ACADEMIA MILITAR

A Inteligência Artificial na Tomada de Decisão no Âmbito da Administração Militar

Aspirante de Administração Militar José Manuel Mendes Oliveira

Dissertação de Mestrado

Ciências Militares na Especialidade de Administração

Orientador: Professor Auxiliar José Alberto de Jesus Borges

Júri:

Presidente: Professora Auxiliar Elisabete Sofia Nabais de Oliveira de Freitas e Menezes

Arguente: Professor Auxiliar Convidado Flávio Ivo Riedlinger de Magalhães

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Diretor de Curso**:** Major de Administração Militar Hélio de Jesus Branco Corguinho Fernandes

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EPIGRAPH

"Civilization advances by extending the number of operations we can perform without thinking about them."

Alfred North Whitehead

DEDICATORY

To my fiancée, family, and friends.

ACKNOWLEDGMENTS

The end of this five-year initial training cycle for officers in the permanent ranks of the Military Administration Service, materialized in this master's thesis, evokes a deep sense of gratitude. It has been an enriching journey, marked by the support of people who have been essential at different times.

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I am deeply grateful to all those who contributed, directly or indirectly, to this research, which has culminated in my training at the Military Academy.

My sincerest thanks,

José Manuel Mendes Oliveira

ABSTRACT

This dissertation investigates the impact of Artificial Intelligence on decision-making within the Military Administration, focusing on its influence on management processes, specific applications for the Defense Sector, and the role of Large Language Models in decision support. Based on a Systematic Literature Review and complemented by interviews with military and private sector experts, the research shows that AI profoundly redefines how organizations operate and make decisions.

The results indicate that Artificial Intelligence optimizes operational efficiency and competitiveness by automating routine and complex tasks, allowing human resources to focus on activities of greater strategic value. In the context of the Military Administration, Artificial Intelligence is proving crucial for optimizing administrative processes, such as budget management and document preparation. It has a growing role in decision support systems and field operations through autonomous and semi-autonomous systems. Large Language Models, in particular, demonstrate the ability to simplify the creation of complex documents, summarize information, and analyze large volumes of data, providing insights that support more informed and accurate decisions.

However, the implementation of Artificial Intelligence is not without significant challenges. These include the need to qualify and train Human Resources with new digital and critical skills, managing ethical issues such as the impact on employment, human dignity, and data privacy, and mitigating risks associated with information security and model bias. Technological infrastructure, especially the choice of on-premise solutions in the defense sector, requires considerable investment and the definition of usage control policies to prevent risks. Change management is a critical factor in the successful adoption of Artificial Intelligence, and it is essential to involve users from the start of the process. In conclusion, the positive impact of Artificial Intelligence on the Military Administration will depend on a balanced approach, combining technological innovation with prudent risk management and valuing human judgment.

Keywords: Artificial Intelligence, Decision Making, Military Administration, Management

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LIST OF ABBREVIATIONS, ACRONYMS, AND ACRONYMS

AI - Artificial Intelligence

ANN - Artificial Neural Networks

DL - Deep Learning

DQ - Derived Question

DT - Digital Transformation

GO - General Objective

GPT - Generative Pre-Trained Transformer

HR - Human Resources

HRC - Human Robot Collaboration

HRM - Human Resources Management

IoT - Internet of Things

LLM – Large Language Model

ML - Machine Learning

PRISMA - Preferred Reporting Items for Systematic Reviews and Meta-Analyses

RPA - Robotic Process Automation

SLR - Systematic Literature Review

SO - Specific Objective

SQ - Starting Question

INTRODUCTION

The emergence and integration of emerging technologies in different sectors are tracing a profound development in how society relates and interacts. At the forefront of this transformation are technologies such as Artificial Intelligence (AI), the Internet of Things (IoT) and Big Data analysis, which provide a new range of opportunities for innovation and even a revolution in modernizing operations and improving human capabilities in the various industries (Brem et al., 2023).

AI encompasses a range of disruptive technologies that reconfigure various aspects of individuals, companies, and even society. These technologies take advantage of the widespread use of digital computing devices and the emergence of large volumes of data, thus providing significant opportunities for society at various levels (Dwivedi et al., 2023).

As mentioned above, AI impacts various sectors, and its integration with Big Data has revolutionized traditional practices (Ayinde et al., 2023). For example, in finance, there are already AI algorithms capable of analyzing market trends for more informed investment decisions, while in education, it is possible to create learning platforms adapted to students' needs. This integration allows for more informed decision-making, increasing efficiency and improving results, providing solutions through the vast volume of data in this digital age (Aldoseri et al., 2024).

Thus, the General Objective (GO) of this research aims to study the impact of Artificial Intelligence on decision-making within the Military Administration. After defining the GO, the following Starting Question (SQ) was developed: What are the impacts of Artificial Intelligence on decision-making within the Military Administration?

Following the fulfillment of the GO of this research, the following Specific Objectives (SO) and the respective Derived Questions (DQ) emerged:

- SO1 – Understand how Artificial Intelligence influences management processes.
- SO2 – Understand how Artificial Intelligence can be applied in the Defense Sector.
- SO3 – Study how Artificial Intelligence Linguistic Models can help the Decision-Making Process.
- DQ1 – How does Artificial Intelligence influence management processes?

- DQ2 – How can Artificial Intelligence be applied in the Defense Sector?
- DQ3 – How can Artificial Intelligence Language Models help in the decision-making process?

To better analyze this study's general objective, a Systematic Literature Review (SLR) using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol was conducted.

This research has the following structure: Chapter 1 presents the literature review, explaining the fundamental concepts of the subject under study. Chapter 2 presents the methodology used in this research. Chapter 3 presents the methods and materials used in the study. Chapter 4 presents the results of the Systematic Literature Review. Chapter 5 discusses the results obtained in the previous chapter and the results obtained through fieldwork. Finally, the Conclusions present the theoretical implications of the study, as well as the limitations and suggestions for future research.

CHAPTER 1 - LITERATURE REVIEW

1.1 Emerging Technologies

Following the development of emerging technologies, the Industry 5.0 revolution has begun, replacing Industry 4.0, with the primary objective of establishing sustainable and ecological work experiences and services, while promoting collaboration between humans, robots, and digital systems to achieve an intelligent environment (Sindhwani et al., 2022). Emerging technologies that reinforce this revolution include the IoT, AI, and Big Data analysis (Wamba et al., 2024).

The IoT is a technology, without human interference, growing with the arrival of the digitalization era, capable of connecting various devices for communication anywhere and at any time (Bothra et al., 2023). The IoT consists of embedded computer systems that collect and exchange data via the internet to achieve specific goals (Ulas, 2019). Integrating various technologies and communication solutions can provide an interaction that identifies and tracks the data collected (Urbinati et al., 2022). Consequently, the IoT appears to be a promising tool for solving other problems and helping to digitize processes (Segooa & Kalema, 2024).

AI technologies have developed as a revolutionary way of streamlining human activities and tasks, enabling the creation of effective and fast solutions to solve complex problems in organizations and thus increase productivity (Burakhanova et al., 2023). AI is designed to reflect human intelligence with algorithms using data capable of performing functions carried out by human beings (Bianchi et al., 2024). A special feature of this type of AI technology is that it constantly increases its knowledge through Machine Learning (ML) and Deep Learning (DL), providing better results over time (Bianchi et al., 2024). This automation of AI makes it possible to reduce errors, increase production, and reduce operating costs for other processes (Aji & Priyono, 2021). Other processes within organizations increasingly require tools capable of using and improving the vast amounts of data produced and collected (Correa & Frate, 2021). That said, when integrated with human intellect and creativity, AI reveals a problem-solving capacity and contributes significantly to decision-making processes (Verganti et al., 2020), through real-time communication by this set of technologies (Al-Edenat, 2021).

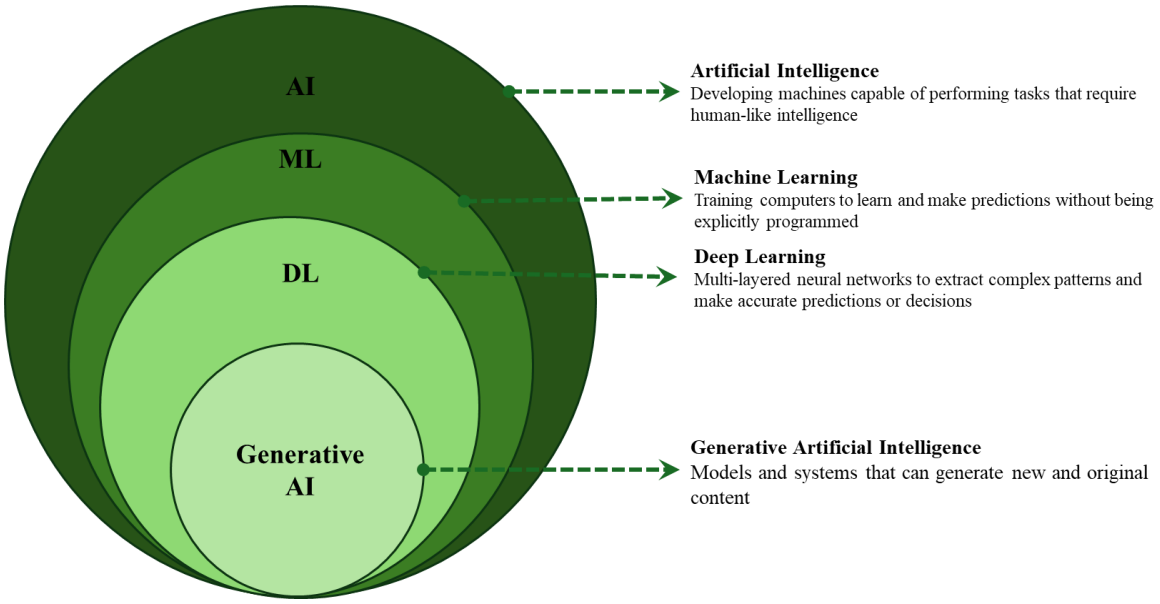

Figure 1 - Comparative view of AI, ML, DL, and Generative AI

Source: Adapted from Zhuhadar & Lytras (2023)

As mentioned earlier, AI includes other fundamental features such as ML, this concept is based on the autonomous training of algorithms in which an abundance of data feeds this tool, training itself through multiple iterations, resulting in an improvement of the algorithms with the passage of time, as well as the introduction of new data (Hajishirzi & Costa, 2021). Given the advances made over the years in computational speed and data storage, predictions made by ML-based systems are increasingly accurate and create a way for organizations to circumvent cognitive limits and discover new trends in the data collected (Warner & Wäger, 2018). The efficiency of these processes can be improved by providing ML algorithms with data from previous interactions and situations, thus allowing them to learn and make new predictions (Bianchi et al., 2024). These transformations make it possible to improve decision-making (Sobczak, 2022) and create value in business processes (Larsson & Wallin, 2020).

AI models are Artificial Neural Networks (ANN), computer systems designed in the image of biological neural networks, such as those that organize the human brain and central nervous system (Freitas et al., 2025). Structurally, ANNs comprise three layers of interconnected neurons: the input layer for receiving data, the second layer works as a learning mechanism, and the last layer generates the outputs and makes predictions (Castillo-Girones et al., 2025). This functionality helps analyze complex data and solve non-analytical problems through self-organizing capabilities (Abbas et al., 2025). An ANN's effectiveness depends on the reliability of the data used (Freitas et al., 2025).

Another concept related to Artificial Intelligence is DL, which is linked to ML and takes advantage of neural networks, through several layers that process the data received as input (Hajishirzi & Costa, 2021).

Generative AI is defined as a specific subcategory of AI that stands out for its ability to create content autonomously, such as text, images, videos, sounds, and code, by identifying patterns from existing data sets (Herold et al., 2025). As an example of unsupervised machine learning, Generative AI uses algorithms, ANN, and DL to collect and process data, generate content, inform decisions, solve problems, and perform tasks that usually require human reasoning (Kumar et al., 2025). By interpreting human commands, these systems produce diverse content and human-like responses, differentiating themselves from traditional AI, focusing more on classification, prediction, and decision-making based on predefined rules or data analysis (Salari et al., 2025).

On the other hand, Big Data analysis has played a key role in successfully implementing Digital Transformation (DT). The increasing flow of information created by this digital age is a challenge, especially in organizations where various departments must collaborate with the same data circulating between them (Segooa & Kalema, 2024). This tool can help overcome this challenge by promoting growth, performance, and competitiveness (Omar & Almaghthawi, 2020).

The transition to Industry 5.0 is a crucial milestone in technological evolution, emphasizing the importance of sustainable practices and the harmonization between human capabilities and technological innovations. This advance reflects a commitment to environmental preservation and promotes an unprecedented integration of intelligent systems in various industries, such as IoT, AI, and Big Data analysis. The convergence of these emerging technologies paves the way for significant optimizations regarding efficiency and creativity, redefining the Human Robot Collaboration (HRC) concept. Thus, Industry 5.0 not only goes beyond the paradigms established by its predecessor but also lays a solid foundation for the future of work and technological innovation, where sustainability and collaboration stand out as fundamental pillars.

1.2 Business Process Management

Business Process Management refers to managing, modeling, analyzing, and improving business processes central to an organization's functioning (Beheshti et al., 2023). This process involves the entire spectrum of organizational activities that transform inputs into

outputs, thus enabling value creation for customers and stakeholders (Beheshti et al., 2023). Therefore, analyzing management processes has always been an effort for organizations (Beheshti et al., 2023).

Business Process Management is a concept that dates back to the pre-digitalization era, in the 1990s, when other organizations aimed to make the most of their investments in information technologies and transform them into more advanced business processes and working practices (Baiyere et al., 2020). Since then, the focus of this type of Management has been predominantly internal and centered on continuous improvement in the design and redesign of individual business processes and how best to identify and develop capabilities that enable organizations to manage Business Processes ever more effectively (Brocke & Rosemann, 2010).

With the advance of digitization and digital transformation, there has been a paradigm shift in business process management, which involves incorporating activities that involve modelling business processes and supporting information technology infrastructures for process improvement (Eikebrokk et al., 2024). This set of technological innovations is often seen as an approach aimed at developing new business models based on emerging digital technologies, integrating products, services, processes, and people (Antonucci et al., 2021).

In this sense, the first efforts to achieve these new goals began with the automation of processes, in which workflow and middleware technology were used to reduce human involvement through better integration of systems and automated execution of business logic (Beheshti et al., 2023). The evolution of these technologies has made it possible to expand the focus of these processes, thus enabling the creation and maintenance of process models that can be adapted to the needs of organizations and support decision-making in real time, however, these technological advances make it increasingly important to analyze data related to the processes to discover helpful information and thus achieve the organization's objectives (Beheshti et al., 2023)

Analyzing this data allows organizations to identify business needs, determine solutions to problems, and make informed decisions. There have been significant advances in data analysis since various sources, such as integrated management systems, sensor data, and even social media, allow organizations to obtain information about their processes, thus creating new knowledge and enabling better performance (Beheshti et al., 2023).

Subsequently, as a result of other technological transformations, the view of innovation and process management shifted away from a focus on internal use, thus enabling innovation,

since it placed greater emphasis on the importance of actively managing the process in which external inputs contribute to it (Eikebrokk et al., 2024). Associated with this type of process management, a business process modeling and notation method has emerged, intending to create models and simulations of business processes, allowing possible adjustments to be assessed, thus making the use and impact of digital technologies more transparent (Seitz & Vogel-Heuser, 2020). This method has become a significant model for process modelling by organizations to create and provide an overview of their structure and operations (Fischer et al., 2020).

Automating this process has become increasingly important given the volatile and competitive environment surrounding organizations. To remain competitive, organizations feel the need to improve their efficiency, reduce costs, and increase productivity (Beheshti et al., 2023). One promising idea in this field is using Generative Artificial Intelligence, such as ChatGPT (Generative Pre-trained Transformer), to automate these processes (Beheshti et al., 2023).

CHAPTER 2 - METHODOLOGY

This chapter describes the methodology adopted in this research, a SLR, following the PRISMA guidelines. This chapter will also detail the stages of identification, selection, eligibility, and inclusion of the relevant studies to answer the starting question, "What are the impacts of Artificial Intelligence on decision-making in the Military Administration?". Table 1 concisely presents the GO, the SO, and the SQ, as well as the DQ that guided the search strategy and selection of literature.

Table 1 - Summary table of research objectives and questions

Objective	Question
GO - To study the impact of Artificial Intelligence on decision-making within the Military Administration.	**SQ -** What are the impacts of Artificial Intelligence on decision-making within the Military Administration?
SO1 - Understand how Artificial Intelligence influences management processes.	**DQ 1 -** How does Artificial Intelligence influence management processes?
SO2 - Understand how Artificial Intelligence can be applied in the Defense Sector.	**DQ 2 -** How can Artificial Intelligence be applied in the Defense Sector?
SO3 - Study how Artificial Intelligence Linguistic Models can help the Decision-Making Process.	**DQ 3 -** How can Artificial Intelligence Language Models help in the decision-making process?

2.1 Research strategy

As mentioned above, this study is based on a SLR, using PRISMA. A SLR is crucial for accurately and reliably summarizing available information, selecting empirical evidence that meets predefined eligibility criteria, and addressing specific research questions. Compared to other methods of literature analysis, a systematic review employs specific and systematic techniques to increase the reliability of the results and reduce bias (Page et al., 2021). This process involves defining clear objectives, carrying out a systematic search to identify all eligible studies, assessing the articles' quality, evaluating the validity of their results, and systematically presenting and synthesizing the characteristics and conclusions of these studies. This process occurs as follows: firstly, clear objectives are defined, followed by a systematic search to identify eligible studies, assessment of the validity of the articles, and, finally, the synthesis of the characteristics and results of the selected studies (Page et al., 2021).

With this in mind, this study was carried out in the Scopus and Web of Science databases, using the article's title, abstract, and keywords to identify peer-reviewed systematic reviews in English. The search expression used in the databases was as follows:

Table 2 - Search expression used in the databases

Keywords	Artificial Intelligence, Management
Query Scopus	(TITLE-ABS-KEY (artificial AND intelligence) OR TITLE-ABS-KEY (ai) AND TITLE-ABS-KEY (management)) AND (LIMIT-TO (DOCTYPE , "re")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (SUBJAREA , "BUSI") OR LIMIT-TO (SUBJAREA , "ECON")))
Query Web of Science	(TS=(artificial intelligence) OR TS=(ai) AND TS=(management)) AND (DT==("REVIEW") AND LA==("ENGLISH") AND SJ==("BUSINESS ECONOMICS"))

2.2 PRISMA protocol

The PRISMA protocol was used to increase the precision of the search and reduce the number of irrelevant documents. Although traditional systematic reviews often use several databases to increase the robustness and credibility of the review, the approach of this research focused on using two databases to achieve the characteristics of a systematic review, including transparency, replicability, and ease of access, more efficiently and objectively (Albhirat et al., 2024).

Figure 2 shows the identification of the 847 studies. The Excel sheet was prepared with the following information: type of article, name of author(s), title, journal, year of publication, and abstract. The next step was to analyze the abstracts of these 847 articles. To define the inclusion criteria for the selected articles, a strategy was developed based on the conceptual vision of AI and Management, as discussed in the previous sections. Concerning the main objective of this research, the studies should provide significant information related to the use of AI in management and the decision-making process itself.

The abstract analysis phase involves defining the exclusion criteria: (1) specific focus; (2) sphere of analysis. General inclusion criteria were developed based on the conceptual outline presented in the previous sections to select the articles included in this study. To meet these criteria and answer the research questions, the studies had to provide a clear and comprehensive understanding of AI, particularly in the context of management and/or the decision-making process. These inclusion and exclusion criteria are systematized in Appendix

B. That said, the research focused on the interconnection of AI with the reality of management processes and the decision-making process, and how they relate and function

Based on the above, only 60 studies met the criteria to be included in this research.

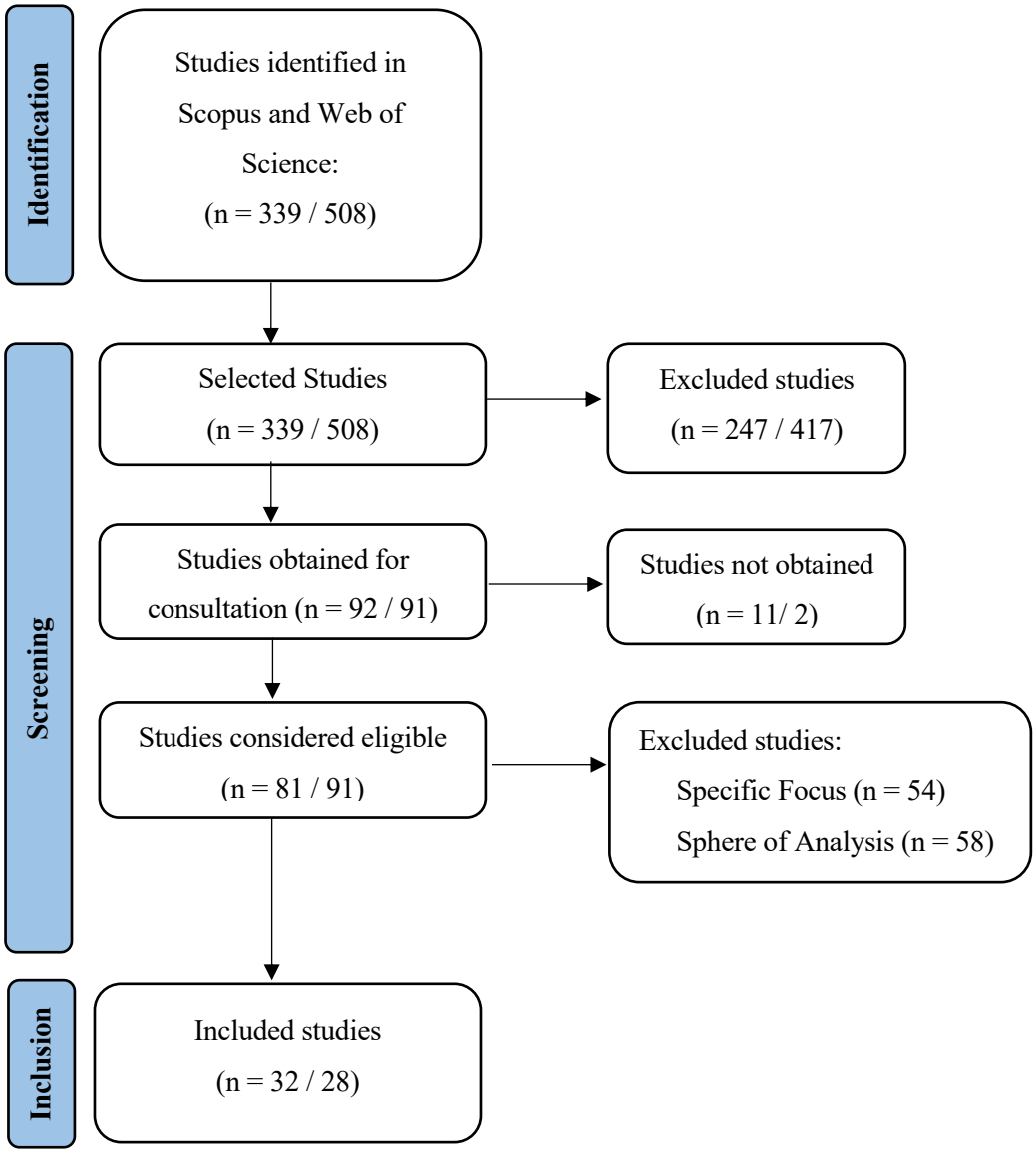

Figure 2 - PRISMA flowchart

2.3 Data Extraction and Synthesis

Extracted from Scopus and Web of Science and refined using the PRISMA methodology, the resulting report (Table A, Appendix A) encompasses essential details, including author(s), year of publication, objective, review methods, and main results of the article.

This comprehensive document helps to synthesize the knowledge accumulated since 2020, providing a holistic understanding of the subject.

Carrying out a content analysis, we precisely explored a selection of reviews, examining them thoroughly and integrating them into Leximancer software for systematic organization and analysis. Analyzing qualitative data is a complex process that involves carefully analyzing extensive texts to identify similarities and differences.

After initially discerning the ideas, the relevant words and phrases were meticulously coded using Leximancer. This software played a crucial role in integrating, coding, and analyzing a large volume of data. This data was then organized into subcategories, creating a map that improved understanding of emerging patterns and ideas (Crofts & Bisman, 2010). Leximancer has been used by researchers in other scientific fields, allowing them to identify themes that might not otherwise be considered and then explore and interpret them in the vast dataset (Crofts & Bisman, 2010).

The results are presented in Chapter 4, facilitating a systematic framework and interpretation of the data obtained.

CHAPTER 3 - METHODS AND MATERIALS

This chapter is dedicated to presenting and justifying the methodology used in this research. Defining a clear and appropriate methodology is fundamental to the validity of any scientific research. As such, this chapter aims to describe in detail the methodological path adopted to achieve the proposed objectives and answer the research questions of this investigation.

3.1 Approach method

This research is guided by a constructivist paradigm, which assumes that social reality and human phenomena are complex, multiple, and subjectively interpreted by the individuals participating. Thus, the study focuses not on objective measurement and statistical generalization but on an in-depth understanding of the participants' meanings, perspectives, and experiences.

In this context, considering the study's objectives - to explore the perceptions, experiences, and challenges associated with AI in decision-making within the Military Administration - adopting a qualitative research approach proved the most pertinent and appropriate. Qualitative research is a methodological approach to exploring and understanding the meaning individuals or groups attribute to a particular social or human problem (Creswell & Creswell, 2017). In this way, it plays a fundamental role when you want to: a) Understand a complex phenomenon from the perspective of the actors involved; b) Explore a topic in depth, capturing details and meanings that quantitative methods would be difficult to achieve; c) Give participants a voice, allowing them to express their experiences and interpretations in their own words; d) Investigate processes, contexts and the interactions between different factors (Flick, 2018). In the case of this research, the qualitative approach allows access to the distinct but complementary views of end users and technical experts on AI, exploring their perspectives, the practical challenges of implementation, and the perceived impact on decision-making processes.

Within the range of qualitative approaches, this study adopted the inductive method, since this, through the collection and in-depth analysis of empirical data, allows the identification of patterns and themes from the experiences and perspectives of the interviewees, progressing from particular and concrete observations to the formulation of possible generalizations and theoretical conclusions intrinsically based on the empirical data

collected (Marconi & Lakatos, 2017). This methodology is justified by the need to understand the subject, without starting from rigid hypotheses, making it possible to describe in detail how the interviewees' perceptions of AI manifest themselves in this specific field and the reasons behind these perceptions.

3.2 Source of data collection

To achieve the proposed objectives and obtain a rich understanding of the participants' perspectives, the primary data collection technique selected was the interview, which followed a semi-structured format, an approach widely recognized for its effectiveness in qualitative studies (Resende, 2016). The justification for this choice lies in its ability to combine structure with flexibility, since the existence of a prior script (Appendix C and D) ensured that the topics defined as central to the research were approached systematically by all the interviewees. At the same time, the semi-structured nature allows for a more dynamic and adaptive interaction, giving the interviewees room to freely express their opinions, deepen their reasoning, and introduce new relevant aspects or concerns, which might not have been anticipated (Flick, 2018).

The scripts for the semi-structured interviews were carefully developed based on the research objectives and an analysis of the relevant literature on AI within the Military Administration. Given the different nature of the two groups of interviewees, two adapted scripts were drawn up: one for the users and one for the technicians (engineers). Although both shared core topics to ensure consistency, the users' script emphasized their perspective, the impact on decision-making processes, and contextual needs. In contrast, the technicians' script delved into aspects of technological development, capabilities, limitations, and challenges of implementing AI. This differentiation was considered essential to gather relevant information from each group

3.2.1 Participants / Sample

As mentioned above, this research occurred in two distinct and complementary contexts. On the one hand, military personnel belonging to the middle ranks of the Portuguese Army, whose duties relate to the Defense data center, were consulted, allowing a technical and application perspective to be obtained. On the other hand, technicians and engineers from private sector companies specializing in developing and applying AI and ML solutions were interviewed to capture the technical, development, and innovation perspectives associated with these technologies.

The selection of participants was a crucial stage of this research, designed to capture the informed and detailed perspectives of two distinct groups, but intrinsically linked to the phenomenon under study, the potential users of the technology in the context of the Military Administration and the experts responsible for its development, which are represented in Table 3.

Table 3 - Interviewees

Interviewee	Post/Function	Workplace
Interviewee 1	Section Head Homeland Security and Defense	GMVIS Skysoft
Interviewee 2	Head of Salesforce at Capgemini PT & DCX PT Delivery Head	Capgemini
Interviewee 3	Colonel/Director of Services	Directorate of Defense Data Center Services

The total sample of this research comprised three interviewees, distributed between the two groups. Criteria of statistical representativeness do not govern the adequacy of the sample size in qualitative studies, but by the principle of data saturation (Saunders et al., 2018). This principle recommends that data collection should continue until the point at which new interviews no longer provide substantially new information or add significant new perspectives to the themes and categories already identified in the analysis.

In this study, preliminary data collection and analysis were carried out to monitor the emergence of themes and the recurrence of information in each group. The interview process ended when there was redundancy in the information collected. It was considered that the main themes related to the study's objectives had been sufficiently explored and understood, thus reaching a satisfactory saturation point for the depth sought in this research.

3.3 Data Analysis Procedures

Once the interviews had been completed, the audio recordings were transcribed into Word processing files, a crucial stage in ensuring the validity and accuracy of the data. Each transcript was then sent to the respective interviewee for review, confirmation, and possible clarification of the content so they could validate it.

This process of developing themes was based on an inductive approach. We tried to ensure that the themes emerged from the data and reflected the interviewees' perspectives.

An essential component of the analysis was comparing the perspectives of the two groups of participants to identify not only cross-cutting themes but also the specificities, convergences, and divergences in their perspectives on AI within the Military Administration.

Qualitative data analysis software Leximancer was used to help manage the volume of data and facilitate the coding and thematic organization process. This software was used to organize the transcripts, apply codes to the text segments, group and visualize codes and themes, and easily retrieve relevant excerpts during analysis and writing.

3.4 Ethical considerations

The interviews were conducted face-to-face and online, and fully audio-recorded, with the interviewees' permission, to ensure the fidelity of the recording. Standard research procedures were followed, and participation in the study was strictly voluntary. Before any data collection, each participant was given a detailed explanation of the research, including the general objective, the nature of participation, and the exclusively scientific purpose of the data collection. It was explicitly mentioned that all information would be treated confidentially and that participants would have the opportunity to ask any questions before deciding to participate. Consent was formalized in writing by signing a separate form (Appendix C and D), which reiterated the participants' willingness to participate, the objectives, confidentiality, the use of the data for scientific purposes, and potential publication, and guaranteed anonymity. As the participants were informed in the consent form, once the data has been processed and analyzed for this research, all materials that may contain identifiable information, namely transcripts and recordings, will be destroyed.

3.5 Methodological limitations

Despite the effort to ensure methodological rigor throughout this research, it is important to recognize and discuss some limitations inherent in the choices and nature of the qualitative study.

Firstly, the nature and size of the sample, although intentionally selected to obtain in-depth perspectives from users and technicians from AI/ML companies, are specific and limited in number. As this is a qualitative study, the main objective is not statistical generalization but understanding the context under study. Consequently, the conclusions presented here reflect the realities and perspectives of the participants involved, and their transferability to other contexts or the entire population represented should be done with caution.

Secondly, the potential bias of the researcher in collecting, analyzing, and interpreting the data is recognized. Although strategies have been implemented to increase objectivity and rigor, such as the validation of transcripts by participants, the interpretation of qualitative data inevitably involves a degree of subjectivity.

Finally, the research depends significantly on the information, opinions, and experiences that the participants chose to share during the interviews. This data type is extremely valuable for accessing individual perspectives, but it is subject to factors such as personal interpretation of the interview questions.

Acknowledging these limitations does not invalidate the study's results but helps contextualize their applicability and suggests guidelines for future research that could complement or deepen the obtained results.

CHAPTER 4 - RESULTS

4.1. Bibliometric analysis

The results of the process described above, in Chapter 2 - Methodology, will be presented in this chapter. This chapter presents a bibliometric analysis of the studies included in this research. Among the 60 articles selected, there is a distribution based on the publication years: 6 are from 2020, 5 from 2021, 6 from 2022, 20 from 2023, 18 from 2024, and 5 from 2025. There has been greater interest from the scientific community in the subject under study, although scientific production has increased sharply since 2023, publications from previous years have maintained the most significant cumulative impact of citations to date, which reflects the delay effect in citing more recent studies, as shown in Figure 3.

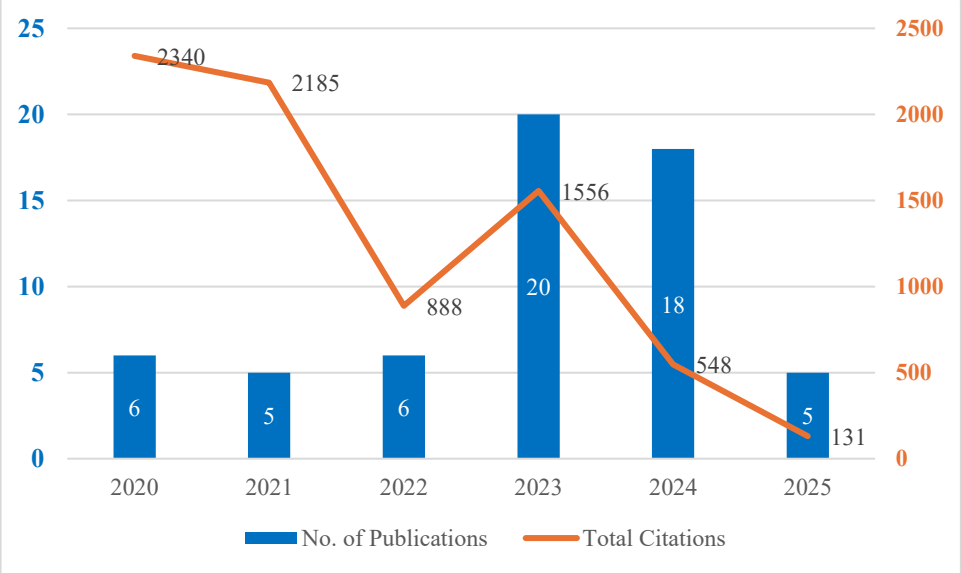

Figure 3 - Publications by year and total citations

All the studies included are scientific journal articles, with Technological Forecasting and Social Change having the highest number of published articles (5 articles). Administrative Sciences and Journal of Business Research also stand out from the other journals, with three articles published, as shown in Figure 4.

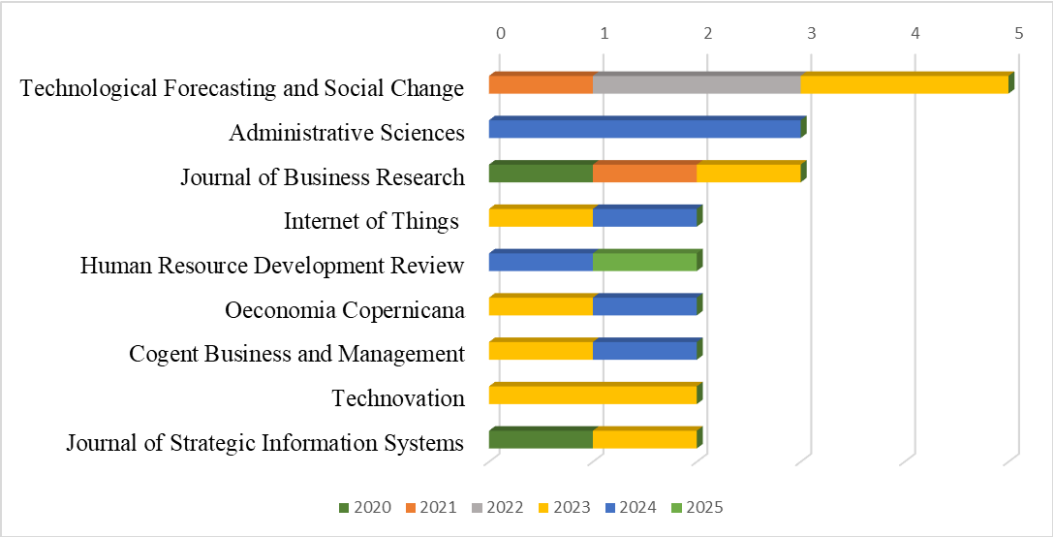

Figure 4 - Publications by journal and by year

Analyzing the various articles that comprise this SLR revealed a strong tendency towards collaboration in research on this subject. Only 7% of the studies are single-authored, and 50% are by teams of four or more authors, as shown in Figure 5.

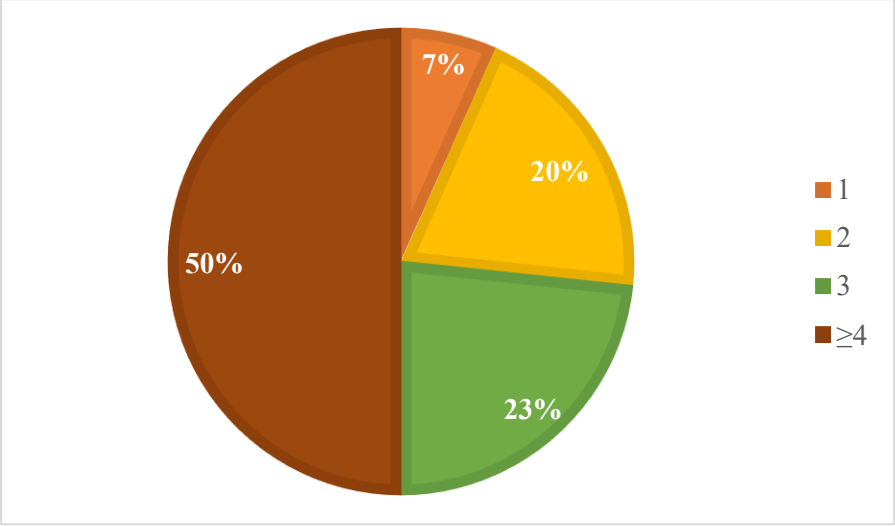

Figure 5 - Number of authors per article

Figure 6 shows the geographical distribution of publications, revealing an intense concentration of scientific production in this study area, namely the United States of America, Western Europe, Australia, China, and India. However, other geographical areas such as Brazil and South Africa still have a significant presence.

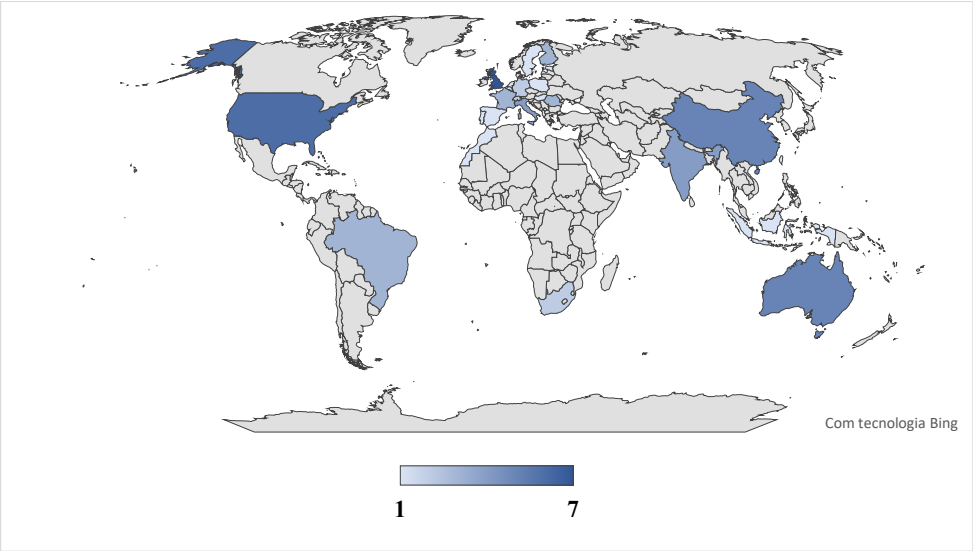

Figure 6 - Number of articles by country

Figure 7 shows a co-citation map of the various authors included in this research, thus enabling a better understanding of how the various studies interconnect. The figure shows three clusters, represented by three colors each inherent to a sub-theme: (1) blue - challenges, limitations and prospects related to the technological theme; (2) red - constitutes the central and densest thematic core of the network which focuses directly on the development and application of technology and AI and which serves as the basis for the other clusters; (3) green - focuses on the organizational and Human Resource Management (HRM) implications arising from the technologies in the red cluster.

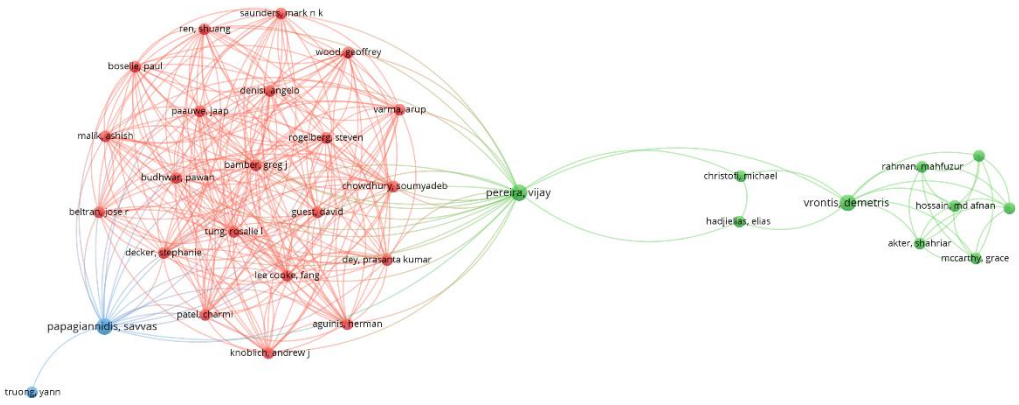

Figure 7 - Author co-citation map

Source: VOSviewer

4.2. Literature review

4.2.1 Analysis of the results obtained with Leximancer

As mentioned above, in Chapter 2 - Methodology, Leximancer was used to hierarchize and show the dominant themes and corresponding concepts for the literature analysis. Figure 8 describes the three phases in the Leximancer results extraction process, which begins by semantically extracting the word, then creates an ordered list of concepts, and finally groups the concepts into themes based on their frequency of occurrence.

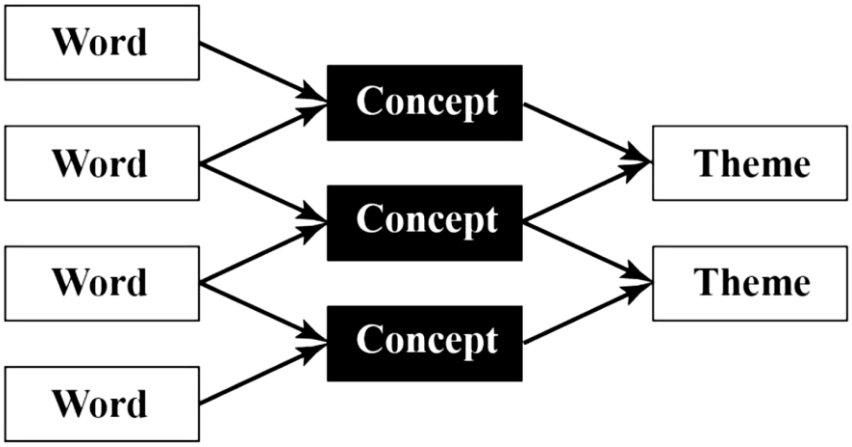

Figure 8 - Leximancer analysis extraction process

Source: Crofts & Bisman (2010)

The dominant themes and concepts are shown in Figure 9, which brings together four themes and 75 concepts. Colored circles around the set of concepts represent the themes. The closer the concepts are, the more often they appear in similar conceptual contexts, since the lines delineate the most common path between concepts. The relationship between the group of themes is illustrated in the concept map with 33% of the concepts, 60% of the theme size, and 0 degrees of rotation.

The themes in the concept map are heat-mapped to indicate importance according to the color wheel, which means that warm colors indicate the most important themes, while cool colors represent the least important themes.

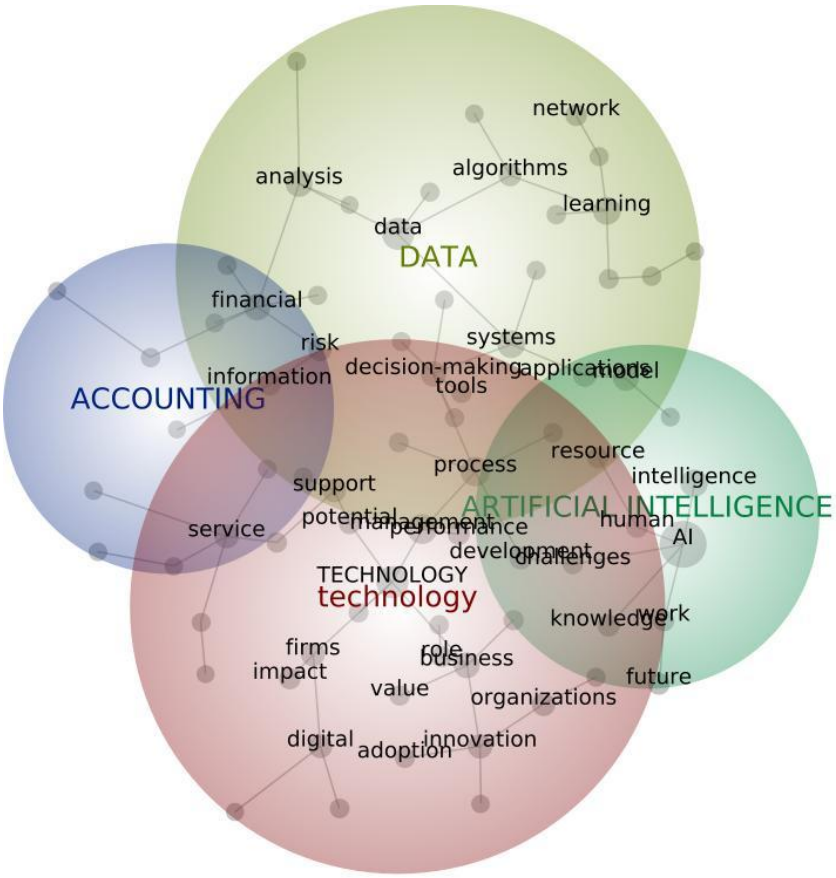

Figure 9 - Map of themes and concepts

Source: Leximancer

The connectivity score, shown in Table 2, reflects how the theme is connected to the other concepts in the concept map.

Table 4 - List of themes – SLR (Leximancer)

Theme	Connectivity	Mentions	Concepts
Technology	199377	22376	technology, management, processes, business, innovation, service, companies, digital, support, organizations, development, performance, impact, function, potential, adoption, value
Data	163363	19346	data, systems, learning, analysis, financial, decision-making, information, risk, algorithms, network, tools
Artificial Intelligence	120529	19790	AI, intelligence, model, applications, human, knowledge, future, resource, work, challenges
Accounting	23093	988	accounting

Table 3 shows the 75 concepts within these themes, including their count and relevance. The concepts are ordered based on their frequency of occurrence. The count represents the number of times a concept appears throughout the body of the text, while the relevance represents the most frequent concepts and the rationale between them.

Table 5 - List of concepts – SLR (Leximancer)

Concept	Counting	Relevance (%)	Concept	Counting	Relevance (%)
AI	11373	100	IoT	1063	9
Data	5119	45	Results	1001	9
Technology	5007	44	Delivery	991	9
Management	4538	40	Accounting	988	9
Learning	3876	34	Capabilities	984	9
Analysis	3816	34	Domain	950	8
Process	3763	33	Time	939	8
Systems	3442	30	Tools	902	8
Intelligence	3407	30	Tasks	891	8
Model	3336	29	Transformation	890	8
Finance	3224	28	ChatGPT	770	7
Business	2844	25	Market	832	7
Service	2519	22	Techniques	820	7
Innovation	2508	22	Practices	812	7
Decision-making	2446	22	Confidence	805	7
Companies	2317	20	Factors	801	7
Digital	2209	19	Efficiency	787	7
Information	2104	18	Design	787	7
Applications	2088	18	Computing	782	7
Organizations	2066	18	Quality	760	7
Future	1998	18	Control	745	7
Support	1926	17	Smart	719	6
Algorithms	1925	17	Security	706	6
Knowledge	1864	16	Public	698	6
Development	1839	16	Creation	697	6
Risk	1811	16	Employees	683	6
Human	1798	16	Perspective	658	6
Network	1646	14	Training	645	6
Performance	1614	14	Cognitive	618	5
Impact	1554	14	Economy	613	5
Work	1489	13	Neural	607	5
Resource	1335	12	Experience	581	5
Function	1333	12	Forecast	570	5
Adoption	1318	12	People	536	5
Potential	1228	11	Advantage	468	4
Challenges	1204	11	Global	440	4
Value	1142	10	Software	439	4
Context	1099	10			

4.3 Analysis of the Interviews

4.3.1. Analysis of Interviews with Leximancer

As mentioned above, in Chapter 3 – Methods and Materials, Leximancer was used to hierarchize and show the dominant themes and corresponding concepts for analyzing the interviews. The dominant themes and concepts are shown in Figure 10, which brings together four themes and 54 concepts. The relationship between the group of themes is illustrated in the concept map, which has 33% of the concepts, 60% of the theme dimension, and 0 degrees of rotation.

Figure 10 - Map of themes and concepts

Source: Leximancer

The connectivity score reflects the degree to which the theme is connected to the other concepts in the concept map, as shown in Table 6.

Table 6 - List of themes – Interviews (Leximancer)

Theme	Connectivity	Mentions	Concepts
Information	1692	144	information, data, LLM, use, security, specific, access, models, on-premise, type, main, understanding, infrastructure, needs
Artificial Intelligence	935	94	AI, LLM, tools, models, importance, using, area
Process	737	57	process, terms, people, systems, development, work, used
Solution	324	11	solution

Table 7 shows the 54 concepts within these themes, including their count and relevance. The concepts are ordered based on their frequency of occurrence. The count represents the number of times a concept appears throughout the body of the text, while the relevance represents the most frequent concepts and the rationale between them.

Table 7 - List of concepts – Interviews (Leximancer)

Concept	Counting	Relevance(%)	Concept	Counting	Relevance(%)
LLM	38	76	Main	12	24
AI	31	62	Understand	12	24
LLMs	23	46	Area	12	24
Army	12	24	Development	12	24
Defense	9	18	Crucial	12	24
Salesforce	8	16	Relevant	12	24
Information	50	100	System	12	24
Data	45	90	Used	11	22
Use	31	62	Solution	11	22
Specific	24	48	Documents	11	22
Model	24	48	Technical	11	22
Access	23	46	Experience	11	22
Security	22	44	Words	11	22
Tools	22	44	Processes	11	22
Models	16	32	Implement	10	20
On-premise	15	30	Military	10	20
Process	15	30	Cases	10	20
Work	15	30	Time	10	20
Type	14	28	Context	10	20
Important	14	28	Team	10	20
Need	14	28	Possible	10	20
Different	14	28	Project	9	18
Terms	13	26	Companies	8	16
People	13	26	Technology	8	16
Infrastructure	13	26	Necessary	8	16
Systems	12	24	Based	8	16
Using	12	24	Financial	6	12

CHAPTER 5 - DISCUSSION OF RESULTS

5.1 Discussion of SLR Results

Based on the map of themes and concepts created by Leximancer, four essential themes emerged, which will be explored later in this chapter:

1. Data Integration in Management
2. The Role of Technology and Artificial Intelligence in Management
3. The Organizational Impacts of Digital Transformation
4. Challenges and prospects for the future

Table 8 - Main results

Theme	Main results
Data Integration in Management	• Digitalization and AI are transforming accounting by enabling the integration and analysis of large volumes of data for more informed decisions. • Technologies such as Robotic Process Automation (RPA) and AI automate routine tasks, increasing operational efficiency and allowing professionals to focus on strategic activities. • Despite the benefits of accuracy and predictive analysis, technological integration brings challenges and requires new skills from professionals for critical validation.
The Role of Technology and Artificial Intelligence in Management	• Driven by technological advances, AI materializes its transformative potential, forcing organizations to adapt business models for greater efficiency and competitiveness. • AI's analysis, prediction, and automation capabilities significantly optimize decision-making, organizational processes, and resource allocation. • The effective implementation of AI requires new skills and strategies, overcoming the challenges of trust and regulation, and balancing automation with human control and strategic thinking.
The Organizational Impacts of Digital Transformation	• DT requires organizational agility, strategic rethinking, and holistic investment to ensure competitiveness in a dynamic environment. • AI drives DT by providing advanced data analysis, prediction, and automation capabilities that optimize decision-making, efficiency, and organizational innovation. • The implementation of AI faces challenges of adoption, impact on employment, and ethics, requiring strategic management and skills development to balance automation with the human factor responsibly.
Challenges and Prospects for the Future	• The successful adoption of AI depends on bridging the human skills gap by developing digital proficiency, critical thinking, and adaptability in the workforce. • Implementing AI raises central ethical concerns about its impact on employment, human dignity, rights, and data privacy. Balanced decisions, responsible management, and a focus on human well-being are required. • Effective AI integration requires prudent management of the costs, risks, and complexities of human-AI collaboration, with a strong role for HRM in reskilling and the need to maintain human oversight and critical thinking.

5.1.1. Data Integration in Management

The digitization of accounting processes has profoundly transformed how organizations manage and analyze all their financial information, so integrating this data into accounting has become increasingly crucial in the age of AI (Brabete et al., 2024). Consequently, the ability to collect, analyze, and interpret large volumes of data from various sources allows accounting professionals to make more informed and accurate decisions (Dong et al., 2024). In this context, the emerging technologies discussed above play an important role in the automation of this data and advanced analysis

As mentioned earlier, one of the possibilities of this type of technology is the ability to automate, which, within this topic, allows for the automation of routine accounting tasks through RPA systems, resulting in greater operational efficiency (Brabete et al., 2024). Since accounting data is well-structured and rule-based, it becomes ideal for automated evaluation by AI models, allowing the recognition of patterns within the various financial statements, which could be overlooked due to the large volume of data present in them, so these disruptive technologies can be effective in carrying out these tasks (Kureljusic & Karger, 2024). Within the various types of processes, from categorizing transactions to creating financial reports, these technologies enable autonomous execution, allowing Human Resources (HR) to focus on value-creating tasks such as analytical and strategic activities (Brabete et al., 2024).

AI has emerged as one of the main technologies within this topic, as it can extract data from unstructured documents, such as invoices and contracts, converting them into formats that can be analyzed (Ranta et al., 2023). In addition, it can also identify patterns and trends in the data collected, allowing professionals to analyze it better and consequently make more informed decisions (Kureljusic & Karger, 2024). Although technological advances contribute to this problem, increasing digitization also plays a key role, increasing the availability of new data sources (Ranta et al., 2023).

Implementing this technological solution throughout the data collection, processing, and analysis process helps mitigate manual errors, thus ensuring greater accuracy and reliability of financial statements (Ranta et al., 2023). Consequently, incorporating these technologies into this process promotes greater transparency and ensures compliance with legal regulations (Agostino et al., 2022).

The ability to access these large volumes of data combined with their real-time analysis allows for the adoption of a strategic perspective, in which predictive models based on AI and ML make it possible to identify trends, assess risks and formulate optimized strategies, thus

making the decision-making process more proactive (Kalbouneh et al., 2023). In this way, professionals can see a more comprehensive picture of organizational performance, allowing for more informed decision-making (Brabete et al., 2024). Integrating technological systems with automated forecasting capabilities appears to be a valuable tool for interpreting data and planning scenarios, and updating data in real time makes it possible to increase agility in the decision-making process (Camilli et al., 2025). Despite these benefits, there needs to be a balance between the information created by these systems and the critical sense of the professionals who work with them to mitigate the risk of bias, so the characteristics of these technologies should function as cognitive aids that increase the accuracy of decision-making by mitigating the effects of incomplete and outdated information (Camilli et al., 2025).

However, there are some challenges when it comes to integrating this data into accounting, namely its complexity, since the inclusion of data from various sources not only presents a certain degree of difficulty, but also requires significant investments not only in technology, but also in training (Dong et al., 2024). In this sense, another important factor relates to data security and privacy, making it necessary to invest in robust security measures capable of protecting other information from the moment it is collected and during its storage, guaranteeing its integrity and confidentiality (Dong et al., 2024). Furthermore, although these technologies are designed to improve data analysis and decision support, there is a risk of over-reliance on the information they generate, in which professionals accept it without critically assessing the data quality (Camilli et al., 2025). At the same time, the effectiveness of AI-based forecasts depends on their maintenance, and it is essential to systematically collect data to determine the appropriate time to re-adapt the models, ensuring their applicability and reliability (Kureljusic & Karger, 2024).

That said, professionals in this area will play a crucial role in using and evaluating these technologies, which requires a new range of skills, not only in how to interpret financial data, but also in how to combine technologies such as AI and Big Data in the tasks they carry out to monitor and interpret the large volume of data created by these technologies, so versatility is required of professionals (Brabete et al., 2024). Since accounting professionals must be advisors to top management, using predictive analysis and data-based alternatives, it is essential that, even if they are not responsible for developing the technologies, they can validate the data generated, which is why there is a need for training in this area, allowing them to collaborate in both the design and adjustment of these technologies (Brabete et al., 2024).

In light of the above, the accounting field has undergone a significant transformation due to advances in data collection and processing technologies, increasing the complexity of accounting activities while improving the efficiency of other processes (Abu Huson et al., 2024). That said, AI has emerged as a disruptive technology in the analysis of accounting data by providing flexibility and efficiency in its processing, allowing for the automation of tasks and the detection of patterns, thus improving financial management and risk assessment; consequently, these technologies make it possible to optimize financial processes, make forecasts and strengthen the decision-making process (Abu Huson et al., 2024).

In short, data integration in accounting is essential for organizations wishing to remain competitive in this age of AI, since by processing this large volume of data, accounting professionals can make more informed decisions, improve organizational efficiency, and improve the accuracy of financial reports. That said, implementing disruptive technologies and ongoing HR training emerge as two crucial factors for maximizing the benefits, ensuring that accounting plays a strategic role in the organizational context, thus constituting a significant milestone of this DT in this area.

5.1.2. The Role of Technology and Artificial Intelligence in Management

More than seven decades after its conceptualization, AI is beginning to materialize its transformative potential in society, the barriers to its implementation and automation have been progressively overcome with the current technological levels of data collection and storage and processing speed being adequate to drive this industrial revolution, creating profound systemic changes and competitive realignments (Chi et al., 2020)

The increase in data management drives the implementation of AI technologies in public and private organizations, which seek to improve information processing through algorithms. On the one hand, public organizations aim to optimize service management, and on the other, private organizations aim to improve competitiveness and mitigate risks (Di Vaio et al., 2020). These technologies can create sustainable business models, increasing productivity, reducing costs, and improving the availability of services, and integrating them into the decision-making process makes it easier to adapt to DT and create value (Di Vaio et al., 2020).

Organizations are re-evaluating their business models due to advances in AI applications and the increasing use of Big Data (Bahoo et al., 2023). These technologies aim to provide innovative products, services, and experiences through digitization and AI, IoT,

robotics, automation, and ML, optimizing organizational efficiency (Bahoo et al., 2023). The implementation of AI in organizations aims to reproduce human behavior, which directly influences business models to promote competitiveness and the creation of opportunities, optimizing the use of resources, which leads to innovation in business models and the creation of value, resulting in more effective decisions and increasingly adapted models (Bahoo et al., 2023). The use of AI provides new approaches to managing the operations of organizations focused on both physical goods and the provision of services. This optimization through AI can provide a competitive advantage due to superior performance made possible by better forecasting using ML techniques (Mishra & Pani, 2020).

As an overarching concept of emerging technologies, AI shows great potential in exploring new avenues for developing solutions, as it can analyze previously unanalyzable data, create real-time forecasts, and optimize the management of organizations (Mishra & Pani, 2020). In addition, it can automate processes, reduce the need for labor, and increase efficiency. However, the successful implementation of AI depends on acquiring and developing knowledge about this technology, which means developing skills and applying them to create products and services (Mishra & Pani, 2020). Through data analysis, the foresight provided by these technologies makes it possible to detect emerging trends through visual representations and drive innovation (Mariani et al., 2023).

AI systems are increasingly gaining prominence as they demonstrate the potential to overcome human limitations in information processing through deep neural networks processing large volumes of data and helping to identify patterns (Haefner et al., 2021). AI has three levels of information processing capacity, at the first level it supports human managers by processing large volumes of data complementing their limitations, at the second level it expands innovation by generating new ideas in collaboration with managers, finally at the last level it partially replaces managers by creating innovative ideas and redefining approaches and problems (Haefner et al., 2021).

The implementation of these new technologies can be carried out on three different levels: on the first level, augmentation involves close collaboration between humans and technology, where these technologies provide support and information to increase efficiency and effectiveness; the second level, automation, involves systems that process predefined flows without the need for continuous human interaction, which is only required in cases of deviations from the standard process that the system cannot resolve autonomously, in which case the technologies take on a large part of the tasks to automate processes based on

predefined rules; at the last level, autonomization, the technologies are programmed to perform the various tasks independently, these processes are associated with more straightforward and more repetitive tasks requiring substantially less human involvement (Herold et al., 2023).

AI plays a fundamental role in reorganizing decision-making processes, manifesting itself in four main ways: firstly, AI's predictive analysis capabilities enable the identification of problems, transforming unforeseen situations into predictable ones; secondly, AI assists managers with data-based suggestions, expanding the range of options and presenting alternative perspectives; next, AI influences the formulation and adoption of new solutions by proposing innovative and personalized approaches; finally, AI facilitates the inclusion of more participants in the innovation process and consolidates the knowledge of participants by optimizing the flow of knowledge (Truong & Papagiannidis, 2022).

Organizations enabled with AI technologies can accelerate process optimization, allowing data capture and analysis to improve and personalize services, enabling value creation, since this optimization can generate insights through statistical, contextual, cognitive, and predictive models, promoting organizational agility (Gama & Magistretti, 2025). On the other hand, adopting AI boosts the development of the decision-making process by amplifying team perspectives, real-time decisions, and optimizing resource allocation (Gama & Magistretti, 2025).

Integrating AI into management improves efficiency, decision-making, and results by analyzing complex data from multiple sources and optimizing resource allocation (Prasetyo et al., 2025). In this context, ML has demonstrated remarkable results in optimizing and allocating resources in complex and dynamic environments through its application in modelling, classification, prediction, and prognosis (Iftikhar et al., 2023). In addition, predictive models based on DL stand out as promising architectures in AI, demonstrating effectiveness in solving problems by outperforming traditional machine learning algorithms (Iftikhar et al., 2023). This superiority is due to DL's ability to identify complex patterns in large data sets (Iftikhar et al., 2023). At the same time, AI plays a crucial role in managing budgets and resources, optimizing their allocation and providing predictive insights to avoid budget surpluses and resource shortages, since AI's predictive analysis, based on historical data, enables informed decisions and proactive management of constraints, allowing real-time monitoring of budget performance and resource use, facilitating dynamic adjustments (Prasetyo et al., 2025). AI also enables schedule optimization by analyzing complex data to

identify risks and optimize deadlines, and ML and automation optimize scheduling and quality management (Prasetyo et al., 2025).

Technologies such as ChatGPT have significant benefits in today's context, including improved accuracy, increased efficiency, and potential cost savings, as its DL capability based on large volumes of data allows it to generate informed decisions for organizations (Singh & Singh, 2023). The features of this technology, such as the automation of routine tasks, multilingual support, improved data accuracy, and real-time analysis, make it suitable for the environment of organizations (Singh & Singh, 2023). Although it has some disadvantages, such as privacy issues and technological dependence, the benefits may outweigh these limitations, and the prospect of its use will depend on how quickly and effectively organizations adopt it and integrate it into their daily operations (Singh & Singh, 2023). That said, it is argued that ChatGPT works as a complement to employees by freeing them up for higher-level tasks that require distinctly human skills, such as critical thinking, empathy and creativity, so it becomes crucial that skills are developed so that professionals can maintain productivity in a scenario of constant technological disruption, thus prevailing the view that ChatGPT will not cause an elimination of jobs, but will mainly be a more advanced search engine capable of assisting workers (Singh & Singh, 2023). However, current AI applications still need to be developed to increase their capacity for reflection, going beyond task automation and pattern recognition, and modeling these properties will allow AI to understand the subjectivity of the social context and acquire collective experiential knowledge (Mishra & Pani, 2020).

At the same time, the development of technologies such as chatbots goes beyond the execution of transactions, allowing them to be configured as sophisticated, secure digital assistants capable of generating empathy by incorporating anthropomorphism to simulate a more humanized interaction, improving the trust and comfort of their users, an essential feature in the financial sector (Bhatnagr et al., 2024). Chatbots represent an AI agent that enables effective communication with users, having been implemented in various service contexts (Chi et al., 2020). These systems process human language and interact with users through a simulated language (Chi et al., 2020). Chatbots have some advantages over human agents, namely the ability to process volumes of data, store a large amount of information, and exhibit a lower propensity to errors or variability (Chi et al., 2020).

Chatbots are mainly used to provide information and guide users through business processes, but their usefulness can be optimized by providing relevant, actionable, and up-to-

date information (Gopinath & Kasilingam, 2023). Improving the performance and efficiency of process automation through this type of agent requires continuous improvement of AI capabilities, where ML applications become key to providing customized solutions adapted to users' needs (Gopinath & Kasilingam, 2023). The usefulness and ease drive a positive user experience with chatbots (Gopinath & Kasilingam, 2023). This type of technology serves as a starting point that offers functional benefits, as it evolves and acquires more humanized capabilities through DL, and can be integrated into organizations' systems (Mishra & Pani, 2020).

DL has driven the development of AI, with the ANN model standing out for its ability to process and use large volumes of data, making it possible to achieve comparable or better accuracy than humans in image and voice recognition, however, this type of AI has limitations such as a lack of explainability, restricting its application in specific scenarios (Jiang et al., 2022).DL has proven to be an important tool in predicting and detecting financial risks through ANNs, since complex financial data is processed in real time, proving to be an effective aid in the governance of organizations (Ahdadou et al., 2024).In addition, AI can be used to evaluate and improve the performance of organizations as it can ensure decisions based on reliable data and prevent biases, in addition to assisting in routine tasks and providing advanced perspectives for decision-making, however the current focus is on augmentation by AI, and it is not expected to replace human decision completely (Ahdadou et al., 2024).

Integrating AI into existing systems promotes a strategic change, as it can assist in planning and create shared values and lasting competitive advantages (Park et al., 2025). This technology also proves helpful in the decision-making process, hiring, and performance evaluation processes, and there should only be a place for this delegation of decisions when AI demonstrates trust and reliability in its suggestions and results for managers (Park et al., 2025). For this to be possible, it is necessary that when introducing AI, managers understand its advantages and impacts, so that organizations can adapt to this transformation, achieving their objectives while minimizing their risks and impacts (Park et al., 2025).

AI has shown impacts in financial forecasting by replacing traditional methods, which affects financial decision-making optimized by the information available using DL technologies (Li et al., 2023). The integration of AI, ML, and DL is transforming the financial sector, redefining services, operations, and decision-making, as its algorithms can analyze data in real time to identify patterns and strengthen risk management strategies based on predictive data analysis (Kou & Lu, 2025). However, this integration drives innovation, efficiency, and

cost reduction, promoting a more secure and transparent financial ecosystem (Kou & Lu, 2025). Hence, adopting these emerging technologies aims to create more accurate, optimized, and agile financial solutions responding to the demands of this dynamic environment (Kou & Lu, 2025). At the same time, generative AI tools are shaping decision-making processes and services in the financial sector by optimizing the automation of financial tasks in organizations' operations using DL algorithms and natural language processing, as well as promoting the analysis of financial transactional data (Andronie et al., 2024). In addition, these techniques, through DL-based predictive modelling in conjunction with Big Data visualization tools, make it possible to optimize decision-making and personalized financial advice (Andronie et al., 2024).

Obtaining objective data for managing organizations requires continuous analysis of financial indicators and the external environment. In this sense, AI is a valuable tool for accessing internal financial systems and external Big Data, collecting, analyzing, and drawing conclusions using DL algorithms (Melnychenko, 2020). The speed of AI makes it possible to make faster decisions in the face of rapid changes in data, something unfeasible for the human spectrum due to the time needed for reflection, these ML models are considered more efficient than traditional techniques, providing an improvement in the quality of data processing, increasing productivity and speeding up the reaction to external changes considering multiple factors and reducing errors (Melnychenko, 2020). However, although AI processes vast amounts of information and makes predictions, it lacks the human capacity for strategic thinking and foresight, which are human management's intrinsic and essential skills

Still on the financial front, adopting AI technologies boosts organizations' ability to reduce operating costs, optimize resource allocation, use resources more efficiently, and minimize financial losses (Lee et al., 2023). In addition to efficiency and profitability, the implementation of AI impacts other dimensions of organizations that can translate into an overall increase in the competitiveness of organizations and their products and services, consequently strengthening other organizational capabilities such as data analysis and knowledge management, resulting in process optimization and greater organizational efficiency (Lee et al., 2023). That said, AI can boost the optimization of data sharing processes, ML algorithms, and data visualization tools, which translates into a personalized tool capable of assisting in financial services (Lazaroiu et al., 2023).

Consequently, the use of AI is considered unavoidable and a trend in the development of the financial sector, however, its implementation faces barriers such as the lack of technical

security assessments and the lack of policies regulating the use of this technology, given the critical importance of the financial sector which must comply with strict standards (Chen et al., 2023). However, it is hoped that with the development of AI, this technology will transform the financial landscape and current business models, since the rationality of algorithms complemented by human interaction can create more reliable relationships and increase organizational efficiency (Chen et al., 2023).

Currently, AI technologies occupy a prominent position in the organizational environment; this expectation, linked to the competitive scenario, drives a growing demand for research and investment in the strategic use of AI to obtain competitive advantages (Borges et al., 2021). ML can be applied to classification and prediction tasks to align analytical requirements with organizational strategy, providing a competitive advantage by combining human and artificial intelligence (Borges et al., 2021). Automation has emerged as one of the most common applications of AI in organizations, given its ease of implementation and rapid return on investment. However, for this to be possible, the organizational strategy must be aligned with developing skills and competencies to leverage automation effectively; however, the most complex tasks require human intervention (Borges et al., 2021).

Advances in Big Data and AI, including ML and natural language processing, have led to a growing reliance on algorithmic decisions by individuals and organizations, covering various areas and tasks, both objective and subjective (Mahmud et al., 2022). The perception of the algorithm's role in human decision making is a crucial factor in the aversion to them, with less trust when algorithms aim to replace rather than support human decisions. In this context, there has been an interest in understanding how they work, suggesting that their transparency benefits their acceptance, since once the algorithmic process is understood, there is greater trust in them (Mahmud et al., 2022).

The rapid technological changes associated with this industrial revolution create challenges and opportunities, in which technologies such as AI and Big Data are crucial to achieving operational excellence (Dhamija & Bag, 2020). In this sense, intelligent decision-making is necessary, where ML learns from real-world data by summarizing this information that supports decision-making; consequently, AI performs intelligent actions based on the learning resulting from this process, optimizing the intelligent decision-making process (Dhamija & Bag, 2020). On the other hand, Big Data has increased the complexity and dynamics of data, requiring more advanced data processing optimization algorithms (Jiang et al., 2022).

Creating value from investments in information systems remains a fundamental strategic issue for organizations (Coombs et al., 2020). The business value of these systems is defined by their impact on the performance and capabilities of organizations, in this sense, AI emerges as a positive influence, capable of providing significant improvements in the performance of other processes (Coombs et al., 2020). These improvements can come from the total automation of processes, i.e., automating routine administrative tasks or increasing human capabilities, thus enabling an improvement in performance by combining AI capabilities with the skills of employees (Coombs et al., 2020). Therefore, intelligent automation represents a global economic development of great relevance, however, trust in AI technologies is particularly critical in situations of conflict between humans and automated systems which can degrade the performance of processes, so it is essential to define a balance between AI autonomy and human control to ensure the overall performance of organizations (Coombs et al., 2020).

The implementation of AI enhances the capabilities of organizations to restructure their processes, and its adoption with other digital technologies increases the innovation potential, increasing the ability to improve products and services or develop new ones by strengthening procedural innovation (Mariani et al., 2023). Many organizations have already implemented AI in their operations by developing business models based on this technology, this innovation generates a significant change in the creation, appropriation and delivery of value, through a successful implementation of this technology enabling disruptive innovation and even the modification of entire value chains (Mariani et al., 2023).

In short, AI is beginning to demonstrate its transformative potential in society, driven by technological advances in the ability to collect, store, and process data, which continue to overcome the barriers to its implementation progressively. Public and private organizations can adopt AI to optimize operational efficiency, increase competitiveness, and mitigate risks, leading to a re-evaluation of business models in the light of technologies such as ML, DL, and IoT. AI also impacts the decision-making process through predictive analysis and provides suggestions based on data and automation, manifesting on different levels such as augmentation, automation, and autonomization. However, although AI promotes significant gains in productivity and innovation, its implementation raises challenges regarding the explainability of its algorithms, the guarantee of privacy, and adequate policies for the development of new skills, and it is equally important to guarantee human discernment and strategic vision to face this new technological paradigm.

5.1.3. The Organizational Impacts of Digital Transformation

DT presents itself as a disruptive force in the various management scenarios, driving a reassessment and reformulation of organizations' strategies and models, since the dynamic nature of digitalization and its constant evolution require organizations to be able to adopt strategic, agile, and adaptive responses (Gouveia et al., 2024). That said, it is imperative that organizations formulate new strategies, develop organizational transformations, and implement innovative methods as a response to this dynamic environment, as this is the only way to maintain their competitiveness and relevance in the current context (Gouveia et al., 2024).

The successful implementation of DT is not restricted solely to the adoption of digital technologies, as a change in organizational culture must accompany it, as investment is needed in various areas such as employee training and development, the implementation of information security measures, and ensuring data protection (Gouveia et al., 2024). Continuous training and development of employees is essential because only in this way can digital technologies and processes be used effectively and efficiently, thus maximizing the return on investment (Gouveia et al., 2024). As such, digitalization is a crucial factor in creating value, impacting the management model of organizations, and redefining the competitive dynamics of the various sectors (Gouveia et al., 2024).

In this context, AI has emerged as a driving force in this transformative environment, resulting in growing investment in the development and implementation of this technology by organizations (Marengo, 2024). As mentioned earlier, AI aims to provide machines with the ability to reason and learn in the same way as humans, with the potential to surpass some human capabilities in specific tasks, since machines are empowered with the ability to process large volumes of data, identify patterns, learn from them and make more informed decisions based on this learning (Z. Chen, 2024). In addition, AI makes it possible to optimize production and processes, predict risks, and solve problems at various levels of organizations, both financially and in HRM (Z. Chen, 2024).

The impact of AI is felt in almost every sector and is equally visible in both existing and new business models, boosting innovation in organizations, which in turn influences economic growth (Nyenno et al., 2023).

AI's ability to analyze large data sets, through Big Data, allows for a more comprehensive understanding of organizations' external and internal environment, providing a more detailed perspective (Z. Chen, 2024). Hence, its integration presents a panoply of

applications and implications, demonstrating significant potential for improving the decision-making process, strengthening competitive positioning, optimizing operational strategies, and improving the governance of organizations (Z. Chen, 2024). Additionally, through its ability to analyze large volumes of data, AI optimizes market segmentation and personalization, increasing efficiency and effectiveness (Alhitmi et al., 2024). At the same time, automation influences processes such as recruitment and organizational responsiveness to stakeholder needs (Alhitmi et al., 2024).

However, the implementation of AI presents some challenges that include difficulties in adoption, issues related to the very nature of the tasks, and the management of AI itself, which may be due to AI's lack of interpersonal skills (Z. Chen, 2024). Added to these challenges are the reduction of the human role in the production of goods and services, the replacement of labor, and the lack of trust in the face of automation, which can lead to a decrease in organizational commitment and a reduction in productivity (Z. Chen, 2024). On the other hand, the implementation of this technology raises concerns about data security and privacy, particularly about unauthorized access and misuse of sensitive information, so organizations through HRM must understand the possible impact of implementing this technology on employees and the workplace, mitigating the associated risks as well as maintaining the beneficial results for them (Z. Chen, 2024)

The introduction of technologies such as AI in organizations has been a controversial topic when it comes to its impact on workers and the workplace itself, since there are two opposing perspectives, on the one hand the reduction of jobs and on the other the increase in productivity and the quality of work (Bankins et al., 2024). However, the impact of AI on the labor market is directly influenced by the type of technology that is designed and implemented, if it is designed to replace workers it results in a decrease in labor demand, wage stagnation and a reduction in the quality of work, on the other hand, if it is designed to create new tasks or to support workers it leads to an increase in labor demand, wage increases and improved working practices (Bankins et al., 2024). In addition to the increased concern about potential job loss, the rapid advancement and implementation of AI and other automation technologies has a substantial impact on the employee experience, in that employees feel respected and integrated into the workplace, so the design and execution of talent management practices has a profound impact on how employees feel this respect and integration (Groves et al., 2024).

Organizations that integrate AI into their operations gain a significant competitive advantage through analysis based on this technology, making it possible to optimize performance, streamline processes, and create new business models (Zhang et al., 2021).

AI enables data-driven decision-making, allowing organizations to analyze large amounts of structured and unstructured data, improving management perspectives, reducing biases, and improving strategic planning (Zhang et al., 2021). The ability to process data in real time contributes to more agile decision-making, allowing companies to respond more quickly to market changes (Zhang et al., 2021). In this context, AI significantly improves organizational agility, i.e., an organization's ability to anticipate and respond to market dynamism. This technology allows data analysis to identify emerging trends and needs, allowing it to adjust its strategy proactively (Akter et al., 2023). This technology also impacts organizational knowledge, improving sharing mechanisms and automating knowledge management processes, promoting innovation and adaptability, and providing a degree of resistance to market disruptions (Akter et al., 2023).

Understanding how digital technologies shape the flow of knowledge is fundamental for organizations to act strategically and efficiently, and the lack of this deeper understanding directly impacts organizational strategies and the practical implementation of these technologies to boost knowledge management and project execution (Gomes et al., 2024). Another impact that these emerging technologies have on organizations is in the fight against corruption, since they influence interactions and the flow of information, so an exemplary implementation of these technologies makes it possible to promote transparency and accountability (Adam & Fazekas, 2021).

Although AI has multifaceted organizational impacts, it demonstrates the potential to optimize production processes, solve problems, anticipate risks, and assist HRM (Pereira et al., 2023). That said, HRM plays a crucial role in facilitating the implementation of AI, mitigating risks, and promoting positive results for employees, with this technology being used to improve management decisions, recruitment processes, learning, and employee engagement (Pereira et al., 2023). That said, AI can help employees by improving their overall performance, increasing the accuracy and consistency of their information analysis, and through interaction with AI, it is possible to create unique resources, increasing the efficiency of organizations (Hang & Chen, 2022).

Automation driven by AI significantly impacts organizations and the job market, affecting almost all professions, which is reflected in concerns such as technological

unemployment and the demand for new skills (Babashahi et al., 2024). Despite the challenges inherent in implementing this technology, it can help with efficiency and cost reduction, however there is a need for organizations to find a balance when implementing AI by promoting continuous learning and skills development to minimize the possible effects of these technologies, providing the creation of new career opportunities for employees (Babashahi et al., 2024).

The integration of AI has a multidisciplinary organizational impact. On the one hand, it strengthens trust between users and platforms through data analysis, and on the other, it is capable of predicting demand and adjusting prices, allowing personalization and increasing operational efficiency through automation (Y. Chen et al., 2021).

AI can potentially increase organizational performance, although not all organizations can achieve the same benefits (Haefner et al., 2023). Its rapid evolution, driven by technologies such as ChatGPT, transforms organizations' operations (Haefner et al., 2023). To this end, successfully implementing this technology requires an appropriate socio-technical system given the nature of AI and the challenges and risks inherent in its implementation (Haefner et al., 2023).

ChatGPT, one of the AI technologies, illustrates the potential of this aspect of generative AI by serving as a base model for various applications with a significant impact on knowledge work and the interaction of humans with this type of technology, consequently, this generation of generative AI has become widely accessible to the whole of society (Heyder et al., 2023). The organizational impacts of AI, in particular ChatGPT, are significant, with this technology boosting efficiency through rapid responses and problem-solving, optimizing the learning process, and improving accessibility by integrating diverse language styles and difficulties (McAlister et al., 2024).

The evolution of AI has highlighted a weakness in the conventional processes of organizations, so the longer they postpone the innovation and implementation of these technologies in their business models, the greater their risk of failure, however, the relationship between the potential of automation and its impact on workers must be a significant issue when implementing it (Sewpersadh, 2023).

Analysis of the organizational impacts of DT and AI integration shows that these are not just technological trends, but disruptive forces that are reshaping the way organizations operate, integrate their customers, and create value (Gouveia et al., 2024). The ability of organizations to adapt to this new digital reality proactively and responsibly will be a

determining factor in their long-term success, and understanding the challenges and opportunities associated with this transformation and adopting measures that promote effective and ethical implementation are essential aspects of achieving this (Z. Chen, 2024).

The fact that technological advances have an impact on the labor market is not a new phenomenon, so we can compare the appearance of steam engines in the first industrial revolution with smart devices and the HRC of Industry 4.0 and Industry 5.0, where initial concerns were raised such as the elimination of various jobs, the impact on society and the very well-being of the population (Budhwar et al., 2023). Although AI is set to have a significant impact on the economy, jobs and even personal life, there is already concern to ensure that this technology works in everyone's interests in the workplace as well as in society, which translates into results that are compatible with improving the quality of life (Budhwar et al., 2023).

In conclusion, DT and AI represent a revolution in the modern, dynamic environment in which organizations that follow this transformation, understand its impacts, and address its challenges strategically and responsibly, will be better positioned for the future. It is equally important that this transformation follows a balanced approach that combines innovation with responsibility, ensuring that these technologies are used to drive significant economic and social progress.

5.1.4. Challenges and Prospects for the future

The current industrial revolution exposes organizations to digital disruption pressures that differ from organization to organization, so the effectiveness of each business model lies in its ability to understand human motivations, translating this understanding into profitability (Sewpersadh, 2023). The responsiveness of the business model is a critical success factor in adapting to challenges, and to this end, the alignment and coherence of this model must be mutually reinforcing, integrating the influence of contextual factors on the organization's performance, and its development must result from the intersection of previous value models with contemporary disruptive technologies (Sewpersadh, 2023). The search for innovation forces organizations to adopt a futuristic perspective, challenging traditional business models. For this evolution to be possible, an analysis of these disruptive technologies is crucial, as well as understanding how they drive innovation in these models (Sewpersadh, 2023).

The increased innovative pressure caused by AI presents significant challenges regarding ethical issues and the uncontrollable progression of this technology (Nyenno et al.,

2023). To mitigate these risks and increase certainty, there is a need for a balance in the decision-making process in which the implementation of these new technologies is carried out ethically in organizational operations (Nyenno et al., 2023).

The adoption of AI by organizations presents a complex scenario, marked by challenges and prospects intrinsically linked to human capacity and the evolution of professional skills (Babashahi et al., 2024). Organizations face the difficulty of finding qualified human capital, which highlights the urgent need to develop skills resistant to automation, to mitigate the growing gaps between the demands of AI and the current capabilities of employees (Babashahi et al., 2024). Hence, skills development, digital proficiency, critical thinking, and adaptability are imperative to face these challenges (Babashahi et al., 2024). That said, the strategic implementation of AI requires carefully selecting solutions aligned with present and future needs, considering workers' skills and workflows, encompassing their performance assessment, job adaptation, and personalized AI training (Babashahi et al., 2024).

Concerning ethical issues and impacts on employment, AI raises concerns related to stress and job insecurity, requiring responsible management of the impact of automation on employees, the creation of new career opportunities, and the ethical integration of automated workflows (Babashahi et al., 2024). The technical requirements and challenges of AI highlight the need for expertise in areas such as language processing, machine learning, and IoT, and AI's inability to solve complex problems and its impact on the workplace require the development of dynamic skills, constant adaptation, and continuous training (Babashahi et al., 2024).

The development of AI presents a set of challenges and prospects for the future of organizations. On the one hand, it challenges the traditional role of human beings in the economic system, raising questions such as the future of work and the need to adapt human skills (Lu & Zhou, 2021). On the other hand, studies on automation show concerns about the potential destruction of jobs; still, there is a lack of evidence about the real impacts of this transformation on organizations (Lu & Zhou, 2021).

Dignity is a concept that is emerging as a central element in the employee experience in organizations, becoming increasingly relevant in the face of the challenges posed by AI, automation and robotics, since unlike previous technological disruptions, leaders face the challenge of ensuring that their employees are supported during the transformation of roles and jobs (Groves et al., 2024). Changes in skills and functions generate instability and require

adaptation, so with the redefinition of jobs and work activities caused by automation, generative AI, and other digital applications, the question arises of how organizations can prioritize the self-esteem and value of their workers (Groves et al., 2024).

Protecting human rights in the context of AI requires understanding and assessing the consequences, as a lack of ability to understand and assess them can lead to a loss of control and unwanted risks (Salumaa-Lepik & Nisu, 2024). AI can be a positive force for society by contributing to security and promoting human rights, however, it can also have adverse effects if it is used negligently by neglecting these (Salumaa-Lepik & Nisu, 2024).

In the economic sphere, AI requires a revision of traditional economic models, including human values and dimensions and even reformulating the concept of economic agents (Lu & Zhou, 2021). Having said this, the challenge arises to overcome the assumption of AI as a mere substitute for human labor and predict more accurately the impacts on economic growth under different parameters and conditions (Lu & Zhou, 2021).

The transformation of business models by AI raises crucial management challenges, since the interaction between humans and AI can lead to lower performance than human work alone, given that interaction with AI requires adaptation and alignment processes, and the interpretation of advice from AI can represent an obstacle (Hang & Chen, 2022). Having said this, a new challenge arises for managers as it becomes necessary to define the role of AI in the work environment, since the human inability to assess the capabilities of AI accurately emerges as a barrier in the search for efficiency (Hang & Chen, 2022).

In this sense, collaboration and knowledge exchange can drive innovation by helping to solve organizational and social challenges, in this respect, HRM has an essential role to play in retraining workers in the face of predicted job losses due to AI, also impacting the perception of fairness, inequality and trust in management (Budhwar et al., 2023). In this sense, generative AI offers tools to optimize HR performance management, nevertheless, this implementation faces obstacles due to the need for a versatile organizational effectiveness model (Budhwar et al., 2023). In addition, the integration of these systems faces challenges such as high investment, a data infrastructure, employee skills, reliability of recommendations, security risks and unknown consequences, so despite the exponential increase in productivity provided by these disruptive technologies, prudent implementation is necessary to minimize these risks (Budhwar et al., 2023). That said, AI technologies demonstrate the ability to take responsibility for tasks by changing the relationship with the human agent, however, these changes raise ethical challenges, so to avoid unintended negative consequences it is necessary to rethink the

management of human interaction with AI in organizations, as well as the promotion of positive results, seeking a balance between strategic objectives with the implementation of AI (Heyder et al., 2023).

The application of these disruptive technologies presents specific challenges and opportunities such as access to limited data and the lack of qualified professionals to develop and manage these technologies, in addition decisions and predictions can generate unexpected results in not-so-common problems where human thinking is required to evaluate the content generated by automation critically (Farshadfar et al.,2024). The convergence of AI with IoT for intelligent data analysis challenges balancing this maximization of data utility and preserving privacy, in which ML models can be helpful (Marengo, 2024). Ethical considerations, privacy protection, and data security challenges become increasingly crucial with the advances of these technologies, underlining the essential role of robust security measures and privacy-preserving technologies (Marengo, 2024).

However, the increasing reliance on AI can compromise the ability to think critically and independently, thus generating a cycle in which the lack of skills makes it difficult to evaluate AI-based decisions, creating a new challenge since this cycle can extend to all organizational levels (Budhwar et al., 2023).

In short, the rise of new digital technologies such as AI imposes disruptive pressure on organizations that require an adaptive reconfiguration of business models that transcends mere technological incorporation. Organizational efficiency increasingly lies in aligning these models with an understanding of human motivations and meeting the challenges inherent in this DT, which include ethical risks, managing HRC, overcoming gaps in skills development, and adapting to these changes. That said, the strategic and prudent implementation of AI, balancing innovation with ethical, technical, and human considerations, emerges as an imperative for future sustainability and success.

5.2 Discussion of Interview Results

Based on the map of themes and concepts created by Leximancer, and relating them to the SLR results, four essential themes emerged, which will be explored in this chapter:

1. The Role of Information in Management
2. The Integration of Artificial Intelligence in Management
3. Restructuring Organizational Processes
4. Solutions and prospects for the Future

Table 9 - Main results

Theme	Main results
The Role of Information in Management	• Digitalization and AI transform information and financial management, making data integration crucial. • The ability to process large volumes of data enables more informed decisions and automates routine tasks, increasing efficiency. • Data quality is crucial for satisfactory results, especially with official information. • Information security and privacy are persistent concerns, requiring robust measures and the restriction of uploads to public models.
Integrating Artificial Intelligence into Management	• AI is realizing its transformative potential in management, driven by advances in data collection, storage, and processing. • Organizations are re-evaluating their business models to optimize efficiency, competitiveness, and resource allocation through AI, IoT, robotics, and ML. • The implementation of AI brings challenges, although its use in tasks such as document summarization and data analysis already demonstrates increased efficiency and improved quality of solutions. • AI must complement human work, speeding up research and information processing, without replacing critical thinking.
Restructuring Organizational Processes	• DT requires organizational agility, strategic rethinking, and holistic investment for competitiveness. • DT in Defense is expanding and facing challenges, yet it can simplify the creation of complex documents and automate workflows. • The implementation of AI can reduce the human role in specific tasks and raise concerns about labor substitution and decreased organizational commitment. • Change management is crucial to the success of AI implementation, as an advanced system can fail if users cannot adopt it.
Solutions and Prospects for the Future	• The adoption of AI faces significant challenges, including ethical concerns about its impact on employment and data privacy. • It is crucial to qualify HR and establish policies to control the use of these tools. • The "contamination" of the model by biased data, including human bias, is a danger that can be mitigated through validation from multiple perspectives. • The interviews confirm the inevitability of AI and the need for robust investment in on-premise infrastructure and HR training to optimize processes and decision-making, complementing human thinking.

5.2.1 The Role of Information in Management

As mentioned in 5.1.1 Data Integration in Management, the profound transformation of financial and management information analysis through digitization and AI makes data integration crucial in this era (Brabete et al., 2024). The ability to collect, analyze, and interpret large volumes of data from various sources allows for more informed and accurate decisions

(Dong et al., 2024). Emerging technologies like RPA are important in automating routine tasks, increasing operational efficiency (Brabete et al., 2024).

The interviews corroborate and detail this perspective, with Interviewee 3, as Service Director of the Defense Data Center and responsible for the operation of the technological infrastructure and database administration, stressing the importance of information management to support decision-making and operational efficiency. He also identifies the drafting of administrative processes and the preparation of technical specifications as time-consuming and complex tasks that benefit from the automation provided by AI. Interviewee 1 also points out that the quality of data and information is critical, since the results will be unsatisfactory if the data and information are of poor quality. He also points out that, when analyzing regulations or drafting documents, it is essential to use official information, which is usually error-free and has excellent wording. Interviewee 2 adds to this by describing how AI is used at the Bank of Portugal to analyze contracts and automatically identify errors and non-compliance, significantly reducing human effort. These practical examples illustrate the transition from manual, routine tasks to efficient processes driven by high-quality data.

Information security and privacy are a persistent concern, requiring investments in robust security measures to protect other information throughout the collection, analysis, and storage process (Dong et al., 2024). In this sense, Interviewee 3 warns of the risk of exposing sensitive information when using public LLMs and external templates, reiterating that institutional documents should not be uploaded to general-purpose templates such as ChatGPT, Gemini, or other public templates. Following this logic, Interviewee 2, in the context of the cloud, highlights the importance of choosing servers with a controlled location, i.e., in the case of Europe, personal data must remain within the European Union, as well as restricting access to data only to those who strictly need it.

5.2.2 Integrating Artificial Intelligence into Management

The results obtained in topic 5.1.2, The Role of Technology and Artificial Intelligence in Management, show that AI is realizing its transformative potential, driven by advances in data collection, storage, and processing (Chi et al., 2020). Organizations are re-evaluating their business models to optimize efficiency and competitiveness using AI, IoT, robotics, and ML (Bahoo et al., 2023). AI thus optimizes decision-making, organizational processes, and resource allocation (Gama & Magistretti, 2025).

The interviewees confirm this interpretation. Interviewee 3 considers that using AI in the Military Administration is inevitable and that current AI models are being implemented in all software products. He also mentions that using LLM for document summarization, content preparation, and data analysis results in increased efficiency, improved quality of solutions, and faster problem solving. In this sense, Interviewee 1 reiterates that implementing LLM on-premise is possible, although it requires assessing computing capacity and the type of models needed. Interviewee 2 describes the use of AI in call centers for article suggestions and sales forecasting, as well as Salesforce's development of Agentic AI, which allows conversation, but the execution of actions, demonstrating a high level of integration and automation.

In this context, the SLR results also address implementation challenges, such as the need for new skills, trust management, and the regulation of this technology (Chen et al., 2023). Interviewee 3 corroborates this by identifying the need to train human resources with high technical skills. The discussion about replacing human labor with AI (Ahdadou et al., 2024) (Z. Chen, 2024), present in SLR, is addressed by Interviewee 3, who sees ChatGPT-type technologies as a tool to help employees complement their tasks. From this point of view, Interviewee 1 reinforces that LLMs should not replace individuals with critical thinking, but rather speed up searching for and processing information.

5.2.3 Restructuring Organizational Processes

DT requires organizational agility, strategic rethinking, and holistic investment to ensure competitiveness (Gouveia et al., 2024). AI drives DT by providing advanced data analysis, prediction, and automation capabilities, optimizing decision-making, efficiency, and organizational innovation (Z. Chen, 2024).

This idea is confirmed in the interviews, since Interviewee 3 points out that DT in Defense is expanding, and some challenges include high implementation costs, integration with legacy systems, and ongoing maintenance costs. He also mentions the consideration of Microsoft 365 Copilot and SAP Joule to automate processes and aid decision-making in Defense, based on internal data, representing a restructuring of existing workflows. On the other hand, Interviewee 1 emphasizes that, before deciding on the architecture of an LLM, it is essential to understand what you want to do and what kind of automation you want. In addition, he describes how LLMs can simplify the creation of complex documents, such as contracts, by automatically creating templates based on examples and legislation. This ability to automate complex tasks implies a redefinition of administrative processes. On the other

hand, Interviewee 2, while stressing the effectiveness of AI in optimizing isolated tasks, suggests that organizations should focus on a complete process transformation, since focusing only on optimizing specific tasks can lead to a delay in evolution.

In topic 5.1.3. The Organizational Impacts of Digital Transformation, challenges are identified when implementing AI, such as the reduction of the human role in the production of goods and services, the replacement of workforce, the lack of trust in the face of automation, which can lead to a decrease in organizational commitment and a reduction in productivity (Z. Chen, 2024). From this point of view, Interviewee 2 highlights change management as critical to success, as a technologically advanced system can fail if users cannot adopt it. To this end, he considers it crucial to involve users from the outset, showing the benefits and how AI makes work easier, thus increasing the likelihood of successful adoption.

5.2.4 Solutions and Prospects for the Future

In topic 5.1.4 Challenges and Prospects for the Future, the results address the challenges of AI adoption, which include the human skills gap, the need for digital proficiency, critical thinking, and adaptability (Babashahi et al., 2024). Ethical issues, such as the impact on employment, human dignity, rights, and data privacy, require balanced decisions and responsible management (Groves et al., 2024). In this sense, HRC and the role of HRM in this reskilling are also crucial (Budhwar et al., 2023).

In this context, Interviewee 3 highlights the qualification of HR, training, and employee awareness as pressing challenges. He also stresses the need to establish policies and standards to control the use of these tools in order to prevent risks. He also states that AI will play an important role in more realistic and practical budget planning in the Military Administration, with the ability to analyze historical data and monitor budget execution in real time, as well as foreseeing the growing use of these technologies in decision support systems and support systems for military personnel in the field with the use of autonomous and semi-autonomous systems.

On the other hand, Interviewee 1, when discussing the contamination of the model by biased data, warns of human bias as an insidious danger, which can be mitigated by involving multiple people with different perspectives in the validation process. He also addresses the issue of the "temperature" of the LLM, which determines the degree of flexibility and imagination in developing answers, and it is crucial to adjust it to the context of the task (as an example, a low temperature is most recommended for regulatory analysis, while a higher one

for programming). Interviewee 2 stresses that fine-tuning is a continuous process to refine the model over time, and also argues that evolutionary maintenance is essential to keep up with new technologies and remain competitive.

In short, the interviews complement the SLR results by providing a practical perspective on the implementation and challenges of AI in the Military Administration. They confirm the inevitability of AI, the centrality of data quality, and the need for strategic change management to ensure effective and ethical integration. The future strategy points to robust investment in on-premise infrastructures and human resources training, to develop customized solutions that, while not replacing human thinking, significantly optimize processes and decision-making.

CONCLUSIONS

The main objective of this research was to analyze the impact of Artificial Intelligence on decision-making within the scope of Military Administration, seeking to answer a set of derived questions that guided the research, namely the influence of AI on management, its application in the Defense Sector and the aid of Artificial Intelligence Linguistic Models in the decision-making process.

Regarding DP1: "How does Artificial Intelligence influence management processes?". AI has a profound and transformative influence on management processes. The SLR and interviews show that AI is realizing its disruptive potential, driven by continuous data collection, storage, and processing advances. Whether public or private, organizations are re-evaluating their business models to optimize efficiency and competitiveness through technologies such as AI, the IoT, robotics, and ML. This movement aims to optimize decision-making, organizational processes, and resource allocation.

AI's ability to process large volumes of data from various sources, often in real time, allows for the automation of routine tasks, such as categorizing transactions or creating financial reports, resulting in greater operational efficiency. This automation allows human resources to focus on higher-value activities, such as strategic analysis and value creation. The interviewees reinforce this perspective, stressing the importance of information management to support decision-making and operational efficiency, and identifying the drafting of administrative processes and the preparation of technical specifications as time-consuming and complex tasks that benefit from the automation provided by AI. In addition, data quality is a critical factor; poor-quality information leads to unsatisfactory results. For tasks such as analyzing regulations or writing documents, using official documentation and reliable, well-written information is essential. Practical examples, such as using AI at the Bank of Portugal to analyze contracts and automatically identify errors and non-compliance, clearly illustrate the transition from manual tasks to efficient processes driven by high-quality data. However, AI must complement employees, freeing them up for higher-level tasks that require critical thinking, empathy and creativity, speeding up the processing of information without entirely replacing human judgment.

Regarding DQ2: "How can Artificial Intelligence be applied in the Defense Sector?". In the Defense Sector, the application of AI is not only a trend, but an inevitability, and is currently expanding. AI can be applied to automate and optimize administrative processes that

are inherently complex and time-consuming, such as the preparation of employee-related processes and the preparation of technical specifications for contracting services, hardware and software. Implementing on-premise LLMs is considered technically feasible, giving greater control over data and security, although it requires a careful assessment of computing capacity and the type of models needed. A pragmatic approach in this context is to adapt and fine-tune robust open-source models, which is more cost- and time-efficient than developing a basic model from scratch.

In addition to administrative tasks, AI has an important role in the military administration's budget planning, enabling historical data analysis and identifying trends for more accurate revenue and expenditure forecasts. AI can monitor budget execution in real time, quickly identifying deviations and facilitating decision-makers' corrective intervention. The growing use of decision support systems and support for military personnel in the field is also expected, with autonomous and semi-autonomous systems, such as uncrewed aerial vehicles and ground robots, which can perform tasks in dangerous or difficult-to-access environments. Integrating solutions such as Microsoft 365 Copilot and SAP Joule in Defense is a concrete example of the restructuring of workflows driven by AI, aimed at automating processes and helping to make decisions based on internal data.

Concerning DQ3: "How can Artificial Intelligence Language Models help in the Decision-Making Process?". LLMs significantly assist the decision-making process, mainly due to their ability to process and analyze vast volumes of information and generate content. These models can simplify the creation of complex documents, such as contracts, by automatically generating templates based on examples and legislation. Their usefulness extends to preparing document and meeting summaries, content creation and data analysis, resulting in increased efficiency and improved quality of solutions and decision-making.

For example, LLMs' ability to analyze historical data and identify trends in budget planning allows for more accurate forecasts and rapid corrective intervention. However, for LLMs to assist in the decision-making process effectively, it is essential to ensure the high quality of the training data to avoid unsatisfactory or biased results. "Human bias" in the data is an insidious danger that can be mitigated by involving multiple people with different perspectives in the model validation process. Additionally, the "temperature" of the LLM, which determines the degree of flexibility and "imagination" in generating answers, must be adjusted to the context of the task to ensure the accuracy and usefulness of the information produced; for example, a low temperature is recommended for regulatory analysis, while a

higher one may be suitable for programming. Human supervision is therefore essential to validate the information generated by the models and mitigate risks such as "hallucinations".

With the answers to the DQ, we have now established the epistemological and methodological premises that are indispensable for realizing the GO of this research, culminating in the answer to the SQ: "What are the impacts of Artificial Intelligence on decision-making in the Military Administration?". The impacts of AI on decision-making within the military administration are vast, multifaceted and irreversible, marking a profound reconfiguration of processes and organizational culture. AI, driven by DT, is realizing its transformative potential, optimizing operational efficiency and competitiveness. The ability to analyze large volumes of data and automate routine and complex tasks, through LLMs and RPA, significantly improves decision-making by providing more accurate, real-time information, freeing up staff for more strategic, value-added functions. AI makes it possible to optimize budgets, manage resources and plan scenarios, making decisions more proactive.

However, this transformation is not without its challenges. Its implementation entails high costs, complexities integrating legacy systems and ongoing maintenance requirements. The human skills gap and the need for digital proficiency, critical thinking and adaptability are pressing challenges that require robust investment in HR skills and training. Ethical issues, such as the impact on employment, human dignity, rights and data privacy, are central and require responsible management and the implementation of clear policies and standards to control the use of these technologies. Information security and privacy are persistent concerns, with a clear recommendation not to upload institutional documents to public AI models and the importance of keeping sensitive data in controlled infrastructures, such as on-premise.

Change management is critical in successfully implementing AI, as user resistance can jeopardize the adoption of technologically advanced systems. It is crucial to involve users from the start of the process, demonstrating the benefits and how AI makes work easier, to increase the likelihood of successful adoption. The interviews reinforce the inevitability of AI in the Military Administration and the need for strategic investment in infrastructure and training to develop customized solutions that, while not replacing human thinking, significantly optimize processes and decision-making. In short, AI can revolutionize military administration. However, its positive impact will depend on a balanced approach that combines technological innovation with prudent management of ethical and operational risks, ensuring that human discernment and well-being remain at the heart of decision-making.

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APPENDICES

APPENDIX A - Main Results of SLR Articles

Author(s)	Year	Objective	Method	Main results of the article
Zhang Y. et al.	2021	Conduct a quantitative review of Big Data research in companies to complement existing qualitative reviews.	SLR	• Big Data is a fundamental basis for AI in business research. • Big Data is becoming essential for competitive differentiation in companies. • Professionals can find out about Big Data applications in various business domains.
Abu Huson Y. et al.	2024	Analyze the state of the art in the literature on information technologies, AI, and blockchain in auditing.	SLR	• There are four independent trends in auditing research related to the impact of technology on audit independence and quality. • The challenges of applying blockchain technology in auditing and accounting are highlighted. • Analyzing accounting data through AI technologies is recognized as a fundamental trend.
Akter S. et al.	2023	Critically evaluate the innovation capabilities of AI-powered services.	SLR	• AI-based service innovation increases organizational agility and competitive advantage. • It highlights the importance of integrating management, infrastructure, and market capabilities to achieve agility.
Bankins S. et al.	2024	Clarify the impact of AI technologies on workers' work experiences and projects.	SLR	• It identifies five themes: human-AI collaboration, perception of capabilities, worker attitudes, algorithmic management, and implications for the labor market. • AI can improve job quality for skilled workers, but it can exacerbate inequalities for less skilled individuals. • The results emphasize the need for organizations to prioritize employee well-being when implementing AI technologies.
Lu Y. & Zhou X.	2021	Explore how AI is represented in economic models.	Literature Review	• He concludes that the "Singularity" is not imminent based on current economic data. • The impact of AI on productivity and employment is complex, with potential increases in inequality. • The Solow Paradox remains unresolved in the case of AI, as with other technological advances.

Dong M. et al.	2024	Review of recent publications on ChatGPT and LLM in accounting and finance.	SLR	• ChatGPT shows proficiency in the non-technical aspects of risk management but has difficulties with the technical details. • Generative AI can improve ESG (Environmental, Social, and Governance) and sustainability reports, improving transparency and accountability. • LLMs improve the quality of financial reports, consistency, and compliance with accounting standards. • The measures generated by AI outperform existing methods in predicting the volatility of stock returns and company responses.
Chen Y. et al.	2022	Understanding how AI influences the sharing economy.	SLR	• AI increases trust, matches assets, and understands the preferences of participants in sharing economy platforms. • It highlights the integration of AI and information technology into the sharing economy, marking it as a significant trend.
Pereira V. et al.	2023	Using AI technology effectively for organizational improvement.	SLR	• It identifies key themes such as learning, training, and knowledge sharing. • The different human resources functions treat AI differently, affecting results in the workplace. • It highlights the importance of considering various HR functions in AI studies.
Babashahi L. et al.	2024	Explore the relationship between technological advances and labor market demands influenced by AI technologies.	SLR	• It identifies the crucial skill sets needed for effective AI integration, highlighting technical proficiency and adaptability. • Workers must acquire new digital skills to minimize the risks of substitution by automation. • Innovative learning methods, particularly experiential learning, are essential for bridging the skills gap. • The conclusions underline the need for continuous adaptation of skills and ethical implementation of technology in companies.
Gopinath K. & Kasilingam D.	2023	Synthesize the literature through a meta-analysis of the adoption of *chatbots* in various applications.	SLR	• The main factors influencing user adoption include playfulness, attitude, usefulness, facilitating conditions, and social influence. • Technological characteristics and culture significantly moderate certain relationships in the model.
Jiang H. et al.	2022	Objectively understand the applications of the AI system and provide a visual representation of the results.	SLR	• The application of AI systems has kept pace with advances in AI technologies. • AI systems are used in intelligent manufacturing, autonomous driving, biometrics, and natural language processing. • The conclusions suggest that the theoretical basis of automated learning is crucial for AI applications.

Adam I. & Fazekas M.	2021	Systematically evaluate the impact of information technologies on corruption.	SLR	• The document concludes that information technologies can increase transparency and accountability, but their impact depends on the context. • Studies indicate that *crowdsourcing* platforms can fight corruption. • Transparency portals can improve public decision-making, but they can provide inconsistent data.
Lazaroiu G. et al.	2023	Explore how fintech boosts business investment efficiency and economic growth through innovative tools.	SLR	• The development of *fintech* improves the efficiency of business investment and economic growth through innovative tools, reducing companies' financing constraints. • Automated learning algorithms improve payment operations, risk assessment, and fraud detection in instant payment networks. • It highlights the role of AI and cloud computing in improving *fintech* management and operational efficiency.
Di Vaio A. et al.	2020	Investigating the role of AI in building sustainable business models.	SLR	• It emphasizes the need for organizations to adopt sustainable practices and improve technological capabilities. • AI can drive the cultural change needed to achieve sustainable goals. • It discusses AI's ethical and social implications, particularly concerning inequality.
McAlister R. et al.	2024	Explore the integration of AI technologies in education, focusing particularly on the implications of ChatGPT.	Literature Review	• Identifies the risks and benefits of AI technologies in education, advocating their integration. • The research highlights the importance of understanding AI prejudices. • It calls for effective policies to ensure that students understand the guidelines for using AI.
Bahoo S. et al.	2023	Critically analyze the intersection between AI and corporate innovation.	SLR	• The study identifies eight lines of research linking AI to business innovation, including the impact of AI on business models and product innovation. • AI technologies, such as IoT and machine learning, significantly influence business innovation.
Haefner N. et al.	2021	Explore how AI can transform innovation management processes within organizations.	Literature Review	• AI plays a constructive role in innovation management, especially when traditional resources are overloaded or ineffective due to digitalization. • It identifies the challenges in implementing AI systems, focusing on technology, human factors, and their interaction. • AI can improve systematic approaches in innovation-seeking organizations by solving information processing constraints. • It highlights the potential of AI to overcome the limitations of information processing during the innovation process. • AI can reduce the risks and costs associated with innovation processes. • The role of AI in innovation management is crucial, as it reshapes organizational processes and the decision-making process.

Li M. et al.	2023	Identify current AI technologies and their applications in finance.	Literature Review	• The document identifies the main AI technologies and applications in finance, highlighting financial forecasting and decision-making as areas of significant impact. • It indicates a growing interest in the role of AI in enhancing financial efficiency and decision-making.
Truong Y. & Papagiannidis S.	2022	Explore how AI can increase innovation for managers throughout the stages of the innovation process.	Literature Review	• The document highlights the critical role of innovation management in companies, emphasizing its ambiguous and resource-intensive nature. • AI is identified as a powerful technology that can reduce uncertainty and labor costs in innovation processes. • The research discusses how AI can enhance innovation managers at various stages of the innovation process. • AI can serve as a new invention method, although its potential is still limited. • AI can support innovators more effectively in the later stages of the innovation process.
Gama F. & Magistretti S.	2025	Summarize the role of AI in influencing innovation capabilities	SLR	• Identifies the facilitating and reinforcing innovation capabilities triggered by the adoption of AI. • It underlines the importance of innovation capabilities in adopting and implementing AI. • It highlights the need for skills and routines to drive the adoption of AI.
Mariani M. et al.	2023	Understand AI adoption's economic, technological, and social drivers for innovation purposes.	SLR	• Identifies economic, technological, and social factors that influence the adoption of AI in innovative companies. • The main results of implementing AI include economic, competitive, organizational, and innovation factors for companies. • The results highlight the growing relevance of AI in supporting innovation decisions over time.
Chi H. et al.	2020	Systematically review AI applications in service encounters and the hospitality industry.	SLR	• The study highlights the need to balance technology adoption with human interaction. • The results suggest that AI will profoundly transform the services sector.
Singh H. & Singh A.	2023	Organize the technological aspects of ChatGPT from a modern perspective of technological disruption.	SLR	• ChatGPT does not generate new ideas, but reproduces existing content, producing derived results. • ChatGPT applications cover various domains, including healthcare, education, and business.

Agostino D. et al.	2022	Review research on digital technologies, accounting, and accountability.	SLR	• It stresses the importance of data quality and the accountability of data translators. • The research highlights the need to pay attention to social equity and inclusion in digitalization.
Herold S. et al.	2023	Achieve a collective understanding of the skills needed for procurement DT.	SLR	• It underlines the importance of strategic choices for procurement managers when adopting digital technologies.
Ahdadou M. et al.	2024	Critically analyze the role of AI in strengthening corporate governance, particularly in non-financial sectors.	SLR	• It highlights the potential of AI to improve corporate governance in various non-financial sectors. • The integration of AI into governance challenges is multifaceted, impacting board performance and sustainability efforts.
Chen Q. et al.	2023	Analyze explainable AI trends in finance.	SLR	• AI has diversified financial capabilities and improved the interpretability of financial models. • The results suggest the need to improve methodologies to increase the adoption of technologies in the financial sector.
Park S. et al.	2025	Analyze the use of AI in organizational development.	SLR	• AI applications in organizational development focus on HR and strategic change interventions, improving innovation and performance. • It identifies potential ethical concerns and recommends future research directions for AI applications in organizational contexts.
Kou G. & Lu Y.	2025	Investigate how emerging technologies are transforming the financial sector and their implications for the future.	Literature Review	• It highlights the significant impact of emerging technologies such as AI and automated learning in the financial sector. • The research identifies the main applications of machine learning in investment analysis, asset modeling, and risk management. • It suggests that balancing the advantages and disadvantages of these technologies is crucial for effective financial operations.
Andronie M. et al.	2024	Clarifying the role of generative AI algorithms in blockchain-based fintech management.	SLR	• The document identifies generative AI algorithms that improve fraud detection and financial decision-making in management. • It highlights the role of algorithmic trading and predictive analytics in personalizing financial services and mitigating risks. • It emphasizes the importance of automated investment guidance and risk management tools to improve operational efficiency.

Haefner N. et al.	2023	Provide a systematic review of AI implementation and scaling approaches in organizations.	Literature Review	• It underlines the importance of creating an appropriate socio-technical system for successfully adopting AI. • Companies must focus on creating data pipelines, technical infrastructures, and AI models for effective implementation. • The results suggest that AI can significantly improve companies' capabilities and competitive advantage.
Melnychenko O.	2020	Develop a representative concept of a company's level of financial security.	Literature Review	• The study emphasizes that stakeholders perceive financial security differently, not just based on economic indicators. • Financial security can be assessed through qualitative data and stakeholder involvement, not just quantitative measures. • The study suggests that expert assessments, although objective, are limited by cognitive biases.
Ranta M. et al.	2023	Explore ML methods and new data sources in management accounting.	Literature Review	• Identifies opportunities for ML methods in management accounting, emphasizing textual data sources and the quantification of qualitative data. • ML methods can improve estimates and forecasts in management accounting, offering potential advantages over traditional methods. • AI is pointed out as a crucial area currently lacking in management accounting, despite its importance.
Brabete et V. al.	2024	Analyze the impact of AI on accounting training and the professional skills needed to adapt.	Literature Review	• It identifies the impact of AI on the accounting profession, highlighting the need for curricular reconfiguration in accounting education. • It highlights the need for accounting professionals to develop technology, data analysis, and human interaction skills.
Lee M. et al.	2023	Develops a conceptual framework to facilitate understanding of the implementation of AI in organizations.	SLR	• There is a growing trend in research into the implementation of AI in organizations. • It proposes a conceptual framework for implementing AI in organizations.
Coombs C. et al.	2020	Conceptualizing intelligent automation and its associated technologies in the knowledge and services sectors.	Literature Review	• It identifies intelligent automation as a significant technological development in knowledge and service work due to advances in AI. • It presents an Intelligent Automation model based on business value to increase organizational value.

Mariani M. et al.	2023	Identify the main antecedents and consequences of AI in the context of innovation.	SLR	• The adoption of AI improves products, processes, business models, and innovation. • Technological, social, and economic factors drive companies to adopt AI for innovation. • AI supports the exploration and selection of problems in the innovation process. • AI can optimize operations, reduce waste, and lower environmental impact.
Mahmud H. et al.	2022	It seeks to advance our understanding of algorithmic decision-making and its implications.	SLR	• The study identifies aversion to algorithms as a significant behavioral anomaly, even though algorithms often outperform humans in decision-making.
Iftikhar S. et al.	2023	Analyze the role of AI/ML algorithms in resource management.	SLR	• Existing studies cover various infrastructures, optimization objectives, and metrics for evaluating performance in resource management. • AI-based methods are used for classification, prediction, and decision-making in resource management challenges.
Prasetyo M. et al.	2025	Supporting organizations in adopting AI and enhancing project management processes in open innovation projects.	SLR	• It identifies the main technical and non-technical factors for successfully adopting AI in project management, emphasizing infrastructure and skills development. • AI technologies, including machine learning and natural language processing, significantly improve project management tasks and decision-making processes. • AI improves resource management and the accuracy of financial planning, which are crucial to project success.
Mishra N. & Pani K.	2020	Discuss approaches to knowledge and innovation strategies for appropriating the value of AI technology.	Literature Review	• It identifies a significant gap between companies' potential and actual adoption of AI technologies. • It highlights the importance of knowledge management as a precursor to product or process innovation. • The study links organizational learning and ambidexterity to increase value creation from AI.
Camilli R. et al.	2025	Provide a comprehensive review of cognitive biases in accounting judgment and decision-making.	SLR	• It identifies the cognitive biases that significantly affect accounting judgment and decision-making, with adverse consequences for companies. • It presents a typology of biases, including easy attribution biases, emotional biases, and frame dependency biases. • It highlights the need for strategies to improve decision-making accuracy and reliability. • It highlights the importance of understanding cognitive biases to improve the design of accounting information and mitigate its adverse effects.

Groves S. et al.	2024	Provide practical strategies to protect and promote the dignity of employees during DT.	Literature Review	• Digital transformation technologies threaten workers' dignity, affecting self-esteem and value in various professional categories. • Leaders must implement strategies to protect and cultivate workers' dignity during DT. • Effectively managing perceptions of transparency and fairness is crucial during DT. • Automation can increase competitive advantage if it is well managed, but it can erode workers' dignity if ignored.
Alhitmi K. et al.	2024	Analyzing the intersection between AI marketing, security, and privacy.	SLR	• The study highlights concerns about the security and privacy of AI-based data, highlighting the ethical and legal implications. • The results advocate a comprehensive strategy involving technological advances and guidelines to improve data security.
Gomes J. et al.	2024	Identify how digital technologies are used in knowledge management and project management contexts.	SLR	• Identifies how technologies are used in knowledge management in project management contexts. • These technologies include Industry 4.0, Cloud Computing, Big Data, IoT, and AI, with an impact on knowledge management practices. • It highlights the importance of sustainability and technological advances in contemporary business challenges.
Sewpersadh N.	2023	Analyzing discontinuous change in business models through interdisciplinary literature flows.	SLR	• It identifies the need for governance structures to manage trade-offs between value factors and benefits for society. • It underlines the importance of multidisciplinary approaches to adapting business models in a rapidly changing environment.
Heyder T. et al.	2023	It seeks to align AI with human values, emphasizing ethical considerations.	SLR	• The document identifies the need for ethical management of the interaction between humans and AI, underlining the alignment with human values. • The results indicate that human judgment is crucial in AI decision-making processes.
Salumaa-Lepik K. & Nisu N.	2024	Explore the correlation between the implementation of e-governance and respect for human values in modern societies.	Literature Review	• Integrating new technologies can increase transparency and comply with legal requirements. • It suggests that ethical considerations in the implementation of technology are often neglected.
Kureljusic M. & Karger E.	2024	Investigate the current state of AI-based forecasting research in financial accounting.	SLR	• It identifies three categories of AI-based forecasting in financial accounting: bankruptcy forecasting, financial analysis, and fraud detection. • AI increases the accuracy of forecasts and enables proactive management of financial accounting.

Hang H. & Chen Z.	2022	Summarize how AI can create competitive advantages in the digital economy.	Literature Review	• It identifies the potential of AI to create competitive advantages in the digital economy through greater productivity and the creation of unique resources. • AI can increase revenues by increasing worker productivity and consumer evaluation, reducing costs, and increasing efficiency. • The main obstacles to AI's full potential include a lack of interpersonal skills, which affect its adoption and management.
Budhwar P. et al.	2023	Explore the intersection between generative AI and sustainable HRM, addressing ethical issues in organizational change.	Literature Review	• It highlights collaborative innovation through the impact of ChatGPT on organizational performance. • It highlights the need to address biases in AI algorithms that affect diversity and inclusion in multicultural teams.
Farshadfar Z. et al.	2024	Analyze the role of ML in strengthening circular supply chains at various stages.	SLR	• Automated learning significantly improves the performance of the circular supply chain by improving resource management. • Automated learning applications optimize supplier selection and operational processes. • He suggests integrating ML with technologies such as IoT to improve operations.
Nyenno I. et al.	2023	Predicting the capabilities of AI in management work in various industries.	Literature Review	• AI's automated learning model has a significant impact on business models and economic growth at various levels. • Ethical considerations in AI include autonomy, justice, and humanity. • The roles of managers include decision-making, information processing, and interpersonal interaction, as identified by Mintzberg. • Understanding the content of management and AI is crucial for strategic development.
Marengo A.	2024	Identify trends and challenges in AI-driven IoT, with a focus on intelligent data analysis and privacy protection.	SLR	• It identifies significant trends in AI-driven IoT, emphasizing intelligent data analysis and privacy protection. • It indicates the need for continuous updates due to the rapid evolution of AI and IoT technologies. • It reveals that the integration of AI improves operational efficiency and data-driven decisions in various sectors.
Chen Z.	2024	It investigates the responsibility, application, and impact of AI in organizational training.	SLR	• It highlights the need for responsible AI training systems that respect ethical standards such as non-discrimination and privacy. • AI applications in training include knowledge management, needs analysis, and feedback for customized solutions. • The research highlights the different impacts of AI-supported training on organizations, trainers, and trainees.

Dhamija P. & Bag S.	2020	Systematically review the existence of AI in operations management.	Literature Review	• It underlines the need for longitudinal studies in various sectors to assess the impact of AI over time. • It identifies a lack of necessary skills among implementers, which hinders the adoption of AI. • Automation is a priority in all sectors, with AI playing a crucial role in this transformation. • It suggests that technological benefits depend on adequate skills and knowledge for effective implementation.
Bhatnagr R. et al.	2024	Exploring the digital customer experience with AI-powered banking chatbots.	Empirical Study	• Perceived anthropomorphism, personalization, and perceived control positively influence the user experience with chatbots. • It highlights the effectiveness of *chatbots* in improving the user experience, although they should be complemented with human service for more complex tasks.
Kalbouneh A. et al.	2023	Developing a map of research trends in sustainable accounting.	Literature Review	• It identifies four major research trends in sustainable accounting: reporting, management control systems, environmental management, and stakeholder involvement.
Borges A. et al.	2021	Critical review of the literature on integrating AI into organizational strategy.	SLR	• He points out that the strategic use of AI technologies is little explored in the literature, despite its potential for competitive advantage. • It identifies four sources of business value creation through AI: decision support, customer engagement, automation, and new products/services. • The results indicate significant opportunities for generating new management theories and practices in the context of AI.
Gouveia S. et al.	2024	Improve understanding of DT in the creation of value and strategy in organizations.	SLR	• DT reshapes value creation and requires adaptation in all sectors. • It highlights the importance of strategic alignment between technological advances and organizational objectives.

APPENDIX B - SLR Inclusion and Exclusion Criteria

Criteria	Inclusion	Exclusion
Period	2020 to 2025	Any study outside this period
Language	English	Non-English language studies
Type of document	Review	Other types of studies
Journal quartile	Q1 and Q2	Studies not in these quartiles
Sphere of Analysis	Studies whose main focus is on AI applications directly related to the research topic.	Focus on other applications of AI that are not directly related to the subject under study.
Specific Focus	Studies that deal with the subject in a more general way or studies whose specific cases provide a comparable view of the research subject.	Studies committed to cases such as specific countries and companies, without the possibility of comparison to the area under study.

APPENDIX C - User Interview

MILITARY ACADEMY

ARTIFICIAL INTELLIGENCE IN MILITARY DECISION-MAKING

José Manuel Mendes Oliveira

Master's dissertation

Interview script

Interview script - Master's dissertation

Purpose of the interview: To gather perspectives and experiences from Military Administration Officers on the use, challenges, and potential of Artificial Intelligence (AI), including tools such as ChatGPT, in decision-making processes and administrative tasks.

Interviewee (Name, Position/Function, U/E/O):

Date:

I. Introduction and Consent

I, _____, agree of my own free will to take part in this research entitled "*Artificial Intelligence in Decision-Making within the Military Administration*", carried out by Military Administration Aspirant José Manuel Mendes Oliveira, following what he has previously explained to me.

I understood the full explanation and objectives of this research, in particular, that the collection of the data requested is solely and exclusively for scientific purposes and that all the information provided will be treated confidentially. I was also allowed to ask any questions I felt necessary regarding the research.

I am aware that the results of this research may be used for publication purposes, and I have also been informed that after processing the data provided, all materials (transcripts) will be destroyed.

I hereby give my consent for all the data processed to be made available in open source. My identity will not be published without prior authorization, and anonymity will be guaranteed throughout the research process.

Researcher's Signature	Signature of Interviewee
_____	_____
_____	_____

II. Professional Background and Familiarity with Artificial Intelligence (AI)

1. Could you briefly describe your main roles and responsibilities?
2. In your day-to-day life, what kind of administrative tasks or processes do you find most complex or time-consuming?
3. How familiar are you with the concept of AI and its applications?

III. Using AI tools

4. In the course of your work, do you use or have you used any AI-based tools?

    A. **If yes**
        i. What kind of tools?
        ii. What kind of tasks do you use these tools for?
        iii. How often do you use these tools?
        iv. Do you find these tools useful in your work? In what way?

    B. **If not**
        i. Is there a specific reason for not using it?

5. Specifically about ChatGPT-type tools (LLM - Large Language Models), have you used them to support any administrative or decision-making tasks? If so, can you give examples?

IV. Information and Document Practices

6. Is there any discussion within the institution about the practice of entering or uploading information or work documents, even unclassified ones, to external AI platforms such as ChatGPT or similar? If so, could you share, in general terms, what the guidance is?

V. Technological Challenges: Security, Privacy, and Integrity

7. From your perspective, what are the biggest technological challenges associated with implementing or using AI in the Military Administration?
8. Focusing specifically on **security**:
    A. What are your main concerns regarding information security when using AI tools, especially those that are external to the military institution?

9. Regarding **privacy**:
    A. How do you assess the balance between the potential benefits of AI and the risks to data privacy in the military context?
10. Regarding **integrity**:
    A. What are the main challenges in ensuring the integrity of AI-supported data and decisions in the military context, and how can they be mitigated?
11. Apart from security, privacy, and integrity, do you identify any other relevant challenges?

VI. Recommendations and Future Vision

12. Based on your experience and vision, what recommendations would you make for a safer, more ethical, and effective integration of AI?
13. How do you see the role of AI in the military administration evolving over the next few years?

VII. Conclusion

14. Are there any crucial aspects that we haven't discussed and that you think are relevant?

I appreciate your time and collaboration, your perspective is extremely valuable for the course of my research.

APPENDIX D - Technician Interview Guide

MILITARY ACADEMY

ARTIFICIAL INTELLIGENCE IN MILITARY DECISION-MAKING

José Manuel Mendes Oliveira

Master's dissertation

Interview script

Interview script - Master's dissertation

Purpose of Interview: To gather the perspective of technical experts on the requirements, challenges, possible architectures, and security considerations for developing, implementing, and maintaining a Generative Artificial Intelligence (AI) system in an on-premise infrastructure controlled by the Army.

Interviewee (Name, Position, Place of Work):

Date:

I. Introduction and Consent

I, _____, agree of my own free will to take part in this research entitled "*Artificial Intelligence in Decision-Making within the Military Administration*", carried out by Military Administration Aspirant José Manuel Mendes Oliveira, following what he has previously explained to me.

I understood the full explanation and objectives of this research, in particular, that the collection of the data requested is solely and exclusively for scientific purposes and that all the information provided will be treated confidentially. I was also allowed to ask any questions I felt necessary regarding the research.

I am aware that the results of this research may be used for publication purposes, and I have also been informed that after processing the data provided, all materials (transcripts) will be destroyed.

I hereby give my consent for all the data processed to be made available in open source. My identity will not be published without prior authorization, and anonymity will be guaranteed throughout the research process.

Researcher's Signature

_____

_____

Signature of Interviewee

_____

_____

II. Experience and Technical Background

1. Could you briefly describe your area of specialization and main experience in the fields of AI and LLMs?
2. Do you have specific experience of implementing AI systems in on-premise environments?
3. Have you ever worked on projects that involved strict data security requirements, or in regulated/restricted environments (such as the financial sector, healthcare, defense, or government)? If so, can you share some of the challenges specific to those contexts?

III. Feasibility and Architecture of an On-Premise LLM for the Army

4. From a strictly technical point of view, do you consider it feasible to develop and operate an effective LLM entirely within an on-premise infrastructure managed by the Army? What would be the main initial obstacles?
5. What kind of system architecture would you recommend for such a solution? What components would be essential?
6. Would it be more pragmatic to adapt and fine-tune a robust open-source model for the military context, or would it make sense to consider developing a base model from scratch, albeit simpler initially? What are the pros and cons of each approach in this context?

IV. Data requirements

7. What type, volume, and quality of data would be needed to fine-tune an LLM so that it is useful for specific tasks in the **Military Administration**[1] (e.g., analysis of regulations, support for drafting documents, summarizing information)?
8. How can we guarantee the security, privacy, and integrity of this data throughout its life cycle?
9. What is the risk of "contaminating" the model with incorrect or biased data during fine-tuning, and how can this be mitigated?

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[1] The **Military Administration** is a service of the Portuguese Army responsible for logistics and finance, with the following main activities:

- Framing the reform of the state's financial administration;
- Apply the principles and rules for drawing up and implementing the state budget;
- Carrying out the monthly and annual accountability process;
- Carrying out the procedures of the public procurement code and operating the respective electronic platforms;
- Operating the integrated management system;

V. Hardware and Software Infrastructure

10. What specific physical and logical infrastructure considerations would be necessary in a military environment (e.g., need for air-gapped systems, resilience to failures, physical hardware security)?

VI. Security measures

11. What technical and procedural security measures would be critical to implement?

VII. Development, Maintenance, and Evolution

12. What is the complexity and estimated effort (in terms of time and resources) to develop and implement a first functional version (MVP - Minimum Viable Product)?
13. How complex is the ongoing fine-tuning process to keep the model up-to-date and relevant? What kind of maintenance would be required?

VIII. Integration and Use Cases

14. Technically, which specific use cases in Military Administration seem most suitable or promising to be supported by an on-premise LLM?

IX. Challenges, Risks, and Technical Recommendations

15. Apart from security, what are the biggest technical challenges or risks you identify in this type of project? What technical recommendations would you give to an institution with the characteristics of the Army if it decided to go ahead with operating an on-premise LLM solution?
16. Are there alternative technologies or simpler approaches that could solve some of the problems of Military Administration without the complexity of a full on-premise LLM?

X. Conclusion

17. Are there any crucial technical aspects that we haven't discussed and that you think are relevant?

I appreciate your time and collaboration, your perspective is extremely valuable for the course of my research.