The Impact of Artificial Intelligence on the Banking and Financial Sector's Strategic Decision-Making.

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Dissertation written under the supervision of professor

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Abstract

Title: The Impact of Artificial Intelligence on the Banking and Financial Sector's Strategic Decision-Making.

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This dissertation explores the impact of Artificial Intelligence (AI) on decision-making processes within the banking and financial sector. The investigation delves into the potential of AI, its existing constraints, and the imperative human skills and considerations for its integration.

This research collected data from 15 in-depth qualitative interviews, after which resulted numerous findings. Evidence shows that AI has an influential role in reshaping decision-making in the banking industry by addressing operational efficiencies and redefining the roles within the sector. Moreover, it is noticeable AI's dual impact on streamlining operations and boosting human strategic knowledge by allowing people to focus more on challenging tasks instead of routine and repetitive chores. While data suggests AI's instrumental role in data analysis and process automation, also underscores the complementary collaboration between humans and AI, since the technology serves as a supportive tool rather than a replacement.

Further, the research also identifies technological constraints, data limitations, and ethical considerations as critical challenges in AI implementation, emphasizing the need for transparent communication, quality data, and AI-focused education for professionals. Some of the highlighted ethical and regulatory challenges include privacy concerns, data bias and veracity, and accountability, which shape the evolving landscape of decision-making in the industry.

According to the findings, the future outlook of AI in the banking and financial sector delves into the integration of both human expertise and AI capabilities as the optimal approach for maximizing benefits. New skillsets will emerge and grant a faster evolution and effective collaboration.

Keywords: Artificial Intelligence, Banking and Financial Sector, AI Implementation, AI-Human Collaboration, Strategic Decision-Making, Transformation of Banking and Finance

Sumário

Título: O Impacto da Inteligência Artificial na Tomada de Decisão Estratégica do Setor Bancário e Financeiro.
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Esta dissertação explora o impacto da Inteligência Artificial (IA) nos processos de tomada de decisão do sector bancário e financeiro. A investigação examina o potencial da IA, os seus constrangimentos atuais e o papel imperativo das competências humanas e considerações para a sua integração.

A investigação recolheu dados de 15 entrevistas qualitativas, após as quais resultam várias conclusões. Os dados recolhidos demonstram que a IA tem um papel preponderante na reformulação do processo de tomada de decisões, abordando eficiências operacionais e redefinindo funções no sector. É notório o duplo impacto da IA na performance das operações e potenciamento do conhecimento estratégico humano, permitindo que as pessoas se concentrem mais em tarefas desafiantes. Embora os dados apresentem a IA como transformadora na análise de dados e automatização de processos, é enfatizada a colaboração entre humanos e a IA.

A pesquisa também identifica restrições tecnológicas, limitações de dados e considerações éticas como desafios críticos na implementação da IA, revelando a necessidade de transparência, dados de qualidade e educação focada em IA para profissionais. Alguns dos desafios destacados incluem preocupações com privacidade, parcialidade e veracidade dos dados e responsabilidade, os quais moldam o cenário em constante evolução da tomada de decisões no setor.

De acordo com os resultados, as perspetivas futuras da IA no setor bancário e financeiro aprofundam a colaboração entre a experiência humana e as capacidades de IA, surgindo como a abordagem ideal para maximizar benefícios. Deste modo, surgem novas competências que garantirão uma evolução mais rápida e uma colaboração eficaz.

Palavras-chave: Inteligência Artificial, Setor Bancário e Financeiro, Implementação da IA, Colaboração IA-Humano, Tomada de Decisão Estratégica, Evolução do Setor Bancário e Financeiro

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To all those who have played a part, my sincere appreciation extends to each of you. This dissertation marks the completion of a wonderful achievement, and I am profoundly thankful for the journey taken to get here.

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List of Abbreviations

AI – Artificial Intelligence

ML – Machine Learning

NL – Neural Networks

DL – Deep Learning

Gen AI – Generative Artificial Intelligence

NLP – Natural Language Processing

LLM – Large Language Model

GPT - Generative Pre-Trained Transformer

1. Introduction

In the midst of Artificial Intelligence (AI) being a prevalent and widely discussed topic among policymakers, business leaders, and scientists, the core focus of contemporary AI scholarship lies in understanding the instances and methods through which machines display intelligent behaviors (Nilsson, 1998).

William Henry Gates III, widely known as "Bill" Gates and the co-founder of the software giant Microsoft, recently published on his personal blog "GatesNotes" the following sentence: "Artificial Intelligence is as revolutionary as mobile phones and the Internet." (Gates, 2023). According to the business leader, we are entering the age of AI, and this technology has the enormous potential to enhance productivity and decision-making processes. In a nutshell, it is expected that AI will enable the creation of a "personal assistant" that will both improve people's work on the tasks they want to do and free them from the ones they don't want to do (Gates, 2023).

AI encompasses a diverse array of technologies showcasing intelligent behaviors, ranging from self-awareness, goal formulation, and goal-directed action to reasoning, optimization, learning, and autonomous movements (von Krogh et al., 2023).

In today's rapidly evolving business landscape, the banking and financial industry has to keep up with the pace to obtain competitive edge and continuously create substantial value. As mentioned by Harvard Business Review, AI has been transforming our previous notion that the use of technology should only be restricted to statistical analysis and search (Olenick & Xemsky, 2023). According to the authors, the age of AI is inevitable, and companies should welcome the "newest strategy team member" which has the ability to solve complex problems and enhance human's creativity (Olenick & Xemsky, 2023).

Despite extensive conceptional research, there is still a lack of clear understanding on how AI technologies in the banking and the financial sector have been applied in companies today and how they could be applied in the future prospect. For that reason, there is a growing interest in AI applications within the financial sector, remaining a significant gap to understand how the technology has been impacting the industry, both positively and negatively. In addition, it is noteworthy to understand the way AI is shaping the outlook on human's role, as well as how AI-human collaboration can successfully be implemented.

This research focuses on understanding the practical impact AI technology has on the banking and financial sector nowadays and what factors foster or challenge implementation of

AI in organizations. In light of the described developments, the study aims to contribute to the growing body of literature in this area by answering the main research questions:

- What is the impact of AI on the quality of strategic decision-making in the banking and financial industry?
- How can the banking and financial industry effectively leverage both human and AI capabilities?

The structure of this dissertation relies on an academic research, starting by researching extant literature about the broad concept of AI and its opportunities and limitations. Further, the review covers the area of the banking and financial industry, specifically how the sector has been evolving and adapting in the domain of technological transformation. Finally, the literature review finishes with one of the primordial areas of investigation, which is the collaboration between AI and the financial sector.

The thesis proceeds in explaining the methodology, describing the sampling strategy and the data collection and data analysis procedures. Then, the interview results are presented in the findings section and later discussed by connecting the insights to the revised literature. Moreover, research limitations, managerial relevance, theoretical contributions, and potential future research areas are also identified. To finalize this research, it ends with a conclusion encompassing the key takeaways.

2. Literature Review

This section aims to provide a synthesis of the main insights from reviewing the literature of AI and the banking and financial sector, as well as to explore the intersection between AI and the banking industry for effective collaboration. This section encompasses research papers retrieved from reputable sources, including peer-reviewed articles, mostly top rated, and some industry reports. The search engine majorly employed was Google Scholar, focusing on key words such as “AI”, “Digital Transformation”, “Banking” and “Financial sector”.

In order to provide an appropriate theoretical frame for this study, this section begins with a broad explanation and definition of AI, delving into its multifaceted dimensions and elucidating the core business applications that form the basis of AI and drawbacks that may be associated with it. The literature review further entails an in-depth examination of the banking and financial sector, encompassing mainly its digital transformation and influencing constraints in the contemporary landscape. The central goal of this literature review is to understand the impact of AI in the banking and financial sector, as well as its collaboration.

The relevant literature was critically reviewed and organized in order to identify research gaps and locate this research, complementing the existing field of study and ensuring its novelty and significance.

2.1 Artificial Intelligence

According to the emeritus Stanford Professor John McCarthy, AI was defined as “the science and engineering of making intelligent machines” (McCarthy, 1955). It consists of two fundamental notions: “First it involves studying human brains like how their thought process works and secondly it helps representing those processes” (Kaur et al, 2020, p. 577).

Since then, AI has suffered countless technological advancements, comprising algorithmic breakthroughs, benefits of digitalization in the form of inexpensive data collection and handling, open-sourcing of key technologies, and access to cloud-based services (Bleier et al., 2020; von Krogh, 2018). Notably, this evolution has led to a massive growth in the adoption of AI in various industries and, consequently, to significant improvements in productivity and operational business functions (Bouschery et al., 2023).

More recently, AI technology has been defined as a branch of computer science which creates and develops machines that can mimic human behavior and it comprises various subfields that were developed throughout the years each having its own unique characteristics (Purohit, 2023). Firstly, Machine Learning (ML) is a subset inside of AI that uses algorithms to learn patterns and relationships from data in order to provide predictions or decisions such as image and speech recognition, natural language processing and recommendation systems (Caprasi, 2023). Moreover, ML demonstrates how computer agents can "improve their perception, knowledge, thinking, or actions based on experience or data" (Manning, 2020). Within ML technology, Neural Networks (NN) "mimic" the way that biological neurons signal to one another and are described as the core of deep learning algorithms (DL) which are mostly applied in complex real-world problems, such as facial recognition or online language translation (Caprasi, 2023). Among all the different categories, Generative AI (Gen AI), a subset of DL, is one of the most recent types of AI and can be differentiated by the fact that it is able to generate different types of content based on learning from the existing content. Lastly, Large Language Models (LLM) are a form of Natural Language Processing (NLP) that provides the ability of generating human-like content only based on patterns found of textual data during its training process (Caprasi, 2023).

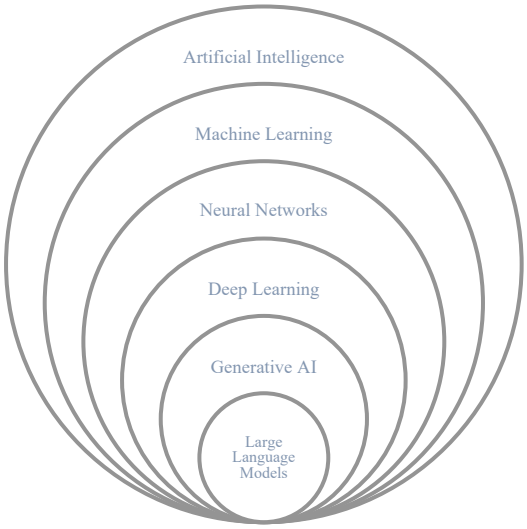

Figure 1: Relationship between AI and its subfields.

Source: own illustration.

Gen AI has drawn substantial research attention in recent years, having the ability to generate a diverse array of content, encompassing images, videos, audio, text, and 3D models. Recent breakthroughs in the field, exemplified by innovations like the Generative Pre-trained Transformer (GPT), a transformer based LLM, have significantly pushed the boundaries of Gen AI's capabilities. Therefore, this kind of technology has not only achieved human-like language understanding skills (Zhang et al., 2021), but also accomplished an intuitive approach of user interaction based on natural language (Bouschery et al., 2023). However, experts agree that this technology will take several more years to mature and achieve the desired level of accuracy (Shrestha et al., 2019).

In terms of expressed concerns, the continued advancement of AI towards superintelligence may pose risks to humanity, as a society, in general, and we are still in the

process of comprehending numerous ethical and economic considerations tied to this technology and its effect on human life, culture, sustainability and technological transformation (Duan et al., 2019; Pappas et al., 2018).

In regard to the power front-runners driving the advancement of AI, the global superpowers of US and China are heavily focused on the race for technology supremacy (Dwivedi et al., 2021).

The overall sentiment shared over AI is reported in McKinsey & Company's article regarding the future of organizations and its uncertainty, in which global executives reported the fear of being left behind on automation and digitization (Durth et al., 2023). Notably, the article remarks the fact that people's mindset and broad view on AI's capabilities and limitations is fundamental: "[the technology] requires experimentation and iteration. There is no time to sit back and learn from others' mistakes." (Durth et al., 2023, p. 8). According to the same research, this technology is expected to have a prominent impact on organizations and the economy over the next decade, since it is accessible and ubiquitous (Durth et al., 2023).

It is expected that AI enables automation of up to 70 percent of business activities, throughout almost all businesses, between today and 2030, adding trillions of dollars in value to the global economy (Durth et al., 2023). Hence, it will possibly transform radically how people work and require a new approach from organizations to "keep up" (Durth et al., 2023), as AI adoption triggers interrelated substitution and complementation dynamics, turning traditional capabilities obsolete and creating new sources of competitive advantage (Krakowski et al., 2022).

2.1.1 Benefits and business opportunities related to AI implementation

In today's fast-paced world, AI technological age is disrupting and astonishing due to the fact that it offers the transformative potential for the augmentation and potential replacement of human activities within a wide range of industrial, intellectual, and social applications (Dwivedi et al., 2021). Applications of AI can include sectors such as finance, healthcare, manufacturing, retail, supply chain or logistics (Dwivedi et al., 2021). In addition, studies have shown that the implementation of this kind of technology for different purposes may enable high annual savings (Dwivedi et al., 2021). For instance, using AI in the form of chatbots for customer service applications is expected to realize annual savings of $439m globally by 2023, up from $7m in 2019 (Juniper Research, 2019). Thus, a great amount of technology giants, like Amazon and Walmart, have been investing in AI for demand forecasting and supply chain

fulfillment. It is likely that other firms will probably also increase their investment in AI in response to the competition of the leaders (Dwivedi et al., 2021).

Organizations are increasingly using AI-based visualization tools to analyze and process complex heterogeneous big data. More specifically, extant literature provides multiple examples and applications on how AI can augment decision-making in distinct domains. First, AI centric technologies are able to monitor and control processes in real time, which increases efficiency over manual processes (Jain & Mosier, 1992; Zhong et al., 2017a). Second, in areas like education and information, a study analyzed the potential of AI within education, proving AI can improve teacher effectiveness and student engagement (Chaudhri et al., 2013). Third, applications in healthcare are also promising, because AI has the potential to provide greater levels of speed and accuracy (Dreyer & Allen, 2018; Kahn, 2017). Fourth, regarding data and information, there are numerous benefits from applying AI to big data problems and significant value in analytic insight and predictive capability for a number of scenarios (Rubik & Jabs, 2018).

Furthermore, AI can also be implemented to explore problem spaces through efficient text summarization, conveying the most important aspects and meaning of the original text. A prominent illustration of this ability is the GPT-3 tool that allows organizations to apply human knowledge in fundamental tasks other than data extraction to overcome problems of myopic search. Additionally, sentiment analysis and insight generation are further capabilities that transformer-based language models are well-equipped to handle, such as extracting the overall sentiment of online communities over a product or service (Bouschery et al., 2023).

AI assures fast, accurate, repeatable, and low-cost decisions, combined with quality approaching human-like intelligence, such as, for example, credit risk predictions in the banking industry (Shrestha et al., 2019). It is estimated that by 2030, 70% of businesses will probably have adopted some type of AI technology within their processes, due to opportunities such as increasing organization effectiveness, enhancing modelling explicability or developing a greater understanding of the real impact of decision-making within the organization (Bughin et al., 2018).

2.1.2 Challenges and concerns related to AI implementation

Although the implementation of AI in business processes may bring numerous opportunities and empower leaders, “they [leaders] must be clear about the risks it may pose

and anticipate potential responses; its's the only way to maintain trust with and among employees, investors, and customers." (Boehm, 2022; as cited in Durth et al., 2023, p. 5).

The World Economic Forum (WEF) predicts that a reasonable percentage of jobs can be impacted by AI. Specifically, about 20% of existing UK jobs could suffer with the economic impact of this type of technologies (Dwivedi et al., 2021). However, this impact does not necessarily translate into the loss of human jobs. Various studies examined the consequences of this profound displacement, envisioning a transformed job market, steering humans towards more creative and cognitive roles further up the value chain, in support of AI technologies (DIN & DKE, 2018; Jonsson & Svensson, 2016; as cited in Dwivedi et al., 2021).

As the business applications of AI evolve and its use becomes more mainstream, diverse concerns arise, which can be grouped in the following scopes: social; economic; ethical; political, legal, and policy-related; organizational and managerial; data-related; and technological (Dwivedi et al., 2021). Social challenges may include cultural barriers, unrealistic expectations towards AI and insufficient knowledge on the values of the technology. Economic challenges may encompass the affordability of the required investments or the lack of profit. There is also a concern related to the lack of trust in AI decision-making and the unethical use of the shared data and moral dilemmas, which represent some of the ethical challenges. Additionally, it is important to mention that the quantity/quality of input data and its transparency may present data challenges. Finally, the threat of human workforce replacement, lack of strategy, and organizational resistance to change pose a great impact in organizations and management teams (Dwivedi et al., 2021).

Several of the most important limitations practitioners and scholars need to take into account are that there is a risk that AI is misled into altering decision outcomes either through the manipulation or design of data. AI-based decisions can also possibly amplify human biases in available data, being crucial to understand in what ways human and algorithmic decision making can be effectively merged to achieve the best of each approach and enable better decisions (Shrestha et al., 2019).

It is fundamental to highlight that these limitations do not render those technologies useless, but rather remind us that AI should not be trusted blindly. Moreover, along with the speed of transformation in this area, numerous academic researchers highlight their optimism "that future generations of language models will mitigate at least some of the limitations of current state-of-the-art models" (Bouschery et al., 2023, p.150).

2.2 Banking & Financial sector

The banking and financial sector is the primary foundation of financial services, entailing the processes by which the consumers or businesses acquire financial goods. Notably, it represents one of the economy's most important and influential sectors since the stability of these systems holds a pivotal place in the prospect of future growth and long-term sustainability, according to the International Monetary Fund (IMF).

The banking system's overarching responsibility within the broader economy and society is to safeguard the stability and sustainability of the economic framework (Ntarmah et al., 2019). On one side, the banking industry is directly related with saving and lending, whose services can be offered by large commercial banks, community banks, credit unions, among others. On the other side, the financial services sector involves investments, insurance, the redistribution of risk, and other financial activities (Catalano, 2023).

2.2.1 The industry transformation and evolution

Along with the rapid development of technology and globalization, the banking and financial industry is shifting faster than ever and leading to a "digital economy". As the emeritus professor Walter Brenner stated about this phenomenon, "The aggressive use of data is transforming business models, facilitating new products and services, creating new processes, generating greater utility, and ushering in a new culture of management" (Brenner; as cited in Deloitte, 2017). Some of the major causes are the changing habits of consumers, demanding new methods to use financial services, as well as the highly competitive market with the burst of technology and Fintech[1] companies, forcing businesses to face digitalization as a matter of urgency to remain relevant and keep their competitive advantage (Cuesta et al., 2015).

Several AI technologies have been applied in financial fields, such as core banking, operational performance, and customer support and analytics, allowing for increased penetration of the system, increased cost effectiveness and fast growth of the industry (Kaur et al., 2020). Technological advancements in the realm of banking services, alongside the burgeoning financial technology industry, have acted as compelling catalysts for financial systems. The entirety of these transformations is occurring with a clear guideline: improving or maintaining profitability levels (Cuesta et al., 2015).

[1] Complex system that unites sectors of new technologies, banking, financial and other services, new business projects using technical innovations (startups) and the corresponding infrastructure (Maslennikov and Fedotova, 2017).

One of the major widespread factors leading the transformation of the banking and financial industry is AI (Kaur et al., 2020). The industry is investing in this technology in an innovative way, such as using algorithms to generate accurate results, which boosts customer service and helps to increase sales performance and profits. Numerous enhancements are also evident in how communication, customer support, recruitment, and asset management are evolving within the financial sector. Presently, activities such as stock investing and finance heavily rely on technical expertise and an element of chance. However, looking ahead, with the aid of integration of sentiment analysis, crowd-sourced data, and advanced algorithms, the banking and financial sector's management is expected to be achieved in a much different way (Kaur et al., 2020).

The AI technology not only has the potential to automate the decision-making processes inside the banking and financial industry, but also to achieve augmentation (Tsindeliani et al., 2022). Notably, augmentation is differentiated by enhancing the quality or value of a process. AI potentially strengthens the resilience and adaptability in the face of external influences, while maintaining the momentum of structural transformations and fostering a competitive environment (Tsindeliani et al., 2022). Hence, the pace of digital transformation requires the prompt development of strategic development documents, target programs, comprehensive legal regulation of innovative financial products and services and the introduction of new mechanisms for the implementation of state powers (Tsindeliani et al., 2022).

2.3 Collaboration between AI and the Banking & Financial sector

Organizational decision making, defined as "rational decision making [based on] the process of selecting the alternative that is expected to result in the most preferred outcome" (Shrestha, 2019, p. 66) is a cornerstone concern in every organization since those can be viewed as a "network of decisions" (Shrestha, 2019).

Extant literature expresses that AI can empower people but only if leaders take a broad view of its capabilities and deeply consider its implications for the organization. Thus, various studies argue that it is important to demystify AI for all collaborators, identify high-impact use cases, and commit to building the necessary roles, skills, and capabilities - now and in the future (Durth et al., 2023).

To create an effective collaboration between the banking and financial sector and AI technology, the literature suggests a set of five contingency factors related to the type of

decision-making processes: the specificity of the decision search space, the interpretability of the decision-making process and outcomes, the size of the alternative set, decision-making speed, and the replicability of decisions (Shrestha et al., 2019). Considering these factors, organizations can understand the best structure for each situation, such as full human to AI delegation, hybrid-human-to-AI, AI-to-human-sequential, and even aggregated human-AI decision making (Shrestha et al., 2019).

To explore the dynamics of complementation and substitution referred previously, a study provided a controlled setting for studying cognitive capabilities and competitive interactions. The experiment led to the conclusion that AI substitutes humans' traditional domain-related cognitive capabilities with machines' abundant computational capabilities and eradicates the extant sources of competitive advantage. However, it instantaneously empowers complementation when humans use previously domain-unrelated cognitive capabilities to augment machines' capabilities and creates new persistent sources of competitive advantage (Krakowski et al., 2022).

The effective utilization of technology has a compounding impact on the growth and progress of banks (Kaur et al., 2020). Consequently, the introduction of AI has led to an increased attraction of customers, contributing to the further expansion of banks (Kaur et al., 2020). Notably, the application of AI in the banking sector extends beyond retail services since the back and middle offices of investment banking and various financial management functions are also reaping the benefits of AI advancements (Kaur et al., 2020).

The banking and financial institutions can build an empowered workforce by using AI, because these technologies have the power to augment employee experience, empower middle managers, prompt senior leaders to lead differently, and help organizations reinvent their talent management practices, which consequently has a great impact on strategic decision-making (Durth et al., 2023).

The review of literature shows the relevance of investigating the context of AI and human collaboration, since there is still a research gap and “dedicated theories that can explain and design collaborative ideation and problem-solving by humans and AI” (Bouschery et al., 2023, p.150).

3. Methodology

The determination of the empirical method to adopt is contingent on the research goal (Saunders et al., 2016). This decision-making process typically entails selecting among quantitative, qualitative, or a mixed-methods approach. For the purpose of this dissertation, qualitative research based on semi-structured interviews is the adopted method. This method allows for studying "human experiences and realities from the subject's perspective" and is commonly designed as an iterative process, in which the main findings emerge subsequently to the data collection (Palmer & Bolderston, 2006). The aim is to identify key themes and patterns in the data, which later can be employed to explain the phenomenon under investigation and answer the research questions (Sandelowski, 2000).

Qualitative research is renowned for its ability to offer an in-depth exploration of complex and innovative phenomena (Palmer & Bolderston, 2006). In the context of the relatively recent and groundbreaking topic of AI's impact on the strategy of the banking and financial sector, qualitative methods provide a valuable approach to uncover nuanced insights and context-specific information. Prior literature demonstrated several perspectives on AI, most of which share a common belief that this is an uncertain and recent technology with an undefined "potential roadmap [in which the] decisions made within the next few years on the forward path for AI are likely to have an impact on all our lives and the lives of future generations" (Dwivedi et al., 2021, p.42).

The chosen method of research allows for flexibility and adaptability, making it particularly well-suited for studying dynamic and evolving subjects, such as the integration of AI in the banking and financial sector, by providing a holistic view. For this reason, it is beneficial to understand the essence of the organizational experience.

Examining social construction processes implies a concentration on how organizational members engage in constructing and comprehending their experiences, emphasizing the methods employed rather than quantifying the number or frequency of measurable occurrences (Gioia et al., 2013). Such an approach would majorly rely on understanding and capturing the perspectives and opinions of participants directly involved in or affected by AI strategies in the banking and financial sector, with the aid of "observations, interviews, and supplemental material provided by industry experts" (Bouschery et al., 2023, p. 151).

While qualitative research offers valuable insights into the intricate and nuanced aspects of a phenomenon, it is essential to acknowledge certain limitations when juxtaposed with

quantitative research. Some of these drawbacks include subjectivity, since it majorly relies on the interpretation of researchers and participants, as well as data analysis and measurement complexity in the absence of standardized procedures. Besides, qualitative methods are based on smaller sample sizes with limited generalizability to a broader population, being subject to the criticism that "it does not adequately justify its assertions, leading to some troubling skepticism about whether qualitative researchers are engaging in creative theorizing on the basis of rather thin evidence" (Gioia et al., 2013, p. 18).

3.1 Sample Strategy

Considering the objective of this study, the researcher chose a sample consisting of experts with solid knowledge and experience working with AI within the banking and financial industry. Several perspectives and multifaceted roles are included, such as AI experts, data analysts, business translators, AI engineers and heads of AI teams (Appendix 1 includes further information on interviewees). Gathering insights from a diverse array of experts in the field is paramount to comprehensively understand the complex impact of AI on the banking and financial sector. AI experts bring unparalleled knowledge into the technical intricacies of AI applications, offering a deep understanding of how artificial intelligence shapes strategic decisions in the banking and financial sector. Data analysts contribute with perspectives on the practical implementation of AI, translating raw data into actionable insights and shedding light on the challenges and opportunities in data-driven decision-making processes. Business translators bridge the gap between technical intricacies and strategic business decisions, ensuring that the potential of AI is effectively harnessed in alignment with organizational goals. AI engineers offer hands-on experience in implementing AI solutions, shedding light on the practical challenges and successes in deploying these technologies. Lastly, insights from heads of AI teams provide a strategic viewpoint, showcasing the overarching organizational strategies and the role of AI in shaping the competitive landscape. Together, the amalgamation of these expert perspectives promises a holistic understanding on how the technology is reshaping the strategies and decision-making processes within the banking and financial sector.

In regards of the assembly of the sample of informants, this study employs a purposive strategy based on several criteria. The individual criteria includes their domain expertise, professional experience, organizational roles, educational background, type of banking/financial organization, and thought leadership, so that the quality and relevance of insights is assured. First, domain expertise refers to the substantial knowledge and experience

in AI in the strategic field of the banking and financial industry. Then, all the interview participants range from 1-20 years of practice in the business, so that the sample includes a vast array of insights and different mindsets, being this a very recent topic in the banking and financial industry. A various collection of organizational roles was preferred in order to provide a more holistic standpoint on the topic. In terms of educational background, the selection of informants ranges from diverse viewpoints, such as computer science, industrial engineering and management, data science, finance, or business administration. Finally, the selection includes participants from different banking and financial institutions recognized for having thought leadership in their domain of expertise, since this type of selection delivers robust insights.

The search tactics included leveraging the researcher's own professional network and utilizing LinkedIn connections, university affiliations and internship colleagues, using a convenient sample to find the first interviewees. After that, the adoption of snowball sampling method enabled the researcher to expand the selection and get a well-curated sample of participants who have relevant expertise for this research study, by contacting suggestions of potential participants made by initial interviewees.

The sample of informants consists of 15 experts. Although the number of interviewees is limited given to time and resource constraints, several patterns were notorious. Common experiences and opinions were repeatedly mentioned in the interviews, pointing to theoretical saturation in some relevant categories.

3.2 Data Collection

This research is based on semi-structured interviews, which combines a pre-determined set of open questions accompanied by follow-up why or how questions and gives the opportunity to explore particular themes or responses further (Adams, 2015). This approach allows for "obtain[ing] both retrospective and real-time accounts by those people experiencing the phenomenon of theoretical interest", and consequently increase the engagement of the informants (Gioia et al., 2013, p. 19).

The interviews were conducted face-to-face, when possible, to increase transparency and to make the informants feel as comfortable and safe as possible. However, videoconferencing was adopted when it was the most convenient and cost-effective alternative, by using the application of Zoom. The average duration of the interviews was between 30-40 minutes and all of them were recorded and transcribed with the aid of the Sonix application.

The interview protocol structure is presented as follows, covering five sections, each considering important topics that can further help to understand the impact of AI in the banking and financial sector (Appendix 2 includes further information on the interview protocol).

- Background and Role: Participants were asked about their role and responsibilities in the banking and financial sector and their involvement and experience with AI.
- AI in Banking and Finance: Participants were asked about the specific areas or functions in their organizations where AI has been incorporated into decision-making processes. Additionally, insights were sought regarding the motivations and the tangible benefits derived from the integration of AI in decision-making, prompting them to share specific experiences and instances.
- Decision-Making and AI Impact: Participants were prompted to recount instances where AI played a role in decision-making and to elaborate on the outcomes of such situations. Furthermore, participants were asked to reflect on AI´s impact in those situations, encouraging them to provide detailed descriptions of the instances.
- Challenges and Ethical Considerations: Participants were inquired about challenges and limitations encountered in projects involving AI. Specifically, they were asked to elucidate on the obstacles faced during their involvement, as well as ethical considerations involving AI's integration into decision-making processes.
- Future Outlook and Recommendations: To conclude, informants were asked to provide their foresight on how AI is expected to shape decision-making processes in the banking and financial sector. Additionally, insights were sought regarding recommendations or best practices for adapting organizational structures to effectively incorporate AI in strategic decision-making processes, as well as any other information they thought was relevant.

3.3 Data Analysis

The approach chosen to analyze the data collected through the semi-structured interviews was the one developed and reported by Gioia et al. (2013). Gioia's inductive approach aims to express concepts pertinent to the human organizational experience in language that is both meaningful to those undergoing the experience and suitable for scientific theorizing about that experience.

The systematic inductive approach is embedded in theory developed by qualitative data (Glaser & Strauss, 1967; Lincoln & Guba, 1985; Strauss & Corbin, 1998; as cited in Gioia et al., 2013), which is able to deliver "deep and rich theoretical descriptions of the contexts within

which organizational phenomena occur" (Gioia et al., 2013, pp. 16-17). The eventual grounded theory model aims to illustrate the dynamic relationships among emerging concepts that either describe or elucidate the phenomenon of interest. It also strives to explicitly demonstrate all pertinent connections between data and theory, addressing the common concern that qualitative research may sometimes lack clarity in showcasing the relationship between data and theory (Gioia et al., 2013).

The first stage (open coding) of the systematic approach involves breaking down the data into smaller units based on content, deriving first-order concepts directly from participants' wording, to ensure that the "knowledgeable agents" truthfully capture the phenomenon of interest and the informants' experience (Gioia et al., 2013, p. 17). The second step (axial coding) requires assembling the constellation of concepts in the data structure. Consequently, the relationships between first-order concepts are grouped into broader categories, allowing for the identification of patterns and dynamic relationships among concepts (Gioia et al., 2013). The final step (selective coding) serves to synthesize second-order themes into aggregated dimensions, representing the researcher's interpretation of the data in a more abstract manner (Gioia et al., 2013).

The systematic approach is particularly well-suited for examining data obtained through inductive research, directly addressing the general critique of a perceived "lack of qualitative rigor" and that it does not adequately justify its statements, "leading to some troubling skepticism about whether qualitative researchers are engaging in creative theorizing on the basis of rather thin evidence" (Gioia et al., 2013, p. 16). Hence, this inductive systematic approach offers a distinct and comprehensive conceptual framework for conducting thematic analyses of qualitative research data and providing a deep understanding of the organizational experience and processes (Gioia et al., 2013). The procedures described not only help organize the data, but also increase the rigor and transparency of the research (Gioia et al., 2013), which help to explore the impact of AI on the strategic decision-making within the banking and financial industry.

4. Findings

Considering all 15 interviews, the data analysis allows to identify numerous patterns and key insights that emerge from the collection of informants' experiences and testimonies.

The following table showcases and structures the main findings starting by the first order concepts, which were selected based on their relevance to discuss the role of AI on strategic decision-making within the banking and financial industry. The results tackle topics such as experiences working with AI, the areas in which the technology is mostly implemented, motivations and benefits of the implementation of AI, challenges and limitations, the impact of AI on strategic decision-making and outlook on the development and implementation of AI within the banking and financial sector.

Table 1: Systematic inductive analysis of the interviews based on Gioia et al. (2013).

1st Order Concepts	2nd Order Themes	Aggregated Dimensions
"From my years in the United States, if it doesn't make dollars, it does not make sense. If you've ever heard that. Yes, it sounds very crude, but it is the reality." (RB)	AI projects involve a robust investment	1. A thorough planning and business case is key for the implementation of AI in the banking and financial sector
"It is much more costly than people think to have these implementations. So, you can't just go and buy AI and implement it. And we will all be millionaires tomorrow. It doesn't work like that." (RG)		
"It is not just in the sense of generating revenue, it can be to save a lot of money by realizing that there are things you don't have to do, it's okay. This has high costs at the scale of a bank." (HV)		
"The projects involving AI always have a significant phase of investment." (LC)		
"It requires a high upfront cost for training and setup." (MC)		
"I think it's a matter of discipline and maturity when it comes to assessing the business cases. You need to have real use cases, and you need to define the business case where you need to make sure that there is a consensus that the benefits are greater than the investment." (PT)	Developing a solid business case is essential for the success of AI implementation	
"You need to think of what's the return on investment. So, make sure you have a solid business case behind you at all times at. The industry changes quite quickly." (RB)		
"There's always tests running using a control group. And then we can see how much uplift we get by the recommendation and how to maximize the ROI." (MP)		
"You have to look at the use cases right and see how much this is going to deliver and what's the probability of success." (CM)		
"We work from the perspective of use cases, that is, to estimate a priori, what can be the results that you will achieve?" (HV)		
"The business cases are always fundamental to make an assessment in terms of the return (…) to ensure at a high level that it is concretely the most suitable digital solution for the process or for the proposal." (LC)		
"We can do everything as long as it can be represented by Y equals the function of X, the possibilities are endless. The planning and use cases are one of the most important phases." (AS)		
"We have a preparatory phase to understand business maturity, where we try to organize everything and define more or less our goals and what we will be able to achieve." (GM)		
"Use cases are one of the most important steps and focus on customer knowledge, experience, value, operational workflow improvement, risk and compliance." (MG)		
"Business cases are very important, since they allow to understand problems, validate technical feasibility, and align with processes. They also serve as proof of value to reduce uncertainties and confirm ROI." (NC)		

“We use AI to help with prediction and patterns by sentiment analysis. So, to predict who's going to buy what, and therefore we can offer a financial product to a client based on what he's been asking before and the history of the product.” (FG)	Benefits of AI usage in the banking and financial sector on prediction and identification of patterns	2. AI offers numerous opportunities to create value and streamline operations in the banking and financial sector
“It includes risk scoring, pricing, conversion probability or churn prediction.” (MG)		
“It allows faster and easier tracking of changes and patterns.” (CM)		
“It can help predict and simplify some complex equations where you would need to do lots of simulation.” (MP)		
“You will have cost savings because you spend less time on alerts that are not relevant, but you spend more time on the ones that are relevant.” (PT)	Benefits of AI usage in the banking and financial sector on data processing and efficiency in decision-making	
“AI should help us to summarize, retrieve, transform information in a way which is much faster than what we have known until now. So, it means that we should be able to take decisions a lot faster.” (PT)		
“Applications are found across domains, with data extraction for operations a key contributor to the number of use cases.” (MC)		
“The goal is to facilitate and to help analyze very long documents, cybersecurity and fraud detection.” (PB)		
“Helps reading documentation, whether it is necessary to extract information or scan the documentation to obtain structured data." (LC)		
“(…) analysis and produce reports on those documents and we're trying to use AI to optimize that big process.” (GM)		
“AI creates efficiency and a better performance for the business, precisely. (…) saving people's time and also earning that edge.” (AS)		
“It has the ability to process more information, such as when it analyzes financial markets to decide which exchanges to do or not.” (NN)		
“AI improves credit process optimization, fraud detection, as well as speeds up the decision-making process making it more transparent.” (RB)		
“It helps on the efficiency of sales and trading.” (AS)		
“We have more than 130 projects with NLP being the biggest enabler.” (MC)	Enhanced benefits through the usage of NLP in the banking and financial sector	
“One of the biggest use of AI for us the in global market is NLP and the reason why we have this team initially in the first place.” (FG)		
“We work a lot with NLP which is basically the task of understanding and structure text, like messages or emails coming from traders to clients or from clients to traders to interpret such.” (AS)		
“NLP is essentially used for projects in order to understand and classify text in documents.” (GM)		
“LLM is the new paradigm for NLP and an accelerator of innovation in the bank.” (NC)		
“NLP’s potential for financial products is enormous: question answering, summarization and classification, content generation, data driven analysis and coding assistant.” (RG)		

“Data is a very precious asset. There are a lot of rules to properly manage and protect the data.” (PT)	Difficulty of accessing consistent and robust data	3. Overcoming challenges in AI implementation: data consistency and model integration
“Sometimes, the data isn't as high-quality and is less accurate, not giving the certainty you wanted.” (HV)		
“That's a problem of lack of accuracy and security in the data.” (PB)		
“It always depends on the quality and consistency of the data. As we work with the financial market, it comes with a lot of uncertainty.” (AS)		
“We have to be careful about data security and compliance.” (GM)		
“In the past and even still today, some of the challenges are in general linked to the industrialization. Meaning how you take your model and embed it into the ecosystem of your company in order to make it work on an industrial scale.” (PT)	Difficulty of AI integration in the company’s ecosystem	
“It's not like you have like a magic algorithm in AI that you're able to see and to know when to buy and when to sell, and instantly become a billionaire.” (FG)		
“There’s also the risk of data leakage and protection of personal data when using LLMs.” (MC)	Ethical concerns of AI implementation	4. Unraveling ethical and bias challenges: privacy concerns, veracity, bias recognition, and regulation
“It’s crucial to keep in mind that there’s no guarantee on answer’s veracity, risking the company’s image." (RG)		
“We have to take into consideration financial inclusion. Some models we actually do need to keep this in mind. Is there human bias inherent in it?” (RB)		
“(...) privacy issues, you can't handle data that isn't consented. So you often have to work with harmonized data.” (MP)		
“Be careful when accessing data. What is the best way to interpret data in a way that is not going to wrongfully impact people.” (AS)		
“I'm saying it's very possible to find bias in everything done by a human. It's processing what is already an input out there, which is not objective.” (FG)	Bias concerns of AI implementation	
“After capturing information, it has to be validated by a human before any final output, there is not 100% trust.” (LC)		
“It's necessary to be very careful when using the models because of hallucination problems, etc.” (HV)		
“Obviously there’s the topic of biases and discrimination that lead to false responses in decision-making.” (RB)		
“There is already a European concern to regulate the concerns regarding AI, such as the AI ACT, so I think it will become a non-issue, because all the solutions will try to compensate.” (NN)	Tackling regulation when applying new technologies	
“We are limited due to regulations which makes it more difficult to transition to AI.” (GM)		

“In the first years I believe it was a matter of culture and maturity of the company to adopt the new technologies.” (PT)	The organization’s culture and mindset have a prominent role on the implementation of AI	5. Urgency of awareness for effective AI-human collaboration and to overcome drawbacks
“You can´t just change the mindset of all the people in one bank for tomorrow, that’s not possible.” (HV)		
“There has to be a change of mindset and demystification to mitigate some resistances. We need to increase awareness, almost like a new person is joining the team.” (LC)		
“People have had to adapt their skill sets to use such new technologies.” (AS)		
“It is necessary to do a lot of work behind the scenes. There's a lot of people supporting the infrastructure, and that turns out to be one of the biggest concerns that should be taken into account in the implementation.” (GM)		
“For me, the key thing to start with is culture. And in order for you to have the culture for AI or for any kind of new technology, you do need to try it.” (MP)		
“I think it also has a little bit to do with the AI literacy that people have, and I think it's important for us to also explain that we don't sell, we produce solutions.” (NN)		
“We should introduce people to AI right from the start. Then, along the way, highlight several times the importance that these people have in the development and that the technical solution is only as good as the quality of information and guidelines that people provide.” (RG)		
“Gen AI component may have come to help here a little bit in that explicability component. And you can ask AI why it classified something in that category, and it gives an interpretation of it.” (NN)	Effective collaboration through overcoming explicability challenges of AI systems	
“One of the areas of interest for us right now is explicability in AI because we can make some very complex and very precise models, but the fact is that you need to explain why to humans.” (RB)		
“Explicability is extremely important to us when dealing with AI.” (HV)		
“People think that the technology is going to solve all the issues, but the technology is just a means.” (PT)	AI doesn’t work as a substitute but as a complement to human’s efforts	6. Transitioning to new skills sets and evolving with the aid of AI
“The information that AI can provide you with can help a lot in decision-making. I think it's more of an access to information than a persuasion to decision.” (NN)		
“We are very far from a machine model surpassing human performance. AI can´t be autonomous.” (AS)		
“AI doesn´t replace but it´s very complementary. Some jobs will be replaced by bringing efficiency to improve the processes.” (MC)		
“So for me it's complementary of course in most of the cases.” (RB)		
“You need people to train the model. The best thing about AI is actually you need to understand how it works to know when you should apply it.” (NC)		
“My idea is to complement people's work, some jobs that people have, which are repetitive and boring.” (PB)		
“The most important thing is to know when humans should come in and take the lead. There’s still a lot of limitations in AI working alone on decision-making.” (HV)		

“I always think of AI as a complement never a substitute. There is always that human part that we have to pay attention to.” (GM)		
“AI should be used on the premise of helping people to do a job that's more challenging. Components such as the critical component, creativity, and human interaction are uniquely human. And I think people should also do these kinds of tasks and not only routine tasks.” (NN)	AI enables human distinctiveness by allowing to focus on more challenging tasks	
“You spend less time on tasks that are not relevant, but you spend more time on the ones that are relevant.” (PT)		
“The major motivations are to spare valuable time and to stop doing tasks that don’t require creativity and human knowledge.” (PB)		
“There’s a lot of tasks that AI can do when there is not human knowledge required, allowing humans to focus on something more strategic.” (LC)		
“AI creates another type of jobs, so it’s a cycle.” (MP)		
“Enables to do strategic work that delivers more value.” (MG)		
“There’s always easier tasks where AI can help.” (CM)		
“The future of AI in the industry promises a better service and performance.” (NC)	AI is expected to revolutionize the way decision-making is done in the industry	7. Evolution and rapidly adaptation of AI: embracing its potential in the decision-making of the banking and financial sector
“It has the potential to change the strategy in two ways. The first in the access to information to make decisions and the second in the elaboration of Beyond Banking packages.” (NN)		
“We are investing on the latest technology to the Bank, including Gen AI, due to the revolutionary prospects.” (MG)		
“AI has already transformed many businesses. It is revolutionary just as phones, internet, or the calculator.” (MC)		
“In my opinion, AI has the potential to change about 80% of the operations in a bank, helping on decision-making.” (LC)		
“AI will be a key differentiator in the future, so we need to invest in internal competencies.” (RG)	Addressing the AI knowledge gap through education	
“The potential is huge. Then it's a matter of how well we are going to be able to use it and leverage on it.” (PT)		
“The larger the scale, the greater the savings.” (NC)	AI’s potential to boost revenues, lower costs and reduce risks	
“For me, AI is going to boost the financial industry in 3 aspects: boost revenues, lower costs and reduce risks.” (MP)		

4.1 A thorough planning and business case is key for the implementation of AI in the banking and financial sector

In the dynamic landscape of the banking and financial sector, the implementation emerges as a strategic tool. Nevertheless, the interviews with the experts underscore a common thread: the paramount importance of planning and reliable use cases for the successful integration of AI in decision-making processes.

In essence, the results accentuate that AI demand meticulous planning, disciplined assessment of use cases, and a strategic alignment of AI initiatives with overarching organizational goals, rather than having a one-size-fits-all-solution for the banking and financial sector. These insights collectively clarify the path forward, underscoring that success in the AI journey is intricately tied to the precision and forethought exercised in the planning and business case formulation stages.

One of the recurrent challenges mentioned by the professionals is the necessity to ensure a compelling return on investment (ROI) before embarking on AI initiatives. The financial sector is defined as still being relatively conservative and having stringent criteria: “(…) if it doesn´t make dollars, it does not make sense.” (RB). Hence, the calculus of a sound business case becomes the cornerstone for decision-makers, directing investments toward endeavors that demonstrate sharp financial viability.

Acknowledging the high upfront costs for training, setup, implementation and maintenance, interviewees caution to strike a balance between generating revenue and optimizing operational efficiency. Participants shared the sentiment that AI investments extend beyond revenue creation, encompassing strategic cost savings and operational enhancements, as HV explains: “It is not just in the sense of generating revenue; it can be to save a lot of money by realizing that there are things you don't have to do” (HV).

Furthermore, several critical aspects in assessing business cases were highlighted, such as discipline and maturity. For instance, the importance of using established principles, procedures, and policies to guide a project from conception through completion, as well as the company's ability to spearhead successful projects were highlighted. Thus, real use cases, solid consensus on benefits outweighing investments, and a dynamic understanding of industry changes are paramount. To this point, PT stated that “I think it's a matter of discipline and maturity when it comes to assessing the business cases. You need to have real use cases, and you need to define the business case where you need to make sure that there is a consensus that the benefits are greater than the investment.”.

4.2 AI offers numerous opportunities to create value and streamline operations in the banking and financial sector

The next category of findings illuminates the profound impact of AI in revolutionizing operational efficiency and decision-making processes in the banking and financial industry. Across numerous domains and applications, AI offers a myriad of opportunities to create substantial value.

The overarching topic resonates with the belief that AI should expedite handling of information, empowering faster decision-making, which is demonstrated by the statement "AI should help us to summarize, retrieve, transform information in a way which is much faster than what we have known until now." (PT). From easing the analysis of extensive documents to enhancing cybersecurity and fraud detection, AI shows versatility with data extraction emerging as a linchpin across diverse use cases in the banking and financial industry. Experts also highlight that AI aids in reading and extracting documentation, subsequently transforming unstructured data into valuable insights.

In the realm of financial markets, AI is recognized by its predictive capabilities, leveraging sentiment analysis to forecast consumer behavior. To this point, FG stated "We use AI to help with prediction and patterns by sentiment analysis.". Then, the predictive expertise extends to risk scoring, pricing strategies, conversion probability, and churn prediction. It is also worth mentioning that AI contributes to cost savings by prioritizing relevant alerts and minimizing time spent on non-fundamental missions.

NLP arises as a pivotal element in the banking and financial industry's landscape, "One of the biggest usage of AI for us the in global market is NLP." (FG), serving as a key tool for understanding and structuring text. The integration of NLP and its latest iteration, LLMs, accelerates innovation within the sector. The applications of NLP range from interpreting trader-client communications to automating coding tasks. Hence, NLP's potential in financial products is vast, encompassing question answering, summarization, classification, content generation, and data-driven analysis.

The efficiency gains reached through AI are not restricted to specific areas; instead, professionals highlight AI's ability to process vast amounts of data, for instance in analyzing financial markets to inform strategic decisions. In sum, experts affirm that AI is not merely a technological addition but a transformative force. For instance, "AI creates efficiency and a better performance for the business, precisely. (…) saving people's time and also earning that edge." (AS).

4.3 Overcoming challenges in AI implementation: data consistency and model integration

Navigating the intricacies of AI implementation in the banking and financial sector emphasizes challenges related to data consistency and model integration. Notably, interviewees voiced their efforts and the critical importance of overcoming these hurdles to unlock the full potential of AI technologies. Overall, experts collectively echo the need for meticulous data management, stringent security measures, and a pragmatic approach to the industrialization of AI. It is through overcoming these challenges that the potential of AI can be fully exploited, paving the way for the creation of value within the financial landscape.

A recurrent topic referred by the experts is the value of data as a precious asset, underscoring the foundational role that the quality of data plays in AI projects, “Data is a very precious asset. There are a lot of rules to properly manage and protect the data.” (PT). Nonetheless, limitations arise when the data’s quality and accuracy fall short, leading to uncertainties in decision-making processes, as emphasized by one of the interviewees, “Sometimes, the data isn't as high-quality and is less accurate, not giving the certainty you wanted.” (HV). Further, AI implementation demands attention to data security and compliance, reflecting the industry’s commitment to upholding stringent standards in handling sensitive financial information.

Integrating AI models into the ecosystem of a financial institution for seamless, industrial-scale operation becomes a complex endeavor: “Some of the challenges are in general linked to the industrialization. Meaning how you take your model and embed it into the ecosystem of your company in order to make it work on an industrial scale.” (PT). The expectation of an algorithm capable of instant financial success is dispelled by another of the experts, “It's not like you have like a magic algorithm in AI that you're able to see and to know when to buy and when to sell, and instantly become a billionaire.” (FG). Thus, the expert highlights the realistic consideration that AI requires a nuanced approach that acknowledges all the complexities and uncertainties characteristic of the banking and the financial sector.

4.4 Unraveling ethical and bias challenges: privacy concerns, veracity, bias recognition and regulation

Evidence collected shows that the incorporation of AI in the banking and financial industry also brings ethical intricacies and biases. For instance, ensuring the reliability and accuracy of AI outputs is a challenge, acknowledging that the consequences of inaccuracies can

extend beyond operational realms to impact the company's reputation: “It’s crucial to keep in mind that there’s no guarantee on answer’s veracity, risking the company’s image.” (RG).

Moreover, privacy concerns take center stage in the ethical discussion surrounding AI, since the industry has to ensure data consent and harmonization in order to protect individuals’ privacy. To this point, AS stated “Be careful when accessing data. What is the best way to interpret data in a way that is not going to wrongfully impact people.”. The cautious approach to AI model usage extends to the need to interpret data in a manner that boosts financial inclusion and avoids wrongful impacts on individuals. This concern reflects a conscientious effort to mitigate unintended consequences arising from AI-driven decisions.

The recognition of bias, whether generated by AI algorithms or by human inputs, is a focal point. Hence, this recognition asserts the necessity to address both known and inadvertent bias, within AI systems, “I'm saying it's very possible to find bias in everything done by a human. It's processing what is already an input out there, which is not objective.” (FG). Thereby, the need for human validation is emphasized, acknowledging that full trust in AI outputs may not be attainable which reflects the recognition of the limits of AI autonomy.

In terms of regulation, regulatory frameworks are seen as instrumental in mitigating ethical challenges and fostering responsible AI deployment. Despite the transformative potential of AI, regulatory constraints pose challenges, "We are limited due to regulations which makes it more difficult to transition to AI." (GM). Thus, the banking and financial industry is faced with the need to balance between harnessing the benefits of AI and complying with evolving regulatory standards.

4.5 Urgency of awareness for effective AI-human collaboration and to overcome drawbacks

The importance of fostering awareness for effective AI-human collaboration is evident from the insights shared by industry professionals. In the initial phases of AI initiatives, the cultural and organizational maturity play a pivotal role in embracing new technologies, being demonstrated that rapid changes of mindset across an entire institution are often a complex endeavor.

Overcoming resistance and fostering awareness are recognized as essential steps in mitigating drawbacks associated with AI implementation, since cultivating an environment that embraces AI and other emerging technologies is highly significant. According to LC, "There

has to be a change of mindset and demystification to mitigate some resistances. We need to increase awareness, almost like a new person is joining the team".

Furthermore, experts state the relevance of skill adaptation and new skill sets development to leverage new technologies effectively. Behind-the-scenes efforts are also noted, “It is necessary to do a lot of work behind the scenes. There's a lot of people supporting the infrastructure, and that turns out to be one of the biggest concerns that should be taken into account in the implementation” (GM).

AI literacy is noted as fundamental, emphasizing the importance of human involvement in AI development, experts stress that technical solutions are only as effective as the quality of information and guidelines provided by humans. In regard to explicability of AI initiatives, it becomes a key area of interest, highlighting the industry’s commitment to making AI models understandable and interpretable to users. To that matter, RB affirmed “One of the areas of interest for us right now is explicability in AI because we can make some very complex and very precise models, but the fact is that you need to explain why to humans.”. With the advent of Gen AI, experts recognize the potential of this technology to enhance explicability in AI systems within the banking and financial industry. In this way, industry professionals are actively working towards creating a collaborative and informed environment for the successful integration of AI in the banking and financial sector.

4.6 Transitioning to new skillsets and evolving with the aid of AI

There seems to be a consensus among experts in the banking and financial sector regarding the role of AI as a complement rather than a substitute for human capabilities. PT stated, "People think that the technology is going to solve all the issues, but the technology is just a mean". AI is recognized as a tool that enhances access to information for better decision-making, emphasizing the collaborative nature of AI-human interaction, “The information that AI can provide you with can help a lot in decision-making. I think it's more of an access to information than a persuasion to decision.” (NN).

Notably, the complementary role of AI in human efforts, leans particularly towards tasks that are repetitive and mundane, and therefore, don’t require deep strategic thinking: "AI doesn't replace but it's very complementary. Some jobs will be replaced by bringing efficiency to improve the processes." (MC). Moreover, complementarity is echoed across various perspectives, emphasizing the need for an understanding of when and how AI should be applied.

One of the biggest advantages of the human-AI collaboration is sparing valuable time and automating routine tasks, allowing humans to focus on more strategic and creative features of their work and not wasting talent. This aligns with the idea that AI should be applied to handle tasks that don't require extensive human knowledge, freeing up time for more critical and creative endeavors: "The major motivations are to spare valuable time and to stop doing tasks that don't require creativity and human knowledge" (PB).

Finally, AI demonstrates impact in the banking and financial sector not just in terms of task automation but also in creating new types of jobs and enabling human strategic work that delivers greater value. Hence, the synergy between AI and humans' capabilities is crucial for achieving optimal outcomes, ensuring that AI is employed in areas where it complements and leverages the strengths of human skills instead of completely replacing the human touch.

4.7 Evolution and rapidly adaptation of AI: embracing its potential in the decision-making of the banking and financial sector

The final category of findings encompasses the general future outlook, in the eyes of the industry experts. The overall sentiment signals a profound belief in the evolutionary potential of AI and its rapid adaptation to reshape decision-making: "The future of AI in the industry promises a better service and performance" (NC). According to NN, AI has the potential to change the industry's strategy by enhancing access to information and introducing innovative packages. AI's outlook is painted as particularly shaping the future of decision-making processes in the banking and financial sector and being a key differentiator. The industry's investment in AI technologies underlines its position as a catalyst for positive change across various facets of the financial domain.

Investment in cutting-edge technology, including Gen AI, is seen as paramount for groundbreaking progress. The potential of AI to significantly impact operations is underscored by experts: "In my opinion, AI has the potential to change about 80% of the operations in a bank, helping on decision-making" (LC).

In addition, experts discuss an outlook signaling AI as a key differentiator for the future, prompting the need for strategic investments in internal competencies: "AI will be a key differentiator in the future, so we need to invest in internal competencies" (RG). Thus, there seems to be a consensus among interviewees that the potential of AI is contingent on how effectively it is leveraged. The anticipated benefits of AI adoption extend beyond financial institutions, with the expectancy that AI will boost revenues, lower costs, and reduce risks.

5. Discussion

5.1. Theoretical and managerial contributions

Comparisons of both the literature review and the results of this research reveal not only confirmations of prior research but also new perspectives, shedding light on the evolving and dynamic nature of the banking and financial sector. This study delves into how the existing environment adapts to the fast-paced shifts in the decision-making landscape, specifically AI related.

The significance of a meticulous planning process and a robust use case resonates with existing literature. Dwivedi et al., (2021), emphasize that economic challenges may encompass the affordability of the required investments or the lack of profit. The prerequisites for the successful incorporation of AI in the banking and financial domain include a well-defined planning phase that helps to justify and predict the return on investment (ROI) and, consequently, overcoming the economic challenges of the conservative industry. Hence, the literature provides a theoretical foundation that echoes with the practical insights garnered from the interviews with industry experts, collectively emphasizing the pivotal role of strategic planning and well-defined business cases in optimizing the outcomes of AI initiatives in this sector. However, an important new insight is the complex nature of AI projects. For instance, AI implementations extend beyond revenue creation, which highlights the need for discipline and maturity when considering the use cases. Then, the research offers new perspectives on the importance of guidance in a project, the company's ability to forefront successful projects and, consequently, the evaluation of benefits outweighing investments.

Concerning the multifaceted value proposition that AI introduces to the banking and financial sector, it aligns with existing literature that underscores the potential of AI technology in financial services. As stated in extant literature, technological advancements, particularly in the financial technology sector, have been instrumental in reshaping financial systems, with a primary focus on enhancing or sustaining profitability levels (Cuesta et al., 2015). Shrestha et al. (2019) further reinforce this notion by emphasizing AI's role in credit risk predictions, exemplifying its contribution to operational efficiency in banking. Additionally, Rubik & Jabs (2028) refer benefits from applying AI to big data problems and significant value in analytic insight and predictive capability for a number of scenarios. Thus, the findings from this research confirm the literature, wherein AI is recognized for its ability to facilitate fast, efficient, and cost-effective decision-making processes. Bouschery et al. (2023) recognizes AI's potential in

tasks such as text summarization, sentiment analysis, and insight generation, converging the findings from the current study and the literature review. In regards of new perspectives, the research conducted offers a consensus on the potential of AI to be a tool for banking and financial companies when it comes to earn competitive advantage. Moreover, the investigation highlights the crucial role of NLP, specifically, when it comes to understand and structure data.

Furthermore, the identification of challenges related to data consistency and model integration in AI implementation reverberates with existing literature associated with the intricate landscape of AI adoption. Dwivedi et al. (2021) stress the importance of data quantity, quality, and transparency as key factors in overcoming limitations. Besides, the same research highlights concerns associated with AI implementation into various scopes, including social, economic, data-related, and technological dimensions. This finding aligns with the current study's observation that effective integration of AI models in the banking and financial sector is contingent upon addressing issues related to data consistency. Still, the research provides richness when it acknowledges the difficulty of industrialization of AI projects, as there are several complexities and uncertainties characteristic of the banking and the financial sector. From a managerial perspective, these findings reinforce the nuanced approach that business managers should adopt to overcome all the challenges and implement AI in the ecosystem of decision-making processes.

The recognition of ethical and bias challenges within the implementation of AI in the banking and financial sector poses as the fourth finding. According to Dwivedi et al. (2021), the finding resonates since concerns related to the advancement of AI and its potential risks are emphasized, especially as society grapples with ethical considerations tied to technology's impact on various aspects of human life. There is a need for a comprehensive understanding of the ethical implications of AI and the broader societal impact (Pappas et al., 2018; Duan et al., 2019). Privacy concerns and the ethical use of shared data emerge as significant challenges, in line with the current discussion of concerns related to trust in AI decision-making and potential ethical dilemmas. Shrestha et al. (2019) contribute by cautioning against the risks of AI being misled through data manipulation and design, while also addressing the possibility of AI amplifying human biases in decision-making. Hence, the necessity of careful consideration and regulation in the banking and financial sector, stated by Tsindeliani et al. (2022), resonates with the findings from the qualitative interviews. Further, the study provides the new and important concept of financial inclusion in AI-driven decisions, which indicates that individuals and businesses must have access to useful and affordable financial AI products and services that

meet their needs, delivered in a responsible and sustainable way. These findings are instrumental for managers who are implementing or planning to implement AI in their decision-making processes, since they need to be aware of these ethical and bias challenges to ensure that the strategies are aligned with the guidelines and can adapt to possible future endeavors.

In terms of the fifth finding, the imperative for awareness and effective collaboration between AI and humans resonates with extant literature. McKinsey & Company's explored the sentiment shared by global executives, fearing the consequences of being left behind in the rapidly evolving landscape of AI (Durth et al., 2023). Aligning with this urgency, it is fundamental for leaders to be clear about the risks posed by AI and to anticipate potential responses to maintain trust with employees, investors, and customers (Boehm, 2022). As mentioned by industry experts in the in-depth interviews, the importance of demystifying AI for all collaborators, fostering a comprehensive understanding of its capabilities and implications is key. Then, committing to building necessary roles, skills, and capabilities emerge as critical steps for effective AI integration and collaboration (Durth et al., 2023; Bughin et al., 2018), which reinforces the need for awareness and proactive engagement to navigate the challenges and opportunities presented by AI in the banking and financial sector. The study also proves a richer picture when it comes to the explicability of AI projects, since they need to be understandable and interpretable to humans.

Further to the next findings, extant literature emphasizes the radical transformation AI brings to the nature of work, demanding a novel organizational approach to keep pace with these changes. As AI adoption triggers a complex interplay of substitution and complementation dynamics, traditional capabilities become obsolete while new sources of competitive advantage emerge (Krakowski et al., 2022). The same authors state that while AI may substitute traditional cognitive capabilities in specific domains, eradicating existing sources of competitive advantage, it simultaneously empowers complementarity. This complementarity arises when humans leverage their domain-unrelated cognitive capabilities to augment and enhance the capabilities of machines, creating new sources of competitive advantage. The study's findings align with this dual impact of AI, promoting collaborative synergy between AI and human capabilities. Still, the findings presented a novel insight where AI indirectly promotes strategic thinking by freeing up professionals from repetitive and routine tasks. This suggests that business leaders should invest in AI not only to increase operational efficiency but also to foster more innovative strategic decision-making processes in the banking and the financial sector.

Finally, results accentuate the rapid evolution of AI, particularly in the decision-making processes of the banking and the financial sector. As Tsindeliani et al. (2022) mention that AI not only can automate decision-making processes within the future outlook in the industry but also achieve augmentation and fostering competitiveness. According to Cuesta et al. (2015), technological advancements in banking services, coupled with the growth of the financial technology industry, serve as potent catalysts for transformative shifts in financial systems. It is predicted a widespread adoption of AI technology by businesses (Bughin et al., 2018), resonating with the optimistic outlook by the interview experts. Finally, AI is anticipated to exert a profound impact on organizations and the economy, necessitating a radical transformation in how people work and compelling organizations to adopt new approaches to keep pace (Durth et al., 2023). The study findings resonate with this affirmations, emphasizing the pivotal role of AI in reshaping decision-making processes within the banking and financial sector. Still, the research goes further by highlighting the need for humans to develop new competencies to remain relevant in the banking and financial industry. Moreover, new insights highlight the importance of investing in cutting-edge technology, including Gen AI. For business management, this finding underlines the importance of fostering continuous learning and adaptability in the teams.

Figure 2, presented below, introduces a conceptual framework delineating the impact of AI on strategic decision-making within the financial sector. It encompasses four key dimensions: organizational, performance, environment and individual. Through conducting the qualitative interviews with industry experts, this figure offers valuable prospects into the nuanced application of AI, providing a comprehensive guide and future outlook on the impact of AI for decision-makers in the financial sector. The framework offers a holistic view of the disruptive changes, fostering awareness and thoughtful consideration of AI's role. Moreover, the framework aids in foreseeing challenges and future potential of AI adoption, contributing to conscientious decision-making and to the transformation of organizational culture. To ensure embracing these technological advancements with awareness of the myriad opportunities and benefits they bring to the financial sector, the framework empowers executives combining the strengths of both human expertise and AI and foster synergies.

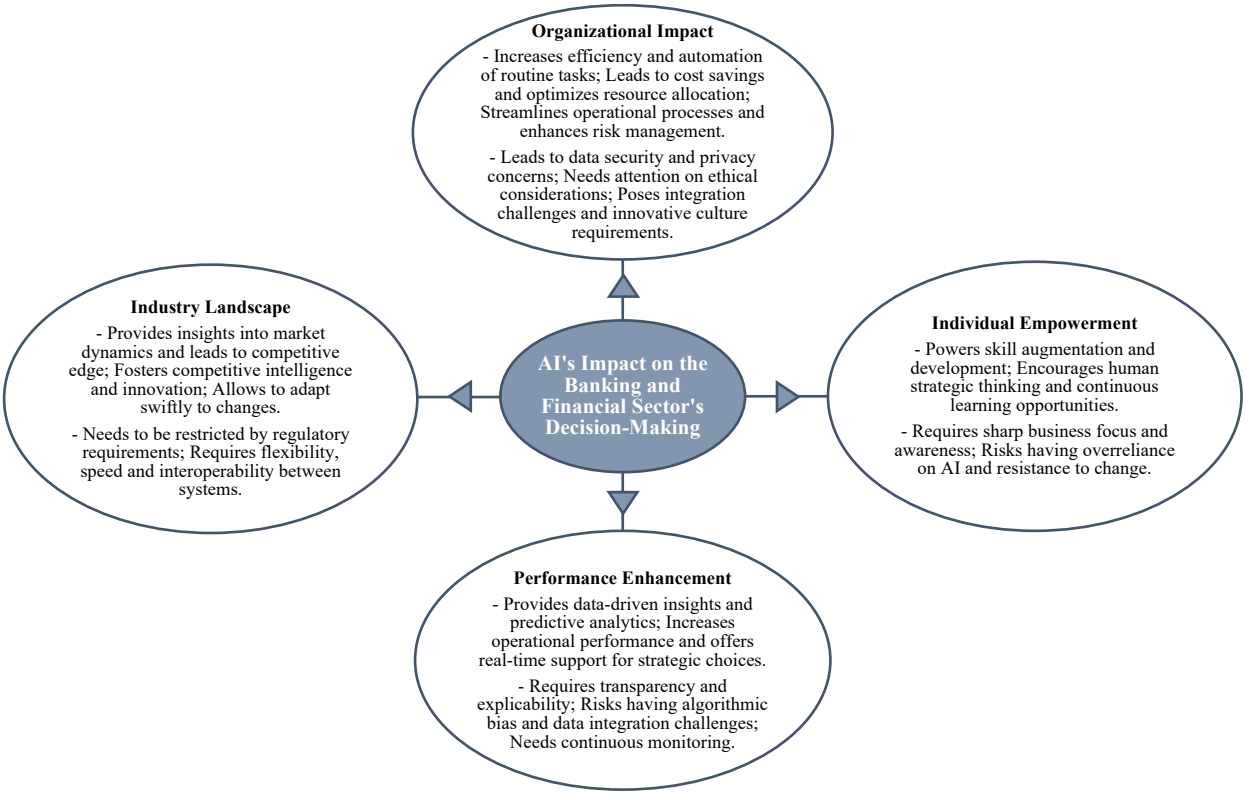

Figure 2: Framework for the impact of AI on strategic decision-making within the banking and financial sector

Source: Own illustration, based on insights from the interviews.

5.2 Limitations and further research

This research provides novelty and valuable insights into the impact of AI on strategic decision-making processes within the banking and financial industry. Nonetheless, it is paramount to acknowledge limitations and identify recommendations for future research.

Firstly, it is important to note that the subject matter of this dissertation revolves around a relatively new and rapidly evolving field. The study conducted provides a momentary snapshot of the current state and advancements of the landscape. However, given the dynamic nature of AI technology, the applicability of the study's findings may diminish over time. Therefore, it is recommended that scholars remain attuned to the advancements in order to be able to adapt to the evolving impacts of AI in the banking and financial sector.

Additionally, this research is based primarily on the experiences of a sample of experts in the area of AI and data within the financial sector. Despite this approach has yielded valuable insights into the present and future trends of AI integration in the sector studied, it might not encompass the perspectives of all the stakeholders involved. Hence, future research could

enhance its comprehensiveness by exploring these diverse viewpoints, offering a more holistic understanding of AI's role in the banking and financial sector.

Still related to the nature of this research, the findings obtained rely solely on a qualitative approach, specifically semi-structured interviews, and textual analysis of the collected data. Qualitative interviews allow to comprehend and explore the nascent topic of AI through an in-depth perspective of experts. However, the study would benefit from the complement of quantitative research, such as surveys and experiments, to quantify the impact of AI in the financial sector.

Due to constraints on time and resources, the research acknowledges having a limited sample size. It is important to recognize that these limitations may impact the theoretical saturation of the results, which is defined as the point in grounded theory analysis when collecting and analyzing additional data does not teach more about a certain topic. Theoretical saturation is highly relevant in qualitative methodologies and deserves further exploration to better understand its implications on the study's findings.

Furthermore, the study was conducted taking the standpoints of industry experts, so incorporating the perspectives of end-users and customers would offer a more holistic view of the AI impact. Exploring how customers perceive and interact with AI-driven services could contribute invaluable insights that not only inform the enhancement of AI systems, but also facilitate the development of customer-centric strategies, ensuring the alignment of AI advancements with user needs and preferences.

Finally, examining the educational implications of AI adoption in the banking and the financial sector presents a promising avenue for future research. The rapid integration of AI needs a deeper understanding of the skill gaps that could emerge within the workforce, as highlighted by the findings of the research. Thus, future studies could explore the most effective educational approaches and training methods that align with the evolving needs of the financial sector.

6. Conclusion

The core of this research sheds light on the complexity and potential of an emerging technology within the banking and financial sector. Although AI is powerful and transforming the financial industry, the human role remains paramount. Hence, it is required a balanced collaboration between AI's capabilities with the unique skills of human.

The investigation has unearthed nuanced findings, contemplating the indispensable role of robust planning, the collaborative synergy between AI and human capabilities, ethical considerations, and the pressing need for heightened awareness in fostering effective integration.

In regards of the collaboration between AI and humans within the sector, the technology should be viewed as a tool or assistant, not a replacement. While AI may provide power for efficiency and enhance decision-making processes, humans' strategic thinking and emotional understanding should not be undervalued. In order to achieve synergies, business leaders need to understand and address AI's limitations and potentials, being able to leverage them when deploying AI.

In a nutshell, the future prospect of AI's role in the banking and financial sector lies in the complementary integration of AI and human capabilities, the continuous adaptation of skillsets and a mindful approach. Adapting to the new landscape necessitates the evolution of skillsets and the promotion of AI literacy, equipping financial teams for the imminent AI-driven future. The fast-paced and dynamic technology, as well as the financial industry can thrive together, achieving lower costs, diminishing risks, and increasing revenues.

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Appendix

Appendix 1: Interview Participants

#	Identification of Experts	Business Position	Domain Expertise	Tenure (in years)
1	RB	Data Scientist and Manager	Data and Analytics	18
2	PT	Chief Data Officer and Head of Analytics and Digital	Data and Analytics	6
3	NN	Head of Artificial Intelligence	Artificial Intelligence	7
4	FG	Head of Global Client Analytics	Data and Analytics	20
5	LC	Artificial Intelligence Project Manager	Artificial Intelligence	8
6	HV	Business Translator	Artificial Intelligence	2
7	PB	Analyst	Artificial Intelligence	1
8	AS	Data Scientist	Data and Artificial Intelligence	3
9	GM	Artificial Intelligence and Machine Learning Engineer	Data and Artificial Intelligence	2
10	MC	Head of Artificial Intelligence Labs	Data and Artificial Intelligence	13
11	RG	Data Scientist	Data and Artificial Intelligence	15
12	NC	Head of Data Analytics and Artificial Intelligence	Data and Artificial Intelligence	16
13	MP	Data Scientist	Data and Artificial Intelligence	3
14	CM	Head of Data Analytics	Data and Analytics	19
15	MG	Data Analyst	Data and Analytics	4

Appendix 2: Semi-Structured Interview Protocol

#	Section	Questions
1	Background and Role	▪ Can you briefly describe your current role and responsibilities in the banking and financial sector? ▪ How long have you been working in this Industry? ▪ Can you please tell me how you have been involved with AI? Can I ask you to describe projects where you were involved in? What was the goal of the projects? What was your role?
2	AI in Banking and Finance	▪ What are the primary areas or functions within your organization where AI has been integrated into decision-making? ▪ From your experience in AI projects, what were the motivations to integrate Gen AI/engage with such projects? ▪ Do you feel the goals and motivations were met after the implementation? Can you provide specific examples or instances? ▪ What were the benefits resulting from the integration of AI in decision-making processes? Can you please share specific experiences?
3	Decision-Making and AI Impact	▪ How has AI affected the speed and efficiency of decision-making within the process it was implemented in your organization? Which additional changes have you observed? ▪ Could you describe situations where AI played a role in a significant decision within your organization? How did it impact the outcome?
4	Challenges and Ethical Considerations	▪ What were the challenges/limitations associated with Gen AI in projects you have been involved in? ▪ What ethical considerations do you have regarding AI's integration in decision-making processes? Are there

		processes that a more susceptible of ethical considerations than others? If so, which?
5	Future Outlook and Recommendations	▪ Looking ahead, how do you foresee AI shaping the decision-making processes in the banking and financial sector? ▪ Based on your experiences, what recommendations or best practices would you suggest in order to adapt the organizational structures to AI in strategic decision-making processes?
6	Closing Remarks	▪ Overall, and in your honest opinion, how has AI influenced the banking and financial sector's strategic decision-making processes? ▪ Is there anything else you would like to share regarding the impact of AI in the banking and financial sector's decision-making processes, or any final thoughts you'd like to convey?