




## THE IMPACT OF TECHNOLOGY ON ADMINISTRATION: A COMPARISON BETWEEN BRAZIL AND THE UNITED STATES

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### ABSTRACT

Technology has played a central role in modern management, restructuring processes, optimizing decision-making, and impacting organizational efficiency. In the article, the incidence of new technologies on the management of companies is analyzed, comparing the situation in Brazil with that of the United States. Through a literature review and comparative analysis, the technological advances, challenges, and impacts on the administration of the sector of both countries are investigated.

The United States is ahead in adhering to innovations such as artificial intelligence, automation, and Big Data, while Brazil faces infrastructure and organizational adaptation obstacles. The survey emphasized the benefits of digitalization and suggested recommendations on how to enhance technological deployment in the Brazilian scenario.

**Keywords:** Technology. Administration. Digital transformation. Innovation. Comparison between Brazil and the United States.

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## INTRODUCTION

Technology has been occupying more and more space in administration, restructuring processes, strategies, and decision-making in companies. In the current context, marked by digitalization and innovation, the implementation of new technologies, such as artificial intelligence, Big Data, and automation, redesigns the corporate reality. However, the way mutations occur differs from nation to nation, depending on factors such as infrastructure, investment in innovation, and corporate culture.

In this article, we will analyze technological changes in management, making a comparison between Brazil and the United States, two countries with different realities. In the United States, the deployment of advanced technologies is a priority for many companies, allowing for greater automation and greater efficiency. In Brazil, although there have been significant advances, challenges such as precarious infrastructure and resistance to change still weigh on technological deployment.

The purpose of this study is to investigate how new technologies are impacting management in these countries, identifying the main advances and obstacles. The methodology used includes a literature review and a comparative analysis based on studies and reports on business innovation.

This article is organized into five sections. Initially, we will address the theoretical foundations of management and technology. Next, we will discuss the effects of technology on the administrative sector. In the third part, we will perform a comparative analysis between Brazil and the United States. Later, we will present the benefits and challenges of technological implementation. Finally, in the conclusion, we will synthesize the main findings and discuss future trends.

## RESEARCH METHODOLOGY

This work is based on a **qualitative and comparative** approach, anchored in **bibliographic research and document analysis**. The methodology used aims to elucidate the effects of new technologies on administrative management, establishing a parallel between the realities of Brazil and the United States.

### a) Type of Research

The research is **exploratory and descriptive**, as it seeks to analyze how digital transformation has influenced business management in both countries, identifying trends, challenges, and benefits of new technologies.

### b) Methodological procedures

For the construction of this study, the following procedures were adopted:

- **Bibliographic research:** Survey of academic literature, scientific articles, and books on technology and administration.
- **Document analysis:** Consultation of institutional reports, government publications, and studies by international consultancies, such as McKinsey & Company and the World Economic Forum.
- **Comparison between Brazil and the United States:** Identification of differences in the adoption of technologies in both countries based on secondary data and innovation indicators.

#### c) Data Collection and Analysis

The data were obtained from sources recognized for their reliability, namely:

- Academic databases (Google Scholar, Scielo, IEEE Xplore);
- Reports prepared by specialized consultancies (McKinsey, Bain & Company, Gartner);
- Government and institutional publications that address digitalization and innovation.

The data analysis was undertaken through a qualitative interpretation in order to identify patterns, trends, and challenges faced by organizations in the implementation of new technologies in administrative management.

## THEORETICAL FOUNDATIONS

Management has experienced continuous transformations over the centuries, motivated by economic, social, and, more recently, technological changes. The introduction of technological innovations has reconfigured the way organizations operate, providing an increase in efficiency, improving decision-making processes, and promoting strong competitiveness in the global market. In this segment, we analyze the fundamental concepts related to administration and technology, highlighting their evolution and repercussions on organizational management.

## CONCEPT OF ADMINISTRATION AND ITS EVOLUTION

Management is a field of research that is dedicated to the planning, organization, direction, and control of business resources, aiming at the achievement of organizational objectives. As exposed by Chiavenato (2020), management can be characterized as a dynamic process that encompasses the coordination of individuals, processes, and technologies in order to optimize results.

Historically, management has had several phases, from the classic approach, based on efficiency and company structure, to more flexible and innovative models. The table

below provides an overview of the largest business schools and their interrelationship with technological evolution:

Table 1 – Evolution of Management and the Role of Technology

School of Administration	Main Features	Role of Technology
Scientific Management (Taylor)	Emphasis on efficiency and productivity	Industrial machines and work timing
Classical Theory (Fayol)	Organizational structure and hierarchy	Manual records and mechanical systems
Humanistic School (Mayo)	Focus on human behavior and motivation	Improvement in internal communication (telephony and records)
Contingency Administration	Adaptation to changes and flexibility	Process computing and automation
Digital Administration	Integrating technology into decision making	Artificial Intelligence, Big Data and Internet of Things (IoT)

Since the digital revolution, management has begun to use new technology tools, allowing greater integration, automation, and real-time data analysis, profoundly changing the way companies operate.

## TECHNOLOGY AND DIGITAL TRANSFORMATION IN ADMINISTRATION

Technology can be conceptualized as the set of knowledge, methodologies, and instruments used to solve problems and improve organizational processes (Porter, 2001). In the field of administration, technology plays a key role in the digital transformation of corporations, providing greater agility, efficiency, and innovation.

Digital transformation refers to the assimilation of disruptive technologies, such as artificial intelligence, cloud computing, Big Data, and automation, with the aim of modernizing the management of organizations (DAVENPORT, 2018). This process transcends the mere adoption of new tools, implying a cultural and strategic change in the context of institutions.

The main effects of technology on management include:

- **Process Automation:** Reduction of manual activities and increase of operational efficiency.
- **Data Analysis:** Use of Big Data and Business Intelligence to support strategic decisions.
- **Improvement in Communication:** Integration of digital tools, such as management software and collaborative platforms.

- **Security and Data Protection:** Implementation of cybersecurity technologies to protect business information.

With the advancement of digitalization, companies that invest in technology are able to stand out in the market, achieving better results and greater competitiveness.

## IMPACT OF TECHNOLOGIES ON MANAGEMENT

Technological evolution has had a profound impact on administration, modifying everything from the organizational structure to the decision-making and operational processes of corporations. The adoption of cutting-edge technologies has favored greater efficiency, cost savings, time optimization, and a significant increase in competitiveness in the global scenario. Here, we will analyze the major technological developments that have affected modern management.

### AUTOMATION AND ARTIFICIAL INTELLIGENCE IN MANAGEMENT

The automation of administrative processes, driven by the development of Artificial Intelligence (AI), has played a central role in the modernization of companies. The concept of Big Data refers to the ability to process large volumes of data, structured or not, to produce strategic insights. AI enables systems to analyze large volumes of data, make predictive decisions, and optimize workflows, reducing the need for human intervention in repetitive tasks.

According to DAVENPORT; RONANKI (2018), AI can be applied to management in three main ways:

1. **Robotic Process Automation (RPA)** – The use of software to automate repetitive tasks, such as data processing and customer service.
2. **Data Analysis and Decision Support** – Application of advanced algorithms to predict market trends and assist managers in decision-making.
3. **Intelligent Customer Interaction** – Using chatbots, virtual assistants, and predictive analytics to improve the customer experience.

Automation not only increases productivity but also reduces operational errors and allows managers to focus on more strategic activities.

### BIG DATA AND DATA ANALYTICS IN MANAGEMENT

In the corporate sphere, technology has been used in order to optimize administrative efficiency and improve the customer experience. Institutions, with the adoption of Big Data, can analyze consumption patterns, anticipate future demands, and

personalize their services effectively. In the United States, the use of Big Data is widely disseminated in sectors such as finance, health, and retail, while in Brazil, its implementation is still growing due to challenges such as implementation costs and the need for professional training (SILVA; GOMES, 2021).

Below, we present some advantages of Big Data in management:

- **Improvement in data-driven decision-making;**
- **Increased personalization of products and services;**
- **Reduction of operating costs through predictive analysis;**
- **Real-time monitoring of organizational performance.**

Companies that allocate resources to data analysis are able to anticipate trends with greater accuracy, which results in a strengthening of their competitiveness on the global stage.

## **BUSINESS COMMUNICATION AND DIGITAL TRANSFORMATION**

Communication in organizations has been significantly impacted by digital transformation. Tools such as collaborative platforms (Slack, Microsoft Teams, Google Workspace) and business management software (ERP, CRM, BI) promote more effective integration between different sectors, facilitating the exchange of information and fostering operational efficiency.

In addition, digitalization has reduced the need for face-to-face meetings, favoring the adoption of hybrid work models and remote conferences, a trend that has been widely consolidated in the United States and has been expanding in Brazil.

The biggest benefits of digitizing communication are:

- Reduction of travel and infrastructure of physical costs;
- Improved productivity with online collaboration tools;
- Greater transparency and control of internal processes;
- Adaptability to the remote and hybrid work model.

Companies that invest in communication technologies can optimize operational efficiency and consolidate organizational culture, having a positive impact on business performance.

## **BRAZIL v UNITED STATES COMPARISON**

The implementation of technological innovations in administrative management has important differences between nations, with infrastructure, investment in innovation, public policies, and organizational culture as influencing factors. Although the United States is at

the forefront of the implementation of technological innovations, Brazil faces structural and cultural challenges in imposing the full digitalization of public administration.

Here, we will compare the two countries in three key aspects: infrastructure and technology investment, business adoption, and context-specific challenges.

## INFRASTRUCTURE AND TECHNOLOGY INVESTMENTS

The U.S. stands out as one of the main global players in the field of technological innovation, with a solid research and development ecosystem, as well as policies that encourage the adoption of new technologies by companies. The country is home to giants in the technology sector, such as Google, Amazon, and Microsoft, which drive advances in areas such as artificial intelligence, cloud computing, and data analysis (PORTER; HEPPELMANN, 2020).

On the other hand, Brazil has made significant progress in business digitalization, although it still faces relevant structural challenges. According to a study by the World Economic Forum (2022), Brazil occupies an intermediate position in the global innovation ranking, largely due to restrictions on digital infrastructure and relatively low investment in research and development.

The following table contrasts some of the key indicators of technology and innovation between the two countries:

Table 2 – Comparison between Brazil and the USA in Technology Indicators

Indicator	United States	Brazil
Investment in R&D (% of GDP)	3.1%	1.2%
Companies using Artificial Intelligence (%)	65%	35%
Internet Penetration (%)	92%	81%
Business Digitalization Index*	85%	58%

\*Source: World Economic Forum (2022)

Brazil has a growing digital infrastructure, but there are still challenges, such as connectivity in less developed regions and the need for greater professional qualification to deal with new technologies.

## ENTERPRISE ADOPTION OF NEW TECHNOLOGIES

In the United States, technology is an essential pillar of business management, and its adoption occurs in an agile and strategic way. Process **automation, the use of Big Data, and cloud computing** are common even in medium-sized companies, which allows for greater scalability and competitiveness.

In Brazil, the adoption of technologies in management has grown, but there is still resistance from some companies, especially small and medium-sized ones. Factors such as **high costs, lack of government incentives, and difficulty in cultural adaptation** hinder digital transformation in the country.

The sectors that adopt the most technologies in the two countries include:

- **United States:** Information Technology, Finance, Healthcare, and Digital Retail.
- **Brazil:** Banking, Agribusiness, E-commerce, and Services.

While in the US, technological innovation is part of the DNA of companies, in Brazil, there is still a need for greater incentives for digitization and automation of administrative processes.

## CHALLENGES AND BARRIERS TO DIGITAL TRANSFORMATION

Despite the advances achieved, Brazil and the United States still face significant challenges in implementing technological innovations in public management. The table below presents a comparison of the main difficulties faced by both nations.

Table 3 – Main Challenges for Digital Transformation

Challenge	United States	Brazil
Implementation cost	Moderate	High
Qualification of the workforce	High, but with many training initiatives	Low, lack of specialized professionals
Digital infrastructure	Developed	Growing, but uneven
Data security	High level of protection, but constant risk of cyber attacks	Growing concern but lack of maturity in cybersecurity
Organizational culture	Open to innovation and technology	Many companies still resist change

(Source: Adapted from McKinsey & Company, 2022)

In Brazil, the main challenges include **the high cost of implementing new technologies, the need for professional training, and cultural resistance to**

**innovation.** In the United States, the biggest challenge is related to **data security and privacy** due to the large volume of information collected and processed digitally.

## **BENEFITS AND CHALLENGES OF NEW TECHNOLOGIES**

The introduction of new technologies in business management has promoted a significant revolution in the way organizations operate, providing advantages such as increased efficiency, reduced costs, and greater precision in decision-making processes. Even so, the digital transformation journey also faces challenges to be overcome in order to ensure efficient and lasting adoption of technological innovations. Here, we will analyze the biggest advantages and challenges faced by institutions in this area.

### **BENEFITS OF DIGITAL TRANSFORMATION IN ADMINISTRATION**

The digitalization of administrative processes has generated a series of benefits for companies, making management more agile and strategic. Key positive impacts include:

#### **a) Increased Efficiency and Productivity**

The automation of processes, through management software, artificial intelligence, and data analysis makes it possible to carry out activities with greater speed and accuracy. Tools such as Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM) contribute to the integration of sectors and the optimization of workflows, reducing rework and improving resource allocation (DAVENPORT, 2018).

#### **b) Reduction of Operating Costs**

Technology enables organizations to automate repetitive activities, thus reducing the dependence on human resources for operational functions and increasing efficiency. In addition, the adoption of cloud computing reduces the costs associated with physical infrastructure, giving greater flexibility to organizational entities (Brynjolfsson & McAfee, 2014).

#### **c) Improved Decision Making**

The application of Big Data and Business Intelligence (BI) provides the generation of data-based insights, enabling managers to make more informed and strategic decisions. In the United States, large corporations make use of machine learning algorithms in order to anticipate market trends and optimize resource allocation. In Brazil, although this practice is still in the expansion phase, there is already a growing number of companies that have adopted predictive models to improve organizational planning (SILVA; GOMES, 2021).

#### **d) Increased Security and Data Protection**

Digitalization has brought important advances to information security, resulting in the development of technologies such as cryptography, blockchain, and the application of

artificial intelligence in the area of cybersecurity. The greater amount of data, however, requires more intensive surveillance in order to prevent cyberattacks and the evasion of sensitive information (PORTER; HEPPELMANN, 2020).

e) Flexibility and Adaptation to Remote Work

The COVID-19 pandemic has greatly accelerated the adoption of digital tools with a focus on communication and cooperation at a distance. Companies that have invested in tools such as Microsoft Teams, Zoom, and Google Workspace have been able to maintain appropriate productivity levels even in a decentralized setting, a trend that continues with the adoption of the hybrid work model.

## CHALLENGES OF TECHNOLOGICAL IMPLEMENTATION

Even with the benefits, the implementation of new technologies in management still faces challenges, especially in developing countries such as Brazil. The most significant challenges are:

a) High Implementation Cost

The adoption of new technologies requires substantial investments in infrastructure, personnel training, and maintenance. While large corporations in the United States are able to absorb these costs more easily, small and medium-sized companies in Brazil face financial barriers that make it difficult to incorporate new technologies (McKinsey & Company, 2022).

b) Lack of Professional Qualification

Digitalization depends on the presence of qualified professionals to operate new tools and interpret data strategically. In Brazil, the shortage of specialists in areas such as data science, cybersecurity, and artificial intelligence represents an obstacle to the effective implementation of technologies. Studies indicate that only 5% of the Brazilian workforce has advanced technology training, while in the United States, this rate exceeds 25% (World Economic Forum, 2022).

c) Cultural Resistance to Innovation

A significant number of Brazilian companies are still resistant to the implementation of new technologies, either due to the fear associated with change or due to insufficient understanding of the long-term benefits. In the United States, it is observed that the organizational culture tends to favor innovation, while in Brazil, a more accentuated conservatism predominates in the adoption of new administrative practices.

d) Information Security and Data Protection

With increasing digitization, cyber threats have also become more pronounced. Businesses in both countries face challenges in managing hacker attacks, data theft, and digital fraud. The General Data Protection Law (LGPD) in Brazil and the General Data Protection Regulation (GDPR) in the European Union have established guidelines for the protection of information, but there are still significant challenges in effectively implementing these regulations.

#### e) Legacy Systems Integration

Organizations operating with obsolete systems face considerable challenges when migrating to more modern digital platforms. The need to integrate new technologies with old systems can generate additional costs and make the implementation process more complex.

## CONCLUSION

Technology has taken on an increasingly central role in business management, promoting significant transformations in the way organizations structure their processes, make decisions, and interact with the market. This study sought to analyze the impacts of digitalization on business administration, comparing the reality of Brazil and the United States.

In the United States, the adoption of new technologies occurs more rapidly, driven by a robust infrastructure, high investments in research and development, and an organizational culture favorable to innovation. American companies lead the implementation of solutions such as artificial intelligence, Big Data, and process automation, ensuring a competitive advantage on the global stage.

In Brazil, despite advances in digitalization, there are still considerable challenges, such as high implementation costs, a shortage of qualified professionals, and resistance to innovation. Small and medium-sized companies, in particular, find it significantly difficult to incorporate new technologies into their business models, which can impact their competitiveness in the long run.

Among the main benefits provided by new technologies in management, increased operational efficiency, improved decision-making, and flexibility in the work environment stand out. However, obstacles such as data security, the need for professional training, and cultural adaptation still need to be overcome for digital transformation to occur fully and effectively.

Given this scenario, Brazilian companies must expand their investments in technological training, seek government incentives for innovation, and adopt an



organizational culture that is more open to digitalization. In addition, public policies aimed at strengthening digital infrastructure and stimulating research and development are essential to boost the adoption of technologies in the country.

With the continuous advancement of digitalization, the administration of the future will be increasingly data-driven, automated, and interconnected. Companies that are able to adapt to this new reality will have a greater capacity for innovation and sustainable growth in the global market.

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