise, technology investments alone cannot guarantee the expected performance improvements.

Furthermore, the widespread use of IT supports more networked, flexible, and transparent organizational structures, facilitates access to new markets, enables process redesign, and accelerates innovation. The rise of robotics, artificial intelligence, and automation is reshaping the labor market, reducing the relevance of certain professions while highlighting new roles in areas such as data analytics, cybersecurity, and cloud computing. Therefore, organizations must align their IT strategies with education and talent management policies that develop the competencies required for the future workforce.

In conclusion, organizations that effectively adopt information technologies across all organizational levels and integrate this transformation with strategy, culture, and human capital are better positioned to achieve cost advantages, enhanced efficiency, stronger decision-making capabilities, and sustainable competitive superiority. Accordingly, IT investments should be approached not merely as technical modernization, but as part of a holistic management strategy that supports organizational learning and transformation.

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