

Digitalization in Banking: Navigating the Effects of Automated Decision-Making on Customer Experience

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Abstract. *This study explores the impact of automated decision-making processes on customer experience within the banking industry, set against the backdrop of digital transformation. The objectives are to provide insights into how automated decision processes shape the contemporary banking experience and influence customer perceptions, acknowledging both the positive and negative implications for the evolving nature of banking services in the digital era. The literature review examined the contributions of the cited authors, generating a summary of information categorized into three parts: a comprehensive overview of the banking landscape in the context of digital transformation, brief considerations regarding automated decision-making processes and several insights into customer experience. The research methodology employed a questionnaire, encompassing both close-ended inquires and an open feedback section. The study was conducted for the Romanian banking system and had a sample size of 102 respondents. The gathered data was subsequently correlated and analyzed to evaluate the alignment of customer perception with the opportunities and challenges identified in the specific literature. This paper also tries to widen its relevance by facilitating practical applications of the research findings. Thus, in the result section, key considerations were formulated, targeting a more precise definition of automated decision-making processes in the banking industry, aiming to optimize the experience for the utilizing customers. The conclusion indicates that both strengths and weaknesses of automated decision-making processes in banking industry are of relevance in the perception of customers, as the questionnaire's responses align in form and extend with the theoretical concepts identified in the relevant literature.*

Keywords: automated decision-making processes, customer experience, banking industry, digitalization, process validation.

Introduction

Technological progress has been developing exponentially in recent years and has also spread to most industries in the world economy. Moreover, individuals live in an unprecedented fast-paced society and promptness is one of the essential factors in the acquiring decisions. As a result, product and service providers find themselves in a new and challenging context, where agility and 24/7 availability are crucial to obtain competitive advantage.

Consequently, we find ourselves in a context where most banking operations, products and services are available to practically anyone with an internet connection. We can independently access almost anything, from services such as online onboarding, account opening, or credit approval, to advice seeking through virtual assistants - chatbots. This was made possible by automating processes and creating algorithms to make quick, near-real-time determinations, replacing human decision-makers.

Digitalization in banking equates to the adoption of next generation integrations to improve business capacity and operational performance, providing superior and prompt processing of customers' requests. Romania joins in the global digitization trend, currently going through a process of dynamically reshaping its banking industry by incorporating new digital technologies to increase internal efficiency and to enhance customer experience (Ionascu et al., 2023). A fast and efficient way to support banking institutions in their digital transformation initiatives is the

automation of processes (Vijai et al., 2020). Proceeding forward, competitiveness in the banking industry is currently under enormous pressure from “so-called financial technology companies”, representing purely digital technology-based companies that strive to compete with traditional financial institutions (Ulrich-Diener et al., 2024).

This paper aims to determine the effects of automated decisions-making processes on customer experience, within the Romanian banking industry. The theme aligns with the contemporary challenges and opportunities arising from technological advancements in the financial sector, making it a pertinent subject for investigation. Currently, banking institutions are aggressively adopting technologies to meet market demands and enhance operational efficiency. Automated decision processes are a crucial element of this digital transformation, directly influencing how customers interact with and perceive banking services. Yet, with the rise of automated decision making, concerns as fairness, transparency and security become increasingly important.

Examining the impact at the customer level allows for a deeper understanding and aids the banking environment in formulating guidelines to ensure adequate use of automated decision-making processes. Customer experiences are highly subjective and powerful; they engage perception and participation, emotional involvement, sharing with others, and lasting memory. The customer's initiative is the main cause of most purchases, product usage, and post-purchase activities (Suharto & Hoti, 2023). The sizing and measurement of customer experience was specifically chosen because it represents one of the important pillars in maintaining competitiveness.

By combining theoretical awareness with empirical data obtained through users' surveys, this approach seeks to offer a wider view and to provide actionable recommendations for banks aiming to navigate the challenges and opportunities of automated decision-making process implementation within the business environment in Romania.

The main hypothesis postulates that a positive correlation exists between automated decision-making processes and enhanced customer experience and has been validated by the research results.

The paper is structured into multiple sections, starting with the literature review, where keywords are analyzed in terms of their meaning and regarding a minimal theoretical correlation between them. It then proceeds with the presentation of the research methodology; following this chapter is the results' section, highlighting the research findings and their interpretation. Finally, there is a conclusion section, emphasizing the main ideas derived from the research and presenting its limitation.

Literature review

The literature review is divided into three main directions: a high-level perspective on the digitalization of banking services, an in-depth understanding of the automated decision-making processes with both positive and negative impact at customer level perception and some general and practical considerations regarding the customer experience in digital banking.

Evolving landscape of digital banking services

In essence, digitization, also termed as digital transformation, involves the incorporation of computerized technologies into various facets of organizational operations. It includes the adoption and use of digital tools, technologies and platforms to leverage greater efficiency, higher productivity and faster innovation (Singhal et al., 2024).

Since the beginning, the banking industry has used technology to carry out transactions, initially through customary banking channels, namely through territorially spread branches. Customers were accustomed to using call centers and automated teller machines (ATMs), before the activities became supported by internet banking platforms and mobile solutions for processing their operations. These technological innovations have allowed banks to transcend geographical boundaries (Ionaşcu & Barbu, 2023).

A crucial factor in accelerating further adoption of innovative technology was the health crisis generated by the Covid-19 pandemic and its disruptive effect on social interactions. The banking industry is also an essential pillar of the economy and served a crucial role in the world economy during the global pandemic because one of its important functions is to facilitate domestic and international trade. Consequently, interruptions of business in this field may have affected the entire society (Marcu, 2021). As a result, the global sanitary situation exerted further pressure and forced the traditional banking sector to embrace thorough structural digital transformation.

Recently, the financial services ecosystem has been shaken by liberalization, which has given rise to fintech companies. Thus, key functions of traditional banks have been taken over and their role is now threatened by these new players in the market. The traditional banking system's competitiveness is put under additional pressure in this context, which has the potential to change customer behavior (Murinde et al., 2022).

It results that in today's landscape, the core of digital banking is defined by the availability of uninterrupted services, which gives the consumer the possibility to access them online anywhere and at any time, offer customization and tailored made products, electronic identification solutions and paperless based transactions (Melnychenko et al., 2020).

Currently, digitalization represents a strategic approach to be achieved both in the short and long run, depending on implemented flows and targets. The goals are mainly about reducing risks, increasing productivity with efficiency and enhancing decision-making processes (Bahaaeddin & Theiri, 2021).

Automated decision-making processes in digital banking

The digitalization of banking processes unfolds across multiple areas: in the visualization of information, in the execution of transactions, in advisory services, etc. However, a specific component will be further addressed, given its significant impact: automated decision-making processes. Automated decision-making implies multiple approaches that typically demand minimal human participation. The intention of these processes is to have a software system independently providing a decision or suggestion (Davenport & Harris, 2005).

The examination of the current state of knowledge has revealed that automated decision-making processes are subject to some division, as digital development brings both opportunities and risks. Automated decision-making processes usually imply elaborate but unclear procedures that rarely permit a complete understanding of their internal functioning, especially for the concerned parties. These automated decision-making processes are therefore vulnerable to inadequate surveillance and calibration, which can produce inappropriate and biased outcomes (Schoeffer et al., 2021). Exploring this idea, unlike machinery making decisions, humans have the potential to be challenged to justify the reasons for the judgements they are making. People can respond to petitions by being argumentative. They can provide rationales for their choices. In human decision-making, this is the major benefit compared to automatic solutions. Nevertheless, artificial processing systems surpass humans' capabilities in terms of the amount of data they can handle in a limited period (Burkart et al., 2021).

Although customers benefit from these automated decision-making capabilities, they still experience significant cyber-attacks threats. The digital transformation of banking environment has brought a number of serious concerns including financial fraud, hacking, phishing and security compliance. Customers' comprehension of safety may be frequently elusive in multiple ways. When using banks' online platforms, they need to be aware of reliable digital practices (Ionaşcu & Barbu, 2023). Customers may also be faced with the inability to find an easy answer to all the problems/issues they face in a digital and automated environment. To prevent system distortion, the process should be populated with reliable data and the algorithm should be constantly evaluated and updated. Openness on these issues could therefore not only increase trust in automated decision-making, but also demonstrate a company's commitment to corporate digital responsibility (Bonson et al., 2023).

Customer experience in digital banking

Digital transformation is about how consumers will embrace new technological advancements, more than how the developments will remodel the internal flows of financial institutions. The conduct of digital customers, their habits and options, as well as their requirements and capacity to accommodate the upcoming reforms are among the greatest challenges (Nătescu & Duna, 2018). To this end, capitalizing technology in customer experience implies utilizing digital instruments to collect and analyze relevant customer metrics, delivering customized journeys, improving efficiency and providing innovative products or services. Digitization can also increase customer usability and convenience, with remote interaction channels that now make banking operations accessible from anywhere and anytime (Krasnic, 2024).

For a more streamlined inquiry in the practical application section of the paper, the concept of customer experience has been explored as being founded upon three primary pillars in digital banking: trust, loyalty and the perceived efficiency of time. Loyalty indicates the engagement of customers to continually and persistently purchase or to make successive subscription renewals in the future, even if the cost changes. Loyalty makes users more likely to re-use the exact same company's services again (Saputra et al., 2023). Moving forward, the findings in related works revealed that there is a significant positive relationship between customer trust and customer loyalty. With applicability to the banking environment, as it is a highly competitive industry, customers who are not willing to trust their financial provider are unlikely to be loyal. Following the same mechanism, if customers are pleased with the bank's relationship, they tend to be loyal (Leninkumar, 2017).

Considerations over the perceived time efficiency has also been discovered as taking serious part of customer experience. People expect rapid, responsive and easy-to-use interfaces when engaging with organizations. For this reason, it is important to consider the implications and challenges users encounter in this new digital landscape (Gavrila et al., 2023).

Furthermore, a highly valuable consideration in understanding the customer experience, even from the design phase, is validating the process that will be digitally exposed with customers, eligible as future users. Including customers in the validation of a process to be launched implies several positive aspects, strictly in line with the perceived level of experience. This is a powerful method of capturing important insights into how the process will be perceived once it is put into production. With a high level of engagement in validation, customers may see themselves as active members of the bank and feel trust, pride and passion towards that brand of banking that relied on their feedback (Cheung & To, 2011).

It is evident, therefore, from a theoretical point of view, that the above addressed concepts are interconnected; automated processes and the adoption of algorithmic decisions serve to enhance the spectrum of digitalization. Also, as these automated processes influence customers experiences, they have the potential to strengthen the market-level competitiveness of banks.

Methodology

The present research seeks to bring meaningful consistency to the existing body of knowledge in digital banking by practically assessing the influence of automated decision-making process on customers' experience in Romanian banking system. In this research endeavor, considering the theoretical framework already outlined, the questionnaire, as the chosen method of data collection, was considered the most appropriate tool to provide an organized empirical structure for gathering banking customers' insights and to allow a systematic exploration of the collected data. The author's contribution includes both the design of the questionnaire, which is the result of own investigation effort, and the fact that it has been specifically crafted to achieve the objectives pointed out in this study.

Apart from demographic inquiries, the questionnaire was designed with a series of items aimed to assess digital inclusion of customers using banking services and to capture perceptions regarding a spectrum of dimensions. Therefore, the study evaluated the subsequent effects of the digital transformation of banking services in Romania on the perception of using clients, assessing dimensions like time efficiency, satisfaction, trust and loyalty.

Most of the questions were close ended with a set of predefined answers to ensure data consistency, to reduce ambiguities on significant queries and to identify patterns among respondents. However, to ensure coverage over not anticipated insights, an open-ended section was inserted at the end of the questionnaire. This qualitative approach was intended to deep dive the understanding of individual experiences, providing a better overview to the quantitative data collected.

The questionnaire was created and distributed online, through Google Forms and had 102 respondents, out of 150 randomly selected Romanian citizens to complete the form, yielding a 68% response rate. The period this survey was answered started on January 10, 2024 and ended on January 29, 2024. The demographic targeted was over 18 years old, because this group of participants can acquire banking products independently. Moreover, to ensure objectivity in responses, this research did not consider as eligible candidates for answering the survey the employees within the banking system who, possessing knowledge of their internal workflows, could have potentially altered the statistical significance of the recorded results.

The distribution of respondents was the following:
by gender – 37.26% male and 62.74% female;
by age – 10.78 % between 18-25 years old, 27.45% between 26-35 years old, 30.39% between 36-45 years old, 9.8% between 46-55 years old and 21.58% over 56 years old;
by occupation – 8.82% students, 70.59% employees, 6.86% self-employed and 13.73% other.

Results and discussions

The research hypothesis asserts that there is a correlation between the presence of automated decision-making processes in banks and customer experience, measured in terms of satisfaction, trust, loyalty and time efficiency perception.

Quantitative research

Proceeding with quantitative analysis of the results, responses were examined within the demographic context and focusing on key elements of the survey.

The first evaluated area was the inclusion of digital services, as shown in Figure 1. In this regard, the vast majority of our questioned individuals, 61,76%, declared that they are using the online facilities on a daily basis. Nevertheless, the winning profile in terms of digital banking services utilization is that of an employed woman, aged between 36 and 45. For this category, we obtained a result of nearly 16% daily usage of remote electronic means, related to the total number of questionnaire respondents. On the opposite end, women with an unknown occupation category, aged over 56, are least likely to have ever used digital banking services.

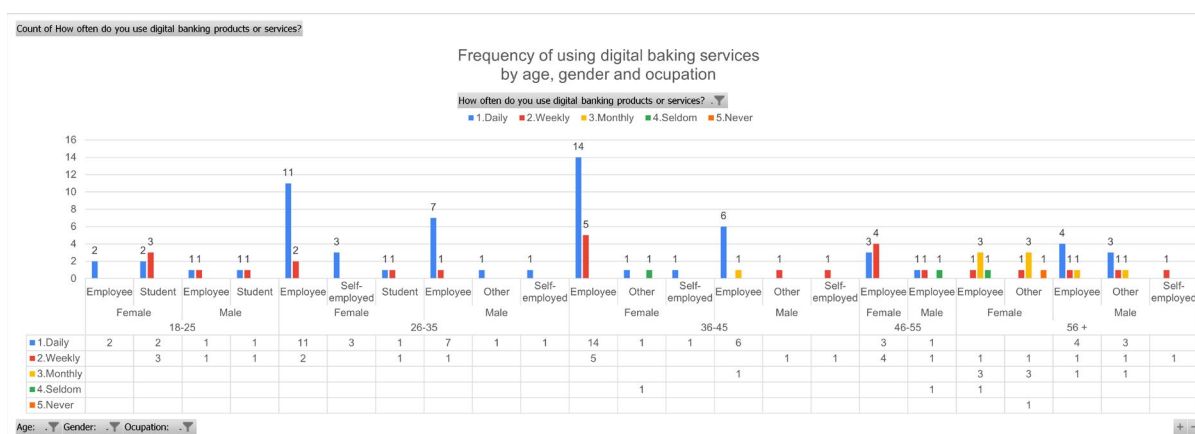


Figure 1. Digital inclusion- frequency rates by demographics

Source: author's own research contribution.

The next assessed area focused on the perception of the questionnaire's contributors related to the automated decision-making process. In this regard, the same category of consumers of digital banking services stands out – namely, the profile of a female individual, employed and aged between 36-45 years old. These respondents, representing a percentage of 11% from the pool of answers, believe that the implementation of automated flows is conducive to improving the decision-making processes. Furthermore, we can affirm that most respondents agreed that the inclusion of automation in banking decision-making processes enhances their efficiency.

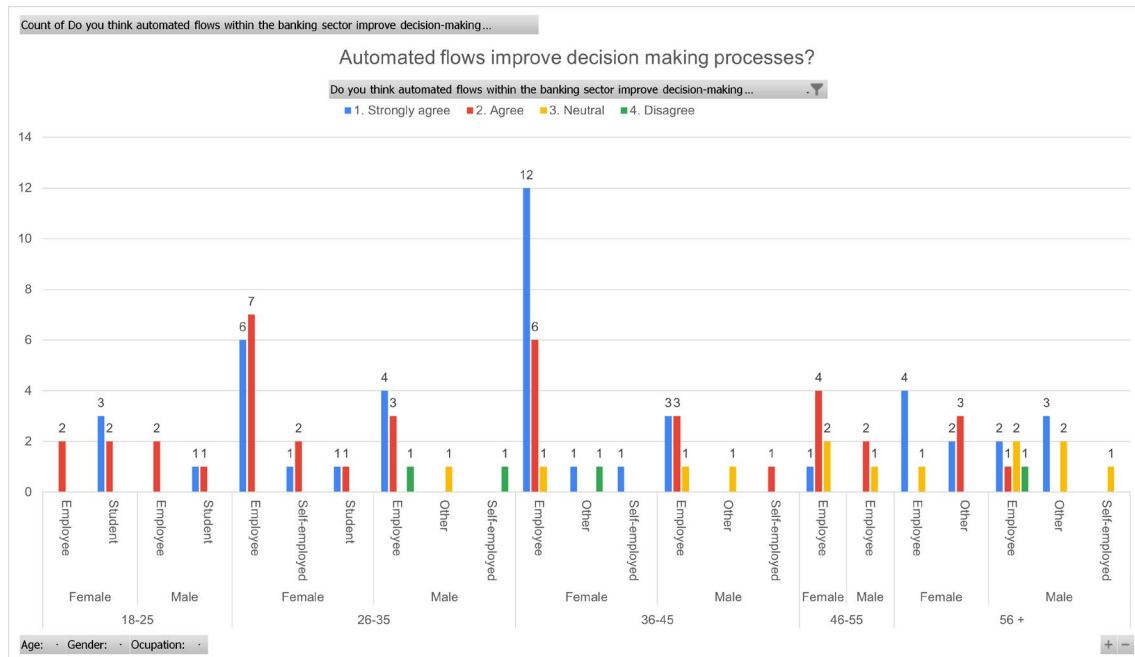


Figure 2. Perception on automation and decision-making

Source: author's own research contribution.

Moving on to the next key element of the survey, the customer experience was determined through 3 impact dimensions: loyalty, trust and perceived time efficiency, when engaging in banking processes which include automated decisions, as shown below in Figure 3, Figure 4 and Figure 5. Therefore, in two cases, the recorded level was in the realm of satisfaction, while neutral and negative opinions remained aggregated under the percentage of 20%. The only difference lies in the loyalty-related question, measured by asking to what extent the customer would switch banks for more digitized services. The interpretation did not focus on the loyalty to the current bank but rather on the extent to which loyalty is positively affected by the services in question. Also, here, we record a majority of votes in favor of automated processes, meaning 65.68%.

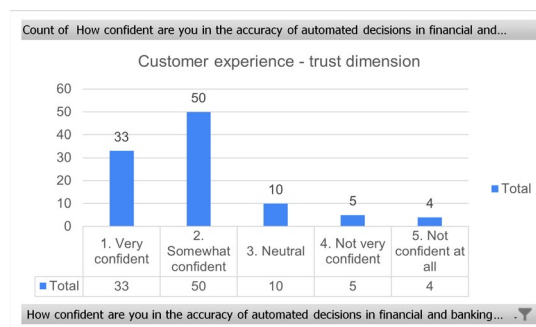


Figure 3. Customer experience – trust dimension

Source: author's own research contribution.

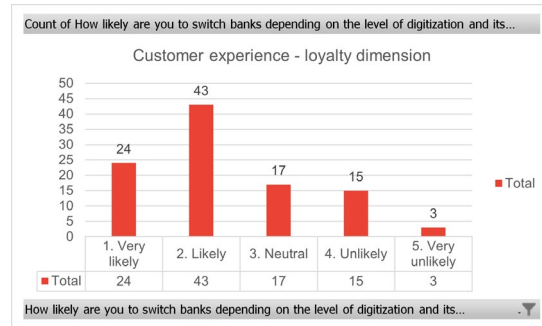


Figure 4. Customer experience – loyalty dimension

Source: author's own research contribution.



Figure 5. Customer experience – time efficiency dimension

Source: author's own research contribution.

Additionally, customer experience was also assessed through a general question pertaining to the perception of service quality overall in the context of digitalization and automated processes. The results are consistent, aligned with the prior findings, indicating that a significant portion perceives these services as having the potential to enhance the overall experience of their consumer. Within the realm of agreement regarding the enhancement of the overall experience, we have documented a percentage of 88.23%, while negative perception is confined to 2.94%. Centralized information is revealed in Figure 6.

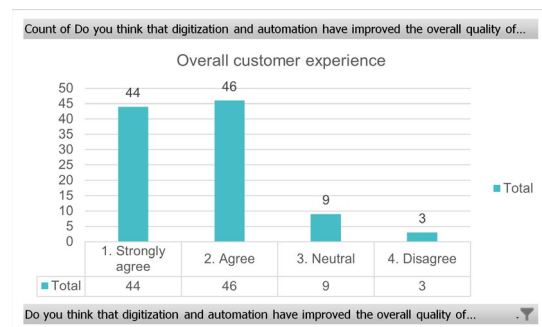


Figure 6. Overall customer experience

Source: author's own research contribution.

The last aspect quantitatively examined and presented in Figure 7 was whether respondents prefer human interaction or end-to-end automated decision-making processes. Here, the highest percentage of results have clustered around a moderate preference for automated processes,

specifically 46.07%. An absolute preference for automation recorded a share of 10.72%, indicating an overall tendency within the sample favoring automated processes over human interaction – 56.79%. Users' reluctance towards the automation of banking processes considers a substrate related to the complexity of their requests. They are more inclined to resort to automated processes for simple inquiries, while they would prefer complex issues to be analyzed by human judgement, as the automated processes cannot consider certain characteristics of the customer. Additionally, in the case of more intricate requests, they fear misunderstandings due to the overly specific banking language used in applications.

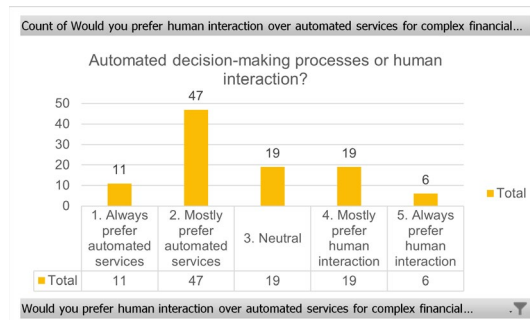


Figure 7. Automated vs human interaction

Source: author's own research contribution.

Examining the quantitative data, with information aggregated into predetermined intervals of preferences, perceptions or agreement, a significant influence of automated decision-making processes in the sphere of customer experience is evident. As a trend in distribution of responses based on demographic data, we obtained a higher proportion of favorable responses towards process automation from employees. The level of inclusion of digital services decreases with the increasing of age of respondents, and women tend to be more frequent users of these banking facilities.

Thus, the research hypothesis is validated, indicating that there is a positive link between the existence of automated decision-making processes and customer experience.

Qualitative research - thematic analysis of open-ended section

As mentioned in the research methodology description, the questionnaire incorporated an open-ended section to allow participants to share any considerations regarding the impact of digitalization and automated decision-making processes on their banking experience. Analyzing and sorting the results by classifying them into three major categories, the following data has been extracted:

62 respondents out of the total 102, representing 60,79%, expressed an overall positive impression; 23 respondents out of the total 102, representing 22,54%, expressed a neutral impression, and 17 respondents out of the total 102, representing 16,67%, expressed an overall negative impression.

Positive impressions were predominantly shaped by the rapidity and promptness of the processes and the time saved as a result for these consumers. The elimination of the need for physical journey to a traditional branch, the comfort for users and the ease of certain processes were aspects that contributed to this favorable outcome.

Negative opinions revolve around a few key concepts, particularly concerning the inclusion of processes with automated decision-making. Discontent is associated with the absence of human

interaction and counselling for more complex cases, the inability to comprehend overly specific language, the disregard for specific customer situations, the inability to deviate or negotiate and concerns related to the security of technological methods.

Refining automated decision-making: key considerations for achieving optimal processes

Following the analysis of the aforementioned survey, this section brings key considerations for setting a robust framework in crafting the automated decision-making processes. These suggested recommendations are applicable to the pre-launch phase of the process, or even to the further development iterations, ensuring an informed and effective implementation to enhance the impact on a positive customer journey.

As an initial step, a detailed exploration of customer use-cases should be considered in the creation of the process. Corner cases, which represent specific customer situations, are of particular importance when the process is being developed, as they might lead to unfair decisions. Therefore, in order to achieve a satisfactory process for as many customers as possible, it is essential to anticipate a wide array of such scenarios. After identifying as many atypical situations as possible, the incidence of cases should be considered, ensuring the recurring ones are addressed while accepting rare ones as losses to avoid resource consumption. This consideration aids in achieving the lowest possible error rate in decisions that disregard the specific situation of the customer, while also reflects upon the planned capital for the process launch.

A second relevant aspect is that customers unable to complete the process should receive personalized error messages. As automated decision processes lack human interaction, which could have provided additional clarifications, the customer experience improves to the extent that the message received is more detailed. Therefore, for effective management of this drawback, eligibility rules should be established with a specific message crafted for the violation of each. These notifications should provide clear explanations regarding the reasons why the flow cannot proceed and, if applicable, should indicate available alternatives for the customer. Finally, to streamline the customer experience and provide a smooth journey, informative messages per process steps should be designed, even for those customers who face no difficulties in completing their digital request. This consideration serves as a mitigant for the lack of transparency in processes that involve automated decisions.

As a continuation of the identified impediments addressed in the preceding paragraphs, the third key observation is that uncompleted digital requests should be sifted through by a human factor to ensure a safety net in the customer experience. It is preferable to set internal alerts for flagging uncompleted request from two perspectives: first, to provide customer support, and second, to gather feedback opinions on the process. The collected feedback may serve as backlog for future iterations.

The fourth consideration is that the initiative of validating the process, prior to its launch, with a relevant sample of potential customers, is a highly beneficial attempt when aspiring for highest levels of satisfaction regarding customer experience. Throughout these validations, valuable insights can be gained on how the process is received by target audience and what their expectations are. The test should also assess if the process is simple and easy to comprehend. The advantages of employing this method, initiated as early as the defining phase, are that omissions on the flow do not make it to production environment and that customers' preferences can be incorporated into the process much more swiftly.

Not least, as a finalizing observation, a nice to have feature in automated decision-making processes involves incorporating a technical algorithm for determining a suitable offer. This serves

to lessen the absence of human interaction by replacing counselling with behavioral mapping, based on various factors, including the customer's relationship history or customer's input regarding anticipated future conduct.

Conclusion

This research sought to add value to the actual state of knowledge by addressing a specific gap, providing valuable insights into the perceived customer experience, especially in the context of digitalization within banking services. This effort contributes to a deeper understanding of user perspectives, potentially influencing strategies, policies, or further research direction in the field of digital banking services, with a focus on automated decision-making processes.

Data analyzed suggests that implementation of automated decision-making processes has a significant impact on the overall customer experience with digital services. Customers clearly value efficient processes as they contribute to shaping a positive perception. The findings also revealed that customers' interactions are positively impacted on efficiency, leading to improved satisfaction with the overall experience.

The author's contribution lies in the creation of the questionnaire, chosen as the research method, setting its objectives, distribution and analysis of collected data. Also, the author's input extends to the formulation of recommendations concerning key elements that should be considered in digital transformation, when implementing the automation of processes and decisions, applicable within the Romanian banking system.

The limitation of the present study consists of a limited number of respondents, which raises the issue of statistical significance of the sample. Moreover, the distribution based on demographic data may not necessarily mirror the same values as those of the general population.

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