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Universidade de Lisboa

MASTER IN MANAGEMENT (MIM)

MASTER´S FINAL WORK

DISSERTATION

THE IMPACT OF ARTIFICIAL INTELLIGENCE ON HUMAN RESOURCES MANAGEMENT: SPECIFIC CASE OF RECRUITMENT

MADALENA ALMEIDA TAVARES PAVIA DE MAGALHÃES

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LIST OF ABBREVIATIONS

AI - Artificial Intelligence

ATS - Applicant Tracking Systems

CIPD - Chartered Institute of Personnel and Development

CPCS - Comissão Permanente de Concertação Social

CV - Curriculum Vitae

EU - European Union

FAQ - Frequently Asked Questions

HR - Human Resources

HRM - Human Resources Management

IoT - Internet of Things

OECD - Organization for Economic Cooperation and Development

SMEs - Small and Medium Enterprises

UNESCO - United Nations Educational, Scientific and Cultural Organization

ABSTRACT

This study aims to understand the relationship between Artificial Intelligence (AI) and Human Resources Management (HRM), with a focus on recruitment as one of the processes most influenced by AI.

AI has undergone remarkable advancements since 1950, when Alan Turing first questioned whether machines could think. Nowadays, AI is reshaping societies and economies, promising to generate productivity gains, improve wellbeing and help address global challenges, such as climate change, resource scarcity and health crises. However, as AI technologies become more widespread, they raise concerns regarding ethics, fairness, privacy, and other critical human values (OECD, 2024).

The literature has explored various contexts where AI can offer both advantages and drawbacks, extending beyond personal use into the workplace. Several issues such as speed and reduction of time-consuming and repetitive tasks, analysis of a large volume of data related with candidate matching and release of functions in HRM positions were addressed.

In this study, we used a qualitative methodology through in-depth interviews as a method of data collection to HR experts. The present work aims to understand the impact of AI on HRM, specifically on recruitment. We intend to contribute to the academic discussion around the use of technology in an area of human science such as the HRM. In a context where talent acquisition is key for the success and survival of companies, we see enterprises investing in new technologies. This symbolizes a change in the traditional view of the way companies operate, where many seek assistance in AI to maximize their performance and their productivity. Based on the analysis, the research finds that AI has significantly transformed recruitment processes by increasing efficiency, reducing biases, and improving candidate matching. However, challenges such as the need for human oversight and the potential for algorithmic discrimination remain.

KEYWORDS: Artificial Intelligence; Candidate Matching; Human Resources Management; Recruitment; Talent Acquisition.

RESUMO

Este estudo tem como objetivo compreender a relação entre a Inteligência Artificial (IA) e a Gestão de Recursos Humanos (GRH), com foco no recrutamento como um dos processos mais influenciados pela IA.

A IA tem passado por avanços notáveis desde 1950, quando Alan Turing questionou pela primeira vez se as máquinas poderiam pensar. Atualmente, a IA está a transformar sociedades e economias, prometendo gerar ganhos de produtividade, melhorar o bem-estar e ajudar a enfrentar desafios globais, como as alterações climáticas, a escassez de recursos e as crises de saúde. No entanto, à medida que as tecnologias de IA se tornam mais generalizadas, levantam preocupações relacionadas com a ética, justiça, privacidade e outros valores humanos essenciais (OECD, 2024).

A literatura explora vários contextos onde a IA pode oferecer tanto vantagens como desvantagens, expandindo-se além do uso pessoal e abrangendo o mercado de trabalho. Foram abordadas várias questões como a rapidez, redução de tarefas repetitivas que consomem tempo, a análise de um grande volume de dados relacionada com processos de seleção de candidatos e a liberação de funções em posições de GRH.

Neste estudo, foi utilizada uma metodologia qualitativa, recorrendo a entrevistas em profundidade como método de recolha de dados junto de peritos de RH. O presente trabalho tem como objetivo perceber a associação entre a IA e a GRH, incidindo especificamente no recrutamento. Pretende-se contribuir para a discussão académica em torno do uso da tecnologia numa área da ciência humana, como a GRH. Num contexto em que a aquisição e retenção de talentos é essencial para o sucesso e sobrevivência das empresas, são cada vez mais as que investem em novas tecnologias e apostam na inovação. Isto simboliza uma mudança na visão tradicional de como as empresas operam, onde muitas procuram na IA assistência para maximizar o desempenho dos seus colaboradores e a sua produtividade.

PALAVRAS-CHAVE: Inteligência Artificial; Correspondência de Candidatos; Gestão de Recursos Humanos; Recrutamento; Aquisição de Talentos.

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1. INTRODUCTION

The concept of Artificial Intelligence (AI) has been widely debated and developed over the years, integrating technologies such as data processing, algorithms, and computing power to perform tasks traditionally handled by humans (European Commission, 2021). As AI continues to evolve, this study explores its growing influence on Human Resources Management (HRM), focusing on recruitment practices.

HRM plays a crucial role in business by managing the recruitment of employees who align with organizational needs. Matching candidate`s skills, abilities, and traits with company values is a complex task prone to human error. AI aims to reduce these errors by improving efficiency, accuracy, speed and minimizing biases. As SDG 10 states, the goal is to reduce inequalities. As recruitment is a key HRM function, technological advancements have continuously reshaped it, making it a dynamic and evolving field (Ahammad, 2017).

This research seeks to answer the question: “How can AI enhance efficiency and accuracy in recruitment, leading to better candidate-job matches and improved recruitment quality?”. It examines AI`s impact on traditional recruitment practices, its relationship with HRM strategies, and the potential benefits and challenges of integrating AI into recruitment. The study also explores new procedures in HRM and identifies areas where existing practices may need redefinition. Additionally, it discusses the adaptations HRM professionals must make to effectively implement AI in recruitment processes.

Data collection was carried out through in-depth interviews with HR experts, employing a qualitative methodology to gain insights into potential developments, concerns, and prevailing perceptions in the field. Twelve interviews were conducted, and following the transcription of the interviews, a categorical analysis identified three distinct categories: characterisation of HRM, perception of the use of AI in HRM, and perception of the use of AI in recruitment. When developing these categories, it is concluded that the interviewees see AI as a support tool that HRM can take great advantage of. However, it was also mentioned that this technology has flaws, which may be irreversible, such as ethical failures, isolation or social exclusion, lack of interpersonal contact, among others. Participants highlighted the need for AI to be associated with

humans as a tool and not as an independent means of execution. They emphasized the need for a hybrid system between human and machine. That said, it greatly enriched the research to obtain the testimonies of experts who provide advice on conventional HRM practices and develop various HRM analysis projects within organizations.

The work is structured into six chapters. The first chapter introduces the topic, presenting the context, objectives, and the main research question. The second chapter reviews relevant literature, establishing a theoretical foundation on Artificial Intelligence, Human Resources Management, and recruitment practices. The third chapter explains the methodology, detailing the research method, sample, and data analysis techniques. The fourth chapter presents the results, highlighting the role of AI in improving recruitment efficiency and accuracy. The fifth chapter discusses these findings in relation to the research objectives and existing literature. The final chapter summarises the key outcomes, acknowledges the study`s limitations, and suggests directions for further research.

2. LITERATURE REVIEW

In the contemporary landscape characterized by an intense wave of technological advancement driven by both digitalization and automation, there are substantial innovations emerging within the sphere of information and digital technologies. These cutting-edge developments are fundamentally transforming the way digital systems, whether operating independently or in synergy with physical environments, engage with various aspects of the economy and society. Prominent among these innovations are cloud computing platforms that offer scalable and flexible access to computing resources, extensive data storage solutions that enable the accumulation and utilization of vast amounts of information, and diverse management systems implemented across multiple organizational levels (Howcroft & Taylor, 2022). Additionally, the deployment of sophisticated sensor networks and the expansion of the Internet of Things (IoT) are creating interconnected ecosystems that facilitate real-time data collection and monitoring, thereby improving operational capabilities across different sectors. Technologies such as machine learning are advancing the capacity of systems to analyse and interpret complex data patterns, while immersive technologies like mixed reality are revolutionizing user interactions by seamlessly blending digital and physical experiences (Benhamou, 2020).

Currently, supported by the rapid growth in computational power and the increasingly effective utilization of data (Deep Learning), AI has been evolving at an unprecedented pace. This swift progression of AI technologies presents a complex and uncertain impact on the labour market, where the balance between job creation and job displacement remains ambiguous. Nevertheless, it is evident that AI, alongside automation, will act as a significant driver of changes in employment dynamics, labour structures, and the nature of work relationships (CPCS, 2021; Eurofound, 2024).

Artificial Intelligence has significantly transformed various business domains, with HRM being no exception. Within HRM, recruitment processes have experienced many advancements due to AI integration, leading to increased efficiency, reduced biases, and enhanced candidate experiences. AI helps identifying qualified candidates by analysing CVs, social media profiles and other data sources. It can also help conduct virtual interviews and analyse facial expressions and body language to identify relevant

characteristics (OECD, 2024). However, the integration of AI in recruitment is not without its challenges and potential risks. While AI can enhance efficiency and accuracy, it can also perpetuate or even amplify existing biases if not properly monitored and managed. For example, algorithms trained on biased historical data may unintentionally favour certain demographics, leading to discriminatory outcomes (European Commission, 2021).

In the context of Portugal, a country that faces significant challenges in retaining top talent, the adoption of AI recruitment can play a crucial role in identifying and securing the right candidates more efficiently. This literature review delves into the impact of AI on recruitment within HRM, examining how AI technologies such as machine learning algorithms, natural language processing, and predictive analytics are revolutionizing traditional recruitment practices (Magnus, 2024).

2.1. ARTIFICIAL INTELLIGENCE

AI can play an important role in shaping the world of work by influencing work organization, working conditions, and ethics. It is a field of computer science that focuses on developing systems and programmes capable of performing tasks that require human intelligence. It involves the creation of algorithms and computer models that allow machines to learn, reason, make decisions and act autonomously (Magnus, 2024).

According to Geoffrey Hinton (2024), often referred to as the "*Godfather of AI*", AI systems may already possess a level of intelligence that surpasses our current understanding, and there is a possibility that machines could eventually assume control in ways we are not fully prepared for. He believes that humanity is navigating uncharted territory, entering a period where, for the first time in history, we are confronted with the prospect of creating entities that could exceed human intelligence. AI systems are not only intelligent but also capable of understanding and interacting with the world in ways that resemble human cognition. These systems, the author posits, can process information, make decisions based on their experiences, and although they may not yet possess full self-awareness, Hinton (2024) believes that this could change in the future (Pelley, 2024).

Artificial Intelligence, as a field of study, began to take shape in the 1950s with researchers such as Alan Turing, who proposed the famous "*Turing Test*[1]" to assess the intelligence and consciousness of machines (Blakemore, 2023). The microchip was invented in the late 1950s by Jack Kilby and Robert Noyce (National Mag Lab, *n.d.*), and revolutionized technology by allowing computers to be miniaturised and their processing capacity increased. Even though microchips were fundamental to the advancement of computing and, consequently, to the development of more sophisticated AI applications, AI itself is a concept that emerged earlier, with roots in areas such as logic, maths, cybernetics and neuroscience (Potthast, 2024). According to Lehmann, Clune and Risi (2014), "AI is an anarchy of methods" that combines three other methods: logic, statistics and biology. For instance, Deep Learning as part of machine learning and AI, was developed inspired by the visual system of the brain and neuroscience studies.

Regarding the recruitment process, AI brings efficiency, speed and precision. By automating tasks and analysing data, it helps to identify the most qualified candidates, and optimise decision-making, contributing to a more effective and accurate process (Benhamou, 2020). There are many techniques and approaches used in AI, such as neural networks, computer vision, genetic algorithms, among others. Each one is applied according to the objective and context of the application (Magnus, 2024).

The introduction of AI into the workplace yields both beneficial and adverse effects, underscoring the necessity for robust ethical guidelines and recommendations to mitigate potential issues (Codagnone et al., 2023). That is why one of the main achievements of the President of the European Parliament, Roberta Metsola, is AI regulation: "AI regulation may sound boring, but we need it" (Celso, 2024). This regulation aligns with the EU`s goal of becoming a global leader in the development of safe, reliable, and ethically sound Artificial Intelligence, as emphasized by the European Council, and ensures the safeguarding of ethical principles, as highlighted by the European Parliament. According to the AI regulation, failure to comply with the rules can lead to fines ranging from 35 million euros or 7% of global turnover to 7.5 million euros or 1.5% of turnover,

[1] The Turing Test is a concept introduced by Alan Turing in 1950 to assess whether a machine can demonstrate intelligent behavior that appears the same as a human being. (Stanford Encyclopedia of Phylosophy, 2003)

depending on the offence and the size of the company (Celso, 2024; Chander & Chen, 2021; European Commission, 2021).

For AI to operate ensuring a high level of safety and fundamental rights while promoting the free movement of AI-based goods and services across borders, it is also essential to follow the objectives of the proposed regulation on AI by the European Commission. These objectives include ensuring that AI systems marketed and used within the EU are safe and comply with existing fundamental rights laws and EU values. Their goals include providing legal certainty to encourage investment and innovation in AI, improving governance and enforcing laws that protect fundamental rights and ensure the safety of AI systems. Additionally, they aim to foster the development of a unified market for lawful, safe, and trustworthy AI applications, helping to prevent market fragmentation (European Commission, 2021).

The proliferation of AI-based technologies, such as algorithmic management systems, AI-driven robotics, and algorithm-enhanced wearable devices, is revolutionizing workplaces across diverse countries and sectors (Codagnone et al., 2023). These advancements have improved workplace performance, increased job satisfaction, enhanced decision-making processes, and positively impacted both physical and mental health (OECD, 2024).

Beyond this, AI improves efficiency by automating time-consuming tasks that traditionally burden HR professionals, such as resume screening, candidate sourcing, and initial assessments. These processes can be efficiently managed by AI systems, freeing valuable time and resources for HR personnel to focus on more strategic aspects of their roles. The accuracy of AI algorithms in analysing large datasets is a notable benefit. These algorithms can quickly and accurately process extensive amounts of data, facilitating the identification of the most suitable candidates based on predefined criteria. This capability not only reduces the likelihood of human error but also mitigates biases that may arise during the selection process (Olya et al., 2020).

Moreover, cost-effectiveness is a critical factor in recruitment. By streamlining processes and enhancing the precision of candidate matching, AI significantly reduces the expenses typically associated with hiring. Furthermore, its ability to harness predictive analytics provides strategic value in recruitment planning. By examining

historical hiring data, AI can forecast future workforce needs, identify emerging trends, and optimize recruitment strategies. This predictive capacity empowers organizations to address talent gaps proactively, anticipate workforce demands, and align hiring initiatives with long-term business objectives. All these advancements underscore the transformative potential of AI in optimizing HR functions and positioning organizations for sustained success in an increasingly competitive talent market (Garg et al., 2021).

The implications for organizations adapting to technology and automation are multifaceted. It is imperative to enhance employee skills to ensure their autonomy is preserved, even in the face of advanced predictive maintenance technologies (Celso, 2024). There is a need to rethink and redesign work organizations to foster continuous learning and the evolution of skills. However, the impact of AI in work environment reveals that not all tasks within core job roles can be automated, particularly those that necessitate human interaction, creativity, and advanced problem-solving capabilities. Consequently, professions that require high levels of skills, such as medical care, as well as those requiring lower skill levels, like care assistants, are likely to remain largely unaffected by automation due to their strong reliance on interpersonal skills, empathy, and real-time adaptability (qualities that AI struggles to replicate effectively) (Benhamou, 2020).

In the realm of recruitment, AI performs pivotal functions across various stages of the process. At the job advertisement stage, AI assists recruiters in creating effective job postings and optimizing their distribution across online platforms. During the job search phase, AI-powered tools support candidates by matching them with opportunities that align with their skills, geographic preferences, and other relevant criteria (Chen, 2023a). This personalized approach enhances the job-seeking experience, enabling candidates to discover roles that best fit their qualifications and aspirations (Magnus, 2024).

In the application stage, AI simplifies the submission process by guiding candidates through digital assistants and automated tools, which reduce complexity and save time. The assessment phase also benefits from AI`s capabilities, with tools facilitating objective evaluations through innovative methods such as gamified tests and video interviews. These AI-driven assessments provide accurate insights into candidate`s skills and competencies, improving the selection process (Garg et al., 2021).

Finally, in the coordination stage, AI enhances communication between recruiters and candidates through chatbots and automated systems that manage inquiries, provide updates, and maintain continuous engagement throughout the recruitment journey (Chen, 2023b).

Although AI is positive in many aspects, it's important to look at the risks. Concerns about AI revolve around several key areas, each highlighting the importance of human involvement in processes where AI is employed (Magnus, 2024).

Firstly, human intervention and verification remain indispensable, even as AI streamline processes and reduces workloads. Secondly, the complexity of human decision-making presents a significant challenge for AI, which relies on binary logic. Human judgment is far more nuanced and complex, often influenced by perception, feelings, and emotions, factors that AI struggles to fully replicate. This inherent complexity limits AI's capacity to replace human judgment, particularly in areas where emotional intelligence and subjective assessment are critical. Moreover, AI`s limitations in handling diverse scenarios are evident, as it may falter when addressing a wide range of questions and situations that human recruiters can address effortlessly. For example, chatbots programmed with a predefined set of questions may struggle when faced with unexpected inquiries, potentially leading to user dissatisfaction (Garg et al., 2021).

Lastly, AI should be viewed as a tool to enhance human capabilities rather than as a replacement for human workers. The risks are having a whole class of people who are unemployed and not valued much because what they used to do is now done by machines, fake news, unintended bias in employment and policing and autonomous robots (Pelley, 2024). As automation advances, Autor (2016) argues that it has led to job polarization, characterized by the growth of high-skill and low-skill jobs alongside a decline in middle-skill positions. This trend is particularly evident in-service economies, where low-wage service roles and high-wage professional positions are increasingly common, while mid-level, routine-based jobs disappear (Autor, 2016).

This transformation aligns with Robert Reich's typology of work, which categorizes jobs into routine production (in-person services), interpersonal services (a diverse group encompassing both low-skilled and skilled workers), and symbolic-analytical services (highly qualified workers) (Brogan, 1992). However, the shift has also exacerbated social

precarity, as many low-skill jobs offer limited job security and benefits. Autor (2016) emphasizes that while technology expands productivity and wealth, it also underscores the need to address the social and economic challenges arising from this uneven job landscape. This concern echoes the broader observation that technological progress does not inherently translate into widespread prosperity (Autor, 2016).

Worker's fear of losing their jobs to Artificial Intelligence is a critical concern. The labour market is constantly evolving, and a study conducted by Microsoft (2024), part of the *2024 Work Trend Index Annual Report from Microsoft and LinkedIn*, reveals that between November and April, the use of AI in the workplace nearly doubled, with 75% of professionals worldwide confirming its adoption. While workers fear that AI will eliminate many jobs, employers report a shortage of talent in key roles requiring technological skills. In fact, 71% admit they would hire candidates with less professional experience but possessing AI skills. Furthermore, 75% of professionals globally already use some form of AI tool in the workplace, with 46% of them starting to use it less than six months ago. Around 90% say AI helps them save time, 85% report increased focus on important tasks, 84% cite benefits for creativity, and 83% state that AI enhances their job satisfaction. According to the Microsoft (2024) study, a new recruitment paradigm has emerged, with 60% of leaders stating they would refuse to hire professionals without AI skills. Additionally, 71% would prioritize AI skills over experience requirements. The report also highlights that 46% of global professionals are considering resigning and seeking new job opportunities next year. Among the roles where recruitment will be most critical are those in cybersecurity, engineering and creative design. Over 60% of leaders anticipate significant challenges in recruiting talent in these areas. Technical services and human resources professionals with AI expertise are also key concerns for leaders looking to strengthen their teams (*Annex a – the hidden talent shortage*) (Microsoft, 2024).

As stated in the Microsoft (2024) report, 76% of professionals acknowledge the need to develop AI skills to stay relevant and competitive. On top of that, 69% believe that mastering these skills will accelerate their professional advancement, while 79% assert that doing so will enhance their job opportunities in the future. The report highlights, unsurprisingly, that the use of LinkedIn Learning courses[2] has increased by 160% among

[2] LinkedIn Learning courses is a platform designed to develop technological skills, including AI.

non-technical professionals, with roles such as project managers, architects, and administrative assistants showing notable growth. Furthermore, the number of LinkedIn members who have added AI skills, such as ChatGPT and Copilot, to their profiles has risen 142-fold, with writers, designers and marketing professionals leading the way. OpenAI's ChatGPT has also become the fastest-growing consumer application in history, amassing around 100 million monthly active users just two months after its launch (a milestone Instagram took over two and a half years to reach) (Oliveira, 2024).

It's important to note that, despite concerns about the shortage of talent in this area and the challenges of hiring, employers don't seem to be doing everything they can to address the issue. Most notably, they are failing to provide their workers with AI training. According to the previous report (Microsoft, 2024), only 39% of the professionals surveyed who use AI in a professional context have received AI training from their company, and only 25% of employers plan to offer AI training in the coming year.

According to the OECD (2024), despite significant progress in AI applications, several barriers continue to hinder its widespread adoption across industries. As AI evolves, it is expected that a large portion of the workforce will require ongoing education and skill development to meet the changing demands of the labour market. This includes acquiring new competencies to interact effectively with AI technologies, as well as developing essential human skills such as creativity, emotional intelligence, cognitive reasoning, and the ability to perform tasks in unpredictable, unstructured environments where AI still falls short (CPCS, 2021).

To combat the inefficient use of AI, it is essential to implement certain public policies: expand digital and data literacy skills on a large scale; provide continuous training in various technologies; introduce provisions in legislation to minimise the new risks associated with the autonomous behaviour of AI, ensuring the protection of privacy, personal data, equality, non-discrimination, ethics, and transparency; and promote access for SMEs to AI and qualified human resources in these fields.

Moreover, regulating algorithms, often developed by large multinational corporations such as Alphabet (Google), Amazon, Meta (Facebook), Microsoft and Apple, is crucial, as their economic interests frequently conflict with public good. These algorithms are typically created by a small, homogenous group (highly qualified men from upper-

middle-class backgrounds), educated at top universities. This lack of diversity contributes to biased data and algorithms, which are often unintentionally reinforced in the environments where they are created. As a result, these models tend to reduce diversity. In recruitment processes, this bias favours profiles that fit a specific mold, ultimately reducing diversity and excluding candidates who deviate from established norms (CPCS, 2021).

There is clear evidence of progress in the use of AI, underscoring the need to fully harness its potential for the benefit of society (European Commission, 2021). Additionally, a deeper understanding of AI`s influence in the field of HRM is necessary.

2.2. HUMAN RESOURCES MANAGEMENT

Although HRM has been a subject of research for many years, it remains one of the most dynamic and ever-evolving fields, necessitating constant innovation and monitoring. Its evolution has been shaped by historical events, cultural shifts, and economic and social changes. The term Human Resources Management emerged several decades ago, but its widespread adoption and evolution as a distinct field have gained momentum in recent years. It was previously known as Personnel Administration, which reflected its role as an administrative function managing the labour force based on the needs of the business (Ahammad, 2017).

Today, despite being in a state of full involvement with the organization's strategy, much more focused on the employee and their professional needs, such as training, the possibility of progression, career management, ambition to participate in different projects, among others, there is still a long way to go.

HRM includes practices such as recruitment, selection, hiring, onboarding, training, current management tasks (payroll processing time map controlling, for example), performance appraisal, career management and exit management (Ateeq et al., 2021). The main objectives in an organization are to ensure that it finds the best possible employees, that it develops them professionally and personally, and to monitor their progress by guaranteeing a good working environment. It is therefore important that HRM strategies are well aligned with the organization's strategy. The HRM department's primary responsibility is to ensure that a well-developed and incentivised workforce drives the organization's performance by achieving its strategic objectives (Al-Alawi et al., 2021).

The HR field is currently facing several challenges. Firstly, gathering social data for HR analytics, needing both qualitative and quantitative approaches to maximize and create new data with significant descriptive value; requires a lack of trust in AI technologies and the literature on AI is noted to lack comprehensiveness, indicating a research gap (Elmnouer et al., 2023). It`s important to explore the adoption of AI tools more thoroughly, considering the flexibility and accessibility of these technologies (Al-Alawi et al., 2021). One of the main challenges is fostering a "data culture" within organizations, which requires leadership guidance and the allocation of dedicated resources to fully realize the advantages of HR analytics (Elmnouer et al., 2023).

Despite these challenges, the future of AI in HR looks promising, pointing to a trend of increasingly efficient and effective HR practices. HRM is centred on building a skilled workforce that supports companies in reaching their objectives and gaining a competitive edge. It is shifting from traditional methods to embrace AI, automation, and advanced technology, transforming roles and responsibilities across different types of organizations. Professionals are observing a growing trend of AI integration in HR, especially within recruitment (Alzyoud et al., 2024).

2.3. RECRUITMENT PRACTICES AND AI

The concept of recruitment can be defined as the process of searching for and attracting talent, which starts from the need to fill a vacancy to the receipt of CV's and applications from the various suitable candidates. The four main objectives that must be successfully achieved in a recruitment process are to defining the role/vacancy; attracting potential candidates; managing the entire recruitment process up to and then, at the start of the selection process, organising an interview (CIPD, 2024).

AI technologies have become increasingly integral to the recruitment and selection processes, offering various tools that significantly streamline and enhance HR operations. Intelligent matching algorithms, for instance, are employed to align job requirements with the details provided in candidate's CV's, thereby increasing the likelihood of identifying suitable candidates and enhancing the success rates of recruitment efforts. However, a significant percentage of individuals exaggerate or even lie about experiences on their CV's, introducing potential bias in recruitment. This raises the question of whether AI could amplify this bias by relying on misleading information. Alternatively, AI could be

used to mitigate such biases by verifying the accuracy of claims made on CV's, using techniques such as cross-referencing credentials and work history or analysing patterns in past performance. By doing so, AI could enhance transparency and fairness in recruitment, potentially reducing the impact of CV's exaggeration on hiring decisions. (Garg et al., 2021). AI is also pivotal in candidate screening, as it systematically analyses resumes to filter out unqualified candidates, allowing HR teams to concentrate their efforts on more promising candidates. During the interview process, AI can automate tasks such as recording and voice recognition, contributing to greater objectivity and accuracy in evaluations (Borrego et al., 2023). Moreover, AI tools are increasingly used to analyse candidate`s emotions and non-verbal cues, providing an objective assessment that supports a more comprehensive evaluation of potential employees. The evaluation objective of AI capabilities extends beyond recruitment, as these tools can also be used to assess employee's performance and competency, thereby minimizing subjective biases that can influence decision-making (Na, 2024).

As technology continues to advance, the application of AI in competency assessments and other HR functions is poised to significantly enhance management practices by improving both the efficiency and the accuracy of these processes. One of its primary benefits is streamlining processes through full automation, which not only reduces operational costs but also has the potential to lower product prices, thereby delivering economic benefits to organization (Alzyoud et al., 2024). The role of AI in HR, particularly in recruitment, is crucial for enhancing the overall employee experience, as it facilitates more seamless and engaging interactions with HR functions. Automated candidate sorting, a key feature of AI-powered systems, leverages training data from human recruiters to score and rank candidates, thus enhancing the efficiency of evaluations and improving the accuracy of candidate-job matching. This automation extends to the broader recruitment process, where AI tools are employed to search for and identify the most suitable candidate profiles from a large pool of applicants. Sometimes the most suitable candidate is not the person with the most experience or the most competent, but the person with the best organizational fit, who will best adapt to the organizational culture and the team (Borrego et al., 2023). By doing so, AI can save organizations considerable time and resources while minimizing the manual effort required in traditional recruitment methods resulting in rapid and efficient screening

capabilities that accelerate evaluations and selections, thereby speeding up the overall recruitment process (Ateeq et al., 2021).

Furthermore, AI helps to improve decision-making and impartiality in hiring by minimizing biases that may arise from human interference. Through the analysis of candidate's CV's and online data, AI tools provide more informed and unbiased hiring decisions, ensuring that selections are based on objective data analysis rather than subjective judgment (Al-Alawi et al., 2021). This integration of AI-driven analytics into the recruitment process not only enhances the quality of hiring but also increases productivity by aligning candidate selection with specific job profiles and organizational requirements. In addition, the use of AI in recruitment processes has been associated with significant cost reductions, contributing to financial savings and optimizing resource allocation within organizations (Borrego et al., 2023).

That said, the transition from traditional recruiting methods to AI-enabled tools has profoundly transformed the recruitment process. Traditional recruitment techniques, such as placing newspaper advertisements and manually screening resumes, are often time-consuming and can lead to suboptimal hiring outcomes due to the limitations inherent in these approaches (Chen, 2023a). In contrast, AI tools have revolutionized these processes by automating key tasks, enabling recruiters to handle large volumes of applications much faster and with greater precision. This automation not only accelerates the recruitment process but also allows HR professionals to focus on more strategic aspects of talent acquisition (Borrego et al., 2023). Moreover, AI-enabled systems expand the reach of recruitment efforts, allowing organizations to tap into a broader talent pool that includes passive job seekers who may not be actively searching for new opportunities. This expanded reach facilitates the attraction of a more diverse and highly qualified group of applicants (Chen, 2023b).

However, the development and use of AI tools are not without its challenges, particularly in the areas of data security and privacy. The data used to train AI systems may raise privacy concerns, demanding that organizations implement robust measures to ensure the confidentiality and security of sensitive information. As AI continues to evolve, addressing these challenges will be crucial in maintaining trust and compliance in the recruitment process (European Commission, 2020).

A significant concern is the potential for AI systems to perpetuate or even exacerbate existing biases rather than eliminating them. To address this, managers must ensure that AI systems are trained on diverse and representative datasets and mitigate any biases that may emerge over time. Additionally, incorporating human oversight in the decision-making process is crucial to provide a safeguard against biased outcomes, ensuring that final hiring decisions are balanced and equitable (Gupta & Mishra, 2022).

Transparency and explainability are also major concerns, as stakeholders often express unease about the opaque nature of AI decision-making processes. Candidates may not fully understand the reasons behind their rejection or selection, which can lead to mistrust in the system. AI could help, especially for younger candidates with little professional experience, to combat the lack of constructive feedback to candidates. Managers should prioritize transparency by offering clear explanations of how AI systems make decisions. This feedback to applicants about their performance throughout the recruitment process, will promote trust and understanding (Chen, 2023b).

There is apprehension about AI displacing human recruiters, leading to job losses within the recruitment field. Managers should address this by emphasizing that AI is designed to augment, not replace, human capabilities. By investing in training and upskilling programs, recruiters can adapt to new technologies and focus on higher-value tasks that require human judgment, empathy, and creativity (areas in which AI continues to fall short, even to this day) (Magnus, 2024).

Finally, concerns about control and accountability in AI-driven recruitment processes are prevalent, as stakeholders may feel a loss of control when decisions are heavily influenced by automated systems. In response, managers must establish clear guidelines for the use of AI in recruitment, ensuring that AI-generated recommendations are not the sole basis for hiring decisions. Establishing a structure for human oversight and involvement is essential to maintaining control and accountability, ensuring that the recruitment process remains fair, transparent, and responsive to the needs of all stakeholders involved (Chen, 2023a).

As CIPD (2024) states, technology is increasingly being used in the recruitment and selection process to assess each candidate`s potential performance and abilities, as exemplified by AI and gamification.[3]

Recruiters can leverage gamified methods as a strategic tool to engage candidates more effectively and enhance their perceptions of potential workplaces. By integrating gamification into the recruitment process, recruiters can assess whether candidates possess the necessary work skills in a more interactive and engaging manner, making the evaluation process both efficient and enjoyable for the candidates. This approach not only aids in determining the suitability of candidates for specific roles but also has the potential to positively influence their opinions about the company and its work environment. Additionally, gamified recruitment methods can invigorate the candidate experience, fostering a more favourable view of the workplace even before the hiring decision is made. Along with these benefits, the global talent acquisition process can be significantly improved through virtual interviews powered by AI, which can help, minimize bias and facilitate the identification of talent across diverse geographic locations. Thus, the adoption of gamified methods and AI-driven tools in recruitment not only enhances the overall efficiency of the hiring process but also improves the candidate experience, making it a powerful approach in modern talent acquisition strategies (Alzyoud et al., 2024).

However, as we will come to later, all technology should be well evaluated before it is adopted by organizations, making sure that it has been tested vigorously and that it can guarantee a good, fair and inclusive candidate experience. As CIPD (2024) says, technology plays an increasingly important role in recruitment, from attracting candidates to the selection process.

To effectively address these issues in the workplace, companies must take a comprehensive and proactive approach that integrates ethical considerations into every stage of AI implementation and use. Companies should adhere to existing ethical guidelines that provide a framework for the responsible introduction and use of AI technologies (Chen, 2023b). One critical step is to incorporate AI discussions into the

[3] Gamification is an application of game-like elements and principles, such as competition, point scoring, rewards, and interactive challenges, to engage candidates and enhance the hiring experience.

broader strategic planning at the executive level, involving employee representatives in these conversations. By doing so, companies can set clear boundaries and develop metrics to measure the ethical use of AI, ensuring that the technology supports, rather than undermines, organizational values. Establishing dedicated ethics committees is another effective strategy. These committees can oversee AI implementations, ensuring that ethical standards are consistently met (Köchling & Wehner, 2020).

Organizations can also look to national trade unions, international bodies such as the OECD, UNESCO, and the Council of Europe, as well as the AI strategies of EU Member States, for guidance on ethical AI use. While these entities provide valuable recommendations and emphasize the importance of ethical AI, there is still a need for further legal frameworks to address the unique challenges posed by AI effectively. By taking these steps, companies can ensure that their use of AI in recruitment is not only innovative and efficient but also ethical and aligned with broader societal values (Codagnone et al., 2023).

2.3.1. THE USE OF CHATBOTS

Nowadays, we see a greater need and affluence in the use of modern and technological systems by companies, which ends up revealing a greater aptitude on the part of their employees to use futuristic methods and an organization that is also attractive and sophisticated in the face of the labour market (Zlotskaya & Zlotskaya, 2021).

That said, along with robots, chatbots have been gaining increasing popularity. A chatbot is a computer programme designed to provide automatic assistance, twenty-four hours a day, seven days a week, in a chat format. It answers multiple questions and replace FAQ, bringing greater interactivity and complete responses (Gomes & Nawaz, 2019).

Chatbots are artificial intelligence software applications and one of the most promising areas for the development of the modern recruiting market (Zlotskaya & Zlotskaya, 2021). The way this digital mechanism works in the recruitment process involves receiving important information from various candidates, including CV's, documents, admission restrictions, and personal data. The chatbot then analyses the information and notifies the candidate of the decision made. In this way, chatbots have been transforming various HR processes, such as recruitment. Therefore, they are used as virtual recruitment assistants in order to reduce time consuming tasks related with candidates contact, using

various messaging channels connected to social network such as LinkedIn specialized in business and employment. Some chatbots can achieve tasks such as contacting candidates, pre-screening applicants or automating the scheduling of interviews. These automatic programmes are also able to gather all the information and requirements of the candidate before they join the organization, passing all this information on to the HR department so that they have a prior idea of the profile of the person in question (Gomes & Nawaz, 2019). Nowadays, with the evolution of technology, there are increasingly more chatbots, some examples of which are:

Skeeled: A rapidly expanding technology startup based in Luxembourg. It has developed an innovative AI-driven talent acquisition platform that transforms the recruitment process. Launched to streamline the early, often labour-intensive stages of hiring, Skeeled's software automates crucial tasks such as job posting, CV screening, and the scheduling of both initial phone calls and in-person interviews (Skeeled, 2014). This automation significantly reduces the time, and resources typically required, offering substantial cost savings for recruiters and employers. By ensuring that only candidates who meet the specified criteria progress in the hiring process, Skeeled optimizes the selection process, enhancing efficiency and effectiveness (HRnews, 2020). Candidates benefit from a user-friendly interface that allows them to upload CVs, post short videos, and participate in pre-employment assessments that evaluate their personality, skills, motivation, and attitude. These features provide employers with a comprehensive and detailed understanding of each applicant (Skeeled, 2014). Since its establishment in 2014, Skeeled has experienced remarkable growth, with a turnover increase of more than 120% in 2019 alone (HRnews, 2020).

Textio: A startup specialized in text analytics. It has been helpful in transforming how companies seeking to enhance diversity in their hiring practices communicate with potential candidates (Lev-Ram, 2019). Companies such as Nvidia and McDonald`s have utilized Textio's original technology to revise their job listings with the goal of attracting a more diverse pool of applicants. Textio's existing tool, Textio Hire, predicts in real time how well the language of a job description will resonate with potential candidates and suggests alternative wording statistically proven to appeal to a broader audience. For instance, the startup discovered that the term *synergy* tends to have a negative impact on people of colour, whereas *alignment* produces a more positive response. Building on this

research, Textio's new product, Textio Flow, goes beyond merely offering wording suggestions; it incorporates AI to generate the job description itself. Textio CEO, Snyder, highlights that the core objective of Textio Flow is to support companies that are genuinely committed to cultural change (Lev-Ram, 2019).

Pymetrics: The Pymetrics platform uses a science-backed methodology rooted in cognitive science to assess soft skills. It is designed with a fairness-first ethos, ensuring that its assessments are not only scientifically rigorous but also engaging for both candidates and employees. By focusing on behavioural data, Pymetrics enables a more precise matching of talent to the right roles, enhancing the overall effectiveness of recruitment and career development processes (Pymetrics, 2022).

HireVue: Offers a sophisticated platform designed to streamline and enhance the job interviewing process using advanced technology, particularly AI-driven video assessments. It enables employers to create customized interview questions that candidates can respond to via video at their convenience, allowing for a more flexible and accessible interview process. This approach not only simplifies scheduling by accommodating candidate's availability but also provides a consistent and standardized method for evaluating applicants (HireVue, 2024). The AI algorithms employed by HireVue analyse numerous aspects of a candidate's performance, such as eye contact, enthusiasm, and overall demeanour, by examining up to 25.000 different features (Business Insider, 2017). This detailed analysis allows for the prediction of a candidate's potential job performance, offering insights that might be missed by human evaluators. Additionally, the platform integrates seamlessly with ATS, enhancing the efficiency of recruiting processes by providing real-time evaluation tools, automated candidate routing, and shareable recordings. By standardizing interviews, HireVue reduce bias and ensures that hiring decisions are based on structured and job-specific criteria rather than subjective assumptions. This technology not only improves the candidate experience by allowing candidates to interview anytime, anywhere but it also significantly reduces the time needed for candidate review (HireVue, 2024).

As Geoffrey Hinton (2024), points out, even the most advanced chatbots currently possess only about a trillion connections, a strong contrast to the approximately 100 trillion connections in the human brain. Yet, despite this difference, these chatbots are

capable of processing and retaining vast amounts of knowledge, often surpassing human capabilities in certain areas. This observation suggests that it utilize a highly efficient mechanism for encoding and accessing information within their connections. Fundamentally, these chatbots function as language models, predicting the next most likely word based on probability, which underscores the remarkable potential of AI in mimicking and, in some cases, even exceeding human cognitive processes. This insight lays the groundwork for understanding the future implications of AI in various fields and its potential to transform how knowledge is acquired and utilized (Pelley, 2024).

3. METHODOLOGY

This chapter is organized into three parts, each detailing the methodological procedures and decisions taken. The first part outlines the method used to collect the data, the second focuses on the process of selecting the sample, and the third part presents an analysis of the data collected. This study is a qualitative analysis, that seeks to understand the complex phenomenon of the impact of Artificial Intelligence on Human Resources Management by exploring meanings, experiences, and perspectives through interviews. It is often used to explore social, cultural, or behavioural contexts, aiming to capture the richness and depth of human experiences. This approach is particularly useful for gaining insights into processes, motivations, and underlying reasons for behaviours, allowing for a more holistic understanding of the subject matter.

3.1. RESEARCH METHOD

The research method employed in this study was the interview. All methods have advantages and limitations. In this specific case, we believe that our research will benefit from a qualitative approach (Albarello et al., 2011; Bryman, 2012; Yin, 2016). The interview, as a data collection method, offers some advantages over other methods, such as questionnaires, because it provides a more open interaction and connection, focusing on the interviewee perspective (Bryman, 2012). The interviewer poses open-ended questions, allowing the respondents to express their perceptions and emotions. The researcher, being involved in the study, can also respond, but must ask impartial questions that align with the purpose of the interview, always respecting the participant`s privacy and maintaining respect.

In this study, semi-structured in dept interviews were conducted, as they are most useful for small sample sizes. The questions were pre-structured to provide some direction, preventing deviations from the research goals. However, some openness was allowed, and questions that naturally arose during the interview were asked, which proved beneficial by making the interviewee feel comfortable sharing information. The interview guide was designed to redirect participants, when necessary, to the defined objectives and to elicit maximum reflections on the topic. Nevertheless, there was flexibility to let the interviewee speak freely. This type of research method proved to be highly useful in the study, as it allowed for exploration of both the defined research objectives and new,

equally important concepts. Its in-depth and flexible nature made it possible to capture, in each response, the tone of voice, facial expressions, and emotions such as hesitation, displeasure and happiness (elements that surveys cannot provide) (Bell, 1997).

In total, twelve interviews were conducted using the interview guide presented in *Annex B – interview guide*. Most were carried out in person, either in meeting rooms at the interviewee's companies or in cafes, except for the sixth and seventh, which were conducted remotely. Prior to the interview, all participants were provided with a brief overview of the general topic, which focused on the influence of AI in HRM, as well as some of the key interview topics, such as recruitment practices. This helped to establish empathy and mutual understanding, greatly facilitating open communication. To simplify the transcription process, the audio was recorded by a recording device. After each interview, the audio was fully transcribed into a word document for future analysis. While each interview took, on average, between forty-five minutes and one hour to complete, the transcription process took approximately three days. Ethical issues were respected, namely a request for authorization to carry out and record an interview, guaranteeing the anonymity of the interviewees, as well as the completion of the information form to provide consent submitted to the ISEG Ethics Committee.

3.2. RESEARCH SAMPLE

The sample for the study was small in order to deepen the analysis of perspectives and opinions within a particular context. This small niche is expected to be representative of the observed phenomena, providing credibility to the findings (Bell, 1997). The desired profile for the interview group includes professionals from different HR areas and at different stages of their careers. To obtain more accurate and reliable results, professionals with two years of experience up to those nearing the end of their careers were contacted.

The interviewees were contacted via institutional email, as a source of direct contact with the academic community, and through LinkedIn platform to reach out to HR managers from various companies. At the end of each interview, the interviewee was asked to suggest additional contacts who might be interested in joining the group of participants and sharing their insights through interviews. This approach aimed to expand the sample size and enrich the study.

The twelve final interviewees, despite having different ages ranging (from twenty-four to fifty-five years), all belonged to the HR field. The study was focused on large organizations because they typically manage more complex and extensive recruitment processes, making them ideal environments to observe the impact of AI-driven optimization. The information about the interviewees, guaranteeing anonymity, can be seen in the Table I.

TABLE I: INTERVIEWEES INFORMATION

Interviewees	**Work Experience in HRM and Current Labour Situation**
Interviewee 1	*Work experience:* HR Manager *Current labour situation:* HRBP & Talent Acquisition Team Leader (currently using AI)
Interviewee 2	*Work experience:* Operational Manager for Occupational Health and Safety; HR Technician *Current labour situation:* HR department of Portuguese Air Force (currently not using AI)
Interviewee 3	*Work experience:* Consultant; HR Development Director; HR Director in 2 technology companies *Current labour situation:* HR Director transitioning between companies (currently using AI)
Interviewee 4	*Work experience:* HR Manager in the Recruitment and Selection area *Current labour situation:* HR Business Partner (currently not using AI)
Interviewee 5	*Work experience:* 2,5 years in the Recruitment area *Current labour situation:* Recruitment Team of the Portuguese bank (currently not using AI)
Interviewee 6	*Work experience:* Accounting Auditor; Sales and Marketing Manager; Operations Director; Performance Excellence Director *Current labour situation:* President of a French company (currently using AI)
Interviewee 7	*Work experience:* Senior HR Business Partner *Current labour situation:* Head of HR (currently using AI)
Interviewee 8	*Work experience:* CEO (HR pole) *Current labour situation:* CEO (currently not using AI)
Interviewee 9	*Work experience:* HR Manager Sales Force & Warehouse; Headquarters Human Resources Manager; Talent Sourcing Director; Founder & Partner *Current labour situation:* Co-Founder & Managing Partner (currently using AI)
Interviewee 10	*Work experience:* More than 25 years in HR – Consultant, Project Manager and Head of HR in different challenges and industries *Current labour situation:* Head of business (Portugal) in a Global Consultant Company (currently using AI)
Interviewee 11	*Work experience:* HR Manager; HR Director; Vice President of Association of HR Managers *Current labour situation:* People & Culture Director (currently not using AI)
Interviewee 12	*Work experience:* Senior RH Consultant; HR Manager & Head Compensation & Benefits *Current labour situation:* Head of Human Resources (currently not using AI)

Source: Own elaboration, interviews

3.3. DATA ANALYSIS

In all research studies involving data collection, interpretation and analysis of the data are required. It is the responsibility of the researcher to carry out this analysis, looking for differences and similarities, grouping and organizing the data into categories (Bell, 1997).

According to Coutinho (2014), when organizing the collected material, it should be reduced, as the open nature of qualitative methodologies and the use of semi-structured interviews generate a large amount of information. This reduction allows for the description and interpretation of the phenomenon under study, known as coding (Coutinho, 2014). At this stage, the researcher looks for comparable elements, keywords, behaviours, and regular patterns that can be categorized. As Coutinho (2014) says, content analysis is, therefore, a collection of methods used to systematically examine textual material, identifying and measuring the frequency of words, phrases, or key themes, enabling further comparison.

There are several possible techniques for analysing the collected data. In this study, was used categorical analysis. According to Guerra (2006), categorical analysis involves identifying variables whose dynamics potentially explain a phenomenon of interest. This categorisation facilitates the organization of data as it structures them and allows for the corelation of similar events (Coutinho, 2014). Bardin (1977), explains five qualities that the categories should possess: mutual exclusivity, where an element can only belong to one category; homogeneity, where each category should have only one dimension of analysis; relevance, as the categories should align with the objectives of the study and the researcher; objectivity and fidelity, as well-defined categories will prevent distortions and subjectivities; and productivity, where categories will be productive if the results yield inferences and new hypotheses (Bardin, 1977).

This type of analysis, being descriptive, is more abstract and not so exclusive, as it is common in an interview to find several of the studied factors (Guerra, 2006). The aim will always be to seek the true meaning of the discourse, the significance of the statements, and to find their connections with the theoretical framework (Coutinho, 2014).

In the data collection of our analysis, Bardin's (1977) assumptions were followed to carry out the content analysis, that can be seen in *Annex c – conceptual framework*. Three categories emerged as the objective of study: characterisation of HRM, perception of the use of AI in HRM, and perception of the use of AI in recruitment. These categories are presented as the three main sections of the interview guide, meaning they are predefined categories established prior to data analysis. However, other subthemes, such as professional development, generational conflict, change management and work-family balance arose during the interviews. These subthemes, which are inherent to the categories, were frequently mentioned by various interviewees and were considered relevant and enriching to answer our research question: How AI technology can enhance efficiency and accuracy in various stages of the recruitment process, leading to better candidate-job matches and improved recruitment quality?

TABLE II: DIMENSIONS OF ANALYSIS IN CATEGORIES

Categories	**Themes**	**Subthemes**
Characterisation of HRM	Challenges to HRM	· Professional development · Generational conflict · Change management · Work-family balance
Perception of the use of AI in HRM	Impact of AI on HRM	· Benefits vs. disadvantages · Most affected practices · Impact on the number of HR jobs
Perception of the use of AI in Recruitment	Impact of AI on Recruitment	· Benefits vs. disadvantages · Ability to deal with change · Examples in practical context

Source: Own elaboration, interviews

4. RESULTS

4.1. CHARACTERISATION OF HRM

Human Resources Management is a field that has always adapted to labour adversities and is subject to constant changes. Through the analysis of the interviews conducted, it was found that currently, especially after the pandemic, HRM needs to humanize work related issues. Attention must be given to employee`s opinions, their mental health, and their career ambitions for the future. It is also essential to invest in the professional development process, considering not only the company`s objectives but also what employees aim to achieve to ensure they feel motivated.

TABLE III: DIMENSIONS OF ANALYSIS IN CATEGORIES - PART I

(Interview 6)	*The big challenge in HRM is how to humanize work issues. Knowing how we make the needs of organizations happen and ensure that professionals are fulfilled not only at work.*
(Interview 7)	*In my opinion, the human development part is fundamental. People's culture will be essential for HR to stand out and mobilize. HR development will undoubtedly be a great challenge both in terms of training and in terms of hard and soft skills.*

Source: Own elaboration, interviews

Interviewees highlighted the importance of ongoing workforce training, emphasizing not only technical skills, but also developmental and transversal skills. They noted that employees require specific training to effectively use AI. When asked, they discussed whether their companies invested in such training initiatives.

TABLE IV: DIMENSIONS OF ANALYSIS IN CATEGORIES - PART II

(Interview 1)	*We have a specialized data and AI team that is trained and certified. We are an IT company.*
(Interview 3)	*In tech companies we normally have an AI division. For HR I'm investing in power BI, again to support data analysis.*
(Interview 5)	*We are starting to explore the utilities of Co-Pilot. The Bank already makes significant use of AI, but the recruitment team does not yet.*

(Interview 7)	*We are exploring 3 business cases: generation of JD, chat bot and automation of administration tasks.*
(Interview 9)	*Common training areas include data analysis, AI ethics, machine learning, and HR analytics, aiming to equip HR professionals with skills to operate and manage AI systems effectively.*
(Interview 12)	*No but preparing to do so in 2025.*
(Interview 2)	*No.*

Source: Own elaboration, interviews

Another relevant point addressed in the interviews, and identified as a challenge in change management, was the current disconnection between an employee's commitment and the monetary benefits received. The sense of belonging becomes increasingly important. With the younger generation entering the job market, interviewees report that there has been a change in the work ethic and a need for purpose where young people are encouraged to carry out projects that they see will make a difference.

TABLE V: DIMENSIONS OF ANALYSIS IN CATEGORIES - PART III

(Interview 7)	*We have some challenges regarding employees, they want to feel more motivated in their day-to-day lives, in the sense of not being so tied to contractual ties, but more connected to projects which is what motivates them.*
(Interview 8)	*Generational conflict will be noticeable in everything. In the case of HRM in terms of compensation and benefits, people of different ages and backgrounds prefer different ways of working, but also different ways of being in the company. We see some Millennials, a Gen Z entering the job market prioritizing these things, valuing work that is based on values, that brings them some validation and some feeling of reward, and not just monetary.*

Source: Own elaboration, interviews

The balance between work and family became a major focus during the pandemic, and interviewees identified it as a significant challenge for HRM. This issue remains highly relevant in the daily operations of companies. Participants noted that many employees prioritized arrangements that offered greater advantages, as excessive time spent at the workplace often came at the expense of family time.

TABLE VI: DIMENSIONS OF ANALYSIS IN CATEGORIES - PART IV

(Interview 6)	*It is a great incentive for workers to have flexibility between their personal life and the time dedicated to work.*
(Interview 10)	*In terms of remote work, I think it is advantageous if it brings results for the organization. For some employees, it is easier to balance personal life with work while working remotely.*

Source: Own elaboration, interviews

4.2. PERCEPTION OF THE USE OF AI IN HRM

The integration of technology into HRM is an emerging topic that prompts questions about its ethical and practical implications. Interviews revealed that most respondents were open to using AI in HRM as a supportive tool, provided it remains complementary and does not operate autonomously. This perspective reflects the willingness of HR professionals to embrace algorithms while emphasizing the potential benefits AI can bring to specific HRM procedures.

TABLE VII: DIMENSIONS OF ANALYSIS IN CATEGORIES - PART V

(Interview 4)	*Improving the employee experience, creating more effective training plans, speeding up and making the recruitment and selection process more efficient, defining career plans tailored to personal and organizational needs, predicting future problems, such as turnover, and suggesting solutions.*
(Interview 11)	*By enhancing efficiency, personalization, and decision-making, recruitment and talent acquisition will be, probably the most impacted or at least the first one namely due the automated screening, predictive analytics, or chatbots for candidate engagement. Secondly, will be possible with AI a personalized onboarding and 24/7 access to information as AI chatbots can provide new hires with instant access to policies, procedures, and FAQs, easing their transition into the organization without overwhelming HR staff.*

Source: Own elaboration, interviews

In contrast to the benefits described above, the interviewees also mentioned some challenges.

TABLE VIII: DIMENSIONS OF ANALYSIS IN CATEGORIES - PART VI

(Interview 12)	*Lack of personalization and proximity with people.*
(Interview 5)	*First, there is the risk of reinforcing biases in decision-making if the AI algorithms are trained on biased data, potentially leading to unfair hiring or promotion practices. Additionally, over-reliance on AI can reduce the human element in HR, which is essential for understanding complex interpersonal dynamics and employee well-being. Lastly, the integration of AI might raise privacy concerns, as it often requires collecting and analysing vast amounts of employee data, which could lead to issues related to data security and ethical use.*
(Interview 3)	*People are people, and prediction does not always cover all people. The risk is to only manage from the head (rational) and forget the heart (emotion, gut feeling and common sense). Although you can heat the target in 80%, we can be missing the 10% of talented people.*

Source: Own elaboration, interviews

During the interviews, participants were asked whether they currently used AI in their companies, and a wide range of responses was received.

TABLE IX: DIMENSIONS OF ANALYSIS IN CATEGORIES – PART VII

(Interview 1)	*Yes, we have an HR BOT.*
(Interview 2)	*No.*
(Interview 11)	*Not yet, but we are working on chatbot project.*

Source: Own elaboration, interviews

Regarding the HRM practices most likely to be impacted by automation, respondents identified recruitment and selection as the areas where AI`s influence is expected to be most significant.

TABLE X: DIMENSIONS OF ANALYSIS IN CATEGORIES - PART VIII

(Interview 2)	*Recruitment and selection are areas where AI has provided significant benefits. For example, AI can analyse CV's and even conduct initial interviews which improve the efficiency of this*

	process. I believe that all HRM practices need to be reformulated, as AI is not only shaping the present but will also dominate the future. However, organizations should weigh the benefits of applying AI against the costs and identify the areas where AI will be more useful.
(Interview 3)	*AI will impact everything, from recruitment to talent management. Once you can predict what really matters to people in a specific company, age and career state then, you need to change career models, compensation models, performance management models and probably organizational models.*

Source: Own elaboration, interviews

The implementation of AI in HRM is met with diverse perspectives among managers, reflecting a blend of optimism and prudence. Some interviewees noted that certain employees fear technological advancements, resisting the introduction of AI in the workplace due to concerns about job replacement. However, they observed greater openness among younger, more highly educated employees who have grown up closely following the digital transformation. It was asked to the participants how they are facing this change.

TABLE XI: DIMENSIONS OF ANALYSIS IN CATEGORIES - PART IX

(Interview 1)	*In the case of our company, being an IT company, we are aware and aware of what this change and innovation means and how this can bring us something new and good, but also the risks. We must find the balance.*
(Interview 3)	*In Portugal, it all seems far away and there are a lot of companies that are not even working with a good HR system. Practices are still very conventional. If you talk about the major 10 companies, then you see a different scenery: companies like Galp, already have a data division in the HR, and managers are working in different organizational models. Also, the career and compensation are much more flexible and adapts a people diversity.*
(Interview 5)	*People often think of AI as machines replacing people and personal judgment, instead of AI helping people.*

(Interview 8)	*I see some resistance in HR teams regarding giving up routine tasks (which they are used to and therefore proficient in) and in sensitive data management issues. I think that only by creating good data management processes with AI can we ensure that we minimize this resistance.*

Source: Own elaboration, interviews

4.3. PERCEPTION OF THE USE OF AI IN RECRUITMENT

Organizations can leverage AI to cross-reference the characteristics required for a specific vacancy with the CVs stored in their employee database and the external CVs of new candidates. The speed and efficiency of this process stem from AI`s ability to analyse large volumes of data rapidly. However, while human beings by nature have a critical nature, empathy, tendencies, value judgments, and prejudices, AI does not have this emotional capacity for judgment. Employees were then asked how they think AI can influence recruitment.

TABLE XII: DIMENSIONS OF ANALYSIS IN CATEGORIES - PART X

(Interview 4)	*AI can speed up the recruitment process by automating repetitive and time-consuming tasks such as resume screening. It quickly identifies candidates who match the desired profile for a particular role, based on their experience and skills. Another way to use AI is by employing virtual assistants to conduct quick interviews with pre-selected candidates and answer any questions they may have.*
(Interview 9)	*AI can make recruitment more efficient by filtering applicants, conducting initial assessments, and predicting candidate success, making the process faster and more data driven.*

Source: Own elaboration, interviews

Although AI is proving to be a great creation, some drawbacks were mentioned and require some caution.

TABLE XIII: DIMENSIONS OF ANALYSIS IN CATEGORIES - PART XI

(Interview 3)	*Even algorithms can be tricked, people will learn how to play with them.*

(Interview 12)	*Lack of human contact in the process; high costs; risk of increasing lack of diversity in profiles since it's a machine with defined profiles making the screening.*

Source: Own elaboration, interviews

There is still fear in the use of AI in recruitment, AI is just a tool but, like any tool, it will have to be monitored and constantly adjusted to the sensitivities that may arise. There will have to be much more work on the introduction of AI and greater monitoring by HRM of both this mechanism and employees to fully understand its impact and potential failures. Participants were questioned whether AI can be carried out entirely by AI, with confidence that it will be a fair and viable system.

TABLE XIV: DIMENSIONS OF ANALYSIS IN CATEGORIES - PART XII

(Interview 4)	*AI significantly assists HR managers in recruitment by automating much of the process, however, human intervention is important to assess soft skills and ensure that candidates fit with the team and organizational culture.*
(Interview 5)	*I believe there are limitations to using AI in social sciences. Issues like emotions, culture, and human behaviour are complex and difficult to assess solely with technology. AI can be useful, but it cannot replace human judgment in processes like recruitment.*
(Interview 8)	*I don't think AI can carry out the entire process, but it can handle parts of it. Tasks such as creating job advertisements and screening CVs, which require less personal interaction and skills evaluation, are well-suited for AI. However, stages like interviews and skills assessments still require a human touch.*

Source: Own elaboration, interviews

AI is still a recent topic, but it will be present for the rest of our lives. That means employees will have to face various challenges and engage in the opportunities that AI will bring. Nevertheless, despite the handicaps mentioned by the interviewees, the opportunities will weigh more heavily in the balance.

TABLE XV: DIMENSIONS OF ANALYSIS IN CATEGORIES - PART XIII

(Interview 1)	*We will have clearer and faster processes, I am sure of that. But we will also be able to innovate in an area where the legal aspect does not always allow innovation. I hope many transformations happen. A company's most precious asset is its people and their data. We must start thinking outside the box.*
(Interview 9)	*AI will likely lead to more personalized employee experiences, proactive workforce planning, and predictive analytics in HR. It may also introduce new tools for continuous learning and development, supporting the transformation of HR into a data-driven, and strategically focused function.*

Source: Own elaboration, interviews

Testimonies and concrete examples of AI`s influence on HRM were gathered during the interviews. Participants shared their experiences with the technology and its impact on their organization's operations in specific areas. While some interviewees mentioned how their organization and employees accepted and were able to benefit from this tool, since it accelerated processes and allowed employees to obtain more complete, faster and easier information, others said that it did not work, and the company ended up giving up on the idea.

TABLE XVI: DIMENSIONS OF ANALYSIS IN CATEGORIES - PART XIV

(Interview 1)	*Recruitment process is already largely carried out using recruitment software. For example, my company uses software created by the company itself. This software employs an algorithm that allows the company to define the desired roles and apply these criteria to a candidate database. The algorithm then extracts relevant information about potential employees. We have a platform where we do practically all the recruitment, but we also have the interview part, which is to be able to have more details about some parts and see if what is on the CV and what the candidate presents is true.*
(Interview 5)	*Vacations management, time banking, and performance evaluations were all automated through a system accessible to managers and the entire organization. The system included*

	questionnaires, and HR managers collected the data, while the system automatically generated results related to the organization`s performance. We also had employee support through a chatbot, but it didn't work.

Source: Own elaboration, interviews

There are several factors that contributed to the success of some cases and not others. The most frequently mentioned were organizational culture, educational qualifications, communication between the company and its employees, and training.

5. DISCUSSION

The interviews were conducted with the aim of gathering testimonies and perceptions from professionals with training and experience in the area, to understand, from the perspective of people who are closest to the subject, how these new technologies could affect an organizational area so closely linked to human beings. This gave us the opportunity to report on the advantages, disadvantages and changes that are already visible today.

As previously mentioned, the interviewees were approached through platforms such as LinkedIn, via institutional email, and through referrals from participants. In other words, both direct contact with acquaintances and a "word-of-mouth" effect were established, with interviewees identifying and recommending potential contacts for the study. This approach, which generates reference chains after contacting individuals whose profiles align most closely with the sample requirements, facilitated the expansion of the sample pool. Although this stage proved challenging, as many approached individuals did not respond or were unavailable due to professional commitments, twelve interviews were ultimately conducted, significantly enriching the present study.

After analysing the data, it can be concluded that, alongside administrative processes such as salary processing, vacations tracking, attendance control, and time banking, recruitment practice are among the most conducive to the introduction of AI in HRM. This is due to the need for organizations to innovate and retain top talent in order to remain competitive in the market (through reducing time-consuming tasks and administrative costs). This allows companies to optimize their resources, focusing on improving the most important dimensions of work such as conceptualization, deepening knowledge, problem solving and humanization of processes such as recruitment. Significant technological advancements have been made, leading to improvements in AI. Overall, AI offers numerous advantages, and participants in this study view it as a tool to help accelerate processes and analyse large volumes of data (Hmoud & Laslzo, 2019).

During the interviews, it was also noted that most interviewees viewed AI as a means, not an end, and emphasized the need for caution. There are several limitations to AI in HRM, as well as in society in general, such as ethics and transparency, which have

become frequently discussed topics (OECD, 2024). Many interviewees stressed the need for an external entity to ensure the proper functioning of AI and regulation. They also highlighted the importance of continuously updating and improving the algorithm, regulating the software to minimize inconsistencies, and clearly communicating the system`s ultimate purpose and benefits to all employees. An example of such an external entity, mentioned during the research, is the European Commission. It is important to recognize the ongoing efforts of the European Commission to promote the sustainable use of AI by explaining its benefits and creating tools to mitigate its drawbacks (European Commission, 2020). The Commission, along with the European Parliament and the European Council, has been developing proposals for AI regulation that establish guidelines on where AI can and cannot be used and how it should be applied. Its goal is to maximise the potential of AI by enabling all Member States to take advantage of this technology, provided it complies with the regulations set forth by the Commission (European Commission, 2021). To sum up, the endorsement of AI by a significant entity like the European Commission, supported by the creation of incentives and monitoring mechanisms, has greatly enhanced its perception as a valuable tool for promoting societal well-being.

Additionally, new concepts emerged in the interviews, such as generational conflict. There is limited literature relating the influence of AI on HRM with differences in work styles, mentality, educational qualifications, and other variables across generations. As a result, this topic was not included in the literature review, as the existing articles did not align with the objectives of the present study. However, it is important to note that several interviewees highlighted generational differences as a possible obstacle and sources of segregation between employees who support the introduction of new technologies and those who do not. This disparity could become a critical factor in hindering AI implementation in some organizations. To address this, internal efforts related to communication and training, as previously mentioned, should be emphasized to help employees overcome their concerns and gain a clearer understanding of AI`s true implications. As Geetha and Reddy (2018, p.64) state, “Organizations will also need to train its employees to handle machines, software or any equipment for that matter.” By the end of the interviews, some participants had addressed this issue, similarly,

underscoring the importance of training all employees to understand how AI will operate, how it will be integrated, and to develop their skills (Benhamou, 2020).

The example provided by interviewee 1 can be comparable to the case of Skeeled, a technology startup mentioned in the research, where the initial stages of the recruitment process are automated. The algorithm is applied to screen CVs and, based on the desired profile input, evaluates and selects the candidates who best match the vacancy (Skeeled, 2014). Both cases have been successful and allow for human intervention at any stage. While, in the case reported by interviewee 1, the company itself schedules the interviews to assess candidate`s skills, the Skeeled platform automates this phase.

The main conclusion we can draw from the interviews is that AI is coming to HRM in full force and will be a very helpful tool. However, it will not be possible to replace the HRM department, nor will it be able to operate independently, as all organizations are made up of people. It is necessary to understand the individuals being hired to ensure they are a good fit for the company. Reinforces the perspective of academics such as David Autor (2015), who argues that the interdependence between automation and human beings enhances our skills, our ability to solve problems and our creativity. AI frees us from repetitive and time-consuming tasks, allowing us to improve and humanize organizational areas where AI cannot intervene. Geetha and Reddy (2018) also demonstrated that, despite being beneficial, this is a human creation. The algorithm is built by humans and will always require corrections and improvements. Hence, they argue that humans and AI go hand in hand.

In an organization, people are the core and cannot be removed, nor can AI perform procedures independently without supervision. Personal relationships between employees, whether formal or informal, are crucial, as human contact improves work efficiency and enhances the organization (Babel'ová et al., 2020).

6. CONCLUSION

This research set out to explore the impact of Artificial Intelligence on Human Resources Management, focusing specifically on recruitment practices. By narrowing the study`s scope, it was possible to derive actionable insights into how AI is reshaping recruitment processes, emphasizing its potential and limitations.

Through the research question: "How can AI enhance efficiency and accuracy in recruitment, leading to better candidate-job matches and improved recruitment quality?", the study demonstrated that while AI holds significant promise, its adoption within HRM remains cautions and gradual. Although AI has rapidly expanded and been successfully applied in sectors such as healthcare, marketing, security, and agriculture (OECD, 2024), its influence within HRM is still developing, often hindered by challenges in implementation, scepticism from stakeholders, and regulatory uncertainties. Both the literature review and the conducted interviews revealed instances where AI applications in HR did not perform as expected, leading to their subsequent withdrawal. Furthermore, a critical issue that emerged is the risk of AI bias in recruitment processes. Despite AI`s potential to enhance efficiency, if algorithms are not carefully designed and continuously monitored, they may reinforce existing biases, leading to the exclusion of underrepresented and socioeconomically disadvantaged groups. This unintended consequence can perpetuate workplace segregation and limit equal access to job opportunities. Over time, the accumulation of biased hiring decisions may result in a decline in team diversity, which is known to drive innovation, problem-solving, and overall business success. To mitigate these risks, AI systems must be implemented with prudence, transparency, and ongoing human oversight to ensure fair and inclusive recruitment practices.

AI-powered tools, such as job-matching platforms (LinkedIn, JobTeaser, Skeeled), showcase its transformative potential by streamlining CV analysis and improving the alignment between candidate profiles and job opportunities. These technologies offer dual benefits: candidates gain tailored job matches, while organizations enhance their exposure to suitable talent pools (Skeeled, 2014). Despite these advancements, regulatory efforts like the European Commission's proposed AI Act highlight the importance of

balancing innovation with accountability, ensuring AI systems are ethically and effectively deployed (European Commission, 2021).

Ultimately, the success of AI in HRM hinges on its alignment with human-centric values. Its ability to automate routine tasks allows HR professionals to focus on strategic objectives, fostering stronger organizational outcomes. However, as a transformative yet nascent technology, AI must continuously evolve to address ongoing challenges and meet the complex needs of HRM.

This research contributes to a deeper understanding of AI`s role in recruitment and offers practical insights for organizations exploring its potential. It also sets a foundation for future studies to further examine the dynamic intersection of AI and HRM, paving the way for innovative and impactful practices in this field.

6.1. LIMITATIONS

Although this study provides meaningful insights and contributes to the existing literature, it is essential to recognize its limitations. Firstly, it is important to highlight that the topic of AI`s influence on HRM is still an emerging field, with limited studies available. This aspect posed a challenge, as despite the practical examples mentioned above, the overall literacy on the subject remains somewhat underdeveloped.

Throughout the study, one of the most complex stages was data collection. Undoubtedly, finding interviewees proved to be a significant difficulty, as many were overwhelmed with work and had limited availability. The fact that the study includes only twelve interviewees as the research sample represents a limitation, which may result in inconclusive findings due to the small number of participants representing the broader population. Although all interviewees tried to provide personal contacts, and some of these contacts were included in the study`s sample, several of them never responded.

6.2. FURTHER RESEARCH

Regarding future research, it would be advisable to include a larger number of interviewees, not only from HRM but also from the technology sector, engaging with developers of AI software that supports recruitment practices. Maintaining in-depth, semi-structured interviews as the research method would remain important. A comparative analysis of results could offer valuable insights into how AI impacts HRM,

incorporating perspectives from both HRM professionals and AI developers. Additionally, investing in projects that allow for the observation of practical AI applications in HRM would provide more conclusive data and better reflect the realities behind algorithm development.

In summary, the contributions of this study should encourage further investigations, particularly to understand how changes in organizational activities and sector reinvention are perceived. It would also be beneficial to promote practical tests of AI applications in HRM, bringing companies and workers closer to this reality. This ongoing process of adaptation would require continuous monitoring by researchers, producing studies that further relate HRM and AI, thereby expanding and enriching this research area.

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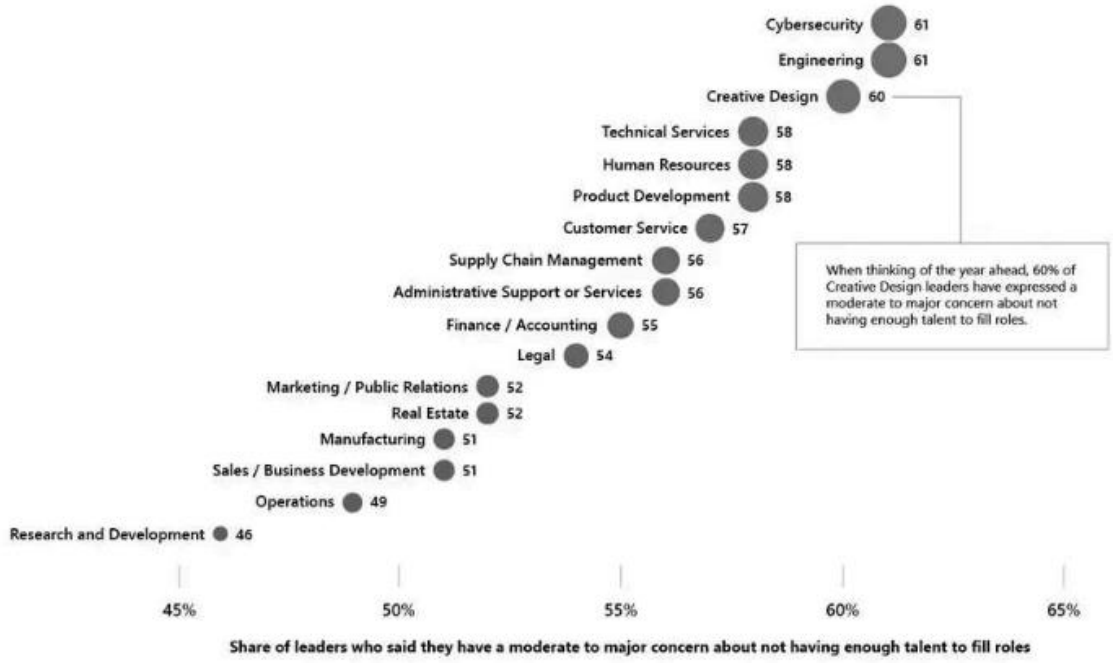
ATTACHMENTS

ANNEX A – THE HIDDEN TALENT SHORTAGE



Source: Microsoft (2024, p.12)

ANNEX B – INTERVIEW GUIDE

This interview aims to understand how Artificial Intelligence influences Human Resources Management, more specifically, the recruitment process. For this reason, the participation of various specialists in the field of Human Resources is essential to enrich the research conducted.

1. How do you think Artificial Intelligence can influence Human Resources Management?

2. What benefits do you think the implementation of Artificial Intelligence can bring to Human Resources Management?

3. What disadvantages may arise?

4. Do you currently apply Artificial Intelligence in Human Resources in your organization? If yes, how?

5. Are you currently investing in Artificial Intelligence training in your organization? If yes, in which areas?

6. In your opinion, which Human Resources Management practices will be most affected by Artificial Intelligence? And which ones will need to be reformulated? What are the reasons?

7. How do you think Human Resources Managers are facing this change?

8. Did you feel any kind of resistance to Artificial Intelligence from the Human Resources team?

9. How do you think Artificial Intelligence can influence Recruitment?

10. What do you think could be the advantages and disadvantages of introducing this technological element into Recruitment processes?

11. Do you think that Recruitment practices can be carried out entirely by Artificial Intelligence, with confidence that it will be a fair and viable system?

12. How do you envision Artificial Intelligence continuing to transform the Human Resources sector in the next 5-10 years?

13. What skills and competencies will become more important for Human Resources professionals given the rise of Artificial Intelligence?

14. Do you believe Artificial Intelligence might change the way Human Resources teams are composed? How?

15. Can the introduction of Artificial Intelligence have an impact decreasing the number of Human Resources jobs?

ANNEX C – CONCEPTUAL FRAMEWORK

Interviews - Questions	Categories	Subcategories	Categorical Analysis		Other categories	To Sum up
Questions that will allow to obtain/achieve the objectives	*Identify the stages in the recruitment process where AI technologies are most effectively applied*	*Stages; Type of AI technologies; Activity/Sector*	*Discourse analysis based on semantics, relationship between meanings of words and phrases; description of the main phrases and words*	*Emblematic phrases and expressions*	*Identification of other categories and subcategories present in the discourse*	*Key ideas*
	C1					
	C2					
	C3					
	C4					

Source: Own elaboration