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## DIGITALIZATION AS A STRATEGY IN THE CONTROLLERSHIP OF FINANCIAL INSTITUTIONS

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**Abstract:** Controllershship structures and processes play a critical role, serving as a central function in ensuring the efficiency, compliance, transparency and sustainability of organizations. The aim of this work is to broaden the understanding the role of controllershship in financial institutions, highlighting digitalization as an essential competitive strategy. To this end, the research was based on a bibliographic and documentary review methodology, analyzing scientific articles and annual reports from major financial institutions such as Banco do Brasil, Bradesco and Itaú Unibanco, in the year 2023. In addition, we sought to contextualize the concept of digitalization in governance and controllershship, as well as analysing its impact on the operational efficiency and competitiveness of financial institutions. The results provide a broad overview of the digital practices and technologies adopted in controllershship and their influence on banks operating in Brazil in recent years.

**Keywords:** controllershship; financial institutions; digitalization; strategy.

## INTRODUCTION

In the book “Deploying Digital Strategy - A Guide to Reinventing Your Company”, Gupta (2020) discusses how the digital world has fundamentally transformed the way we do business, making the adoption of digital strategies essential for competitiveness. The author addresses how companies can take advantage of the opportunities offered by digital technology, how to build an organizational culture that promotes digital innovation and how to develop and implement effective digital strategies.

In this context, the field of financial institutions became the target of this study. Publications by major consultancies have led to reflection on how the digitalization of banking poses risks for controllershship, whose main challenges are cyber security, *Open Finance* and online financial transactions, such as PIX.

The overall objective is to provide a better understanding of how digitalization as a competitive strategy has changed the role of controllershship in financial institutions. We sought to identify the main digital practices and technologies adopted in the sector and analyze their impact on the operational efficiency and competitive performance of financial institutions.

The central research question is: how can digitalization in controllershship be used as a competitive strategy to increase the operational efficiency and competitiveness of financial institutions?

The justification for this study, in addition to its academic and business relevance, is based on the line of research Management in Organizations and Society, of the Postgraduate Program in Administration (PPGA) at Salvador University, contributing to the understanding of the new technological dynamics and their implications for operational efficiency and competitiveness in the financial sector, in line with the themes of technological innovation and organizational management. As such, this study is structured in five sections: (i) introduction; (ii) theoretical background on the proposed issues; (iii) methodological procedures; (iv) analysis and discussion of the results; and (v) final considerations.

The first subsection of the theoretical framework, entitled “Digitalization in Financial Institution Controllershship”, explores the concepts of digitalization and its application to controllershship within financial institutions. This section contextualizes the digital landscape, as well as examining the main digital technologies used in financial institutions, such as the use of artificial intelligence and digital financial transactions, such as PIX.

The second subsection of the theoretical framework, entitled “Digitalization, Governance and Risk Management”, aims to assess the influence of digitalization on corporate governance and risk management within fi-

nancial institutions. This section seeks to map the practices adopted and their impact on the structure and mechanisms for controlling and mitigating risks.

The third subsection of the theoretical framework, entitled “The Impact of Digitalization on Operational Efficiency and Competitiveness”, presents a detailed analysis of the impact of digitalization on the operational efficiency and competitiveness of financial institutions, investigating the changes in the processes and functions of controllership resulting from the adoption of digital technologies.

The methodology adopted in this study is based on bibliographic and documentary research, with analysis of scientific articles and annual reports from major financial institutions such as Banco do Brasil, Bradesco and Itaú Unibanco in 2023, which was the last publication. The research stages include a literature review, document analysis and content analysis to interpret the data collected and identify patterns and best practices.

Finally, the text’s considerations will deal with the consolidation of the research based on the focus of the key aspects, the resumption of the sections, the achievement of the objectives, the answers to the research question, the main findings, the limitations of the research and also the future prospects and recommendations of the study.

## THEORETICAL BACKGROUND

### DIGITIZATION IN THE CONTROLLERSHIP OF FINANCIAL INSTITUTIONS

The term digital refers to the conversion of predominantly analog information into a binary language that can be read by computers. The manipulation of an artifact in its digital representation is done through software that customizes this interaction and creates new possibilities for relationships, processes and organizational forms (Yoo et al., 2012).

Digitalization has become a fundamental element for transformation and innovation in contemporary companies. According to Gupta (2020), leaders who achieve transformative results are those who integrate the digital strategy into all aspects of the organization, promoting a revolution that goes beyond the simple implementation of new technologies. Gupta (2020) criticizes the isolated approach to technology, stressing that many companies fail by creating independent technology units, carrying out experiments without strategic planning and focusing exclusively on reducing costs and increasing efficiency, without considering the changes in the global operating scenario.

Integrating digital strategy with overall business strategy is essential if companies are to reinvent their operations and adapt to new market demands. To achieve this vision of a leading company, Gupta (2020) proposes a theoretical framework that includes: (1) reinventing the company, (2) reassessing the value chain, (3) reconnecting with customers and (4) rebuilding the company, as shown in Figure 1 below.

The concept of digitalization is reinforced by Vian and Gouvêa (2021), who note that companies outside the banking sector, such as Amazon, Apple, Cielo and Google, are behaving like financial managers, increasing competition in the sector. In this context, digitalization transcends the simple creation of ATMs, apps and payment methods, representing an innovation that transforms companies into capital managers, exemplified by the launch of *G-pay*, Google’s digital wallet.

To contextualize the possibilities for banks to operate, DeYoung, Lang and Nolle (2007) identify three models of banking service: *brick-and-mortar* (banks without digital service), *click-and-mortar* (*multichannel* banks that offer physical and digital service) and *internet only* banks (banks that operate exclusively

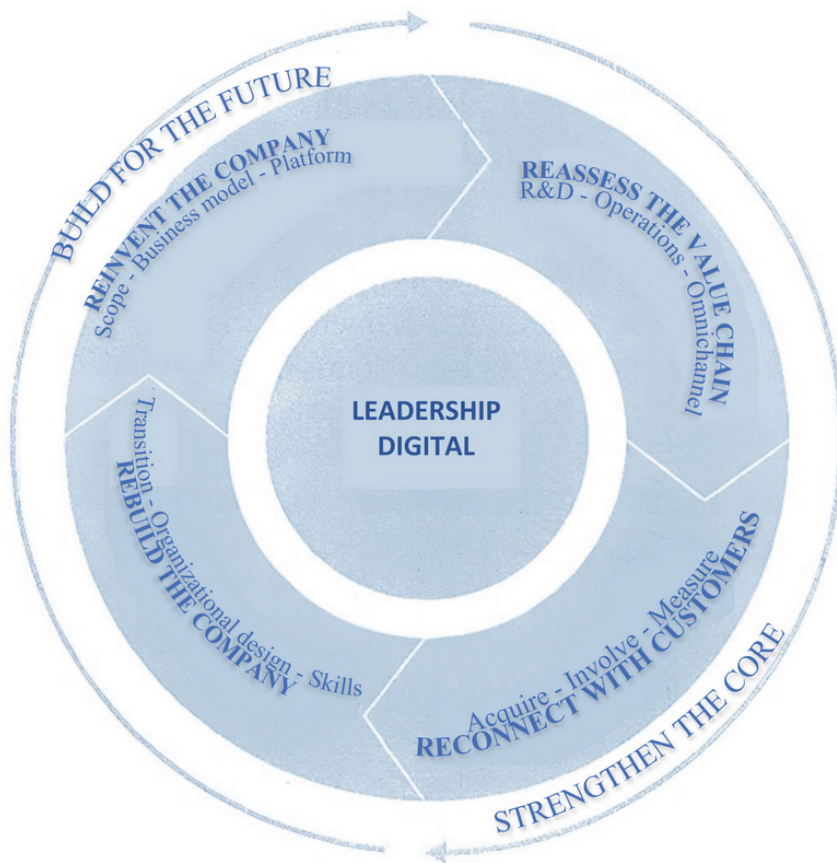


Figure 1: Illustration of Gupta's Theoretical Framework

Source: Gupta (2020, p. 20).

online). Currently, the term “digital bank” is most commonly used for this last definition (Banco Central do Brasil, 2020).

Growing competition in the banking sector has pushed traditional banks to seek innovations to increase profits and compensate for declining revenues (Pinto; Santos; Martens, 2021). Digital accounts, defined as accounts with no physical interaction between consumer and bank employee, are an example of how digitalization is reshaping the sector (Costa; Carvalho, 2017). The Central Bank of Brazil (2020) predicts that the entry of new institutions, such as credit *fintechs* and digital banks, will increase competition, expanding service offerings to consumers and encouraging traditional institutions to improve their processes and explore new market segments, such as *Open Banking* and PIX.

Banks are looking to modernize because this way they can reduce costs and significantly increase profits. The digitalization of banks is not just about meeting the demands of a generation of digitally connected customers who want ease: there is an important issue of costs and efficiency that is also at the heart of finance companies (Gouvea, 2021). In addition, with the use of artificial intelligence and *machine learning*, the financial market has started an even more digital movement, such as robo-investor platforms and *autonomous finance* (Bianchini; Malagolli, 2021)

Faced with all these changes in banking digitalization, it is crucial to discuss the importance of controllership. It is understood that it plays a vital role in adapting financial institutions to new technologies, guaranteeing the efficiency and compliance of processes. It

becomes essential for monitoring and analyzing financial performance, managing risks and ensuring that digital strategies are implemented effectively, in line with the company's overall objectives. Controllershship therefore not only supports digital transformation, but also ensures that this transformation results in tangible and sustainable benefits for the organization.

## DIGITALIZATION, GOVERNANCE AND RISK MANAGEMENT

For Borinelli (2006), Controllershship means a body of knowledge that is based on theoretical and conceptual foundations of an operational, economic, financial and equity nature, relating to the control of the organizational management process. Although there are many scientific papers on the subject of Controllershship, there is little research dealing with its aspects in financial institutions (Carraro; Soares, 2013). Seeking to relate traditional banking institutions to the challenges and risks of the digitalization era, the study of bank controllershship is essential.

According to Gomes and Bruni (2010, p. 19), the use of Controllershship in a management system makes it possible to produce information for the various decisions made by managers, not only financial, but also in terms of Human Resources, Environmental, Technological, Regulatory, Marketing, etc. Therefore, using the expertise provided by control activities, companies can direct governance to follow standards based on the standard set to mitigate risks.

The study by Martin, Santos and Dias Filho (2004) discusses three types of internal control that are essential for corporate governance: custody control, performance control and information quality control. **Custody control** involves ensuring that all the company's resources are conserved and used in accordance with the corporate mission, without fraud or

deviation. **Performance control** ensures that resources are used in a way that generates results for shareholders. **Information quality control** aims to ensure that the information provided by managers is accurate and reflects the true situation of the company.

Each management control, when fulfilling its function within the entity, can also generate risks, conceptualized by Martin, Santos and Dias Filho (2004) as:

1. **Process risks:** originate from the use or operation of assets to achieve business objectives, including human operation risks, equipment or process defects, and fraud and omissions. Examples include embezzlement, receipt of bribes, and misrepresented pricing schemes.
2. **Behavioral risks:** related to the acquisition, maintenance, use and disposal of human assets, such as employee dissatisfaction or demotivation, dysfunctional work environments and inadequate perception and judgment. These risks are linked to problems of unproductivity, lack of adequate training and development, and negative decisions influenced by erroneous perceptions.
3. **Property risks:** include losses of critical assets, which can be tangible or intangible, and strategic or external risks, which result from environmental forces beyond the organization's control. Examples are fires, floods, the departure of key personnel, and changes in the characteristics of the input and product markets

The intertwining of risks, shown in figure 2, also includes the problem of agency, where managers can prioritize their own interests to the detriment of shareholders. Given that "*All business risks are also risks of poor management*" (Jensen; Meckling, 1999), it is necessary to know these risks in order to show how



# Interconnections of the Main Concepts of Internal Controls and Risks

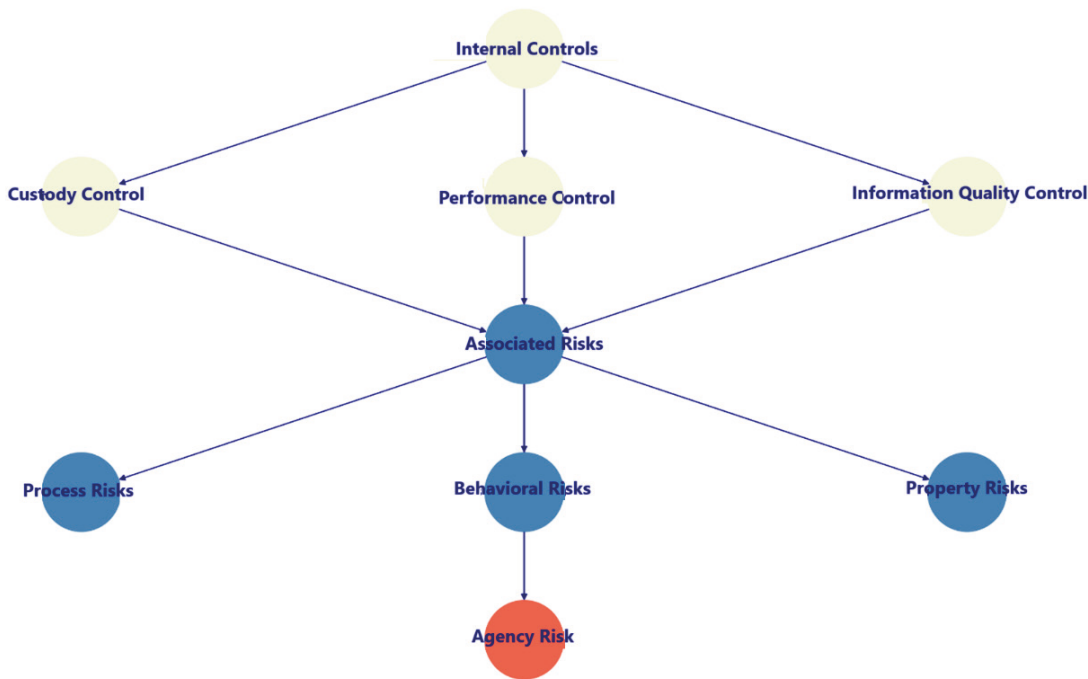


Figure 2: Risk flowchart

Source: prepared by the authors, based on Martin, Santos and Dias Filho (2004).

<b>Corporate Bases</b>	Creating a unified infrastructure for customer, agency and product data to eliminate inconsistencies and reduce maintenance costs.
<b>Business Management</b>	Development of the Business Portal to automate customer service activities and facilitate business simulation and induction.
<b>Resource Management</b>	Implementation of the Resources Portal to automate the requisition and administration of materials, technological and human resources, optimizing logistical and contractual processes.
<b>Event Processing</b>	Introduction of a new data processing model, allowing automatic bookkeeping of accounting events and integration between operational and accounting systems.
<b>Information Management</b>	Review of management systems to standardize and unify data, generating reliable and consistent information to support the decision-making process.

Chart 1: Information Architecture Program

Source: prepared by the authors, based on Santos (2005)

companies have avoided operational disruption and damage to the business in the financial institutions sector.

Digitalization the governance of financial institutions must therefore be focused on identifying and minimizing risks to prevent them from happening. According to Kosinski (2021), the interaction between Pix and the Internal Revenue Service will lead to changes in the security of user data and the inviola-

1. Through internal audits, external audits, audits by regulatory bodies (TCU, BACEN, Ciset), external consultancies and audit committees.

bility of banking systems. And with the new technologies employed by banks in their internal controls, efforts must be made to avoid, above all, the risk of custody, which is the risk of fraud and errors.

Santos (2005) already pointed out in his study on Banco do Brasil's controllership that the bank's controls are assessed adopting an acceptable level of risk that does not compromise the result<sup>1</sup>. An interesting point in the

study is that even at a time when the internet was still underdeveloped and people didn't have as much access to it as they do today, the institution was already concerned about developing management systems and an intranet portal for customer relations.

Among the systems developed, Banco do Brasil prioritized improving the connection between its accounting and operational systems, based on the Information Architecture Program (PAI), which is subdivided into 5 plans, shown in table 1.

New data on this bank's controllership will be explored in the methodologies section of this study. Santos (2005) also points out that one of the differentials of this financial institution, which is one of the most traditional in the country, is the high level of employees with specializations, masters and doctorates in Controllership, driven by career progression programs and the corporate university. Yet another indicator of how Management can act internally to reduce the chances of operational risks.

### **IMPACT OF DIGITALIZATION ON OPERATIONAL EFFICIENCY AND COMPETITIVENESS**

To find out how the processes and functions of controllership have changed as a result of the adoption of digital technologies, you need to know the main technologies. In 2020, at the height of the COVID-19 pandemic, the Central Bank of Brazil launched PIX, which among other innovations is the most striking because it is accessible to anyone with a bank account and funds can be transferred between accounts in a few seconds, without paying any fees.

PIX has the potential to leverage market competitiveness and efficiency, encourage the electronicization of the retail payments market, promote financial inclusion and fill a series of gaps in the basket of payment instruments currently available to the population (Central Bank, 2020).

According to Kosinski (2021), with the rapid advance in the use of Pix in Brazil, this means of payment should soon become the main one used. As a result, the system will become a crucial tool for monitoring productive and financial activities in the country, enabling faster and more effective responses to monetary and fiscal policies. This can be seen in data from the Central Bank (BC), from April 2024, in which 201.6 million transactions were recorded in a single day, a record number since its launch until the period covered in this article.

In addition, research has already observed how investment in IT generates profitability gains in Brazilian banks (Freitas; Kirch, 2019; Bianchini; Malagolli, 2021). In order to modernize, banks are investing in innovation, with the aim of increasing capital and reducing costs and risks of custody, fraud and theft, so it is their primacy to ensure that financial operations, whether PIX or any other, are protected by regulations and transactional security.

And with the use of artificial intelligence and machine learning, *chatbots* are being used in banks to solve everything from simple queries to changing a card password, actions that make it more convenient for the user and save banks resources. In an article in Forbes magazine in 2017, technology startups were already creating *chatbots* capable of helping customers manage their money in the UK, such as the Plum, Chip and Cleo tools.

Brazilian banks have also invested in *chatbots* to improve customer service and service efficiency. Bradesco has BIA (Bradesco Artificial Intelligence), which uses AI to answer questions and carry out basic transactions on various platforms, including *WhatsApp* and *Facebook Messenger*. Itaú Unibanco has Cora, a virtual assistant that helps customers with transactions and solves questions in the app and on social networks. Banco do Brasil has a *chatbot* available on the app, website and social media, offering support and helping with various banking operations.

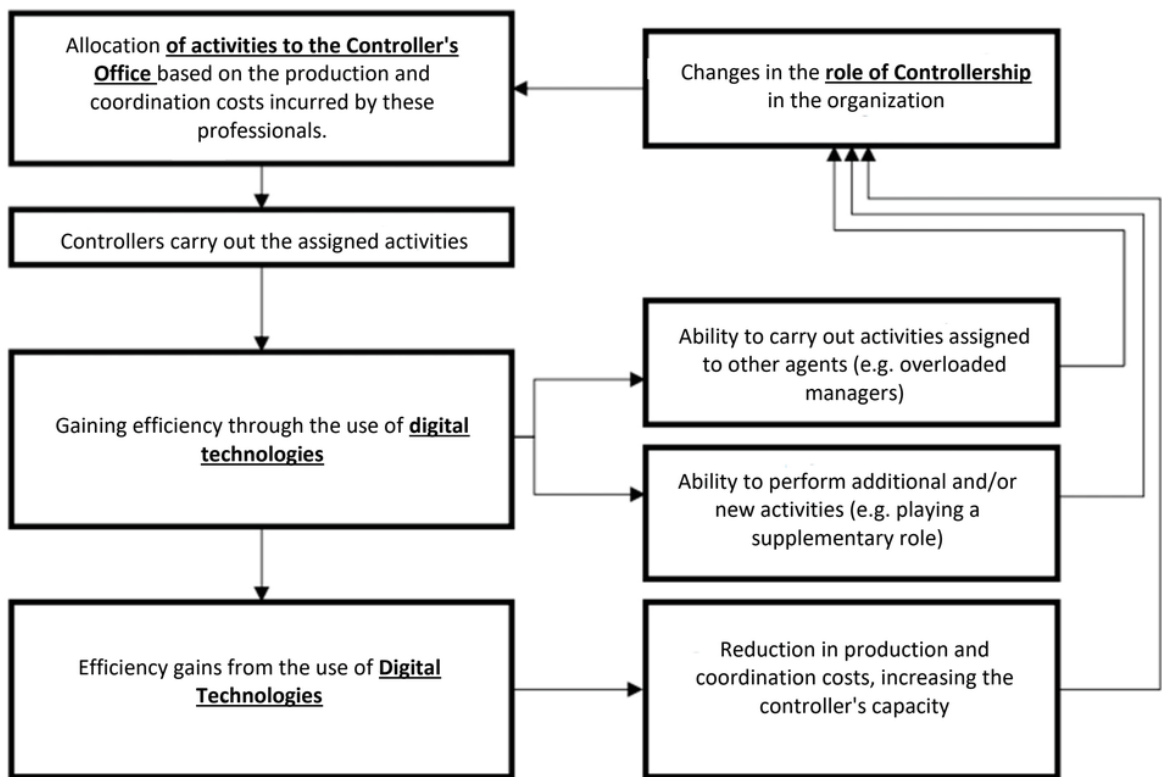


Figure 3: The development of the controller's tasks with the use of digital technologies

Source: Mancebo (2022)

Digital technologies are significantly transforming controllership functions, as described in the model adapted from Weber (2011) by Mancebo (2022) in Figure 3. Process automation and the integration of advanced systems, such as ERP and RPA, increase efficiency by reducing operating costs and freeing up resources. This allows *controllers* to perform their tasks with greater precision and less manual intervention. In addition, *business intelligence* (BI) and *big data analytics* tools improve effectiveness by providing detailed and predictive insights that support strategic decision-making. The combination of these technologies allows *controllers* to provide more detailed analysis, absorb activities from other areas and perform additional functions, such as internal consulting and risk management.

With the adoption of these technologies, the *controller's* role has evolved into a strategic partner within the organization, requiring IT

skills and data analysis. The ability to generate financial reports in real time and the automation of routine tasks allow *controllers* to focus on higher-value activities, such as strategic planning and financial projections, as well as transforming the *controller* into a highly specialized, consultative role (Peltoniemi, 2021; Rauramo, 2021).

Therefore, the transformation in controllership depends on how the gains in efficiency and effectiveness are used by the organization, and whether the technology is used well. According to Maximiano, (2011), effectiveness is the relationship between the objectives and the results obtained by a system, organization or process; and efficiency is the relationship between the resources employed and the results obtained by a system, organization or process.



## METHODOLOGICAL PROCEDURES

In order to analyze digitalization in the controllership of financial institutions, specifically the Bradesco, Itaú and Banco do Brasil banks, a methodology based on bibliographical and documentary research was adopted.

The nature of the research is applied, focusing on solving concrete problems and gaining an in-depth understanding of a specific phenomenon. According to Cervo and Ber-  
vian (1996), applied research is characterized by the search for practical solutions to real problems, as opposed to basic research, which aims to generate new knowledge without immediate application. This approach is essential in order to understand how digitalization is being implemented in the controllership of these banks and what practical impacts have been observed.

The approach to the problem is qualitative, allowing for detailed analysis and a deeper understanding of the context. According to Raupp and Beuren (2010), qualitative research is concerned with capturing the essence of phenomena, going beyond numbers and statistics to explore the nuances and complexities that cannot be measured quantitatively. This approach is particularly relevant when you want to investigate subjective and contextual aspects of controllership practices.

The research objectives are descriptive, seeking to describe the characteristics of a given population or phenomenon. Gil (2008) points out that the main objective of descriptive research is to characterize a particular group or phenomenon, establishing relationships between variables. In the application of this study, the focus is on describing how digitalization is being incorporated into the controllership practices of the Bradesco, Itaú and Banco do Brasil banks, identifying the technologies used and the perceived impacts on operational efficiency and competitiveness.

Data was collected through bibliographic and documentary research. Bibliographic research involves reviewing existing literature, including scientific articles, books, theses, dissertations and other relevant publications. Gil (2002) states that bibliographic research is fundamental for providing a solid theoretical basis and identifying the state of the art on the subject studied. Academic databases such as *Google Scholar*, *Scopus*, *Scielo* and *CAPES Periodicals* were used, as well as specific business and finance databases.

Documentary research, in turn, is based on the analysis of internal documents and reports from financial institutions. Severino (2014) points out that documentary research uses primary sources that have not received prior analytical treatment, such as annual reports, internal policy documents, published case studies, *white papers* and reports from specialized consultancies. This approach allows for a detailed understanding of the practices and technologies adopted in the controllership of the banks studied.

Finally, the synthesis of the results combined the information collected to provide a comprehensive and, at the same time, more assertive view of digitalization in the controllership of financial institutions. Comparing the data obtained with existing theory made it possible to highlight the main digital practices and technologies adopted and their impact on operational efficiency and competitive performance.

## RESULTS AND ANALYSIS

The results of this documentary analysis study are presented based on the data collected and analyzed based on the findings of other academic authors and the reports of Bradesco, Itaú and Banco do Brasil banks published in 2023. This section describes the main digital practices and technologies adopted in the controllership of these financial institutions, as well as the impacts observed on operational efficiency and competitive performance.

The 2023 integrated reports of each bank were analyzed, followed by a review of the risk management practiced by each bank and the digital strategies adopted. At Banco Bradesco, in addition to the integrated report, there is a specific report on Risk Management, which was also analyzed. The use of integrated reports facilitates clear and concise communication about the organization's strategy, governance, performance and perspectives, considering the external environment and how this affects long-term value creation (IFRS, 2024).

These financial institutions were chosen because they are organizations that were born as traditional banks and now need to reinvent their business in an increasingly digitalized scenario, according to the competitive advantage strategy promulgated by Gupta (2020). Analysis of the documents revealed that the three banks have invested significantly in digitizing their controlling functions over the years.

At Bradesco, robust initiatives were identified for the automation of accounting and financial processes, including the use of integrated management systems (ERP) and artificial intelligence platforms for analyzing financial data. This result is in line with the study by Figueiredo (2003, p. 40), on the technological advantages that Bradesco has historically had over other companies, such as in 1981 making the *Bradesco Instant System*, which, for the first time, used magnetic cards to carry out network banking operations and in 1982 launching the *Book Collection System* with electronic processing, which eliminated the issue of duplicates and other documents.

Itaú's report highlighted the implementation of *big data* and *analytics* technologies to improve the accuracy and speed of accounting information. At Banco do Brasil, there was a focus on adopting *blockchain* solutions to increase the level of governance, through transparency and security of financial transactions. It is noteworthy that almost all products and services from the physical format

have gone digital and there has been an increase in digital segments and offices in the three institutions after COVID-19 (Pinto, Santos & Martens, 2021). Table 2 below shows the main digital initiatives that each bank has undertaken in its structure.

The documents analyzed indicate that digitalization in the controllership has generated significant improvements in the banks' operational efficiency. At Bradesco, process automation has reduced the time and costs associated with accounting activities, allowing resources to be redirected to strategic areas. At Itaú, the use of *big data and analytics* has made it easier to identify financial trends and anomalies in real time, resulting in faster and more informed decision-making. Banco do Brasil reported that the implementation of blockchain solutions not only increased the security of transactions, but also reduced the need for extensive audits, optimizing the use of human resources and redirecting efforts towards optimizing other technologies such as PIX.

Analysis of the Bradesco, Itaú and Banco do Brasil reports suggests that these financial institutions have adopted different strategies to improve their operational efficiency, competitiveness and security. Although each bank has its own particularities, there is a common emphasis on the use of digital technologies to strengthen controllership, optimize processes and improve the customer experience.

## FINAL CONSIDERATIONS

Digitalization in the controllership of financial institutions plays a key role in the modernization and competitiveness of the banking sector. Analysis of the practices and technologies adopted by Bradesco, Itaú and Banco do Brasil revealed a growing trend towards integrating digital solutions, resulting in significant improvements in the operational efficiency, security and accuracy of financial operations.

Itaú Bank	
Initiative	Description
The cube	The main hub for technological entrepreneurship in Latin America, with more than 500 member startups and 104 large corporations.
Ion	Investment app, product platform for different investor profiles, using cloud, microservices and APIs. Included cryptocurrency trading in 2023.
Acquisition of Avenue	Strategic participation in the digital securities brokerage, facilitating access to international products and services.
Rebranding as 'Itaú made for the future'	Positioning as a leading bank in sector trends, focused on customer journeys and needs.
Bank of Brazil	
Initiative	Description
For the bank's controller	
AI Assessment Engine (Maia)	Implementing AI to improve efficiency in banking operations.
Portal Developers	Main channel for integration with BB's APIs, offering a test environment, documentation and innovation support for the bank's controllership.
Innovation Platform	Implemented in February 2023, it supports innovation and intrapreneurship processes from the collection of ideas to the execution of projects.
For the customer	
BB Pay	Platform that simplifies receipt processes, integrated with Open Finance. Supports Pix, boleto, credit card and cryptocurrency payments.
My ATM Finances	Provision of an enhanced version of the multi-bank financial manager integrated with Open Finance, offering a unified view of the customer's financial situation.
Pix	Implementation of instant transactions in real time, free of charge for PF clients. Financial inclusion of millions of Brazilians and increased market competitiveness. New solutions such as Pix Periódico and Canal Secundário de Mensagens (CSM).
Shopping BB	Platform launched in 2021, evolved into Shopping BB in 2023, offering non-financial products and services. Expansion of partner e-commerces and inclusion of new gift card content.
For society	
Structure for New Business Development	Focus on enabling initiatives to operate in the context of the tokenized economy, with open innovation and external partnerships.
Corporate Venture Capital	Startup investment program that has already invested in 48 startups with the potential to generate value in areas such as blockchain, asset tokenization and financial intelligence.
BB Digital Week	Technology, innovation, business and sustainability event held in November 2023. It included lectures, panels and hackathons to develop innovative solutions.
Bradesco Bank	
Initiative	Description
APIs	43 APIs available on partner sites, services such as boletos registration, debt renegotiation, credit simulation.
Data Intelligence	Advances in data analytics, use of robust infrastructure and analytical tools, data-driven culture, improved customer experience with machine learning.
Artificial Intelligence (AI) and Generative AI	BIA, a pioneer in the use of AI, 2.2 billion interactions, 88% success rate in meeting customer demands. Generative AI increases efficiency in customer service, legal and consortia.
Digital Platforms	Digital solutions for all customer profiles, 98% of transactions carried out via digital channels by 2023, 33% increase in financial transactions via the app.
Open Finance	Transformation of the financial market, greater autonomy for customers, financial manager that consolidates information from various accounts, 110.3 million accesses since 2021.
Inovabra	Innovation ecosystem with acceleration of functionalities, new products and services, exploration of emerging technologies. By 2023, 62 trials completed, 20 with new technologies. Innovation vehicles include strategy and portfolio, collaborative laboratory, open innovation, corporate venture, R&D, culture and communication.

Chart 2: Banks' Digital Initiatives

Source: prepared by the authors, based on the integrated report 2023 of the aforementioned banks.

The results obtained show that, at Banco Bradesco, the automation of accounting and financial processes, the use of artificial intelligence and advances in *data analytics* have significantly reduced the time and costs associated with accounting activities. At Banco Itaú, the implementation of *big data* and *analytics* technologies made it possible to identify financial trends and anomalies in real time, resulting in faster and more informed decision-making. At Banco do Brasil, the adoption of blockchain solutions has increased the transparency and security of financial transactions, reducing the need for extensive audits and optimizing the use of human resources.

In addition, digitalization has had a positive impact on the competitive performance of the banks analyzed. At Banco Bradesco, improvements in operational efficiency have enabled greater agility in launching new financial products, quickly meeting market demands. At Banco Itaú, advanced data analysis capabilities have made it possible to create more assertive financial strategies, increasing competitiveness in the sector. For its part, Banco do Brasil noted that the greater transparency and security provided by blockchain solutions strengthened investor and customer confidence, consolidating the bank's position in the market.

The central research question was how digitalization in controllership can be used as a competitive strategy to increase the operational efficiency and competitiveness of financial institutions. The findings of this research confirm that digitalization in controllership is an effective competitive strategy, increasing the operational efficiency and competitiveness of financial institutions. Digitalization practices, such as the use of artificial intelligence, *big data*, *analytics* and *blockchain*, have had a positive impact on reducing costs, optimizing processes and improving decision-making.

These digital innovations have enabled the banks studied to respond quickly to market changes, launch new products and services with greater agility and maintain a robust competitive position.

However, this study has some limitations. The research focused on traditional financial institutions (Banco do Brasil, Bradesco and Itaú), which may limit the generalizability of the results to digital banks. In addition, the methodology based on document analysis may not capture all the nuances and informal practices that occur within these institutions. The analysis of the 2023 annual reports offers a one-off view, and the results may not reflect long-term trends or the impact of recent digitalization initiatives that have yet to show full results.

For future studies, it is recommended to expand the sample by including a wider variety of financial institutions, such as smaller banks and fintechs, to obtain a more comprehensive view of digitalization practices in controllership. Conducting longitudinal studies to track the impact of digitalization over time is also relevant, providing a more complete understanding of long-term trends and effects. In addition, incorporating in-depth interviews and case studies can complement the documentary analysis, capturing a deeper insight into the practices and challenges faced when implementing digital technologies in controlling.

We conclude that digitalization in controllership is a vital strategy for financial institutions seeking to remain competitive and efficient in an increasingly digitalized environment. Technological innovations will continue to play a crucial role in the transformation of the financial sector, and institutions that adopt these practices will be better placed to face the challenges and seize the opportunities ahead.

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