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# Impact of Digitalization, Big Data Analytics, and Artificial Intelligence on Business Transformation in It Companies: Literature Review and Conceptual Framework

Amit Joshi, Aivars Spilbergs and Elīna Miķelsone



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# IMPACT OF DIGITALIZATION, BIG DATA ANALYTICS, AND ARTIFICIAL INTELLIGENCE ON BUSINESS TRANSFORMATION IN IT COMPANIES: Literature Review and Conceptual Framework

Amit Joshi[1], Dr.oec. Aivars Spilbergs[2], Dr.Elīna Miķelsone[3]
[1]Research Scholar
[1,2,3]BA School of Business and Finance
amit.joshi00008@gmail.com

**Abstract:** More data is available now than ever, thanks to the broad adoption of digital technologies that have revolutionized businesses. Analytics for large datasets and AI have become indispensable to make sense of this deluge of information and help businesses operate optimally. This study looks at how digitalization, big data analytics, and artificial intelligence have affected the business transformation of IT firms. Although the usefulness of big data analytics is widely acknowledged, putting a price on it is a complicated and ever-changing endeavor. Other artificial intelligence (AI) technologies, like machine learning and blockchain, may also improve crisis management, adaptability, and judgment. However, a thorough familiarity with these technologies is necessary for their application. To understand how digitalization, big data analytics, and AI have affected the development of IT companies and their creativity, productivity, and profitability, this research seeks to examine these factors.

**Keywords**: Digitalization, big data analytics, artificial intelligence, business transformation, IT companies, machine learning, process optimization, managerial decision-making

## 1. Introduction

Technology and the internet have driven organisational transformation, resulting in several work method changes. "These technologies are essential to all sectors of our economy and society and will change the character and distribution of employment in the next decades.'' The Global Commission on the Future of Work has recognized new forces that are changing the face of work, the workforce, and work organization and management (ILO, 2019a). Technology, especially since the 21st century, has caused widespread job displacement, insurmountable skill shortages, and a threat to human intelligence by artificial intelligence, according to the World Economic Forum (2020a).

Technology-Adaptation Leading Strategies Technology transforms business models and management culture, but there may be little research on how leaders can adapt and capitalize on these changes. This gap may need understanding adaptable leadership traits, strategies, and practices. AI, robotics, IoT, and other sophisticated technologies have revolutionized work practices, yet there may be a study vacuum in their unique nature and breadth across industries and organizations. A full study of how digitalization has impacted work procedures and practices is needed.

Organizational Culture and Technology Change Technology change and organisational culture may be understudied. How leadership may establish and align organizational culture to enable technology advances may be a study gap. Challenges of technological disruption Job displacement, talent shortages, and AI's threat to human intelligence are key challenges. Upskilling/reskilling, human-AI collaboration models, and automation-enhanced creativity and problem-solving may be understudied.

Technology's changing workplace will affect workers, work organization, and management. Studies that foresee and analyze these future possibilities and their effects on leadership and organisational practises may be lacking. Empirical studies, case analyses, surveys, interviews, and multidisciplinary research can cover these research gaps by giving insights, frameworks, and recommendations for leaders and organisations to adapt to technology advances and digitalization's problems and benefits.

### 1.1 DIGITALIZATION

The term "disruption" has gained widespread usage as a result of the rapid development of digital technology and the digitization of the economy, both of which are anticipated to have an effect on both businesses and their workforce. According to Perez (2015), the idea of influence is pervasive across the ever-changing environment of the contemporary workplace. The development of new technologies has ushered in Industry 4.0, the fourth industrial revolution after mass production, which was ushered in by the electronic age (Industry 1.0) and Taylorism (Industry 2.0). 0) and automation powered by electrical and analogue computing. 0) and mass production, which was ushered in by Taylorism (Industry 2.0). An investigation into this phenomenon was carried out by Voss, Maack, and Rego (2019)

Artificial intelligence, robotics, the Internet of Things, big data analytics, quantum computing, 3D printing, nanotechnology, biotechnology, information science, autonomous cars, and energy storage are just some of the technological revolutions that are featured in April Market. According to Schwab (2017), this revolution will entail the development of technologies that bridge the gap between the physical, digital, and biological worlds.

Data is essential for decision-making, production, and digital transformation, according to the OECD (2019b). Decision-making needs clarification. According to the OECD (2019b), data is essential for decision-making and production. Decision-making requires carefully considering and choosing a plan of action from a variety of options. A thorough review of data, preferences, organizational goals, and external restrictions informs this approach. Data-driven insights help decision-makers make smart, well-informed decisions that meet their goals.

The importance of data goes beyond decision-making. It optimises and improves manufacturing processes, operational efficiency, and resource allocation throughout production. Data-driven production helps streamline processes, increase quality, and maximize resources. Data is crucial to productivity and decision-making. It helps decision-makers make informed choices and boosts manufacturing efficiency and innovation. This synergy between data, decision-making, and production shows how data-driven techniques may revolutionize modern situations.

The development, manufacturing, or generation of commodities and services is called "production". Production is the complex processes that turn raw materials, components, or inputs into completed products or services that meet specific needs, according to the OECD (2019b). Data has become a crucial production asset. It guides efficiency, innovation, and optimization throughout the production lifecycle. Data-driven insights can improve production processes, product quality, supply chains, and decision-making.

Figure 1 shows the network of mutually reliant digital technologies that will underpin the digital revolution that will revolutionize economic and social life. Digitization, digitalization, and digital transformation are sometimes used interchangeably, therefore they must be distinguished. Digitization converts analog data and procedures into machine-readable format (Verhoef et al., 2021). However, digitalization uses digital technologies, data, and interconnection to create new or modified activities. The OECD defined 'digital transformation' in 2019 as the effects of digitalization on the economy and society.

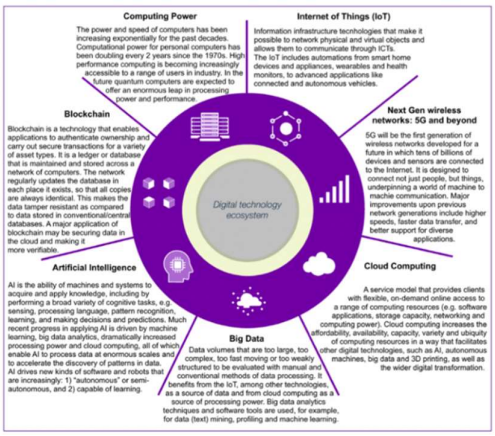


***Figure I:****Source: Adapted from OCED (2019b), and Voss, Maack, & Rego (2019).*

### 1.1.1. Artificial Intelligence (AI)

According to R. Parasuraman and M. Mouloua (2018), artificial intelligence enables automated systems to drive on their own, assist with legal casework, and detect medical ailments. As a result, it is anticipated that AI-based solutions will be implemented in the following industries: manufacturing, agriculture, care, hospitality, transportation, and services, including jobs that include direct interaction with customers (Sarker 2022).

When occupations are reorganised, the Health and Safety at Work (HSW) programme might have to deal with new challenges. Automation of tasks may lead to an increase in sedentary labour and a reduction in the variety of tasks, leaving individuals with monotonous employment. It has been demonstrated that task automation can lead to cognitive underload, boredom, performance pressure, job intensification, isolation, and decreased peer contact, in addition to negatively impacting teamwork (EU-OSHA, 2021).

Therefore, integrating AI into business and information technology strategy catalyses the transformation of data and technology into

value and competitiveness. This requires a complete understanding of the concepts underlying AI as well as a willingness to take risks and explore. The importance of using AI in today's digital age is emphasised in this research. Businesses have no choice but to challenge the status quo and investigate the uncharted territory of AI if they wish to remain competitive in today's rapidly evolving market. They have the potential to liberate value and generate a competitive advantage that is difficult to imitate.Kitsios, F. (2023) and Perifanis, N.-A. (2023)

### 1.1.2. Big Data

Roger Magoulasin formally coined the phrase 'big data' in 2005 to describe vast amounts of data that, because of their size and complexity, cannot be handled and managed using traditional data management techniques (Ularu et al. 2012). Big data is renowned for its vastness, which consists of intricate and distinct data sets that are too unexpected and inconsistent to be managed by conventional methods.


***Figure 2:*** *Big data analytics and competitive advantage adopted from (Davenport & Dyché, 2013).*

On the other hand, velocity is a term that refers to the rate at which considerable amounts of data are continuously updated inside data streams. According to Lidong Wang and Alexander (2016), big data management necessitates the use of specialised tools since it may deal with quantities of data that are too enormous for conventional database software to handle well.

Recent studies have confirmed the significance of big data and digital transformation in contemporary organisations. For instance, Kim and Lee's study from 2022 revealed that big data analytics significantly boosts business performance in terms of effectiveness and profitability. Another study conducted by Zhang et al. (2023) revealed that the positive effects of digital transformation on customer experience and satisfaction can increase customer loyalty and retention.

**Table 1 Considerations linked to change fostered by digitalization and AI**

| | |
|---|---|
| Policy | How can rules and other policy measures be harmoniously balanced to effectively manage developing hazards in novel forms of employment, while at the same time not limiting rapid advancement both inside and outside the organisation? |
| Responsibility | In the context of risk management in contemporary digitalized work contexts, such as remote virtual work, work-from-home setups, virtual reality environments, and work involving AI-enabled devices, how can the obligations of employers and workers be differentiated from one another? How can social protection and the well-being of employees even be ensured for workers who are self-employed? |
| Autonomy and Control | How can the ideal equilibrium between worker autonomy and control over their work be maintained while fostering flexibility? What strategies can be employed to support worker participation and facilitate collective bargaining? |
| Privacy | How can worker privacy be effectively safeguarded in a digital work environment where algorithmic monitoring and surveillance are prevalent? How can ethical hiring, appraisal, and evaluation processes be developed to uphold human dignity? |
| Technology Interface | How can new technological interfaces, such as enhanced sensory stimulation, AI, and robotics, be seamlessly integrated into virtual work processes |

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|---|---|
| | while ensuring user-friendly and human-centric design principles? |
| Productivity | How can the organization strike a balance between achieving optimal economic performance and fulfilling social performance goals? How can health, safety, and well-being be proactively addressed in the era of digitalization? |
| Workforce Diversity | How can the increased engagement of different groups, such as women, older and younger individuals, migrants, low-educated workers, and populations at the margins of society, be fostered in virtual work environments? How can we best encourage the continual development of our workforce? |

*Table 1: Source: Adapted from Leka (2021).*

### 1.3 AIM and Objective

- To identify the challenges faced by IT companies in decision-making.
- To propose a solution to address the challenges in decision-making using AI, Digitalization, and big data analytics in IT companies.
- To investigate the role of AI, Digitalization, and big data analytics in transforming business operations in IT companies.
- To explore the challenges associated with the exploration and research of AI technologies in IT companies.

## 2. Literature Review

The careful curation of literature is of utmost importance in conducting a study that examines the effects of Digitalization, big data analytics, and AI on business transformation within IT companies. This is necessary to establish the credibility and dependability of the research findings. A thorough and all-encompassing literature review is imperative, encompassing a diverse array of pertinent sources, such as scholarly journals, conference proceedings, and industry reports.

Prominent scholars in this domain comprise Brynjolfsson and McAfee (2014), who have produced copious literature on the influence of technology on the economy, and Davenport and Harris (2017), who have concentrated their efforts on the function of big data analytics in the metamorphosis of businesses. Additional noteworthy authors comprise Westerman et al. (2014), who have expounded upon the significance of digital transformation for corporations, and McAfee and Brynjolfsson (2017), who have investigated the prospective applications of AI in the realm of commerce.

In conclusion, digitalization, big data analytics, and AI have transformed IT organizations significantly. "To fully understand the impact, scholarly literature, industrial analysis, and empirical instances must be considered. These technologies can improve efficiency, customer orientation, and innovation, but they also bring challenges that require careful handling to ensure successful adoption and execution.

### 2.1 Digitalisation as enable od business transformation

Digital technologies into many aspects of an organization's operations and strategies, digitalization plays a crucial role as a catalyst for corporate transformation. Businesses go through a significant transformation in terms of their core operations, customer interactions, and value generating techniques. Fundamentally, digitization encourages process improvement and greater efficiency, which promotes operational excellence and cost savings. Additionally, it enables companies to provide more individualized and enhanced client experiences by utilizing data-driven insights to make defensible choices that are in line with market demands. Organizations that embrace digitization open doors for innovation, allowing them to rapidly experiment, explore new business models, and react to shifting market dynamics. Beyond internal operations, this transformational journey broadens global reach, promotes collaborations, and increases supply chain resilience. However, a thorough strategy that includes technological adoption, cultural changes, and a dedication to data protection and compliance is necessary for effective digitalization, eventually guiding organizations

toward a future of sustainable growth and competitive advantage.

**2.2 AI as catalyst of data into technology of value is competitiveness**

Indeed, using AI as a catalyst to turn data into useful technologies can greatly increase competition in a variety of markets and areas. This is how:

i. Data-Driven Insights: AI can quickly and efficiently analyze vast volumes of data to find patterns, trends, and insights that people might overlook. These insights can help organizations make well-informed decisions, enabling them to react quickly to changes in the market, client preferences, and competitive challenges.
ii. Enhanced Efficiency: Automation enabled by AI may synchronize processes and minimize manual labor. This results in improved productivity, lower operating expenses, and quicker time to market for goods and services.
iii. Individualized Customer Experiences: Utilizing AI, businesses can better comprehend the preferences and behaviors of specific clients, creating experiences that are highly relevant and individualized. This could improve client satisfaction and loyalty, providing business an advantage.
iv. Innovation and Product Development: AI can be used to examine market data and pinpoint areas for innovation or unmet demands. This aids businesses in creating new items or improving old ones to keep one step ahead of rivals.
v. Optimized Supply Chain Management: AI can improve logistics and supply chain processes by forecasting demand and adjusting inventory levels. Costs are reduced, delivery times are shortened, and customer service is improved as a result.
vi. Risk management and fraud detection: AI may examine data to find trends that point to fraud or other dangers. This is signific performanceant in industries where staying ahead of dangers is essential for competitiveness, such as banking and cybersecurity.

**2.3 Big data analysis as booster of business performance**

Big data analysis can in fact be used in a variety of ways to increase corporate performance. The following are some significant ways that big data analysis can help to improve company outcomes:

i. Informed Decision-Making: Big data analysis offers information on internal operations, market trends, and consumer behavior. Businesses can use this data to create more accurate and market-driven decisions that are data-driven.
ii. Consumer Insights and Personalization: Large amounts of consumer data are analyzed to assist pinpoint preferences, buying trends, and behaviors. Businesses can use this to customize marketing campaigns, enhance consumer interactions, and create products and services that are tailored to satisfy particular needs.
iii. Operational Efficiency: Big data analysis may streamline operations throughout the company, from production to supply chain management. Businesses may streamline operations, cut costs, and boost overall efficiency by identifying bottlenecks and inefficiencies.
iv. Market Trends and Competitive Analysis: By analyzing big data, organizations can keep up with market trends and keep tabs on their rivals' actions. This knowledge aids in modifying tactics, introducing new goods, and spotting new business prospects.
v. Risk management and fraud detection: Big data analysis can spot trends that point to possible risks or fraudulent activity. In fields like finance and cybersecurity, where early discovery can stop substantial losses, this is essential.

vi. Product Development and Innovation: Big data analysis can provide information about client demands and preferences, which can help with the creation of new goods and services. Businesses can innovate more successfully by knowing the needs of the market.

### 2.4 IMPORTANT FACTORS RELATING TO CHANGE FACILITATED BY DIGITALIZATION & AI

The gap between technology breakthroughs and organizational and societal policies must be overcome to capitalize on the digital era's potential and address its challenges. Many pre-digital legislation may take time to analyze and adjust since it might be difficult to understand the changes and their impact. Understanding how the digital shift affects enterprises, the economy, and society is crucial (OECD, 2019b).

Digitalization and AI aid organizational change, according to 2022 and 2023 studies. Cao et al. (2022) found that AI technologies can boost business productivity and competitiveness by improving process efficiency. Zhang et al. (2023) underline the relevance of company culture and leadership in digital transformation, since these aspects can considerably effect digital projects. The findings imply that while technology is essential to digital transformation, it must be backed by a strong organizational culture and competent leadership to create real change.

### 2.5 Business Transformation In IT Companies

Digital technology, big data analytics, and AI are helping businesses transform and stay ahead (TechFunnel, 2023). These advancements are helping IT companies boost productivity, customer satisfaction, and revenue (TechFunnel, 2023). Relevance Digitalization, big data analytics, and AI impact IT business transformation:

Digitalization, big data analytics, and AI are transforming IT by enabling real-time data collection, analysis, and utilization (TechFunnel, 2023). Businesses can adapt to market changes and client needs better due to their greater ability to make educated decisions fast (TechFunnel, 2023).

Digitalization, big data analytics, and AI have greatly impacted IT business transformation. This has helped firms boost efficiency, customer satisfaction, and income. Adoption of these technologies boosts IT and other sector innovation, but it raises data security and privacy concerns. Businesses who conquer these challenges will gain competitiveness, growth, and profitability (TechFunnel, 2023).

## 3. Theoretical Framework

In order to construct a robust theoretical foundation for this inquiry, it is necessary to perform a synthesis of relevant theories and principles associated to digitalization, big data analytics, artificial intelligence, business metamorphosis, decision-making processes, data protection, and organisational culture. The purpose of the proposed research is to acquire insight into the application of AI in corporate decision-making, data administration, and human resource management by drawing from a selection of the most important theories and concepts in these areas. These theorizations and ideas will be derived from the previously published literature. Some examples of these include the Technology Acceptance Model (TAM), the Resource-Based View of the Firm (RBV), Big Data Analytics (Big Data), and Digitization.

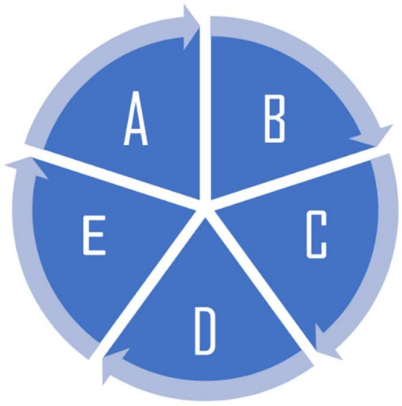


***Figure 3:*** *Theory framework generated by author.*

**A:** The proposed research is based on several main theories and concepts related to the use of artificial intelligence (AI) in business decision-making, data management, and human resource management.

**B :** The Technology Acceptance Model (TAM) by Davis et al. (1989) supports the research. TAM helps explain how users adopt new technologies, especially AI-based solutions. The concept suggests that perceived usefulness and simplicity of use drive technology uptake. This theory will help us comprehend how business decision-making, data management, and human resource management may adopt AI-based solutions.

**C :** The Resource-Based View (RBV) of the firm will also inform the research (Barney, 1991). RBV highlights that a firm's competitive edge depends on its human, physical, and technology resources. This theory will assess how AI-based technologies might boost a firm's resources and competitiveness.

**D :** The project will also use big data, which is vast, complex datasets that may be computationally analysed to identify patterns, trends, and relationships (Chen et al., 2014). Human resource management and business decision-making are using big data analytics to improve performance. The project will examine how AI-based solutions can handle and analyze massive data to improve HR and decision-making.

**E :** Finally, the investigation will use digitalization, which converts analog data to digital form (Brynjolfsson and McAfee, 2014). Recent technical advances have been driven by digitization, allowing AI-based systems to automate numerous corporate activities. The study will examine how digitization and AI-based solutions can enhance corporate processes, lower costs, and boost performance.

The present study will incorporate various theories and concepts in its theoretical framework to investigate the interrelationships among the independent variables, mediating variables, and dependent variable of business transformation in IT firms. The analysis will take into account the control variables to address variations in the resources of firms.

### 3.1 Information sources (primary and secondary)

**Primary sources are those that provide firsthand information, and they include:**

1. ***Interviews:*** Interviews are conducted to collect data from individuals or groups.
2. ***Focus groups***: Focus groups involve the collection of data from a IT industry of people discussing a particular topic.
3. ***Observations:*** Observations are made to collect data by watching and recording behaviors, interactions, and events.

**3.2 Secondary sources are those that provide information that has already been collected and analyzed by someone else. They include:**

1. ***Books:*** Books are written by authors who have conducted research on a particular topic.
2. ***Journals:*** Journals contain research articles written by experts in a particular field.
3. ***Databases***: Databases are online repositories of information that can be accessed by researchers.
4. ***Reports***: Reports are documents that provide information on a particular topic, often based on research conducted by an organization.
5. ***Websites:*** Websites can provide a range of information, from news articles to academic research papers.

## 4. Discussion

The paper will analyze, evaluate, and contextualize the findings within existing knowledge. It will also discuss study goals, consequences, limitations, and future directions.

**Anticipated Impact of Digitalization, Big Data Analytics, and Artificial Intelligence:**

The research is expected to show that digitalization, big data analytics, and AI improve IT business transformation. These technologies

are expected to improve decision accuracy, data security, HR replacement, data mining, time, and cost. This will support earlier studies (reference relevant studies) that show digital technologies may revolutionize business operations and strategies. The study should highlight IT businesses' decision-making issues, especially when integrating AI and data analytics. Data security, HR relocation, and data mining tactics may be issues. The recommended approach of using AI, digitalization, and big data analytics to address these difficulties should be validated by research. The integration of these technologies should increase decision-making accuracy, data security, HR functions, and data mining.

## 5. Conclusion and Future Research

This research is expected to be groundbreaking since it will conduct an exhaustive investigation into the effects that digitalization, big data analytics, and artificial intelligence will have on the evolution of organisations, particularly in the field of information technology enterprises. The unique component of this study is that it attempts to interweave these themes within the specific context of IT organisations and their sophisticated decision-making procedures. While previous research endeavours have independently investigated each of these topics, the distinctive aspect of this study is the attempt to do so. This research is pioneering in nature, and the incorporation of intermediary elements, such as the precision of judgements, the protection of data, the substitution of human resources, the extraction of data, and considerations of time and expenses, serves to highlight this pioneering quality. The purpose of this study is to provide significant insights into the transformative potential of cutting-edge technologies within the context of the IT industry by means of a methodical analysis of the interconnection between the aforementioned variables.

- **Theoretical novelty**: According to Sivarajah et al. (2017), the fundamental objective of this study is to enhance the theoretical knowledge about the influence imposed by digitalization, big data analytics, and artificial intelligence on the process of business transformation inside IT firms. Specifically, the goal of this research is to better understand how these three factors interact with one another.
- **Methodological novelty**: The study will employ a cross-sectional survey research design, utilising a range of statistical tools and techniques for data analysis (Chen & Zhang, 2014). This approach will provide a comprehensive and rigorous methodology for investigating the research objectives.
- **Practical novelty:** The research project aims to provide practical recommendations for IT companies to optimise their decision-making processes through the implementation of digitization, big data analytics, and artificial intelligence (Lacity & Willcocks, 2017). This practical contribution has the potential to enhance the competitiveness and efficiency of IT companies in the current business landscape.

**Role of AI, Digitalization, and Big Data Analytics in the Future:**

The investigation into the role of AI, digitalization, and big data analytics in transforming business operations within IT companies will underscore their significance in driving organizational change. The findings are likely to suggest that these technologies facilitate innovation, efficiency, and competitive advantage. By harnessing AI and data-driven insights, IT companies can be better equipped to adapt to dynamic market conditions, improve customer experiences, and develop data-driven strategies for sustained growth.

**Exploration of AI Technologies in the Future:**

The research will also shed light on the challenges associated with the exploration and research of AI technologies within IT companies. While AI offers transformative potential, its future implementation will require careful consideration of factors such as workforce training, ethical considerations, and alignment with organizational goals.

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