FACTORS DRIVING THE ADOPTION OF ARTIFICIAL INTELLIGENCE TECHNOLOGY IN THE RECRUITMENT PROCESS IN MOROCCO

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ABSTRACT

General Context: In response to the rapidly changing technological landscape, companies are increasingly embracing artificial intelligence to streamline their recruitment processes. The incorporation of artificial intelligence involves deploying advanced algorithms and machine learning techniques to identify and select candidates for various positions.

Objective: This research endeavours to investigate the factors motivating Moroccan companies to adopt artificial intelligence in their recruitment practices.

Methodology: Our focus was on Human resources managers to discern the factors influencing their decision to adopt algorithmic recruitment.

Results: The findings underscored that the pursuit of expeditious transmission of recruitment data, acquisition of more pertinent profiles, and the security of Human Resources systems were foremost considerations in implementing algorithmic recruitment.

Conclusion: The study is based on an original approach aimed at determining the reasons why Moroccan companies are adopting AI technology, which serves as motivation, companies aspiring to optimize their hiring processes stand to gain multiple benefits from artificial intelligence recruitment. Its capacity to augment efficiency, mitigate biases associated with streamlined processes, and facilitate informed talent management decision-making have been highlighted. Notably, the overall candidate experience has seen enhancements. In the pursuit of diverse team composition, fostering innovation, and achieving sustained success in the fiercely competitive contemporary job market, organizations must recognize artificial intelligence as an indispensable tool.

Keywords: Artificial Intelligence, Recruitment, Algorithms, Human Resources, Gender Discrimination

JEL classification: M51, J60, J71, O33

Paper type: Research article

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INTRODUCTION

Based on a study conducted within the Moroccan job market, it was found that 77% of Moroccan recruiters face difficulties throughout the recruitment process. These obstacles have been attributed to the outdated practices commonly utilized by Moroccan firms and the fierce competition in attracting skilled talents (Panorama HR, 2024). This statistic underscores the significant challenges associated with the conventional recruitment methodologies still prevalent among many Moroccan enterprises. The recruitment process stands as a pivotal phase for companies aspiring to enhance their workforce and fortify their market presence. Functioning as an administrative and technical endeavour within the realm of human resources management, its purpose is to search, select, and integrate new profiles (Barber 1998; Benchemam & Galindo 2013; Diard, Baudoin & Berthet 2022). With the advent of technological progress, we’ve observed a recent digitization of
the recruitment process initiated by companies (Baykal 2022; Bejtikovský, Rózsa, & Mulyaningsih 2018; Masarova & Gullerova 2020). This shift towards digitization is part of a broader framework influencing the managerial landscape of companies, aiming to implement technological modalities capable of substituting human labour in specific tasks. In the context of recruitment, this process is integral to a broader transformation that has automated human resources management.

Presently, we find ourselves amid the fourth industrial revolution, incorporating several key concepts and technologies into the production and management processes of businesses. These include algorithmic technologies such as artificial intelligence, big data analytics, blockchain, and connected technologies like the Internet of Things, among others (Rüßmann et al., 2015; Santos, 2018).

The advent of artificial intelligence technology has revolutionized the business world, particularly in terms of data analysis approaches. Artificial intelligence emerged from a protracted process of academic and scientific development in university laboratories during the 1950s (Buchanan, 2005; Foote, 2010). In the contemporary landscape, every machine is equipped with artificial intelligence. This remarkable revolution has left an indelible mark on businesses, influencing their recruitment processes. The term «algorithmic recruitment» simply denotes the incorporation of this technology into the recruitment process, either by substituting human effort or complementing it. Our study will delve into these two approaches, as well as the factors compelling companies to adopt «algorithmic» recruitment. In the Moroccan context, a study conducted by Panorama HR revealed that 88.6% of surveyed companies lack any advanced technological infrastructure capable of maintaining efficient recruitment processes. Conversely, 11.4% of enterprises incorporate technology, particularly artificial intelligence, into their recruitment procedures. Our study aims to investigate whether the integration of artificial intelligence can alleviate the challenges faced by Moroccan firms using traditional methods and enhance candidate recruitment practices. Additionally, we aim to address the primary research question: What factors influence Moroccan companies' adoption of AI in their recruitment processes?

This research contributes to existing literature by focusing on the factors driving companies to embrace AI in recruitment, a perspective less explored compared to studies primarily centered on assessing HR service performance post-AI technology adoption in organizations (e.g., Johansson & Herranen, 2019; Rathore, 2023; Sithambaram & Tajudeen, 2023; Sucipto, 2024).

This article aims to elucidate the advantages that artificial intelligence offers to companies in the realm of recruitment, particularly in terms of performance, security, and the mitigation of discrimination. Consequently, our article is organized as follows: the first section expounds on the concept of algorithmic recruitment and its characteristics; the second section delves into the challenges motivating companies to integrate artificial intelligence into their recruitment processes; the third section outlines the methodology and hypotheses of our work; the fourth section presents the results; the fifth section is dedicated to the discussion and elaboration of the results, and finally, a concluding section wraps up the article.
LITERATURE REVIEW
Algorithmic recruitment entails the utilization of computer algorithms and artificial intelligence (AI) software to automate diverse facets of the recruitment process (Yadav & Kapoor 2023). To gain a more profound understanding of these algorithms, it is imperative to scrutinize the mechanisms underpinning algorithmic recruitment.

These mechanisms encompass: (1) Data Collection: Recruitment algorithms aggregate a diverse set of pertinent data, including CVs, cover letters, assessment results, and online profiles. This data forms the foundational information for candidate evaluation. (2) Data Analysis: The scrutiny of behavioural data and client feedback to assess employee performance and assign a Job Success Score index. (3) Application of Predictive Algorithmic Models: Employing predictive algorithmic models to anticipate interview outcomes and recommend the most fitting candidates for specific positions. (4) Automation of Diverse Recruitment Process Stages: This involves the automation of various stages, such as selection and operational decision-making, often with minimal or no human intervention (Meijerink et al., 2021).

1. Definition of AI-driven Recruitment

The realm of human resources technology is in a perpetual state of evolution, progressively harnessing artificial intelligence to power both software and hardware solutions. These innovations are aimed at aiding human resources specialists and, in some instances, automating and improving tasks related to Human Resource Management (Stone et al., 2015).

The influence of artificial intelligence spans across both administrative domains (e.g., payroll, employee benefits, recruitment/talent acquisition, and management) and psychological realms (e.g., personnel training). Presently, artificial intelligence stands poised to thoroughly redefine a segment within the human resources technology sector (Wheeler & Buckley 2021). In the words of (Chevalier & Dejoux 2021), the term “Artificial Intelligence” encompasses various technologies dedicated to processing and manipulating data through algorithms, such as machine learning and/or deep learning algorithms. These technologies not only automate but also quantitatively enhance the job matching process between job seekers and job offerings over time. Furthermore, they bring about qualitative improvements by incorporating scientific and technological advancements from disciplines like Natural Language Processing (Saidj, 2022) and behavioural and brain sciences. This amalgamation holds the potential to yield swifter, more accurate, and consistently reliable outcomes in Human resources practices (Li et al., 2021).
Across the decades, the recruitment process has undergone a profound transformation, progressing from what could be termed as Recruitment 1.0 to a more sophisticated iteration, Recruitment 4.0. This metamorphosis is intricately linked to technological advancements and advancements in the field of human resource management.

Recruitment 1.0 primarily relied on manual methodologies, encompassing face-to-face interviews, paper resumes, and job advertisements in newspapers. In contrast, electronic recruitment, or e-recruitment, denotes the use of electronic technologies and the Internet to streamline the recruitment process. It encompasses a spectrum of electronic practices and tools designed to attract, assess, select, and hire candidates (Carroll et al. 1999; Ensher, Nielson, & Grant-Vallone 2002).

E-recruitment involves the utilization of online platforms, applicant tracking systems, internet job postings, candidate databases, online interviews, and other digital tools to simplify and enhance the recruitment process. This paradigm shift has profoundly altered how organizations seek and acquire talent, making the process more efficient and broadening the scope of candidate discovery (Kapse et al., 2012). Transitioning to a more innovative model, Recruitment 4.0 relies on digital tools, artificial intelligence, machine learning, advanced data analysis, and the dissemination of job offers on online platforms (Moseson et al., 2020).

This evolution has optimized talent acquisition processes, refined the alignment between candidates and positions, and heightened the overall efficacy of recruitment. In essence, the shift from Recruitment 1.0 to Recruitment 4.0 signifies a momentous change in how organizations approach the search and selection of their personnel.

Recruitment driven by Artificial Intelligence (AI) can be characterized as an expansive class of software algorithms empowering computers to execute human resources management tasks traditionally reliant on human cognitive abilities and intervention. Essentially, AI-based recruitment involves leveraging artificial intelligence to automate the recruitment and candidate selection processes. These AI-driven recruitment algorithms can be categorized into two types: static or self-learning, signifying their capacity to evolve based on the data they process, employing techniques such as machine learning (Meijerink et al., 2021).

Algorithmic recruitment is defined as a technology aiding employers at every juncture of the recruitment process, from candidate identification to selection, utilizing dedicated tools for candidate sourcing, data analysis, and automated decision-making. This technology harnesses artificial intelligence to interpret external data, assimilate insights, and employ them to accomplish specific objectives and tasks with adaptable flexibility. The infusion of artificial intelligence into the realm of recruitment streamlines the identification, attraction, filtering, evaluation, interviewing, and coordination of candidates, adeptly handling massive volumes of information and making decisions at a pace far exceeding human capabilities (Li et al., 2021).

2. **Algorithmic Recruitment Process**

Conventional recruitment refers to the traditional approach to hiring. In today's dynamic job market, it involves an interactive process among individuals, devoid of digital tools or mechanisms. Essentially, human
recruiters rely on their personal expertise and skills to navigate candidate recruitment in a fiercely competitive environment, where technological advancements have revolutionized various aspects of our lives. Despite these changes, traditional recruitment remains a fundamental component in the hiring processes of many organizations.

Peretti (2020) underscores that the traditional recruitment process encompasses several stages designed to identify and select the most suitable candidates for vacant positions. These stages typically commence with the analysis and specification of the job, where employers distinctly outline the roles and responsibilities associated with a particular position. This step aids in establishing specific criteria for candidate evaluation. Subsequently, organizations advertise the job opening through diverse channels like newspapers, online platforms, or professional networks, enabling potential candidates to discover available opportunities. Employers must create compelling job descriptions and employ pertinent keywords to attract qualified individuals.

Upon receiving applications, a pre-selection process ensues to form a shortlist of candidates meeting the initial requirements. Pre-selection methods may involve scrutinizing resumes, cover letters, or conducting preliminary phone or video interviews.

The goal is to assess the qualifications, skills, and experience of candidates before proceeding to the next stages. Pre-selected candidates then undergo a series of interviews, both individual and group sessions, where their skills are evaluated through behavioural questions or case studies. Additionally, reference checks are conducted to verify the information provided by the candidates. Finally, a decision is made regarding the selection of candidates based on their performance throughout these stages. Organizations consider factors such as cultural alignment within their teams, alongside technical skills, before extending job offers (Garner-Moyer, 2011; Zirari, 2022).

Today, we discuss the integration of artificial intelligence in the recruitment process, which has empowered Human resources professionals to streamline and automate their procedures (Oswal et al., 2020), eliminating time-consuming tasks. The digitization of the recruitment process brings forth numerous advantages (Okolie & Irabor, 2017), among the most significant are as follows: (1) Expanding Reach: Posting job opportunities on online platforms, such as websites and social media, broadens access to a more extensive pool of potential candidates. (2) Accelerating the Process: By allowing online submissions, recruiters can expedite the processing of applications, ultimately reducing the overall duration of the recruitment process. (3) Cost Savings: Digitizing the recruitment process results in reduced costs related to job posting distribution, application management, and communication with candidates. (4) Enhancing Candidate Experience: Providing candidates with the ability to apply online and track their application progress contributes to an improved overall experience throughout the recruitment process. (5) Improving Recruitment Quality: The integration of online pre-selection tools allows recruiters to efficiently sift through applications, facilitating the identification of the most qualified candidates for available positions. (6) Streamlining Data Management: Online candidate management systems simplify the organization and storage of candidate data. In summary,
the digitalization of the recruitment process enables companies to effortlessly identify highly qualified candidates while simultaneously reducing costs, expediting operations, and elevating the overall candidate experience.

Concurrently, the methodology of Artificial Intelligence (AI) undergoes variations based on specific applications and contexts. However, in a broad sense, the artificial intelligence process involves the following stages (Lee, 2021): (1) Data Acquisition: Artificial intelligence relies on gathering data to learn and enhance its performance. This data can be sourced from various outlets such as sensors, databases, files, images, videos, etc. (2) Data Preprocessing: The collected data undergoes a process of cleaning, filtering, normalization, and preparation for analysis. This stage may also include selecting the most relevant features for analysis. (3) Data Analysis: artificial intelligence utilizes machine learning algorithms to analyse data, identifying patterns, trends, and relationships. Depending on the availability of training data, algorithms can be supervised, unsupervised, or semi-supervised. (4) Results Evaluation: The results of the analysis undergo evaluation to determine accuracy, reliability, and relevance. This phase may also involve methods like cross-validation, testing results on data separate from that used for training. (5) Model Improvement: If the results are unsatisfactory, the model undergoes optimization by adjusting parameters, incorporating additional data, or utilizing a different algorithm. This phase may necessitate multiple iterations of analysis and evaluation. (6) Model Deployment: Once the model is deemed satisfactory, it is deployed in a production environment to perform tasks such as predictions, classifications, or recommendations. (7) Model Maintenance: Regular maintenance and updates are crucial to ensure the model's continuous accuracy and relevance. Maintenance activities may include performance monitoring, collecting user feedback, and adjusting parameters and data in response to evolving environmental or application needs.

It is essential to highlight that the artificial intelligence methodology can be adjusted based on the unique requirements of the application and its context. For instance, in computer vision, the methodology might involve stages like image segmentation, object detection, pattern recognition, and image classification. In the realm of natural language processing, the process could include steps such as tokenization, lemmatization, named entity recognition, and text classification. In every instance, the artificial intelligence process generally hinges on utilizing data, employing machine learning algorithms, and subjecting the results to rigorous evaluation to ensure the precision and reliability of the model.

3. Challenges Prompting Companies to Embrace artificial intelligence in Recruitment:

Artificial Intelligence (AI) is progressively permeating diverse industries, and recruitment is no outlier. In the contemporary professional sphere, businesses recognize the significance of integrating artificial intelligence technology to effectively optimize their recruitment processes.

Primary Challenges in AI-driven Recruitment:

Insufficient Relevance in Candidate Selection: artificial intelligence recruitment frequently confronts difficulties in accurately pinpointing suitable candidates. The algorithms underlying artificial intelligence rely
on data and models, potentially neglecting critical details that could distinguish a candidate as the ideal match for a position or an organization's culture. This relevance gap may result in suboptimal selection decisions, leading to the recruitment of less qualified candidates or overlooking highly qualified individuals (Drage & Mackereth, 2022; Oswal et al., 2020).

Gender Discrimination in Hiring: Despite the intention of recruitment artificial intelligence to eradicate biases and promote diversity, it may unintentionally sustain gender discrimination. The algorithms powering artificial intelligence systems are built on historical data, which may reflect systemic biases in past hiring decisions. Consequently, biased patterns may persist and even be exacerbated throughout the selection process, resulting in discriminatory outcomes (Henningsen et al., 2022; Hofeditz et al., 2022).

Security Concerns in the Recruitment Process: The use of artificial intelligence algorithms for candidate evaluation raises security issues. Risks include unauthorized access to candidates' sensitive data and breaches stemming from vulnerabilities within the algorithm. Organizations must prioritize the utmost protection of candidates' personal information shared throughout the recruitment process (Ween, 2020).

Opacity in Recruitment Processes: The trust relationship between organizations employing recruitment artificial intelligence and job seekers engaging with such systems is contingent upon transparency. Owing to their intricacy or lack of clarity, candidates often find themselves without a comprehensive understanding or trust in AI-driven selection processes. Scepticism regarding impartial treatment during the recruitment process may stem from this opacity. Organizations must confront this challenge by articulating clearly how recruitment artificial intelligence operates and the role it plays in decision-making. Disclosing information about the algorithmic mechanisms employed by these systems, such as the significance of features or weights, will not only enhance transparency but also fortify candidates' trust (Mujtaba & Mahapatra, 2019).

Benefits of Algorithmic Recruitment:

The integration of algorithmic technology has afforded businesses various managerial advantages, notably enhancing the recruitment process. The table 1 delineates the primary benefits identified in the literature:

<table>
<thead>
<tr>
<th>The Advantages of artificial intelligence Recruitment</th>
<th>Références</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time Efficiency:</strong> Artificial intelligence contributes to time efficiency by preserving records in their current state, eliminating the need for repetitive actions. The conventional recruitment process often demands a significant amount of time devoted to reviewing candidates' resumes, making this step inherently repetitive.</td>
<td>Mirji (2021)</td>
</tr>
<tr>
<td><strong>Talent Mapping:</strong> Artificial intelligence assists human resources in securing the optimal talents required for the organization. It also targets candidates based on their skills, ensuring their placement in suitable positions aligned with their talents.</td>
<td>Hunkenschroer &amp; Luetge, (2022)</td>
</tr>
</tbody>
</table>
**Cost Efficiency:** The process of identifying the ideal candidate for the organization is executed with a qualitative approach, diminishing the reliance on external recruitment agencies. Consequently, artificial intelligence tools play a pivotal role in achieving cost efficiency.

<table>
<thead>
<tr>
<th>Selection of Top-tier Candidates: Artificial intelligence software facilitates the filtration and selection of top-tier candidates, evaluating whether they possess the requisite skills, qualifications, and characteristics for the applied position. This, in turn, aids in recruiting highly talented individuals.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemalatha et al. (2021)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Addressing Employee Inquiries: Providing employees with updated information and prompt responses to their questions enhances overall job satisfaction and boosts employee engagement. Additionally, this approach diminishes employee turnover rates, ensuring sustained excellence in service to the company.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geetha &amp; Bhanu (2018)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fair Recruitment: Machines handle candidate recruitment without human intervention, ensuring an unbiased sorting and selection process.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geetha &amp; Bhanu (2018)</td>
</tr>
</tbody>
</table>

Artificial Intelligence (AI), a cutting-edge technology capable of intelligent operations akin to human thinking, is increasingly transforming recruitment processes compared to conventional methods. Recognizing the centrality of recruitment for organizations, the sector is witnessing substantial growth due to the integration of artificial intelligence techniques. Industries are closely monitoring the ongoing evolution of recruitment processes, underscoring the significant impact of artificial intelligence technology on this pivotal activity. This technology empowers recruiters to streamline operations by harmonizing unstructured data, establishing uniform profiles, and identifying industry-specific skills. While some recruiters view artificial intelligence as a potential competitor, it is imperative to highlight that these computational tools are crafted by human professionals to enhance the process, ensuring control throughout. In essence, the role of artificial intelligence manifests as a collaborative synergy between artificial intelligence and human capabilities. This collaboration facilitates more efficient data management, substantial time and cost savings for organizations, and heightened access to the entire recruitment process—all achieved with superior precision.

**METHODOLOGY**

Our research endeavours to uncover the motivations behind Moroccan companies adopting artificial intelligence (AI) technology in their recruitment systems. To accomplish this, we have crafted an empirical study aimed at establishing a connection between this technology and the benefits it brings to Moroccan businesses. Surveying a representative sample of 75 Moroccan companies, we administered a questionnaire utilizing both Computer-Assisted Web Interviews and Computer-Assisted Personal Interviewing methods.
Targeting human resources managers and managers, the questionnaire is structured with direct questions, employing a dichotomous response format to simplify choices for participants. The primary objective is to discern the advantages generated by the integration of this novel technology (Table 2).

Table 2. Presentation of the questions proposed to the managers and their codes

<table>
<thead>
<tr>
<th>Variable Code</th>
<th>Presented Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transparency</td>
<td>Is your recruitment system transparent? (Yes =1)</td>
</tr>
<tr>
<td>Speed of info</td>
<td>Is your recruitment system quick in terms of information transmission? (Yes =1)</td>
</tr>
<tr>
<td>Discrimination</td>
<td>Do you feel that your recruitment process is discriminatory? (Yes =1)</td>
</tr>
<tr>
<td>Accuracy</td>
<td>Does your recruitment system enable you to accurately select the desired profiles? (Yes =1)</td>
</tr>
<tr>
<td>Security</td>
<td>Is your recruitment system secure? (Yes=1)</td>
</tr>
</tbody>
</table>

In this study, we aim to examine three hypotheses that have caught our attention, particularly in the context of Moroccan companies. Our first hypothesis is geared towards determining the factors that have driven companies to implement algorithmic recruitment (H1): Recruitment factors impact the adoption of Artificial intelligence recruitment. We constructed a conceptual model to illustrate the main factors identified during an extensive literature review.

Figure 2. Conceptual Model
Source: Author’s illustration

We selected factors that align with the Moroccan context, meaning, identifying the factors that drive Moroccan companies to take action: Firstly, data transparency during the recruitment process, avoiding any practices that hinder the proper functioning of the recruitment procedure, especially during mass recruitment.
campaigns. Secondly, gender discrimination; companies are striving to eliminate any discriminatory practices that could affect their public image. Thirdly, the speed of processing and dissemination of information among the different departments involved in the recruitment process. Fourthly, the relevance of recruited profiles and their level of adaptation to vacant positions. Fifthly, the security of the internal recruitment system and data confidentiality.

The second hypothesis aims to verify the impact of specific company criteria on the adoption of artificial intelligence recruitment, including the industry sector (Sector), personnel size (Person), and annual turnover (Turnover) \((H2): \text{Company criteria impact the adoption of artificial intelligence recruitment.}\)

**RESULTS**

The outcomes will be presented using two approaches: a univariate analysis to illustrate the sample and a multivariate analysis to ascertain the factors propelling companies to digitize their recruitment processes.

**Descriptive Analysis: Overview of the Sample**

Our data collection focused on companies located in the Casablanca-Settat region of Morocco. The ensuing results are outlined below:

<table>
<thead>
<tr>
<th>Criterion</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sector of activity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>17</td>
<td>23%</td>
</tr>
<tr>
<td>Secondary</td>
<td>23</td>
<td>31%</td>
</tr>
<tr>
<td>Tertiary</td>
<td>15</td>
<td>20%</td>
</tr>
<tr>
<td>Quaternary</td>
<td>20</td>
<td>27%</td>
</tr>
<tr>
<td><strong>Turn-over</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 10 MMAD</td>
<td>5</td>
<td>7%</td>
</tr>
<tr>
<td>Between 10 MMAD and 50 MMAD</td>
<td>14</td>
<td>19%</td>
</tr>
<tr>
<td>Between 50 MMAD and 100 MMAD</td>
<td>20</td>
<td>27%</td>
</tr>
<tr>
<td>Higher than 100 MMAD</td>
<td>36</td>
<td>48%</td>
</tr>
<tr>
<td><strong>Number of employees</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 10 Person</td>
<td>5</td>
<td>7%</td>
</tr>
<tr>
<td>Between 10 and 50 Person</td>
<td>22</td>
<td>29%</td>
</tr>
<tr>
<td>Between 50 and 100 Person</td>
<td>16</td>
<td>21%</td>
</tr>
<tr>
<td>More than 100 Person</td>
<td>32</td>
<td>43%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>75</td>
<td>100%</td>
</tr>
</tbody>
</table>

The presented table outlines the breakdown of our sample concerning three key factors: (1) Industry Sector, (2) Annual Turnover, and (3) Number of Personnel within the company. Notably, 27% of the surveyed
companies operate in the IT sector, justifying their embrace of technologies like artificial intelligence for recruitment processes. Similarly, 20% belong to the industrial sector, underlining the importance of their workforce and the necessity for advanced tools to manage human resources effectively. Annual turnover serves as an indicator of the company's financial capability to absorb the costs of investing in equipment and technological infrastructure. Impressively, 48% of the participating companies report an average annual turnover exceeding 100 million MAD. Lastly, the size of the workforce significantly influences the adoption of algorithmic technology in the recruitment process. Companies with a substantial workforce often grapple with high employee turnover (e.g., retirements, layoffs, resignations), highlighting the need to manage these changes efficiently. Approximately 43% of the surveyed companies have a workforce exceeding 100 employees.

**Multivariate Analysis: Determining Factors for Implementing Algorithmic Recruitment**

In our exploration of the factors driving companies to adopt algorithmic recruitment systems, we utilized the binomial logistic regression econometric model.

The above figure provides a visual representation in a "Forest plot" of the factors influencing the implementation of an Artificial Intelligence (AI)-assisted recruitment system.

![Figure 3. Forest plot](https://journal.access-bg.org/)

Source: The Authors illustration

Notably, factors showing statistically significant impact on the adoption of the artificial intelligence recruitment system include: Accuracy ($b = 1.78, s.e = 0.77, p < 0.05$), Security ($b = 1.51, s.e = 0.62, p < 0.05$), and the speed of information ($b = 1.22, s.e = 0.68, p < 0.1$). Conversely, other factors such as
Transparency ($b = 0.76, s.e = 0.58, p > 0.1$), Discrimination ($b = -0.33, s.e = 0.75, p > 0.1$), Industry Sector ($b = -0.57, s.e = 0.25, p > 0.1$), Personnel Size ($b = 0.21, s.e = 0.58, p > 0.1$), and Turnover ($b = -0.22, s.e = 0.26, p > 0.1$) do not exhibit statistical significance. These outcomes lead us to infer that companies, aiming to enhance their recruitment processes, particularly in terms of data security, profile relevance, and the expeditious handling of Human resources information, favour AI-driven recruitment due to its inherent advantages. Further investigation into this matter will consider the variations in two pivotal parameters affecting recruitment: personnel size and annual turnover of companies.

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>The pursuit of data transparency has implications for the adoption of Artificial intelligence in recruitment.</td>
<td>Rejected</td>
</tr>
<tr>
<td>The fight against discrimination influences the adoption of Artificial intelligence recruitment.</td>
<td>Rejected</td>
</tr>
<tr>
<td>The quest for expeditious transmission of Human Resources information has implications for the adoption of artificial intelligence recruitment.</td>
<td>Accepted</td>
</tr>
<tr>
<td>The quest for relevance in candidate profiling influences the adoption of artificial intelligence recruitment.</td>
<td>Accepted</td>
</tr>
<tr>
<td>The pursuit of security in the Human resources system influences the adoption of artificial intelligence recruitment.</td>
<td>Accepted</td>
</tr>
<tr>
<td>The industry sector of the company influences the adoption of artificial intelligence recruitment.</td>
<td>Rejected</td>
</tr>
<tr>
<td>The size of the workforce influences the adoption of artificial intelligence recruitment.</td>
<td>Rejected</td>
</tr>
<tr>
<td>The annual revenue of the company affects the adoption of artificial intelligence recruitment.</td>
<td>Rejected</td>
</tr>
</tbody>
</table>

Based on the findings, there are only three factors motivating companies to adopt Artificial intelligence recruitment in Morocco. We will assess the significance of these results by delving into the literature that has explored these three factors.

According to the findings, there are only three factors driving companies to adopt AI recruitment in Morocco: the speed of HR information transmission within company systems, the relevance of selected profiles, and the pursuit of system security. This implies that Moroccan businesses are primarily interested in implementing technological solutions for technical and operational purposes. We will further evaluate the significance of these results by reviewing relevant literature that discusses these three factors in depth.

**DISCUSSION**

The advent of artificial intelligence has brought about a revolution in various industries, notably in human resources, within the current digital landscape. Artificial intelligence has made remarkable strides in reshaping recruitment processes. An artificial intelligence recruitment system represents a technological solution that automates diverse facets of the recruitment process through the utilization of artificial intelligence algorithms. In this section, we will draw upon the insights from the literature review to provide a more in-depth analysis.
of the results obtained in our study. We aim to delve into the contributions of artificial intelligence recruitment, specifically focusing on its impact on enhancing the speed of information transmission within the Human resources system, ensuring security, and optimizing the relevance of candidate profiles during its implementation.

The contribution of AI recruitment to improving the speed of information transmission within the HR system, its security, and the relevance of profiles during its application have been the subject of several studies. Concerning the speed of data transmission in human resources, Gong et al. (2022) aimed to capture the contribution of algorithms in the recruitment process. They applied neural network models to analyze candidate CV selection criteria during recruitment and contractual salary formulation standards. Experimental results demonstrated that employing neural network algorithms improved convergence speed and forecasting effectiveness in managing HR administrative operations such as salaries.

Regarding system security, Verlande et al. (2023) adopted the federated learning AI model to enhance security in HR management platforms within companies. The authors' findings showed that integrating an FL system could enhance information security in HR management, evident in service design, which simplifies task operations for universal usability, and user experience, ensuring quality interactions with digital platform environments. Thus, security reinforces and facilitates user interaction with the HR platform.

Regarding the relevance of selected profiles, Li et al. (2021) relied on semi-structured interviews to explore the benefits of AI application in their recruitment processes. The authors identified several advantages, including the relevance of candidates through the implementation of skills matching systems fueled by algorithms. We will further expand our discussion based on a literature review exploring the role of these three factors and their impacts on AI recruitment processes.

- **The Velocity of Information Transmission in the Artificial Intelligence Recruitment Process**

The expeditious transmission of human resources information is paramount in an artificial intelligence recruitment system for various reasons. Upadhyay & Khandelwal (2018) highlight that organizations frequently encounter a high volume of job applications, particularly for coveted positions or during peak recruitment periods. The swifter the transmission of Human Resources information within the system, the faster recruiters can evaluate candidates and identify suitable matches. Delays or inefficiencies in transmitting Human Resources information can adversely affect the entire recruitment process. A slower system response may lead to qualified and potentially high-performing candidates losing interest or accepting offers from competing companies. Consequently, valuable talent is at risk of slipping away due to communication delays.

Numerous factors impact the speed at which Human resources information is transmitted within an artificial intelligence recruitment system: (1) Technological Limitations (Johansson & Herranen, 2019): The capabilities of the underlying technological infrastructure play a pivotal role in determining the speed at which data can be processed and transmitted within an artificial intelligence recruitment system. (2) Data Processing Capabilities (Zehir et al., 2020): The efficiency with which data processing algorithms extract relevant knowledge directly influences the overall speed of human resources information transmission. Constant
optimization of these algorithms is necessary to ensure timely and accurate results. (3) Data Integration (Benhmama & Bennani, 2023): Seamless integration with other Human resources systems, such as candidate tracking systems or human capital management platforms, is vital for the effective transmission of information. Challenges related to data integration can impede the process, causing delays. (4) Organizations reap several advantages from the rapid transmission of Human resources information in artificial intelligence recruitment systems: (1) Reduction in Recruitment Time: By minimizing communication delays, organizations can significantly reduce their recruitment time, ensuring that top talent remains engaged throughout the hiring process (Ismail et al., 2023). (2) Enhancement of Candidate Experience: Candidates value prompt responses throughout the application process. Swiftly providing Human resources information to candidates improves the overall candidate experience (Gupta & Mishra, 2023).

Nevertheless, prioritizing speed can give rise to issues of fairness and precision: (1) Accuracy Concerns: Swift transmission of human resources information introduces the risk of compromising accuracy. Organizations must find a delicate balance between swiftly assessing candidates’ qualifications and ensuring an accurate evaluation. (2) Bias in Historical Data: Biases present in the historical data used by artificial intelligence recruitment systems may unintentionally persist through rapid transmission if not appropriately addressed (Chen, 2023; Hunkenschroer & Luetge, 2022).

The Precision of Profiles in the artificial intelligence Recruitment Process

Profile precision can be defined as the degree to which an individual's resume or application accurately represents their genuine skills, qualifications, and experiences within an artificial intelligence recruitment system. These systems assess candidates' suitability for specific roles by scrutinizing diverse data points, encompassing work history, educational background, skill sets, certifications, and more.

Assessing the accuracy of profiles entails cross-referencing information provided by candidates with external sources or references to validate its authenticity. Background checks, for example, can verify educational degrees or employment history stated in applications.

Furthermore, an artificial intelligence system can extract keywords from applications or resumes to align them with job descriptions or employer-set requirements. Human resources professionals and organizations at large accrue numerous advantages from the presence of precise profiles within artificial intelligence recruitment systems.

Firstly, this allows recruiters to make more informed decisions about potential candidates by relying on reliable information rather than mere assumptions, thereby reducing biases arising from unconscious human biases during the evaluation process (Jasim & Karthick, 2023). Secondly, accurate profiles contribute to enhanced efficiency. Armed with precise profiles generated by artificial intelligence algorithms, human resources professionals spend less time manually sifting through numerous applications. These algorithms facilitate the swift identification of highly qualified individuals possessing the necessary skills for specific roles (FraiJ & László, 2021).
Accurate profiles also empower organizations to make better hiring decisions. Artificial intelligence recruitment systems assist in identifying top candidates with the required skills and qualifications for a specific job opening, ensuring the reliability and validity of the information provided by candidates (Geetha & Bhanu, 2018; Jasim & Karthick, 2023).

Despite these advantages, achieving profile accuracy through artificial intelligence recruitment systems can be challenging due to various factors. Data bias presents a potential obstacle, as biased or incomplete training data can lead to the generation of inaccurate profiles. For example, disproportionate representation of certain demographic or industry data in historical employment data may result in biased assessments of candidates from underrepresented groups (Pena et al., 2020). Another limitation is algorithmic biases in artificial intelligence recruitment systems, as these algorithms are based on patterns found in historical data shaped by human decision-making processes. Consequently, these algorithms may inadvertently perpetuate biases present in such data, potentially leading to discriminatory practices against certain groups during the screening process (Tilmes, 2022).

Data Security in the Artificial Intelligence Recruitment Process

In the implementation of artificial intelligence recruitment systems, (Abdul et al., 2020) underscore the paramount importance of upholding stringent data security standards. These platforms amass a diverse array of sensitive candidate information, spanning personal details (such as names and contact information), employment history, skill assessment results, academic qualifications, and more. The failure to maintain adequate security protocols can lead to severe consequences, including privacy-compromising breaches or unauthorized access resulting in the misuse or manipulation of candidate data.

To ensure robust data security practices within artificial intelligence recruitment systems, several measures must be instituted. Sensitive candidate information should be securely protected during both storage and transmission through the implementation of encryption techniques. Access controls must be enforced, allowing access only to trusted individuals with specific levels of authorization based on their roles and responsibilities within the organization. Regular audits, conducted initially and periodically thereafter, are imperative to ensure adherence to data protection standards (Ibrahim & Hassan, 2019).

Despite the benefits of artificial intelligence recruitment systems, they are not impervious to potential data security threats. Noteworthy concerns include hacking attempts by individuals or malicious groups seeking unauthorized access to candidate information. Additionally, data breaches within these systems can be instigated by the presence of malware designed to exploit vulnerabilities. Insider threats further amplify risks, as employees with authorized access may compromise security protocols either through negligence or malicious intent (Scott-Hayward, 2022)

CONCLUSION

Recruitment stands as a pivotal process for any organization, directly influencing the calibre of talent it brings on board. Recent years have witnessed significant strides in technology, notably within the realm of artificial
intelligence (AI). The deployment of artificial intelligence algorithms and tools to refine and elevate various facets of the hiring process is encapsulated by the term artificial intelligence recruitment. This discourse delves into the definition, advantages, augmented candidate sourcing capabilities, improved screening and selection processes, bias mitigation, challenges, limitations, and potential future trajectories of artificial intelligence recruitment. Foremost among the merits of artificial intelligence in recruitment is its prowess in streamlining the hiring process. Centralized automation substantially diminishes the time entailed for tasks such as resume screening or initial candidate assessments. By harnessing intelligent algorithms capable of scrutinizing specific resumes or job applications within seconds, companies can economize valuable time during preliminary screenings. Artificial intelligence recruitment also lends itself to the cost-saving endeavours of organizations. It empowers them to redirect their focus toward strategic activities like interview processes or cultivating relationships with potential candidates. This redirection is achieved by expunging repetitive tasks associated with CV screening or candidate selection from the repertoire of human recruiters. Consequently, this augments overall productivity while curtailing operational costs. Another laudable facet of artificial intelligence recruitment lies in its ability to augment the efficiency and precision of candidate selection. Traditional decision-making in hiring often leans heavily on intuition or gut instincts, inviting biases to permeate these processes. The reliance of artificial intelligence in recruitment on objective criteria serves to mitigate unconscious biases during initial screening sessions, fortifying fairness and amplifying diversity and inclusion within organizational ranks.

However, the implementation of artificial intelligence recruitment is not without its set of challenges and limitations. Principal among these is the apprehension regarding privacy protection and data security, given that artificial intelligence delves into substantial troves of personal information about individuals. Adhering to privacy regulations becomes paramount, necessitating companies to adopt fitting measures for safeguarding candidate data while leveraging artificial intelligence recruitment tools. This work has delineated the driving factors propelling Moroccan enterprises toward the adoption of sophisticated technologies like artificial intelligence in their recruitment systems. Findings underscore that speed, relevance, and security stand out as pivotal factors coveted by every enterprise. While transparency and discrimination are posited as catalysts for refining the recruitment process, we acknowledge the limitation of lacking statistical verification. Furthermore, our study grapples with constraints, notably the diminutive sample size employed. Future endeavours are directed toward scrutinizing the impact of artificial intelligence recruitment on the managerial performance of company.

- Implications of the Findings:

This study presents an opportunity for professionals keen on integrating AI technology into their recruitment processes, offering both financial and social benefits to their organizations as a whole. The results underscore the importance of speed, relevance, and security as critical factors sought after by every company. Additionally, while transparency and discrimination are likely to play pivotal roles in improving the recruitment process, their statistical validation was beyond the scope of this study.
• Limitations and Future Research Directions:

Several limitations are notable in our study. Firstly, the targeted sample size was relatively small, albeit providing a glimpse into the landscape of companies operating within the Moroccan economy. Secondly, we neglected to account for other psychological parameters such as HR manager satisfaction and motivation, as well as management's intention to optimize the recruitment process, which could also influence the adoption of AI technology. Consequently, future research will delve into these psychological aspects, particularly exploring the impact of AI recruitment on overall managerial performance within organizations.

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Conceptualization, Y.BB and A.B.; methodology, Y.BB.; software, A.S.; validation, Y.BB. and A.B.;; formal analysis, A.B.; investigation, A.B.; resources, A.B.; data curation, A.B.; writing—original draft preparation, A.B.; writing—review and editing, Y.BB.; visualization, A.B.; supervision, Y.BB.; project administration, Y.BB.; funding acquisition, A.B.

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Conflict of interests

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References


Ween, F. (2020). *How Artificial Intelligence May Impact Traditional Recruitment in the War for Talents*


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