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BETWEEN INNOVATIONS AND DISRUPTIONS: A CASE STUDY OF A PUBLIC BANK AMID CHANGES IN THE FINANCIAL MARKET

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Mariana Vieira da Silva Santana: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Resources, Data curation, Original, Revision and editing, Viewing, Project management. **Glessia Silva de Lima**: Conceptualization, Methodology, Validation, Formal analysis, Resources, Data curation, Original, Revision and editing, Viewing, Supervision.

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Abstract

Objective of the study: This article aims to understand how a public bank responds to technological changes in the financial market.
Methodology / Approach: A qualitative methodology was used in a single case study involving the Sergipe State Bank, with data collection through interviews with innovation management directors and analysis of reports from the bank and the Brazilian Federation of Banks.
Originality / Relevance: Digitalization, widely adopted in the financial market, accentuates the distinction between fintechs and traditional banks, highlighting technological innovation as a fundamental element. Based on this, this paper has the originality of studying financial innovation, more specifically the technological type, from the perspective of public banks, which has been little explored in the field of innovation studies. Regarding the relevance of the work, a socioeconomic interest is generated as public banks stand out, which, among traditional institutions, act with a social bias.
Main results: It was observed that most of the innovations promoted by Banese aim to gain operational efficiency and improve service.
Theoretical / methodological contributions: It is considered that a public bank rarely innovates in a disruptive way, and does not necessarily replicate what is trending in the market, as it prioritizes what is interesting to its consumer public and its strategic mission.
Social / management contributions: The use of data related to innovation in research helps governments understand socioeconomic changes, in addition to monitoring and evaluating the effectiveness and efficiency of their policies (OCDE, 2018).

Keywords: technological innovation; financial market; public bank.

Entre inovações e disrupções: um estudo de caso de um banco público em meio às mudanças no mercado financeiro

Resumo

Objetivo do estudo: Este artigo visa compreender como um banco público responde às mudanças tecnológicas no mercado financeiro.
Metodologia / Abordagem: Utilizou-se uma metodologia qualitativa em um estudo de caso único envolvendo o Banco do Estado de Sergipe, com coleta de dados através de entrevistas com diretores de gestão de inovação e análise de relatórios do banco e da Federação Brasileira de Bancos.
Originalidade / Relevância: A digitalização, amplamente adotada no mercado financeiro, acentua a distinção entre *fintechs* e bancos tradicionais, destacando a inovação tecnológica como um elemento fundamental. A partir disso, o estudo tem a originalidade de estudar a inovação financeira, mais especificamente a do tipo tecnológico, sob a perspectiva dos bancos públicos, a qual tem sido pouca explorada no campo de estudos da inovação. Quanto à relevância do trabalho, é gerado um interesse socioeconômico à medida que se destaca os bancos públicos, os quais, dentre as instituições tradicionais, atuam com um viés social.
Principais resultados: Observou-se que a maioria das inovações promovidas pelo Banese visa ao ganho de eficiência operacional e ao aprimoramento do atendimento.

Contribuições teóricas / metodológicas: Considera-se que um banco público raramente inova de forma disruptiva, não replicando necessariamente as tendências de mercado, uma vez que prioriza interesses específicos de seu público e sua missão estratégica.
Contribuições sociais / a práticas organizacionais: O uso de dados referentes à inovação em pesquisas ajuda governos a compreenderem mudanças socioeconômicas, além de monitorar e avaliar a efetividade e eficiência de suas políticas (OCDE, 2018).

Palavras-chave: inovação tecnológica; mercado financeiro; banco público.

Entre innovaciones y disrupciones: Un estudio de caso de un banco público en medio de los cambios en el mercado financiero

Resumén

Objetivo del estudio: Este artículo tiene como objetivo comprender cómo responde un banco público a los cambios tecnológicos en el mercado financiero.
Metodología / Enfoque: Se utilizó una metodología cualitativa en un estudio de caso único, con foco en el Banco do Estado de Sergipe, con recopilación de datos a través de entrevistas con directores de gestión de innovación y de análisis de informes del banco y de la Federación Brasileña de Bancos.
Originalidad / Relevancia: La digitalización, ampliamente adoptada en el mercado financiero, acentúa la distinción entre fintechs y bancos tradicionales, destacando la innovación tecnológica como un elemento fundamental. El estudio tiene la originalidad de estudiar la innovación financiera, más específicamente la innovación tecnológica, desde la perspectiva de un banco público, algo que ha sido poco explorado en el campo de los estudios de la innovación. Em cuanto a la relevancia del artículo, genera interés socioeconómico al resaltar los bancos públicos que, entre las instituciones tradicionales, operan con un sesgo social.
Resultados principales: Se observó que la mayoría de las innovaciones impulsadas por Banese apuntan a ganar eficiencia operativa y mejorar el servicio.
Aportaciones teóricas / metodológicas: Un banco público rara vez innova de manera disruptiva, no necesariamente replicando las tendencias del mercado, ya que prioriza los intereses específicos de su audiencia y su misión estratégica.
Contribuciones sociales / de gestión: El uso de datos relacionados con la innovación en la investigación ayuda a los gobiernos a comprender los cambios socioeconómicos, además de monitorear y evaluar la efectividad y eficiencia de sus políticas (OCDE, 2018).

Palabras clave: innovación tecnológica; mercado financiero; banco público.

1 Introduction

The financial market has been dominated by digitalization (Diniz, 2021), following a pattern of technological change previously seen in other industries (e.g., newspapers, photography, and entertainment) (Karimi & Walter, 2015; Ho & Chen, 2018). Accompanying the technical-

scientific revolutions with notable innovations – from trade exchanges and the creation of banks to credit markets, stocks, financial derivatives, culminating in the rise of digital transactions (ADAPT, 2019) – digitalization in the financial market has made its services more accessible, faster, and more personalized (Diniz, 2021; Veronese & Bertran, 2023).

Digitalization as a phenomenon has also been observed in the Brazilian financial market, through the popularization of technological innovations such as Pix (the Brazilian instant payment method), which saw a 471% increase in usage between November 2020 and March 2021 (FEBRABAN, 2021). This popularization, along with the shift in banking service culture from in-person to virtual formats (FEBRABAN, 2022), indicates a digital transformation in the Brazilian financial market.

Such phenomenon is understood through Schumpeter's Theory of Economic Development (1997), which views innovations as fundamental to the natural flow of capitalism: they disrupt the equilibrium of an economic cycle, highlighting new developments driven by the technologies on which they are based, as well as by the competitiveness and dynamism of a market. Due to this movement, some organizations decline while others rise, generating products and processes that are completely different from those existing in the market or simply making adjustments to what is already used (Schumpeter, 1997). It is based on this distinction that innovation can be classified as incremental or disruptive (Christensen, 2012).

In the financial landscape, this classification highlights certain players as drivers of the transformation that digitalization imposes on the market – fintechs, startups in the financial sector (BCB, 2024), hold significant mastery of disruptive technologies (Fintech Deep Dive, 2020; Veronese & Bertran, 2023; Naceur, Candelon, Elekdag & Emrullahu, 2023). This contrasts them with traditional banks, which are still known as strong competitors and are also leveraging financial technologies to their advantage (Leahy, 2018; Melnyk, Kuchkin & Blyznyukov, 2022; Birkinshaw, 2023).

However, because these traditional banks have organizational cultures that are less tolerant of error, relying on outdated information systems, and carrying heavier physical and human resource structures, it becomes challenging for these institutions to keep up with waves of change in a timely manner (Diniz, 2021). This is an obstacle that investors, managers, and researchers in the field need to be aware of, as no institution is exempt from the instability caused by disruptions in the financial market (Karim & Lucey, 2024).

Among these more traditional financial institutions are public banks, which, according to developmental theorists, operate with a social bias in order to fill some of the gaps left by the rest of the sector (Stiglitz, 1993; Marois, 2022). The presence of these banks in the financial market is advocated due to their potential for economic stabilization (Bosshardt & Cerutti, 2020; Marois, 2021) and to support socially uplifting projects and initiatives (Allonsol & Trillol, 2024).

Despite having strategic missions different from other financial institutions, with less emphasis on profit (Marois, 2022), it is still essential for a public bank to be able to respond to changes in the market it operates in. This is because, in addition to its performance being of interest to society as a governmental asset, there is also a need for efficient responses for a bank to resist and survive (Araújo & Cintra, 2011; Marshall & Rochon, 2019; Marois, 2022; Viegas Neto, Souza, Venturini & Caraffini, 2021). Given the described scenario, consisting of disruptions caused by technological changes imposed on the financial market, and the importance of public banks' survival and efficient operation, concerns arise regarding how these institutions respond to such changes.

From this concern, some questions emerge: what is necessary for a public bank to adapt to the highly competitive reality in which it operates? What are the paths taken in this adaptation process? How are these paths followed? Understanding the perspectives related to innovation in a traditional bank is valuable because it allows financial institutions to outline strategies for modernization, helping to avoid obsolescence in a typically innovative sector (Diniz, 2021). Moreover, using innovation-related data in research can help governments understand socioeconomic changes, as well as monitor and evaluate the effectiveness and efficiency of their policies (OECD, 2018).

In light of this, the present article aims to understand how a public bank adopts technological innovations in response to technological changes perceived in the financial market. To this end, a single case study was conducted, based on results obtained through the analysis of institutional documents and interviews with technology and innovation managers at the Sergipe State Bank – Banese. Banese is a well-established and relevant institution in its local context. Celebrating 63 years in 2024, Banese is one of the five remaining state banks in the country (Banese, 2024). This institution is characterized by its social bias, offering funding for projects and initiatives aimed at the state's economic growth. As one of the last public banks in the country

(Valor, 2020), this also presents an opportunity to assess the role of innovation in its survival in the market.

With the digitalization of its services, observed in recent years (Banese, 2021), along with the technological initiatives driven by the Central Bank of Brazil, it is possible to understand that Banese has both technological and non-technological innovations in its portfolio. Additionally, the bank acts as a local developer, filling a market gap through financial inclusion. This research evaluates the organization, systems, and methods used to achieve such results, understanding that a public bank responds to technological changes in the financial market through a strategic response.

The remainder of the research is structured as follows: a section is presented with the theoretical framework, focusing on innovations in the financial market; the third section describes the methodological procedures chosen to operationalize the case study; the fourth section presents the results obtained from interviews and document analysis; the fifth section discusses these results, comparing them with the theory; and the sixth and final section presents the concluding remarks of the research.

2 Disruptive innovation versus incremental innovation: financial market typologies

Christensen (2012), in his work "The Innovator's Dilemma," highlighted disruptive innovation, whose definition directly links the innovative product or process to its respective markets – innovation is considered disruptive only if its initial commercialization is aimed at an emerging market. Moreover, there is generally an incompatibility between this type of innovation and companies already established in mainstream markets, as these organizations are structured to cater to a more mainstream layer of consumers, who are more profitable for them (Christensen, Altman, McDonald & Palmer, 2018).

Another characteristic of disruptive innovations is that the technologies underlying them are less costly, structurally simpler, more accessible, and their development begins in established companies that often assess their economic viability negatively (Christensen, 2012; Antonio & Kanbach, 2023). There are several examples in different industries that fit this pattern: newspapers, with print editions opposing the online distribution of news; education, with face-to-face learning seen as traditional and remote learning as a disruptive possibility (Ho & Chen, 2018; Karimi &

Walter, 2015). The banking industry follows this trend, with long-established banks being labeled as "traditional," while digital banks offer less costly, simple, and accessible products, continuing the list of financial innovations (Table 1) that have emerged over time (Zalan & Toufaily, 2017).

Table 1
Financial innovations in the financial market

Financial innovation (and respective decades of greatest popularization)	Types of institutions to which it relates
Back-office computerization (1960s and 1970s)	Traditional financial institutions
Computerization of customer service, electronic banking (1980s and 1990s)	Traditional financial institutions
Online banking – Internet Banking, Mobile Banking (2000s and 2010s)	Traditional financial institutions and fintechs
Big Data (2010s and 2020s)	Organizations from different segments; traditional financial institutions and fintechs.
Blockchain (2000s, 2010s and 2020s)	Fintechs
Open Banking (2010s and 2020s)	Traditional financial institutions and fintechs
Embedded finance (2020s)	Organizations from different segments; traditional financial institutions and fintechs.

Source: Adapted from Bradley & Stewart (2003); Diniz (2021); DUE (2012); Franco (2018); Hassani, Huang and Silva (2018); Hung, He and Shen (2019); Lin (2011); Long, Tan, Jiang and Zhang (2021); Premchand and Choudhry (2018); Vukovic, Pivac and Kundid (2019); Zhalan and Toufailly (2017); Zheng and Lu (2021).

Many organizations are concerned with the innovations and technologies that must be adopted to avoid failing in the face of such disruptions (Birkinshaw, 2023), giving rise to a corporate saying – "disrupt or be disrupted", referring to the changes that must be made to continue achieving success (Zalan & Toufaily, 2017). However, Christensen et al. (2018) warn of a potential mistake made by some of these organizations, as their structures are already geared towards known products or processes, and a sudden shift has a high chance of failure.

The adoption of disruptive technologies is an uncertain process in terms of development, commercialization, and impact on portfolios, both for new entrants and established companies (Birkinshaw, 2023). Digitalization, for instance, is generally seen as positive and beneficial, as it optimizes time through automation (Sewpersadh, 2023), and is also viewed as a favorable trend in various markets, which enhances competitiveness (Kamalaldin, Linde, Sjödin & Parida, 2020).

However, the adoption of technologies that constitute a digital transformation requires the development of new skills and the creation of new organizational processes (Sjödin, Parida, Palmié & Wincent, 2021), which raises questions about the viability of such adoption (Birkinshaw, 2023; Sewpersadh, 2023). Additionally, there is also an important consideration regarding the impact of the technology to be adopted, both on the company's existing portfolio and on the environment in which it will be implemented (Birkinshaw, 2023; Sewpersadh, 2023). Therefore, it is essential to highlight the importance of a strategic response to the diffusion of disruptive technologies in a market, taking into account available resources and skills, viability, and potential impacts.

Many organizations already established in their sectors choose, instead of adopting disruptive innovations, to stick with the technologies that helped them consolidate their position (Christensen, 2012). As a result, the changes they make to their products or processes provide them with resilience, aiming to meet customer needs or some other convenience that keeps them in a strong market position (Nakandala, Yang, Lau & Weerabahu, 2023; Christensen et al., 2018; Schumpeter, 1997). These changes are called incremental innovations and, in this context, are based on technologies developed to improve the performance of already established products and processes, maintaining an organization's market leadership by focusing on mainstream markets (He, Liu, Shao & Tian, 2023).

Incremental innovations are responsible for continually renewing the process of creative destruction (Cirani, Silva, Cassia & Pedro, 2021), which, according to Schumpeter (1997), occurs with the replacement and eventual obsolescence of a product or process. Thus, it becomes clear that incremental and disruptive innovations are not exactly opposed but complementary. Disruptive innovations begin a cycle of continuous improvement once they achieve profitability in the emerging markets they enter; the pace of technological progress eventually surpasses the users' ability to keep up, and the innovation in question aligns with the needs of consumers in mainstream markets.

From that point on, the changes made to the technologies in question are no longer disruptions but rather incremental innovations (Zalan & Toufaily, 2017). From this perspective, it can be argued that disruptive innovation cannot exist without incremental innovation, and vice versa. In this cycle, as disruptions move from emerging markets to mainstream ones, they pose a genuine threat to established companies (Antonio & Kanbach, 2023). It is then that these

companies need to formulate strategic responses that consider their specific circumstances to remain well-positioned.

To analyze such circumstances, there are classifications that may be interesting because they guide companies with different characteristics, contexts and results. Therefore, below are the most relevant types of innovation for this work (table 02), for their possible connection to the object of study:

Table 02

Innovation typologies

Innovation typologies	Description	Connection to the financial market through the aforementioned examples
Product innovation	A new or improved good or service that is significantly different from what is previously available on the market.	Online banking – internet and mobile; embedded finance.
Process innovation	Implementation of new techniques and procedures for manufacturing and distributing products or operating services.	Computerization of backoffice and service; electronic banking; open banking; embedded finance.
Organizational innovation	New developments or improvements in management processes or techniques that aim to increase the performance of the organization in question.	Backoffice computerization; big data; blockchain; open banking.
Marketing innovation	Significant changes in the way a product is promoted to its users.	Computerization of service.
Incremental innovation	Performance improvements to an existing product, process or service to meet the needs of a company and, consequently, its consumer audience.	Computerization of service; embedded finance.
Disruptive innovation	Unprecedented products or processes are novelties capable of shaping their respective markets.	Online banking – internet and mobile; blockchain; open banking.

Source: Prepared based on OECD (2018); OECD (2005); Tidd, Bessant and Pavitt (2008); Francis and Bessant (2005); Schumpeter (1997); Christensen (2012); He et al. (2023).

The financial market, in turn, is a scenario composed of different players—traditional banks and fintechs differ in their organizational structures, adopted technologies, and strategic directions (Naceur et al., 2023; Veronese & Bertran, 2023). According to Diniz (2021), the current

stage of banking activity is characterized by the development of services that offer convenience and practicality to customers and are easily integrated into their daily lives.

It can be said that both traditional institutions and startups pursue these characteristics (Melnyk et al., 2022; Birkinshaw, 2023; Veronese & Bertran, 2023), but this has not always been the case: traditional banks are financial institutions that have been consolidated in their markets due to their long history of operation (Furtado & Mendonça, 2020). At the time of establishing this position and for a long time afterward, their service offerings were marked by a low focus on users and a strong culture of in-person operations and customer service (Diniz, 2021).

With the high competitiveness in the sector – resulting from the globalization of the national economy and the subsequent entry of young national and international competitors – such characteristics of traditional banks led them towards destabilization (Diniz, 2021). As a result, traditional banks began to chart paths that incorporated the new market paradigms, thus allowing these institutions to remain strong participants in the landscape they are part of (Furtado & Mendonça, 2020; Birkinshaw, 2023).

However, some authors discuss the risk of fintechs replacing traditional banks (e.g., Naceur et al., 2023; Karim & Lucey, 2024; Bakker et al., 2023). Karim and Lucey (2024), for instance, in their study on the impact fintechs have had on the banking sector, advise investors, managers, and researchers in the field to pay attention to the destabilizing potential of emerging technologies. This guidance is further justified by the cases of major bank collapses in the United States and Switzerland in March 2023, which were caused by management failures, among other factors (Gortsos, 2023) – even though traditional banks have resources to deal with the sector's technological transformation, no organization is too big to fail. Therefore, strategic management to address financial disruptions must be continuously improved.

Among these more traditional financial institutions are public banks, which operate with a social bias in order to fill certain gaps left by the rest of the sector, financing projects and actions that stimulate economic growth in the regions where they are located (Stiglitz, 1993; Marois, 2022). Generally speaking, public banks are based on very dense infrastructures (Berenji, Rahmaty & Kiakojouri, 2024), which constitutes a negative factor in the process of adapting financial institutions to external issues (Diniz, 2021). However, the presence of these banks in the financial market is defended for their potential to provide economic stabilization (Bosshardt & Cerutti,

2020; Marois, 2021) and to support socially uplifting projects and initiatives (Allonsol & Trillol, 2024).

To survive and maintain their leadership positions, both traditional banks and fintechs had to evolve and develop their financial innovations. This places them in competition with each other, but brings them closer in terms of their shared need to constantly change and grow in order to keep up with the shifts in the financial market (Diniz, 2021; Furtado & Mendonça, 2020).

3 Methodological Procedures

This research adopted a qualitative approach and is exploratory and descriptive in nature, in line with what is described by Gil (2008). The research method used was a single case study, as it is ideal for explaining the functioning of a phenomenon in a given context (Yin, 2015). This uniqueness was attributed to the fact that Banese, the Sergipe State Bank, is a well-established institution known for its clear social orientation, funding projects and actions that have boosted the economic growth of the state (Banese, 2024), which aligns with the concept presented in the theoretical framework (Marois, 2022; Allonsol & Trillol, 2024). Another reason for this methodological decision is the digitalization process that Banese has recently introduced in its customer service. Moreover, being one of the last state banks in the country, this was also an opportunity to assess whether innovation – one of the institution's guiding values (Banese, 2024) – played a role in its persistence in the market. Furthermore, as with any public bank, Banese is an asset of its state government, and it is in the interest of the people of Sergipe to understand how it is being managed according to its guiding values.

The case study was conducted using a specific protocol – which Yin (2015) claims is essential to enable reliable analysis – as shown in table 03:

Table 03

Case study protocol

Research question	How does a public bank respond to technological changes in the financial market?
Unit of analysis	Technology and innovation management area of the Bank of the State of Sergipe
Organization	Banco do estado de Sergipe – Banese
Time frame	Year of 2022
Data sources and reliability	Cross-referencing data collected through documents analysis and interviews based on a semi-structured script
Data validity	Sources of evidence (performance reports and institutional presentations released to assist investors, multiple interviews)
Case study question	a) What innovations were developed/implemented by the public bank selected for the study? b) How does a public bank adapt to the competitive reality in which it operates?
Protocol Field Procedure (Preparation)	• Preparation of the interview script; • Contact with participants.
Protocol Field Procedure (Action)	• Scheduling interviews; • Conducting interviews; • Transcribing interviews.
Case Study Report	• Consolidation of the data obtained; • Comparison of the data obtained with the objectives and theoretical framework of the research.

Source: Prepared based on Yin (2015).

The sources of evidence were documents and interviews. The interviews assist in seeking answers to the case study questions, providing the perspective of actors involved in innovation and technological management at Banese. The interview script consisted of both open and closed questions and was developed based on the categories and elements of analysis. Its structure provided flexibility, with questions that could be answered concisely or in a more detailed manner, depending on the interviewee. This is important, according to Vergara (2009), because it allows for enriched information from a given perspective without losing focus.

Three interviews were conducted between October 13 and 26, 2022, with the first lasting about 1 hour and 35 minutes, the second 56 minutes, and the third 1 hour and 6 minutes. Interviewee 1 is the Director of Innovation and Customer Success at the Banese Group, with an 18-year career at the institution and a central role in establishing the group's digital bank. Interviewee 2 is the Manager of the IT Governance Area at Banese, who, in 2024, will have completed twenty-two years of work at the institution. Interviewee 3 is the Superintendent of

Technology in the same organization, also with twenty-two years of service, assuming leadership, in 2021, for the creation of the aforementioned digital bank. These interviewees were selected due to their significant and long-standing participation in managing the bank's innovation, as well as their involvement in the current digitalization process.

Interview 1 was conducted in person, while the other two were conducted remotely. After transcriptions, the analysis was based on the analytical category – innovations developed and implemented – and analysis elements: adoption of innovative technologies; exchange of value between the bank, clients, and society; innovation typologies; and transformation in the financial market. These analysis elements are derived from the theoretical framework of this research, which connects to the objective of understanding how a public bank responds to technological changes in the financial market.

The documents analysis was divided into two parts: the first part analyzed the annual performance reports and institutional presentations from 2010 to 2021, which were also the only ones available on Banese's investor relations website until the conclusion of the research. Thus, the first research question – what innovations were developed and/or implemented by the public bank selected for the study? – was partially answered. The second part of the documents analysis used the annual reports from the FEBRABAN (Brazilian Federation of Banks) Bank Technology Survey from 2013 to 2022 (the only ones available until the research was completed), which helped answer the second research question: how does a public bank adapt to the competitive reality in which it is embedded? From these documents, it was possible to outline the banking sector scenario in which Banese operates.

The analysis was conducted using the basic qualitative technique, defined by Merriam (2002) as a means of understanding a phenomenon through the perspectives of its participants, identifying recurring patterns or common themes. After this identification, both through interviews and documents, a descriptive account was developed, using the theoretical framework to draw conclusions that answer the case study questions. The documents analysis consisted of exploring material to build the context, both for the banking sector in general and for the more specific environment surrounding the investigated bank – this part of the research was essential for identifying innovations in both contexts. The interviews, in turn, provided data that complemented the documents analysis, as they offered an internal strategic perspective, specifically that of those responsible for operating the innovation policies of the institution. A concrete example of the

analysis described here is the coding of the results, presented in table 05, which summarizes the innovations implemented or developed by Banese, classifying them according to the theoretical framework, based on different innovation typologies. Subsequently, it was possible to discuss the implications of these results and this classification in relation to the research questions.

Focusing the analysis solely on the interviews or the documents would carry potential biases: if the study relied only on the interviews, it would be biased by the interviewees' perspective, and if it relied solely on the documents, it would present an overly cold analysis of the case. To avoid this, the study was based on the analysis of multiple sources of evidence, as recommended by Yin (2015) regarding the pursuit of validity in a case study.

By analyzing the results obtained from both sources of evidence, it was possible to gain a broader view of the financial sector and a more focused one on the object of study. This allowed for the association of these two elements, helping to understand how a public bank responds to changes in the financial market.

4 Presentation and Analysis of Results

Founded in 1961, Sergipe State Bank – Banese is a publicly traded company primarily controlled by the government of the state in which it is located. With 63 years of existence, the bank's business model values various types of capital beyond financial capital – social and relational; its human capital, composed of 1,007 employees; intellectual capital, which is directly related to building its brand as a driver of innovation at the state level; manufactured capital; and natural capital. Banese's mission, vision, and values are guided by the reconciliation of its roles as a promoter of state economic development and as a publicly traded company: its mission is "to simplify people's lives with innovative financial solutions", and its vision is "to be recognized for contributing to the socioeconomic development of the regions where we operate". Some of its values include: focus on results, focus on the customer, and innovation (Banese, 2024).

4.1 Adoption of innovative technologies and innovation typologies

Regarding the use of innovations, it was possible to point out several applications and incorporated technologies, which help to compose a heterogeneous mix – at Banese, traditional and digital banks meet. This is illustrated by the statement of Interviewee 3:

> Banese, even though it is a bank whose mission is to help strengthen the economy, needs to be a profitable bank, it needs to make a profit. If we don't take action in a situation like this, our own customers will run after these other [competitor] banks, and we will be left without customers [...].

In an attempt to remain competitive, the bank has made significant investments to adopt some innovative technologies and practices in recent years, as shown in Table 4.

Table 04

Banese's investments in the adoption and use of technologies

Report	Investment value	Investment conversion
2010	R$ 22.1 million	"[…] data processing, adaptations of dependencies, IT [Information Technology] systems, updating of the technological park, communication and security infrastructure, in addition to training personnel for the implementation of tools, processes and systems."
2011	R$ 16.8 million	"[…] implementation of structuring processes focused on systems development, processes improvement, IT architecture and governance."
2012	R$ 27.9 million	"[…] continuous restructuring of IT infrastructure, continuous improvement of processes, architecture and IT governance."
2013	R$ 21 million	"[…] process automation [...] And also, the implementation of tools […] for the Bank's business process management governance, migration of the Bank's Central Automation Server to a Microsoft Cluster."
2014	R$ 25.7 million	"Structuring the IT governance area with the purpose of applying practices that enable greater strategic alignment of IT with the business."
2015	R$ 10 million	"[…] acquisition of equipment, licenses, customizations, implementation and documentation of systems."
2016	R$ 15.2 million	"Technological update of database management systems, systems integration and monitoring […]; acquisition of one hundred ATMs, with banknote recyclers and card dispensers."
2017	R$ 7.1 million	"[…] acquisitions of equipment, software licenses and information systems aligned with the Banese 2.0 Platform, with emphasis on: provision of new functionalities in Mobile Banking; implementation of the API Gateway tool."

Source: Documents analysis (2022).

To understand what innovations were extracted from the application of these technologies, it is important to consider, first of all, what innovation is for Banese. Interviewee 1 responds that,

taking into account the new strategies for operating in the digital environment, innovating for Banese means, first of all, improving on what it has been or still is:

> […] the fact that we launched a digital bank with the technological structure practically implemented from scratch, this is an innovation for us. Because the bank had already tried to replace these technological components some time ago […] looking inside the bank, we understand that it is an innovation because it has never been done before.

Interviewee 2 highlights that innovation for Banese is finding ways to continually improve its portfolio:

> […] we have to be launching new products. Not necessarily with new technologies, but with new service offerings for our customers. […] Banese is not one of the banks that deliver disruptive things. It delivers innovative things.

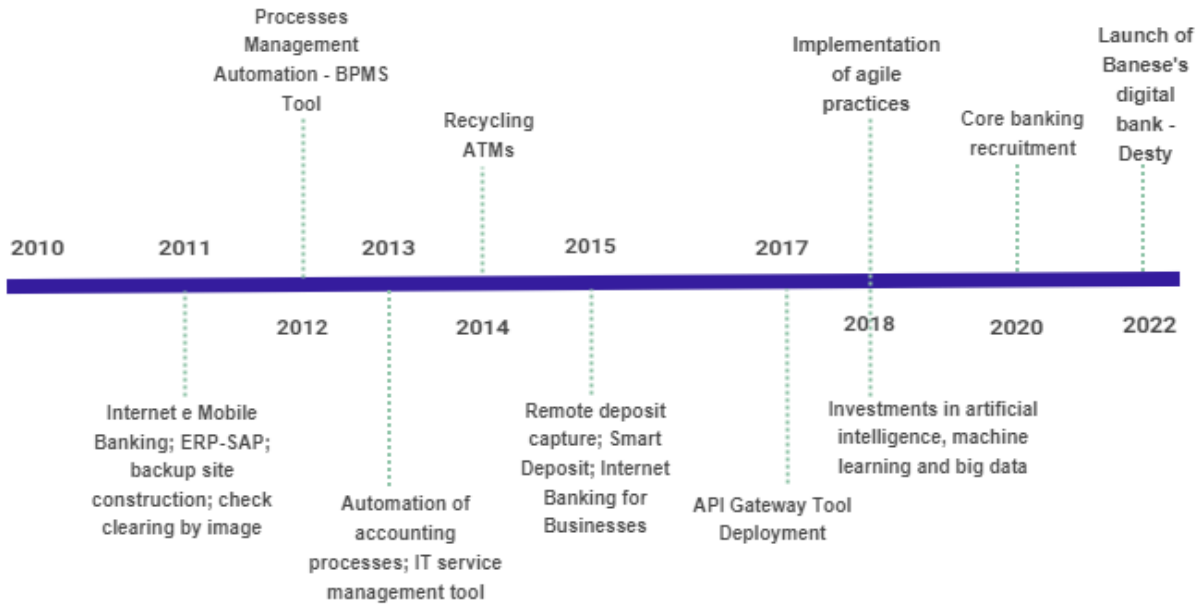
Interviewee 3 reinforces the idea that innovation for Banese is a concept more focused on improvement:

> […] doing something different from what other people already do, doesn't have to be something disruptive, something that changes the market and the way people think and act. A simple process, where you change the way it acts, how it impacts the customer, can be considered innovation.

Considering the interviewees' statements and the documents accessed, it is possible to trace a history regarding the development and implementation of innovations in the bank, shown in figure 1:

Figure 1

Timeline of use and development of technologies in the investigated bank



Source: Field research (2022).

In view of the search for a complete mapping, it is interesting to comment on the adoption and implementation of these technologies in the bank. Regarding the automation and integration of processes and tasks, Banese has adopted, throughout the analyzed period, related technologies and practices that aim to increase operational efficiency.

The Enterprise Resource Planning-SAP (ERP-SAP) is a business process management support software, and its implementation was consolidated as mentioned in Banese's 2011 performance report, as part of a set of actions aimed at more efficient risk management. More specifically, this document states that the bank benefited from considerable cost reductions and increased operational efficiency. The Business Process Management System (BPMS) was mentioned in the following year's report as part of the technological modernization promoted at the bank, which aimed at the continuous improvement of management and integration of the different business areas.

There is also a version of a tool that supports IT process management called ITIL (Information Technology Infrastructure Library), which was implemented at Banese in 2013. The performance report from that year highlights it as an important part of the institution's technological modernization process. Interviewee 2 also pointed it as a significant innovation in the bank's recent history.

> […] no company in the state made this type of use of best practices, some large companies from Brazil came to visit us to see how the project was going. [..] we had a significant improvement in service availability [...] through monitoring, through incident contingency.

It is evident that these tools and systems contribute to the creation of an integrated business environment, where different work areas can communicate, reducing risks and the time spent on tasks. These were some of the most relevant benefits of process automation and integration for the bank.

In terms of operational efficiency gains, another highly relevant highlight is agile practices. Interviewees 2 and 3 emphasized the implementation of agile practices, pointing out that the reduced response time to the market was a major advantage gained. Interviewee 2 mentioned these practices through the adopted framework's name, Scrum, which was implemented to solve two major problems faced by the bank's IT department: the lack of information regarding business area demands and the high demand for coordination between different teams in project management.

Regarding the first problem, the framework helped because it centralizes the search for information related to demands in the role of the product owner (P.O.). This role, performed by a professional, is responsible for "refining, understanding, and breaking down the story of that demand so that it can reach the team and development can begin" (Interviewee 3). The second problem highlighted was solved because the employed framework inherently includes coordination and interdependence work among the teams involved in the same project. Considering this, Interviewee 3 reports the advantages: "there was a good productivity gain. [...] We managed to get this functionality or this product into the hands of the customer more quickly".

Still concerning the bank's service operations, there has been a more recent adoption of some technologies highlighted in both sources of evidence analyzed: the implementation of an API tool and the acquisition of a core banking system. One of the 2017 reports introduces the API Gateway as part of the "Banese 2.0" campaign and as a technology capable of integrating different systems inside and outside the bank. This internal integration refers to the support provided for the implementation of the aforementioned agile practices; external integration was also described as important – when questioned about the process of modernizing Banese's technological infrastructure, Interviewee 3 mentioned the new API-based architecture as a significant innovation for "facilitating the connection of new components, new partners, new services within the infrastructure".

Additionally, the adoption of this technology signals that Banese is already prepared to adopt and benefit from Open Banking, and according to Interviewee 1, the bank is already participating in this open platform. This is a sign of its readiness to respond to the increasing competitiveness in the financial market, which is driven by the launch and use of this platform.

As for the acquisition of core banking, it is described by the interviewees as an essential investment. Only with this system has Banese been able to execute its new operational strategy, including the launch of its digital bank, as it requires a technological solution that offers high data capacity, as well as customization options, increased speed, and other features that will be translated into a portfolio of financial services and payment solutions. Interviewee 3 made it clear that this would not have been possible with the traditional bank's technological infrastructure alone:

> The bank still has some systems built in the 80s and 90s. And the technology they have there, which is old, cannot handle volume, cannot handle many changes [...]. It leaves us very rigid. It was a prerequisite for us to be able to make this change in this infrastructure to make new business viable.

This same interviewee also clarified why the bank has not yet fully migrated from these legacy systems – currently, this process would be too costly and complex, and there isn't enough time to do it while also responding to the various market demands. Therefore, the solution found is to make adaptations that allow the execution of new operational strategies while maintaining the traditional system. Thus, for each project generated by a market demand, a decision is made regarding the use of traditional systems.

As for the bank's service formats and cultures, it is evident that the adoption of certain related technologies has been fundamental for business continuity. According to Banese's 2011 and 2016 performance reports, Internet and Mobile Banking were introduced to the public as part of a commercial strategy to expand service distribution and meet the need for more convenient service. Since then, their use has been steadily increasing. In addition to a growth of approximately 198.78% over a five-year period, there was also an increase in the financial volume handled by these channels, which went from 3.8 billion reais to 41.2 billion reais during the same period.

These two digital channels are extremely important for Banese, according to the interviewees, as they respond to the "change in customer behavior" (Interviewee 3). However, it is observed that another trend in customer service is the continuity of the in-person format, with digital channels accounting for only a portion of the bank's transactions:

> The more we offer services on these digital channels, the more we see a drop in face-to-face services and an increase in digital services, but the thing is: we can't just stick to digital, we don't have that luxury (Interviewee 2).

Here the Interviewee refers to the remaining expectation of in-person service from Banese, which he also mentioned; “the service has to be in-person because of our audience, right? In terms of the number of transactions, this is decreasing” (Interviewee 2), implying that the service sought in person is more consultative than transactional. This can also be proven by the number of Bank’s physical branches, which increased from 61 in 2010 to 63 in 2021. Physical branches carry something important for certain segments of the clientele, which was also commented on by the interviewees, with one of them mentioning the “social role” of Banese, as it is mostly controlled by the government:

> When we close a branch that, historically, has never brought any results to the bank, but it has that social, economic bias for the municipality… we can’t do it. But I don’t think there is any idea of increasing it. There is an idea of reducing it, yes, but I don’t know if it will be possible (Interviewee 2).

> I don't see the bank closing branches. But I also don't see it opening new branches. The strategy, in general, is to leave the state, but to do so through digital means. Neither closing nor growing, in a physical branch model (Interviewee 3).

Another important physical service channel for Banese is the automated teller machine (ATM). The latest annual report available indicates that a portion of these are the recycling ATMs or ATMRs, a new feature introduced to the state in 2014, and which is referred to by all interviewees as a remarkable innovation in the organization’s history. These terminals were called “recycling” because they use the money deposited in them to feed their other functions, reducing their need for supplies, which reduced costs and risks.

Another initiative that can also be considered here is the Banese Card, a payment solution with credit concession that, in itself, is not an innovation. However, one of its features brought a significant difference at the time of its launch and for a long time afterwards: the absence of an annual fee since 2002, which was planned based on the perception of the opportunity and the need to serve a segment of the population that was not financially included:

> When we looked at the bank’s target audience, it was public workers and classes C, D and E. Classes C, D and E couldn’t afford to pay the annual fee for the card. [It was decided:] ‘Well, I want that audience’. Give them credit. But if I add an annual fee, they won’t want it. So let’s test this possibility (Interviewee 1).

This decision ensured, according to Interviewee 1, a large customer base and promoted a value exchange – the customer benefited by being financially included, while the Banese

conglomerate succeeded by maintaining this competitive advantage for over a decade and a loyal customer base.

Regarding data management and analysis, few planned actions were identified based on data-driven decision-making within the organization, along with the use of some technologies that could enable these actions. The only mention of these technologies is made in the 2018 performance report, which states that the bank is investing in artificial intelligence, machine learning, and big data, aiming for application in the personalization of products and services, helping the institution achieve its goal of expanding its market.

However, this application has not yet taken place, as evidenced by some of the interviewees' responses. Interviewee 1 said, "This is an area where we really need to improve a lot. We do have [personalized solutions], but it's done manually." Interviewee 2 mentioned that, in the traditional bank, there are no data analysis initiatives or tools in place yet, but there is an intention to do so, as the development of such initiatives has been in the project portfolio for a long time, but it has never been materialized due to the bank's need to prioritize other areas and the resulting lack of investment.

Nevertheless, there is one initiative: the customer segmentation, designed to offer personalized service and more targeted solutions. It was defined and disclosed in the 2015 performance report based on the "customers' reciprocities with the Bank". Beyond the personalization of products and services, Banese also uses data collected from satisfaction surveys to support improvements in customer service. It is also reported that data analysis helps in the definition of behavioral patterns that support the prevention of electronic fraud.

Finally, it is relevant to highlight that there is a department that strictly handles Banese's innovation management. To better understand the identified technologies and practices as financial innovations, the detailing of their applications is shown on Table 05:

Table 5

Summary table of identified innovations

Financial innovations	Typology according to the innovation's use	Use of innovation in the investigated bank
Automation of process management (ERP-SAP; BPMS; ITIL V2)	Incremental innovation	The tools mentioned were adopted to improve existing tasks and routines, making them faster and less error-prone. These are the main improvements achieved by improving the bank's operations.
	Organizational innovation	These innovations employed in the bank's management processes aim to increase operational efficiency, with the benefits mentioned above, in addition to reducing costs. In this way, an increase in organizational performance is intended, based on a change in the offers to the end consumer as well.
Application of agile practices (Scrum)	Incremental innovation	The relationship between the bank's IT and business areas, which involves demands and deliveries, already existed. The adoption of Scrum has drastically changed this relationship, making the dialogue more efficient by bringing significant improvements to delivery management.
	Organizational innovation	There was a reduction in the delivery time of products and services to consumers, which helped the bank to react to changes in the market n skillfully, which represents a significant improvement in the search increased organizational performance.
APIs implementation	Organizational innovation	It is an enabling technology, cited as an innovation for facilitating the implementation of Scrum and for benefiting the bank with the ability to bring its partners into the business operations. It is also one of the technologies responsible for enabling Open Banking. Both these partnerships and adherence to the open platform are processes improvements currently required by the sector for good business continuity.
Core banking	Incremental innovation	Core banking proposes a new way of operating the institution, drastically reducing the IT structure, bringing agility, flexibility and scalability. These are improvements perceived in services that were already operated before its adoption.
	Organizational and process innovation	The improvements mentioned above can be seen in the management of services, but also in their distribution, enabling progress in operations and organizational performance, with innovations that are noticeable to the bank and its customers.
Internet and Mobile Banking	Process innovation	Both Internet and Mobile Banking have been implemented as part of strategies to expand the distribution of the bank's services. In addition, there is report of improvement in customer experience.
Recycling ATMs	Incremental innovation	The recycling ATM is a new version of the automated teller machine, which was previously used by Banese. The improvements obtained with this version are risk and cost reductions.
Banese Card	Product innovation	The Banese conglomerate's credit card stands out for not charging an annual fee since its launch, as at that time this practice was not common in the financial market.
Image-based check clearing and remote check capture	Incremental and organizational innovation	Although these are new techniques, both refer to existing banking operations: check clearing and deposit. Both have brought significant improvements, with increased efficiency and reduced risk.
	Process innovation	The way the customer and the bank participate in these processes has changed significantly, making them more agile and convenient for both parties.

Financial innovations	Typology according to the innovation's use	Use of innovation in the investigated bank
Artificial Intelligence, Machine Learning; Big data	Organizational and product innovations	It should be noted that the use of these technologies in the bank has not yet been identified, only the investment in them. However, the purposes for which these investments would be converted refer to improvements in the design and offering of solutions to customers, aiming for assertiveness and personalization.
Customer segmentation	Organizational innovation	Segmentation aims to provide more personalized service, with improvements in customer relationships and retention.

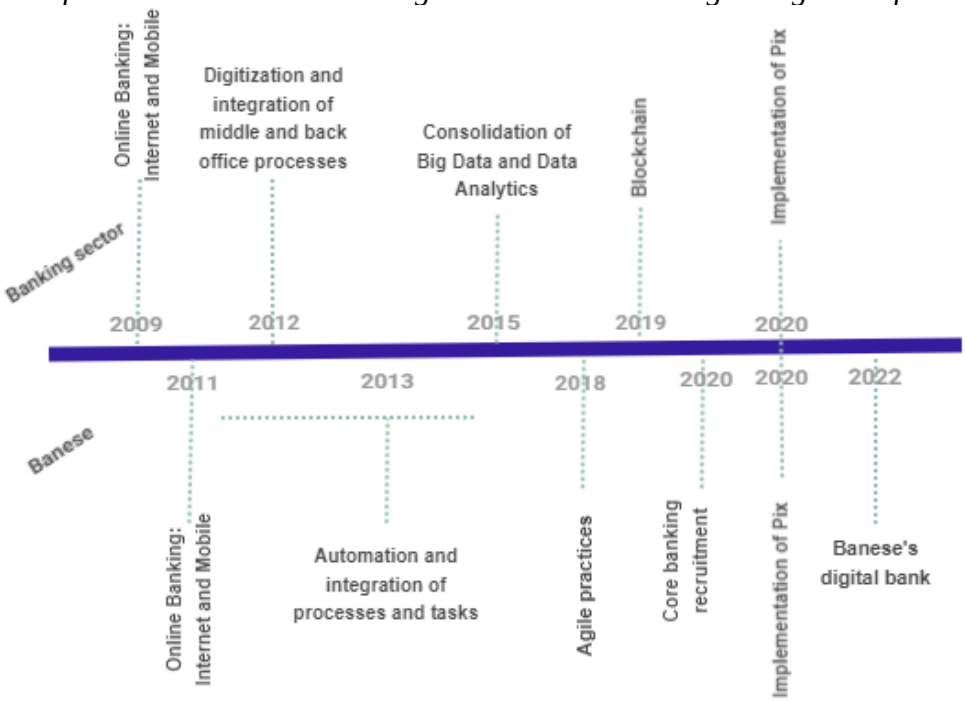
Source: Field research (2022)

4.2 Banese's transformation in the financial market

Figure 2 shows how a public bank responds to market changes. When comparing Banese's perspectives, it is clear that although there is no equivalence – its public and traditional nature entails particularities that put it at a natural disadvantage – a public bank reacts to the dynamics of the financial market in a strategic manner, partially justifying the delay in implementing some innovations. This strategy considers the target audience and the demands that Banese's management believes are relevant.

Figure 2

Comparison between the banking sector and Banese regarding the implementation of innovations



Source: Field research (2022).

It is clear, with the comparison shown in figure 2, that Banese demonstrates a delay in the application of the mentioned technologies, presenting concomitance with the banking sector only in the application of technologies that were provided by the Central Bank for all institutions, as is the case with the implementation of Pix.

5 Discussion

After identifying the innovations developed or implemented by Banese, it is clear that this institution fits into what is pointed out by Stiglitz (1993) and Marois (2022) regarding the roles played by a public bank: at the intersection of traditional and digital banking, several actions are taken to promote the socioeconomic development of the state of Sergipe. Even so, the need for market positioning through internal technological change is still highlighted.

It is noticeable that such technological change has been beneficial to the bank, especially in terms of time optimization, resulting in improved operational efficiency. However, these benefits were partially achieved through the use of non-technological innovation – agile practices adopted by the institution. Therefore, it is understood that, although the financial market emphasizes the use of technologies to maintain competitive positioning, the adaptation of a public bank can also be based on organizational innovations. This aligns with what Sjödin et al. (2021) highlight about the importance of developing new skills and organizational processes during the adoption of transformative technologies.

The adoption of technologies such as API tools and core banking systems was implemented to support the bank's adaptation to the digital transformation of the financial market, as it was designed to enable the development of digital services and operations. It is also observed that there are technical viability analyses to support the adoption of these technologies, as adjustments to the existing infrastructure under which the traditional bank operates are necessary. This analysis is essential for a strategic response to external technological changes (Birkinshaw, 2023; Sewpersadh, 2023) and is conducted with consideration of available resources. In the case of Banese, it is necessary to take into account its legacy systems, which are difficult to disassociate from, constituting one of the biggest challenges for these public institutions (Diniz, 2021).

Regarding the analysis of the institution's own circumstances and particularities, the persistence of in-person service at the bank must also be discussed. The emphasis placed by the

interviewees on the need to maintain this service format is interesting because it connects to Banese's social role in financially including segments of the population that do not constitute the target audience of most financial institutions. This social role ties into the notion that a public bank serves to fill certain gaps in the market (Stiglitz, 1993; Marois, 2022). The slower transition from in-person to digital service is also pointed out by Diniz (2021) as a characteristic of traditional banks.

This market gap-filling role also refers to strengthening customer relationship, which is one of the ways Banese adapts to the competitive environment it is part of. This relationship can be further strengthened by using technologies that offer personalized services (Hassani et al., 2018); however, the development of innovations like the Banese Card is a clear attempt to create a connection with the target audience.

In general, by aligning its strategies with its customers, a public bank may take longer to implement innovations seen in the banking sector. However, this delay is justified by bureaucratic processes and, above all, by the perception that the clients of these institutions may not yet want or need these innovations. To rely on this justification, a public bank must be data-driven, as this is the only way to truly identify the demand from its consumer base (Hassani et al., 2018). Aligning the roles of a public bank in this way can lead to the ultimate goal of customer satisfaction, which will bring benefits and value to all stakeholders.

Through this analysis, it is understood that a public bank attempting to align its roles and expectations as both a local development agent and a profit-oriented organization can respond effectively to technological changes in the financial market. This response can be seen in the pursuit of operational efficiency, with the automation of tasks and functions and continuous improvement, as well as in the aim of enhancing customer service, which will be possible by using data analysis to guide strategic direction.

5 Final Considerations

This research began with the question, “How does a public bank respond to technological changes in the financial market?” To answer it, the study drew on the literature on financial innovations. When discussing innovation in certain contexts, it is common to observe that one or a few market players introduce disruptions, while the rest follows with replications and imitations.

In general, this can be a positive behavior as it ensures individual survival, though it has the potential to obstruct the pathways through which further innovations are developed.

In the case of the financial market, these replications and imitations became widespread with the digitization of services, but they cannot be considered the norm for all players. With digital transformation, both traditional and digital banks have benefited from technological advancements in operational formats and customer service, enabling leaner business models. However, based on insights generated from this study, it is understood that a public bank responds to technological changes in the financial market in a unique way, taking into account its peculiarities and possibilities, and positioning itself strategically rather than adopting innovations simply because they are market trends. These institutions are not as agile in their responses as the rest of the sector, but by considering the duality of roles, as local developers and publicly traded companies, they align with the needs of their customer base. It is also evident that there is innovative potential in better understanding these needs and developing customer relationships, which could be key to both financially including and retaining them.

Thus, this case study connects with the literature on financial innovations by highlighting the need for a public bank to formulate a strategic response to the technological innovations in the market in which it operates. This need is observed in Banese's adaptation to digital transformation, through both technological and non-technological innovations, and by maintaining in-person service. It is important to emphasize that even while preserving in-person service, it is possible to adopt technological operations. Here, the opportunity to use data analytics is highlighted to continue strengthening customer relationships.

This research contributes to the field of financial innovation studies, which has not yet thoroughly explored public banks. By depicting the priority given by financial institutions to technological innovations, this study deepens the discussion on the need to prepare for technology adoption, to develop new skills and processes, and to expand the innovation portfolio beyond disruptions. Thus, a theoretical implication is introduced: innovation should be based on a strategic perspective.

There are also practical implications, as the peculiar context of a bank that has been surviving and responding to market changes is portrayed. From the case studied, relevant management suggestions can be drawn: better integration between traditional and digital banking, with the decentralization of innovation management through the implementation of agile practices

within IT departments, dissemination of information on digitalization advances, and employee training to foster the desired innovation culture.

This research encountered limitations, such as the difficulty of accessing some interviewees. Another limitation highlighted here is the challenge of answering the research question without forming generalizations. From the analysis of Banese, one of the few remaining public banks in Brazil, and which plays roles identified in the literature as typical of traditional financial institutions, it is possible to understand how a public bank can respond to technological changes in the financial market. However, as previously discussed, merely replicating practices does not constitute innovation. This, therefore, implies the need to pay attention to the particularities of each context, considering both internal and external factors.

For future research, it is interesting to explore the social role of public banks and how it can be based on financial innovation: how can innovation drive financial inclusion in such a way that a public bank can foster local productivity? It is also suggested to analyze more institutions to reach broader conclusions regarding financial innovation, thereby maturing the theory related to financial innovations in public banks.

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