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Completed Research Paper

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Abstract

This study presents a solution to the low operational efficiency and inadequate use of inputs in the customer service channels of a major Brazilian financial institution. The work adopted the Design Science methodology to develop a platform that unified customer service systems and direction of demands and business processes. The solution initiated the digital transformation of service channels and contributed to the significant improvement in process management by allowing an integrated view of the relationship, facilitated the analysis of services and promoted to customers, regardless of the point of contact, the experience of successful journeys.

Keywords

Digital Transformation. Omnichannel. Technologies. Customer Support. Design Science Research.

Introduction

Customer dissatisfaction tends to cause a loss of profitability and competitiveness for companies due to the termination of the client relationship or the sharing of negative experiences with future company consumers (Hult et al., 2019). These aspects can add to the cost of retaining the current customer base or conquering new ones.

A study by the Technical Assistance Research Program (TARP), as cited by Fernandes and Santos (2008), probed the impact of the spread of negative experiences on companies. The survey showed that dissatisfied customer disclosed their experience with the brand to nine other people, causing companies to lose 10 to 15% of their annual sales volume. This influence has grown increasingly with the spread of social networks (Buskens, 2020) and the creation of private pages, such as Reclame Aqui, which is currently the largest platform for resolving conflicts between companies and consumers in Latin America.

In this sense, the literature shows that the more a consumer interacts with a brand, the more positive these interactions are and the greater is the value created (Ammen et al., 2021; Priem, 2007). Using inputs from customers' spontaneous activations with brands is essential to intensify, strengthen and even improve the consumption experience (Soetan et al., 2021).

Thus, customer service channels are excellent tools for identifying strategies for the creation, increase and support of competitive advantages, increase efficiency in improving or creating products and services, as well as correcting possible errors and crisis management (Sturgeon, 2019). This set of strategies for customer service brings 'new' advanced digital technologies that seem poised to drastically reduce the demand for routine tasks and transform organizations and job content. These actions positively impact customer experience (Mahr et al. 2019) and make relationships with companies longer and more profitable.

The industry 4.0 era brought considerable changes in consumer behavior to online and/or mobile channels, triggered by advanced digital technologies and easy access to the global market. Intelligent digital devices and advanced technologies have enabled a 'contactless' service, facilitating the encounter and creating value

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for the customer (Verleye, 2015) without personal contact with employees of various institutions, including financial ones (Lee & Lee, 2020). Therefore, Information Technology (IT) has been considered one of the most important components of today's business environment; Brazilian organizations have used this technology extensively and intensely, both at the strategic and operational levels.

Furthermore, administrators have faced the challenges of this increasingly complex environment and require a deeper knowledge of its particularities and dynamics (Saeidi et al., 2019). The use of technology depends on the value it has for the company and availability of IT applications and their different levels of configuration. At the highest levels, technology can even contribute to changes or even the creation of new business models (Peng et al., 2016; Ilmudeen et al., 2019; Tavoletti et al., 2022).

Moreover, Straker et al. (2015) claim that customer interaction with companies has changed significantly with technological advances in recent years. Shen et al. (2018) argue that, in addition to traditional channels, companies began to provide new forms of interaction, such as apps, social networks, digital stores and contact centers (Mainardes et al., 2019).

The company studied for the preparation of this work, not identified by confidentiality issues, and named throughout the text as Bank A, was present in the ranking of banks and financial institutions most complained about within the Central Bank of Brazil - BACEN, with a high rate of complaints about the active customer base, which can negatively impact its future sustainability. Thus, this research proposes the development of a platform that unifies the systems of customer service and mapping, and standardization business processes, following the methodological principles of the Design Science Research (DSR) approach (Hevner et al. 2004; De Sordi et al., 2020). The artifact proposed in this study was developed based on theoretical foundations and empirical surveys, which considered different perspectives on the solutions development.

The article is structured as follows: the theoretical foundation is presented, highlighting aspects associated with customer service in financial institutions and Omnichannel's strategy as an improvement in customer service. Forward, the method used is described, while in the next section, the development of the artifact is presented with the requirements gathering, operationalization of the solution and the evaluation of the artifact, and finally, the final considerations of the study and the next steps in the implementation of the solution are presented.

Customer service in Brazilian financial institutions

Vasiliev and Serov (2019) define the banking sector as a complex, service-oriented architecture of several systems that unite the different organizational areas that manage discrete parts of the customer experience.

Regulatory bodies and supervisors control the functioning of these institutions. Among the main ones stand BACEN, which has the task of ensuring that financial operators comply with legislation, respect citizens' rights, and form a fair competition environment.

It is essential to highlight that the perception of quality offered by financial institutions can also be analyzed through a ranking elaborated by BACEN itself. This ranking is formed from the customer's requests made directly in the BACEN's service channels. According to BACEN, the listed institutions are classified in descending order of the complaints index, which is calculated according to the following formula:

$$Complaints\ Index = \frac{Complaints\ .\ 1.000.000}{Customer\ Base}$$

The ranking is published quarterly and presented in two listings: a) 10 largest banks and financial in the number of customers and b) other banks and financial banks that have thirty or more regulated complaints closed in the reference period, as presented in Table 1. Although present in this table, Bank A is not identified due to confidentiality.

Position	Financial Institution	Index	Complaints	Customer Base
01	FACTA FINANCEIRA S.A.	1,416.17	132	93.209
02	BARIGUI	996.26	28	28.105

03	NOVO BANCO CONTINENTAL S.A.	532.98	39	73.172
04	SAFRA	463.34	1,247	2,691.273
05	INDUSTRIAL DO BRASIL	255.51	16	62.618
06	BNP PARIBAS	217.64	684	3,142.799
07	BANK A.J. RENNER S.A.	163.43	39	238.631
08	ORIGINAL	159.83	443	2,771.671
09	SOFISA	84.31	20	237.213
10	BRB	83.58	76	909.295

Table 1. Complaints Ranking: Q1 2020

Source: BACEN (2020).

The Omnichannel Strategy as an improvement in customer service

Kotler et al. (2021) state that marketing must adapt to the changing nature of consumer paths in the digital economy. The authors also state that with disruptive technologies, shorter product life cycles, and rapidly changing trends, the brand needs to be dynamic enough to behave in certain ways in specific situations.

One of the strategies used by companies to ensure satisfactory experiences is omnichannel, defined as an evolution of the concept of multichannel, as it provides for the unification of customer experience among all communication channels provided by organizations (SEBRAE, 2017; Rosman, 2015; Saghiri et al., 2017; Vasiliev & Serov, 2019). The difference between omnichannel and multichannel strategy is the possibility that consumers can continue an interaction initiated on another channel without duplicating information (Vasiliev & Serov, 2019), which refers to a strategy that improves the quality of customer service and reduces specific costs.

Lazaris and Vrechopoulos (2014) and Shen et al. (2018), cited by Mainardes et al. (2019), state that the omnichannel solution is relevant in the banking sector, as it emphasizes joint action in the various access channels so that an integrated and consistent experience is available to meet customer needs. However, Shen et al. (2018) reinforce that the success of the implementation of the omnichannel strategy depends on the perception, usability, and positive effect generated. Therefore, omnichannel banking, or the omnichannel strategy applied to banks, focuses on the principles of consistency, optimization, and perfection, intending to make the customer experience as satisfying as possible (Komulainen, & Makkonen 2018, cited in Vasiliev, & Serov, 2019).

It is important to note that more than the evolution of multi-channel service platforms for the omnichannel strategy is needed. It is also recommended to improve data mining processes for the use of information in a structured way for corrections of the customer journey, business processes management, and even possible systemic incidents (Gissoni, 2017). Arantes (1998, as mentioned in Boianovsky, 2008) also states that business process standardization contributes to the satisfaction of customer needs.

From the point of view of customer service, this situation is corroborated by Silveira and Moura (2010), who affirm that analysts from the front line of customer support should have all the information organized in script procedures. Also, according to the authors, this standardization aims to unify the company's and the service agent's speech. In this sense, mapping the service processes of each customer contact channel and standardizing all scripts ensures greater uniformity of the customer experience, both from the point of view of response time and in the resolution offered.

Methodological Aspects

This study was conducted following the guidelines of the Design Science Research (DSR) methodology, whose objective was to develop an artifact, to which we refer to the Omnichannel Customer Service Platform. The DSR approach adopted in this study followed the guidelines of Hevner et al. (2004), which structured this methodological approach in three primary cycles of associated activities: cycle relevance, cycle rigor, and cycle design.

Figure 1 illustrates the scope of the research and its association with the primary key components of the study, based on the cycles of Design Science Research proposed by Hevner et al. (2004).
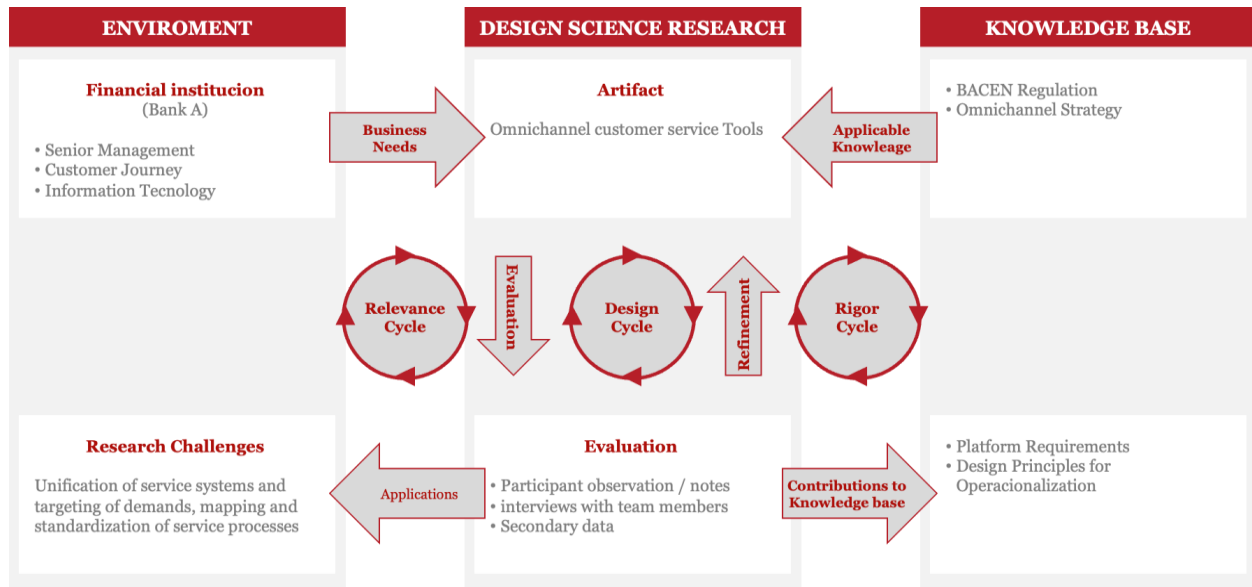

Figure 1. Association between the main components of the study based on DSR's cycles source

Source: Adapted from Hevner et al. (2004, p. 80).

The relevance cycle allows requirements to be identified, such as the problem to be addressed and the insertion of the artifact developed and evaluated in the environment, to solve the research challenges identified (Hevner, 2007). In this research, we dealt with the aspects related to the unification of care systems, mapping, and standardization of bussines processes, these being the challenges addressed in this study. The design cycle aims to perform development activities and evaluate the artifacts resulting from the study (Hevner, 2007). This research proposed the development of an artifact in the form of a platform whose objective was to improve customer support in organizational environments. It is also added that to evaluate the artifact developed. The artifact was demonstrated, followed by evaluative steps. Thus, the following stages of DSR were followed to develop the model proposed in this study. This research contributed with data relevant to the development of the omnichannel customer support platform for a financial institution, which allowed us to see the development journey in this institution, whose results were used in the evaluation stage during the demonstration of the model. The rigor cycle enables the research and application of theories and methods present in the knowledge base to support the development and evaluation of the artifact developed in the Design Science research (Hevner, 2007). In this research, different sources were identified to support the development of the proposed artifact, such as some regulatory aspects determined by BACEN and a survey of concepts associated with the omnichannel strategy theme applied to customer service.

Artifact Development

Context of The Investigated Reality

Bank A was positioned among the most complained banks and financial institutions of the secondary group of the BACEN's ranking, with a high rate of complaints about the customer base and negative brand exposure. Thus, inserted in a market where the characteristics and prices of products are similar, to differentiate itself from the competition, Bank A has bet on developing customer service excellence in all its contact points. Before the implemented solution, service analysts manually classified the reason of the

client's requests. This process may incur interpretation errors, besides disregarding valuable information, such as suggestions for improvement in internal processes.

Only two customer service systems used by the institution had the functionality to direct demands to the second level support areas automatically. As this functionality was unavailable for all customer service channels, customer demands and requests would be directed to second level support via email. It is also noteworthy that only the demands directed by these two tools could control the time of performance in each service, allowing the identification of possible bottlenecks in processes so that there is no traceability to demands sent by other systems. Moreover, the systems were not integrated, so customer service analysts could not identify possible actions already commanded by the teams that served the customer previously.

The analysis of the data obtained by contacting customers to identify experience problems with Bank A was made possible through the manual extraction of the databases of each registration and targeting system. These databases were reviewed by each customer service area, indicating an overlap of human resources and, consequently, increased transaction cost for support.

In addition to the low resolution identified by the solution scope limited to 60% of the demands received and the volume of previous passages in the transactional and primary channels of care, the causes for the manifestation of the efficiency problem appeared to be heterogeneity in the systems of registration and targeting of customer requests and lack of integration between the applied solutions, databases, and the organization's internal systems. This situation made it difficult to identify the similarities between the customer's drives with the company, the elaboration of improvement plans for the customer experience, and the increased cost of transactions stemming from human resources overlap.

Survey of Users' Requirements and Literature

It is known that organizations depend on specific requirements to ensure their success, which can be achieved with the use of information technology. For this reason, one of the first steps for the development of the solution was the definition of the main functional requirements of the single system of registration and direction of service, formalized in a meeting that brought together participants of customer service, back-office, and technology teams in June 2020. As suggested in the rigor cycle of DSR, we sought the realization of theoretical support, documents, and concepts to the knowledge base to assist in developing the proposed solution. This review allowed for additional requirements to direct the elaboration of the solution. The requirements mapped by the working group were combined with the indications of the literature studied to develop the solution proposal. This procedure highlighted the system's design principles based on the expected results with the implementation, as presented in Table 2.

Empirical Requirement	Design Principle	Expected Result	Literature Indications
Omnichannel: unique system across all customer contact channels. Cross-device compatibility: online platform, allowing consultation and interaction from anywhere, at any time. Simplified access: login with the current network username and password. Cadastral integration: history of previous contacts, registration data, contracted products, complaints, and cancellations. Systems integration: hiring and cancellation of products at any time. Telephony integration: authenticated contact is initiated when receiving a call, protocol number is generated automatically.	Adopt the omnichannel approach as a customer satisfaction strategy. Perform mapping and standardization of service processes and scripts.	Reduce the volume of complaints received in critical channels and, consequently, the negative exposure of the brand in the complaint rankings. Offer agile service to solve customer requests.	SEBRAE, 2017 Lazaris and Vrechopoulos, 2014 Rosman, 2015 Saghiri et al., 2017 Shen et al. 2018 Komulainen and Makkonen, 2018 Mainardes et al., 2019 Vasiliev and Serov, 2019 Arantes, 1998 Boianovsky, 2008

Integration with regulators: collect open calls from regulatory agencies. Targeting: allow the support area to be chosen and triggered automatically from the choice of the request. Attach documents: at any time.			Silveira and Moura, 2010 Oliveira, 2016
Manual classification: drop-down list with the types of customer request. Automatic classification: integration with speech and text analytic solution for automatic classification Crisis Protocol: automatic crisis protocols based on deviations from the volume of drives.	Improve data mining processes.	Greater efficiency in improving or creating products and services. Quick response to consumers desires and needs. Easy identification of opportunities for continuous improvement.	Gissoni, 2017
Pipeline control: automatic dashboard considering: Total Tasks, In Progress, Inside and Outside the Deadline. Safety Net: predictive and prescriptive models for claimant customers in critical channels to increase primary channel elevation and agility.	Centralize control processes for all service cells in a single team.	Lower transactional cost.	Magalhães, 2018

Table 2. Empirical Requirements and Solution design principles

Artifact operationalization

Design principles and requirements were shared with the Technology team to evaluate the development and deployment effort. The solution proposal was validated and prioritized by all the involved teams (transactional, primary, critical, and external channels). The result of the technical analysis regarding the functional specification was the dismemberment of the implementation of the solution proposed in four phases:

1) transactional and primary channels; completed in February 2021.

2) reputational channels; completed in September 2021.

3) critical channels; completed in February 2022.

4) integration with speech and text analytics solutions to improve the data mining processes, in planning by the technology team.

The phase 1 delivery was completed without delay by the development team, and upon its termination, the service teams and impacted support areas were trained regarding the system's usability. The need to develop a functionality for scheduling demands overdue was identified throughout the use. Thus, protocols expired generate an automatic notification for the analyst responsible for completing the demand and their manager. This request was included in the technology project pipeline and delivered in May 2021, so phase 2 delivery already contemplated this functionality. The customer service teams contemplated in Phase 2 and 3 of the project were also trained regarding the system's functionalities and also indicate positive acceptance of this new feature.

In addition, the business process mapping and procedure standardization for contact channels were carried out. Furthermore, the quotas for the primary channels were increased to resolve at least 80% of customer requests in the first contact. This addition is supported in the literature: in his study, Oliveira (2006) sought

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to evaluate whether operational indicators of care were related to customer satisfaction and identified that only the first call resolution indicator was significant for increasing the level of customer satisfaction. That is, the greater the number of customers served by a single call, the higher the satisfaction level.

Artifact evaluation

The evaluation of the model is an important step in design science research as it allows evidence of the artifact's behavior in the solution of the problem (Hevner et al., 2004; De Sordi, 2020). Thus, to meet the DSR's design cycle, we chose to perform a descriptive evaluation, in which we sought to demonstrate the performance of the artifact from the evaluation of people involved in monitoring decisions related to customer service in this organization. Finally, to evaluate the impact and results of the implemented solution, qualitative research techniques were adopted, the steps of which are described in Table 3.

Step	Main Objective	Data	Methodology	
1	Understand the perception of Bank A employees regarding the impact of the project, in positive and negative aspects.	Primary	Qualitative	Participant Observation
2	Identify possible detachments among the data collected by participant observation of the real feeling of the other project participants.	Primary	Qualitative	Semi-structured interview
3	Evaluate the impact of the project implemented so far in the ranking of complaints of BACEN.	Secondary	Qualitative	Documentary analysis

Table 3. Steps of data collection for evaluation

Marietto (2018) states that participant and non-participant observation methods are becoming a research tool prioritized by many researchers in organizational studies. According to the author, participant observation is a qualitative method rooted in traditional ethnographic research that allows the researcher to become part of the analyzed group and understand their interactions more deeply.

One of the authors of this study was a fixed member of all meetings of the project, from its specification and approval to the meetings of development monitoring, homologation, training, and post-implementation of each implementation phase presented throughout the intervention. This evaluation method, however, has limitations. According to Geertz (1993 as quoted in Marietto, 2018) the reading that the researcher makes of contextual reality will always be on the shoulders of others, and only these can attribute the true meaning of the reality they experienced. For this reason, the second stage of data collection for evaluation was conducting a semi-structured interview with the general superintendent of Bank A's call centers. Next, secondary data obtained by documental analysis of BACEN's complaints ranking, published on the institution's website, were evaluated.

It is noteworthy that the solution adopted continues to be developed and implemented in the institution, and it is only possible to measure the gains of efficiency and effectiveness in its entirety at the moment of writing this work. After the full implementation of the solution, the evaluation can be complemented by a qualitative method of documental analysis of the databases of drives and complaints registered in all service channels provided by Bank A. The indicators collected should be compared to those analyzed at the project's beginning. It should also be evaluated if there was

- reduction in the index of complaints about the customer base, calculated by BACEN between the beginning and end of the implementation
- reduction of the rate of customer recurrence in service channels; and
- it increased the rate of demands solved at first contact.

Regarding the adoption of the new service system , the acceptance by users impacted by phases 1, 2 and 3 were quite positive. Among the features that favored the adoption of this technology, we highlight the

functionalities of automatic targeting of service demands to the support teams and the possibility of controlling the solution term of each targeted demand via reports made available.

To corroborate the identified gains and mitigate the limitations of the researcher's perception, in October 2021, a semi-structured interview was conducted with the management of Bank A's call centers. When asked about her perception of the tool implemented and the main gains she brought to the day-to-day life of her teams, the manager stated that the observed benefits could be classified as improvements in safety, operational efficiency, and management:

> "From a security point of view, the tool already presents the client to the customer analyst identified and authenticated, ensuring the security of operations, both in the customer's vision and the Bank's vision. Regarding efficiency, from the tool's implementation, we now have the visibility of the effective service time of our customers for cases where a back office makes the completion. Until then, we had a "gentlemen's agreement" regarding the average time of each demand, but today we can see in real-time the service queues and deadlines and act to give a faster response to complaint cases [...]"

Both aspects have been highlighted throughout this work. On the need for companies to be attentive to their customers' experiences, Gissoni (2017) indicates that companies can do this by using their service management systems as tools that generate improvement insights. The real-time view of the service queues and dynamism of corrections mentioned by the interviewee is in line with the mentions of Kotler et al. (2017). This interviewee was also asked about her perception of the future vision of the tool and what is expected after its disclosure to all customer contact areas:

> "By accessing a single platform, all channels will have the customer's contact history and use the same language and procedures in the service. I believe this will minimize friction with speech differences between channels and bring even more agility and quality to our customers [...]."

This perception is corroborated by Silveira and Moura (2010), according to which the standardization of the process ensures greater uniformity of the customer experience, and by Lazaris and Vrechopoulos (2014) and Shen et al. (2018), cited by Mainardes et al. (2019), which claim that the omnichannel solution offers an integrated and consistent experience to meet customer needs. The governance establishment collaborated in this study to control the deadline for customer demands based on the system implemented and highlighted by both the participant observer and the interviewed manager. Therefore, the continuous improvement in processes, products, and services contributed to the reduction of negative brand exposure in the BACEN complaint ranking and this previously mentioned result is due to the mitigation of the volume of protocols closed after the deadline. Table 4 shows the ranking of complaints from banks and financial statements of the secondary group of BACEN at the time of writing this article. Bank A is not among the leading institutions that make up the ranking, confirming the effectiveness of the implemented solutions.

Position	Financial Institution	Index	Complaints	Customer Base
01	FACTA FINANCEIRA S.A.	854.46	845	988,923
02	MASTER	647.82	296	456,914
03	BANCO DIGIMAIS S.A.	187.09	51	272,956
04	GRUPO BONSUCESSO – BS2	152.09	50	326,810
05	XP	150.01	223	1,486,516
06	DAYCOVAL	101.28	192	1,895,613
07	AGIBANK	87.85	184	2,094,424
08	PORTO SEGURO	64.64	194	3,000,851
09	BMG	63.04	813	12,894,925
10	MERCANTIL DO BRASIL	61.46	381	6,198,860

Table 4. Complaints Ranking: Q1 2023

Source: BACEN (2023).

Final Considerations

This research identified that the low operational efficiency and the lack of visibility of the customer journey between service channels was caused by the fact that the customer service areas used different systems to record and treat customer requests. This scenario also incurred in the overlap of human resources with the same functions in different areas, which generated high transaction costs in service and control activities.

To solve the problem in question the strategys of unification of service systems, improvement of data mining processes obtained from the institution's contacts with its clients, in addition to mapping, and standardization of procedures were adopted. The platform was developed according to the precepts of DSR and based on the literature on the theme investigated, in addition to considering the regulations that affect public sector organizations and empirical requirements.

Under the managerial aspects, the work elaboration process contributed to the service teams incorporating in their culture the continuous improvement of processes. Until the current implementation stage, the system already allows the analysis of previously unknown indicators, such as the average time of completion of a service directed to a support area. These functionalities were determinant so that the service management teams could control the solution time of each of the customer's querys.

This alternative has as its main gains the possibility of centralizing the visualization of all previous contacts of the client with Bank A; the guarantee of uniformity in customer service, both from the point of view of response time and in the resolution offered; the mitigation of operational errors caused by information asymmetry between service agents; and the facilitation of analysis of service information to identify problems and opportunities. This perception of the gain obtained by the solution is in line with the mentions of Kotler et al. (2017) on the need for companies to be attentive to the experiences of their customers and Gissoni (2017), which indicates a way for companies to do this is by using their service management systems as tools that generate improvement initiatives, both aspects highlighted throughout this work. It was also possible to observe that the changes caused by this work positively impacted the position occupied by Bank A in the BACEN complaint rankings, so the institution is no longer among the ten most complained institutions in the regulatory body.

The need to improve curtomer service channels and their updating and application as a tool for creating and maintaining a competitive advantage has proven to be a possibility for several sectors. Therefore, from the elaboration and implementation of the omnichannel solution presented in this work, it is recommended to consult by professionals who intend to create or boost the customer service area of their business.

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