

Evolution of digital transformations in IT companies

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Abstract

This article discusses the evolution and approaches of digitalization of business processes within IT companies, highlighting the transformative effects of this shift on operational efficiency and strategic management. By integrating digital technologies like artificial intelligence, blockchain, and cloud computing, IT companies are redefining the landscape of business process management. The paper examines how IT companies' digital technologies have evolved as business processes have been optimised, management decision-making processes have been improved, and service quality has been enhanced. It also looks at issues such as data security, privacy concerns and the need for skilled labour. The evolution of digitalization in IT Companies is investigated through the prism of retrospective historical analysis of how digitalization has evolved in the IT sector and early adaptations, the shift towards more integrated digital solutions. The research methodology includes a blend of qualitative and quantitative approaches, analyzing case studies from various IT companies that have successfully navigated the digital transformation journey. The findings indicate that digitalization, when strategically implemented, leads to significant improvements in process efficiency, cost reduction, and competitive advantage. However, it also necessitates a cultural shift within organizations, emphasizing the importance of continuous learning and adaptation to technological advancements. The paper concludes by proposing strategies for effectively managing the transition towards a digitally empowered business environment.

Keywords: evolution, digitalization, IT companies, business process management, artificial intelligence, blockchain, organizational transformation.

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1. Introduction

In the rapidly evolving landscape of the information technology (IT) industry, the concept of digitalization has become a cornerstone in reshaping how companies manage their business processes. Digitalization refers to the integration of digital technologies into all areas of a business, fundamentally changing how they operate and deliver value to customers. For IT companies, this transformation is not just a trend but a critical component for staying competitive in a technology-driven market. This paper delves into the digitalization of business process in IT companies, exploring how leveraging digital technologies enhances operational efficiency, decision-making, and overall business performance. The advent of technologies such as cloud computing, artificial intelligence, blockchain, and big data analytics has provided IT companies with unprecedented opportunities to optimize and innovate their business processes. However, alongside these opportunities, digitalization also brings its own set of challenges and demands a strategic approach to successfully integrate these technologies into existing business models.

The aim of this paper is to provide a comprehensive overview of the current state of digitalization in the business processes within IT companies. It will examine the key drivers of digitalization, the benefits it offers, the challenges encountered, and the strategies necessary for effective implementation. Through a series of case studies, the paper will also highlight practical examples of successful digital transformations in the IT sector, offering insights and lessons learned from these experiences.

By exploring the multifaceted aspects of digitalization in business process, this paper seeks to contribute to the understanding of how IT companies can navigate the complexities of the digital age. The findings and discussions presented here aim to serve as a resource for IT companies looking to harness the potential of digital technologies for enhanced business process management.

2. Results and discussion

Historical perspective on how digitalization has evolved in the IT sector

The journey of digitalization in IT companies is a rich tapestry woven with innovation, technological advancements, and evolving business needs. This evolution has fundamentally reshaped how companies manage their business processes, transitioning from manual operations to sophisticated, integrated digital systems. Digital transformation refers to the changes in society or in the social subsystems that accompany digitalization. In common usage, the underlying term digitalization oscillates between a selective technical change with a limited broad impact and a fundamental change (Hess T. 2019).

Digital Transformation is a technology-induced change on many levels in the organisation that includes both the exploitation of digital technologies to improve existing processes and the exploration of digital innovation, which can potentially transform the business model (Berghaus & Back 2016).

When talking about digital transformation, it should be made clear that it is a fundamental change process with far-reaching consequences in social, economic or political terms. In this connotation, the term digital transformation is closely related to the terms digital revolution or

fourth industrial revolution. In international usage, this is understood to be much more far-reaching than the German term Industry 4.0 as a historical upheaval in global society (Haug, F., Langes, B., & Boes, A. (2024, January 10)).

Figure 1 outlines the dynamics evolutionary of digital transformation in the IT sector.

The roots of digitalization in the IT sector can be traced back to the mid-20th century with the advent of mainframe computers. These behemoths, while limited by today's standards, were groundbreaking in their time, offering unprecedented data processing capabilities. Companies like IBM and Honeywell were pioneers, introducing mainframe systems that could handle complex computational tasks and large volumes of data (Campbell-Kelly M. 2004)

This era marked the first significant step in digitizing business processes, transitioning from manual methods to automated data processing.

The 1970s and 1980s witnessed a monumental shift with the introduction of personal computers (PCs). This era democratized computing, making it accessible to smaller businesses and individual users. The introduction of PCs, spearheaded by companies like Apple and Microsoft, transformed business operations, allowing for more personalized and localized computing solutions (Freiberger P. & Swaine M. 1999). Software applications for tasks like word processing and spreadsheets became integral to business operations, laying the foundation for digital tools in everyday business activities.

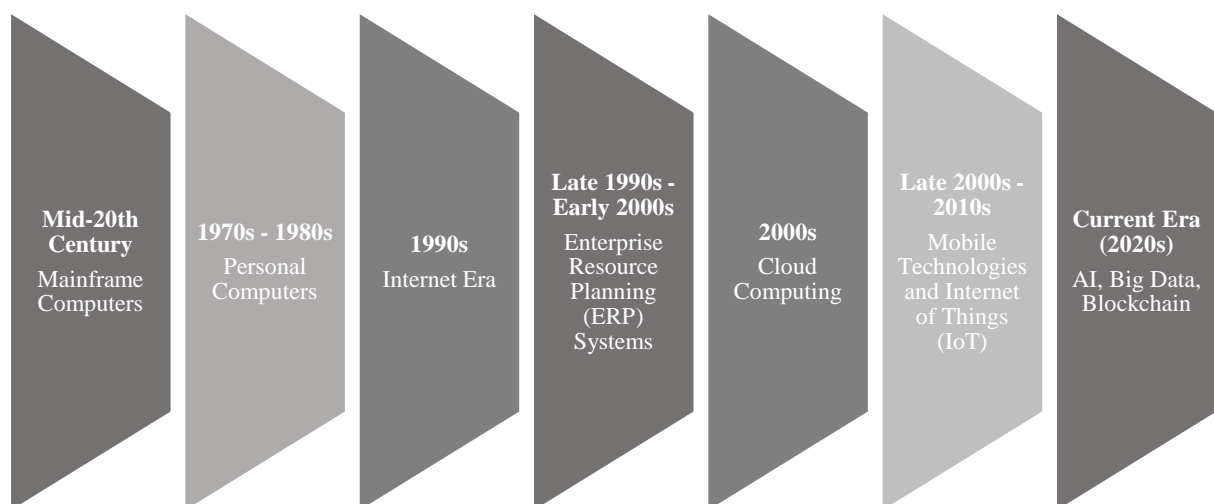


Fig. 1. The dynamics evolutionary of digital transformation in the IT sector

(developed by the authors).

The 1990s heralded the Internet era, a period that revolutionized the IT sector. The rise of the Internet facilitated global connectivity and data exchange, paving the way for e-commerce and online business models. This period saw the emergence of email and the World Wide Web, transforming business communication and information access. Companies began to leverage online platforms for broader market reach and customer engagement (Berners-Lee T. 2011).

The late 1990s and early 2000s marked a significant shift towards integrated digital solutions. The development of Enterprise Resource Planning (ERP) systems integrated various business functions into a unified digital platform, streamlining processes and improving data flow across departments (Davenport T. H. 1999).

The introduction of cloud computing further transformed digitalization, offering scalable and flexible IT resources. Cloud platforms like Amazon Web Services and Microsoft Azure enabled companies to access data and services remotely, revolutionizing how IT resources were managed (Marston, Sean & Li, Zhi & Bandyopadhyay, Subhajyoti & Zhang, Julie & Ghalsasi, Anand 2011).

The adoption of mobile technologies and the Internet of Things (IoT) expanded the scope of digitalization. Smartphones and mobile applications allowed for greater flexibility in accessing and managing business processes, while IoT devices provided new streams of data connectivity, blurring the lines between the physical and digital worlds (Porter M. E. & Heppelmann J. E. 2014).

Today, digitalization in IT companies is characterized by using Artificial Intelligence (AI), Big Data, and Blockchain. AI and machine learning algorithms automate complex tasks and provide predictive analytics. In contrast, Big Data analytics enables strategic decision-making based on vast data sets. Blockchain technology offers secure and transparent data management and transaction systems (Iansiti M., Lakhani K. R. 2017).

The potential contribution of digital technologies to the green transition depends on the context and the maturity of the technology. Digital technologies will need to be adapted to fit the setting in which they are applied, considering for example the country, region, demography, or skill level of users (Muench, S. et al, 2022).

The evolution of digitalization in IT companies reflects a journey from manual data processing to an era of integrated, intelligent digital systems. This transformation has been driven by the need to optimize business processes, enhance productivity, and maintain competitiveness in a digital-first world. The future of digitalization promises further advancements, with emerging technologies continually reshaping the landscape of business process in IT companies.

Early adaptations and the shift towards more integrated digital solutions

The initial phase of digitalization in IT companies was characterized by the adoption of standalone systems, primarily for specific tasks like data processing, accounting, and inventory management. These systems, while revolutionary in bringing digital technology into business operations, operated in isolation, limiting their efficiency and scope. This period saw the rise of mainframe computers and personal computers (PCs), which laid the groundwork for the digitalization of business processes (Campbell-Kelly M. 2004).

The 1980s and 1990s witness a significant shift with the introduction of local area networks (LANs) and the emergence of the internet. This era marked the beginning of interconnected systems, allowing different software and hardware to communicate and share data. The development of network protocols and the standardization of data formats facilitated the exchange of information across various platforms, paving the way for more sophisticated digital solutions (Leiner, B.M., Cerf, V.G., Clark, D.D., et al. 2009).

One of the most significant advancements during this period was the development of Enterprise Resource Planning (ERP) systems. ERPs integrated various business functions such as finance, HR, and supply chain management into a single, cohesive system, streamlining operations and improving data accuracy and accessibility (Davenport T. H. 1999).

Companies like SAP and Oracle led the way in ERP technology, offering solutions that dramatically enhanced the efficiency and effectiveness of business processes.

The late 2000s saw the advent of cloud computing, which marked another major transition in the digitalization journey. Cloud technology offered scalable, on-demand computing resources, allowing businesses to store and access data over the internet rather than on local servers. This shift led to the rise of the Software as a Service (SaaS) model, where software applications are hosted on cloud servers and provided to users over the internet (Marston, Sean & Li, Zhi & Bandyopadhyay, Subhajyoti & Zhang, Julie & Ghalsasi, Anand 2011).

This model significantly reduced the cost and complexity of IT infrastructure and software management for companies. According to Statista Market Insights revenue in the Data Security market is projected to reach US\$6.86bn in 2024. Revenue is expected to show an annual growth rate (CAGR 2024-2028) of 13.01%, resulting in a market volume of US\$11.19bn by 2028. The average Spend per Employee in the Data Security market is projected to reach US\$1.96 in 2024. In global comparison, most revenue will be generated in the United States (US\$2,705.0m in 2024) (Statista market forecast 2023).

The integration of mobile technologies and the Internet of Things (IoT) further expanded the capabilities of digital business processes. Smartphones and mobile applications allowed employees and customers to access and interact with business systems from anywhere, increasing flexibility and responsiveness. Similarly, IoT devices provided real-time data collection and analysis, enabling more informed decision-making and process automation (Porter M. E. & Heppelmann J. E. 2014). Today, digitalization in IT companies is heavily influenced by Artificial Intelligence (AI) and data analytics. AI technologies, including machine learning and natural language processing, are being used to automate complex tasks, provide insights, and enhance customer experiences. Big Data analytics has become a cornerstone of business strategy, enabling companies to make data-driven decisions and gain a competitive edge (Iansiti Marco, Lakhani Karim R. 2017).

Digital transformation refers to the integration of digital technologies into all areas of a business in a way that fundamentally changes how an organization operates and delivers value to customers. That's a fussy way of saying digital transformation is using digital technology in a way that truly transforms your day-to-day business practices, improves your customers' experience, and increases your ROI. Digital transformation goes far beyond simply adopting new technologies; it requires a mindset shift that embraces innovation and agility (Partner, J. B. M., George Levy E. L., Will Hershfeld J. M., & Visionary, S. R. W. (n.d.). 2024)

The evolution of digitalization in IT companies from early standalone systems to today's integrated digital solutions illustrates a journey of continuous adaptation and innovation. As technology continues to advance, IT companies are poised to further embrace digital transformation, integrating new technologies to enhance business process and drive organizational success.

Conclusion

The article provides a detailed account of the digitalization journey in IT companies, illustrating how this sector has evolved from simple data processing systems to the sophisticated, integrated digital ecosystems of today. The narrative begins with the introduction of mainframe computers in the mid-20th century, marking the initial steps towards digitalization. This evolution accelerated with the advent of personal computers in the 1970s and 1980s, democratizing computing and laying the groundwork for more advanced digital tools in business operations.

A significant transformation occurred with the emergence of the Internet in the 1990s, facilitating global connectivity and giving rise to e-commerce and novel online business models. The late 1990s and early 2000s witnessed another leap with the development of Enterprise Resource Planning (ERP) systems and the introduction of cloud computing, further enhancing the efficiency and effectiveness of business operations.

The integration of mobile technologies and the Internet of Things (IoT) marked another milestone, introducing greater flexibility and real-time data analysis into business processes. Today, the influence of Artificial Intelligence (AI) and Big Data analytics is reshaping the IT sector, automating tasks, providing critical insights, and enabling data-driven strategic decision-making.

This evolution from isolated systems to a fully integrated digital framework illustrates a story of constant adaptation and innovation. IT companies have progressively embraced new technologies, enhancing their operations and staying competitive in a rapidly changing digital landscape. The future promises even more advancements, with emerging technologies poised to further revolutionize the way IT companies operate and succeed in a digital-first world. The evolution of digital transformations in IT companies is quite different from conventional business transformations. Digital transformation is the ethos of IT organizations. And business transformations tend to end when the goals have been achieved. Digital tools and technologies are constantly being improved and regularly modified, they are integrated into the current work of IT companies.

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