

E-Recruitment in the UAE: An Artificial Intelligence Approach

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Abstract— This study proposes a hybrid AI framework for UAE e-recruitment, combining LLM, RAG, ML, and XAI to optimize candidate-job matching, support Emiratization, and ensure compliance with UAE Federal Law No. 45 on data protection. It automates recruitment while reducing bias and ethical risks through governance strategies. The research evaluates AI's impact on hiring productivity, equity, and efficiency using surveys, interviews, and ML analysis. It also provides guidelines for responsible AI adoption and a roadmap for developing recruitment systems aligned with UAE legal and societal expectations. The goal is fairer, more efficient hiring processes.

Keywords—*E-Recruitment, Artificial Intelligence (AI), Emiratization, Machine Learning (ML), Large Language Models (LLMs), Natural Language Processing (NLP), Deep Learning (DL), Retrieval-Augmented Generation (RAG), Data Privacy, UAE Federal Law No. 45 of 2021, Ethical AI Governance, Algorithmic Fairness, Bias Reduction*

I. INTRODUCTION

Recruitment processes are an integral part of all businesses, and entities as they influence the operational productivity and achievement of strategic objectives through human capital [1]. Existing online recruitment and onboarding systems continue to deal with numerous drawbacks that include mismatching candidates' qualification to jobs, biased screening processes, and overall long hiring processes. These issues not only result in hiring inefficiencies but also adversely impact the diversity and quality of the workforce. The adoption of Artificial Intelligence (AI) algorithm, promises to revolutionize these traditional methods. The solution will improve candidate-job matching capabilities and reduce biases to enhance overall recruitment quality and efficiency [2].

The recruitment sector in the UAE is expanding rapidly due to the demand for new and innovative hiring strategies. In 2021, the value of online recruiting in the Middle East and Africa was estimated to be around USD 1.94 billion and is predicted to increase to USD 2.51 billion by 2028, at a CAGR of 3.8% [3]. The magnitude of this growth illustrates the competitive job market exceeding 155 competitors along with 27 job boards such as Bayt.com, LinkedIn, Naukrigulf.com, and GulfTalent that provide comprehensive services for recruiters and candidates. The region's impact on creating a demand for more

sophisticated recruitment techniques to achieve effectiveness as well as competitive advantage [4].

The Emiratization Policy, has been implemented to foster the employment of Emirati nationals as part of the UAE National Innovation Strategy 2015, is focused on workforce diversification and improving employment security for Emirati citizens. The current over-dependence of the UAE private sector on the expatriate workforce, which constitutes 84.59% of employees, serves as a hindrance to achieving this national goal [5] This population context offers a challenge and an opportunity for improving recruitment systems that increase organizational efficiency while addressing national workforce supply issues.

Recruitment systems are set to shift drastically due to the introduction of AI-powered based electronic recruitment systems. These systems automate and provide more accurate matching of professional seekers and employers while correcting inefficiencies and biases that are left unchecked by traditional systems [6]. The expectation is the introduction of such AI capabilities as a framework will shift hiring paradigms by enhancing accuracy, equity, and adherence to local legal and ethical norms. They also offer substantial improvements by optimizing the recruitment process and addressing the limitations faced by job seekers and employers due to inadequate matchmaking [7].

This study seeks to create and implement an AI recruitment framework for electronic recruitment platforms with special attention to candidate sourcing, bias reduction, and compliance with the Federal Law No. 45 of 2021 in the UAE [8]. This framework will improve the efficiency of the recruitment processes by automation and accurate matching of the employers to the employees and ensure compliance with national employment policies and legal stipulations, hence contributing to Emiratization and workforce diversity within the UAE.

This study focuses on creating an e-recruitment framework powered by Artificial Intelligence (AI) that assists in candidate-job matching, compliant with UAE Federal Law No. 45, and supports Emiratization. The scope of this work is limited to evaluating the HR processes by applying AI ethics, monitoring the recruitment key performance indicators (KPIs), and providing practical recommendations. Other AI functions not

related to recruitment, such as retention or performance appraisal, are outside the scope of this study.

The study also utilizes both qualitative (interviews with human resource managers, recruiters, and specialists in artificial intelligence) and quantitative (surveys of various stakeholders) methods to investigate the use of artificial intelligence in recruitment in the United Arab Emirates. The legal documents are scrutinized within the framework of described biases, compliance challenges, as well as attempts to refine factual practices regarding ethical and legal candidate-job matching.

As the use of AI-powered recruitment systems becoming increasingly widespread across the world, a significant gap in frameworks exists that suit the UAE's unique labor regulations, Emiratization policies and multicultural workforce dynamics. Current research primarily deals with Western markets, and in some cases, disregards compliance with UAE's data privacy laws and the necessity of explainability within the AI hiring tool. A gap exists in terms of fairness, transparency, and legal compliance in the case of the existing AI framework for the UAE. This study attempts to fill the space by introducing a hybrid AI framework which includes completeness in terms of fairness, transparency, and legal compliance for UAE e-recruitment context.

The developed conceptual framework is meant to serve as a guide and remains open to future design and integration based on the results of this thesis.

II. PROBLEM STATEMENT

The UAE's job market is undergoing active development, yet is faced with persisting systemic problems that affect both employers and employees. Employers face issues such as lengthy hiring times because of skill gaps and inefficiencies associated with hiring and candidate evaluation processes; these issues lower employer recruitment efficiency and create a mismatch between available talents and organizational requirements of entities [9]. On the other hand, Emiratis and expatriate job hunters face a myriad of challenges including discrimination and inadequate job offers made worse by oversupply of poorly suited jobs [10].

Employment skill gap is one of the most crucial problems within the job market for both Emiratis and expatriates. Emirati job candidates often find themselves lacking the requirements of the job market, especially for the private sector. There are also many expatriate applicants who fall under the category of not being able to satisfy the requirements and expectations of employers. This occurs as a result of the lack of efficiency in traditional recruiting processes, which contributes to poor time and resources management that affects capitalization [9], [1].

The recruitment process suffers from biases and outdated filtering techniques which delay recruitment and make it difficult to assess a candidate accurately. These issues not only reduce productivity, but also raise ethical issues related to inclusion and diversity. Such biases, whether based on gender, ethnicity or age, restrict the potential of deserving candidates and thus, violate basic principles of discrimination-free employment [11].

The vast use of AI recruitment technologies has revealed a substantial lack of research about how hybrid AI systems can benefit e-recruitment services in the one-of-a-kind UAE employment environment. The integration of LLM + RAG + ML receives limited research attention for its ability to enhance recruitment procedures through improved search functions and hiring system automation. The utilization of AI recruitment technology in the United Arab Emirates labor market, specifically for Emiratization procedures, requires further study because Western market studies dominate research into AI systems.

The screening of candidates, as well as matching them to appropriate positions, is streamlined through the use of AI technology. The adoption of AI also diminishes existing inefficiencies and biases, contributing to a faster and fairer recruitment process. Recruitment platforms can manage large candidate portfolios more efficiently by employing AI, which also helps most Emirati and expatriate applicants get better jobs [1].

While AI systems are already increasingly utilized in hiring, glaring issues still persist with current e-recruitment systems. Conventional applicant tracking systems (ATS) tend to have specific serious flaws: studies show that most employers believe that automation in screening processes poses a significant problem because qualified candidates are filtered out by stringent rules based on matching criteria [12]. Additionally, the use of AI recruitment software comes with well-understood bias problems, with some tools replicating or worsening discriminatory biases that exist in hiring practices [13]. Such biases can result in discrimination toward certain groups, impacting the intended objective of enhancing fairness and diversity. A further secondary concern is the "black box" aspect of many hiring AIs; they do not provide information or justification for their decisions. In the absence of mechanisms involving explainable AI (XAI), recruiters and candidates are none the wiser as to why a particular candidate was deselected, which turns focus on responsibility issues [14][15]. The highlighted points are illustrative of a clear gap in research AI-based recruitment systems have focused primarily on efficiency and neglected concepts of equity and interpretability.

The Emiratization National Policy Framework – intended to enhance employment opportunities for UAE citizens – requires local policies to be compliant with local workforce policies and inclusivity frameworks [16]. AI-powered recruitment tools and software do not often include such policies, which may jeopardize compliance with important national employment fulfillment goals. Also, the UAE's new data protection law (Federal Decree-Law No. 45 of 2021) places heavy restrictions on the use of personal information for hiring with regard to the candidate's privacy and consent [17]. More constraining and justifiable AI systems are needed in this context. Therefore, there is an unparalleled need for an AI-based e-recruitment system designed for the UAE that incorporates fairness tailoring features, explainable AI (XAI) for decision-making transparency, and compliance with regional legislations and cultural frameworks. In addressing these gaps, the designed framework mitigates biases and integrates explainability into the recruitment process, unlike other solutions lacking such integration of ethics and legal frameworks.

III. LITERATURE REVIEW

The adoption of artificial intelligence (AI) and machine learning (ML) technologies has profoundly transformed the management of human resources (HR), especially in regards to employees' recruitment [18]. This review examines the impact of AI technologies on the recruitment procedures of organizations. It concentrates on some e-recruitment components such as predictive analytics, natural language processing (NLP), and deep learning (DL) among others. These AI technologies have automated several other processes, resulting in more efficient candidate screening and matching.

In the United Arab Emirates (UAE), the recruitment frameworks are sophisticated and employ provisions that facilitate the nationalization of employment—the Emiratization policy focuses on hiring UAE nationals across public and private sectors. The recruitment process involves several core activities, including job advertising, sifting, shortlisting, and interviewing, which are increasingly influenced by automation via e-recruitment systems [19].

Recruitment begins with crafting a detailed candidate pool, which starts with crafting job descriptions and advertisements aimed at qualified applicants. In the UAE, candidates can be sourced using older methods such as job adverts and recruitment agencies, through referrals and internal promotion programs, and lately through online job portals and social media [20][21]. Furthermore, portals and professional networks have further enabled access to new and varied candidates for recruiters using digital forms of recruitment [20].

One of the most widely used tools is the resume screening tool, or the ATS, which is used to automate initial resume screening [22]. Oracle Taleo, SAP SuccessFactors, and Workday are major ATS systems and are accepted widely across industries. The primary function of these systems is candidate matching based on specific keywords and set benchmarks, with qualifications, skills, and experience being evaluated [22].

Recruitment as an industry is marked by diversity and dependency on algorithms to organize non-linear data. This processes information that is often complex and unstructured, making patterns useful in hiring. Random Forest models assist with providing interpretability which is a critical component to transparency and fairness in the hiring process. Ensemble learning techniques are effective for classification and anomaly detection, as with Random Forest, bagging, and boosting [23]. These models contain important information on why some candidates may be labeled as outliers or dismissed, thereby shedding light on their perceptions.

Building from the preceding works on Random Forest's benefits, its integration into recruitment processes can enhance decisions and alleviate the biases that stem from them. Placing Random Forest with other sophisticated tools like large language models (LLMs) and retrieval augmented generation (RAG) could optimize the recruitment process while ensuring adherence to Emiratization policies concerning employment in the UAE. Thus, it is important to study AI's roles in recruitment to fulfill the United Arab Emirates' propelling talent acquisition demands.

As far as utility in recruitment goes, Random Forest is one of the most promising ML algorithms [24]. This is advantageous on account of the fact that it processes, multi-source, intricate information with precision and reliability. For instance, Singh (2024) noted that Random Forest excelled over other algorithms in recruitment processes because it manages high-dimensional, chaotic data while mitigating overfitting. Such ability has been reported in other areas too, particularly in finance [23]. E-recruitment systems are designed with the expectation that they will fairly analyze various types of data without bias while maintaining equity and transparency in their decisions.

Employing LLMs for Natural Language Processing (NLP) fueled job matching is becoming a common feature of modern e-recruitment systems. An older model of an Applicant Tracking System (ATS) relies on keyword searching and tends to disqualify many relevant candidates irrespective of the potential they might have, leading to worse results. LLM-powered NLP models drastically improve job matching accuracy by deep learning from the attribute data of job seekers [25]. Well-known LLMs are Generative AIs such as OpenAI's Chat GPT and Google's BERT, which understand and generate text from processing colossal datasets. These models are capable of working with both structured and unstructured information, which makes them suitable for résumé parsing, creating job descriptions, candidate profiling, and more. Moreover, multilingual LLMs such as ESCOXLM-R+ assist international firms in cross-border hiring by classifying resumé to global vocabularies of job descriptions.

RAG facilitates real-time knowledge retrieval which supports recruiters with improved decision-making systems and enhancing effectiveness in hiring. Through the inclusion of external data sources, RAG offers insight on hiring behavior, trends in the labor market, and employer expectations, assisting organizations in their hiring decisions [26]. This model also helps in mitigating bias since evaluations are made based on empirical data rather than subjective human perception.

The following Literature summary reviews aids in understanding the recruitment process and how AI affects the entire ecosystem:

Author/Year	Purpose/Objective	Methodology	Findings	Discussion
Jatobá et al. (2023)	Analyzing research HRM and the adoption of AI	systematic literature review	Growing academic interest in AI's role in HR development. AI in strategic HR is primarily	AI in strategic HR is primarily focused on profit maximization and organizational growth.

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Larsson et al. (2024)	Examining the Risk of Discrimination in AI Systems:	110 completed questionnaires from representatives of 10 major recruitment agencies and 100 large Swedish companies	AI and ADM raises concerns about transparency and awareness of bias risks.	There is need for greater transparency, accountability, and awareness in AI-driven recruitment processes. It emphasizes the importance of defining responsibility for mitigating bias and ensuring fairness in hiring decisions.
Al-Quhfa et al. (2024)	analyze the use of machine learning models to enhance recruitment accuracy and efficiency in business intelligence.	Recruitment data from a major Yemeni organization (2019–2022). Hype r-parameter tuning and cross-validation were applied for optimization.	Random Forest achieved the highest accuracy (92.8%), followed by Neural Networks (92.6%) and Gradient Boosting Classifier	Advanced machine learning models can optimize hiring strategies in business intelligence.

			(92.5%)	
Almeida et al. (2025)	Explore recruiters' perceptions of AI tools in recruitment, using the Technology Acceptance Model (TAM) to analyze ease of use, usefulness, and attitudes toward AI.	Qualitative study: 100 recruiter interviews on AI adoption. Quantitative study: Online questionnaire with 355 recruiters.	AI enhances efficiency and resource management but raises concerns about loss of personal interaction and role adaptation.	Ethical considerations and human involvement are crucial for effective AI integration. Provides actionable recommendations for organizations adopting AI in recruitment.
Zheng et al. (2024)	Introduces BAMBOO, a novel bilateral multi-behavior modeling method for reciprocal recommendation in online recruitment to better match job seekers and recruiters.	conducts offline experiments on real-world datasets. Performs online A/B testing to evaluate real-world effectiveness.	BAMBOO outperforms state-of-the-art baseline methods in accuracy and efficiency of job-candidate matching.	The proposed BAMBOO method offers an innovative way to improve the matching accuracy between job seekers and recruiters by incorporating multi-typed user behaviors and dual perspectives.

Qin et al. (2023)	Analyze AI-driven talent analytics in HRM, categorizing applications and identifying challenges.	Survey of AI techniques in talent analytics, categorizing research into talent management, organization management, and labor market analysis.	AI enhances HRM through deep learning, NLP, predictive analytics, and automated decision-making, but data bias and explainability remain challenges.	AI-driven HRM improves recruitment, retention, and workforce planning, but requires fairness, transparency, and integration with evolving digital HR systems.
Zeng et al. (2024)	Investigate privacy risks in RAG systems and their impact on LLM data leakage.	Empirical studies with attack methods on RAG privacy vulnerabilities.	RAG exposes retrieval data but reduces LLM training data leakage.	RAG improves security for LLMs but requires stronger retrieval data protection.
Bano et al. (2024)	Explore diversity and inclusion in AI-based recruitment and lessons from industry applications.	Industry workshop discussions, qualitative analysis.	Identifies biases in AI-driven hiring, challenges in diversity, and potential solutions.	Highlights best practices and regulatory needs for ensuring fairness in AI recruitment.
Ali & Kallach (2024)	Analyze AI-enabled HR recruitment functionalities through a scoping review.	Review of AI-based recruitment applications in HRM.	AI enhances efficiency, reduces bias, but requires careful implementation.	Discusses ethical concerns, AI transparency, and HR adaptability in AI-

			entation	driven hiring.
Chapano & Iwu (2025)	Evaluating the implementation of HR practices	Qualitative case study	HR and recruitment strategies, to provide reasoning for results such as transparency and how AI supports results	The AI roles in enhancing HR practices by enabling the clarification of efficient candidate assessment and transparency
Wu et al. (2024)	Candidate evaluation with by using data driven analytics	Fine-tuned LLM and multimodal data for job to CV matching; recruit r-guided corrections	Enhancing the matching process accuracy and introduce fairness in candidate evaluation	Highlights on combining AI various models with human expertise that will optimize recruitment and expand on bias
Potočnik, Anderson, Born, Kleinmann, & Nikolau (2021)	Provide the current recruitment elements, which includes, developments, challenges, and opportunities	Systematic Literature Review	Provides the insight of highlighting the AI integration and machine learning tools in reducing bias and	The AI technologies implemented in the recruitment processes and focusing on the bias issues and identify some

			increase recruitment efficiency	ethical concerns for decision making
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IV. METHODOLOGICAL APPROACH

To develop the AI-based e-recruitment framework, information will be gathered using various data collection methods. To understand and assess the recruitment practices as well as the stakeholders' needs, primary data will be collected through semi-structured interviews and surveys with HR professionals and job applicants in the UAE. Additionally, to create a dataset for training and validating machine learning models, historical recruitment data such as job postings, candidate profiles, and hiring outcomes will be recorded. This approach allows the framework to incorporate stakeholders' integration and perspectives alongside factual recruitment data.

After it is created, the framework will be tested on a basic deployment within a recruitment context to evaluate its effective functioning. The AI's recommendations will be evaluated by measuring how they are aligned with human judgment by checking how hiring decisions ranked against AI suggested ranks. The AI's advantages will be measured by defined criteria: time-to-hire, meaning if the AI actually makes it faster to fill open positions, and matching accuracy, which measures how well AI suggested candidates against actual hires. In addition, recruiters and candidates will be interviewed or surveyed to determine their perceived value and enhancements associated with the system due to the changes made. All of these factors combined will provide an assessment of the effectiveness of the framework, its proven effectiveness, and guiding iterative optimization. The developed conceptual framework will be implemented and integrated where parameters defined in the thesis are bound to be the foundation, and deployed under the context of e-recruitment where online platforms are used as conditions for application.

No research activity will diverge from ethical compliance. Each data collection component will first seek designated ethics clearance based on the institutional policies ADSM-set guidelines. Ethical recommendations as well as the signed consent will be required from all case study participants and the data collected is to be kept confidential and kept only accessible under specific conditions that require anonymization of every identifying detail in the collected data without compromising validity. At minimum, following ADSM ethic principles guarantees that rights and welfare of the participants will be safeguarded continuously throughout the life cycle of the project.

In this qualitative phase, semi-structured interviews will be useful for exploring depth and context-specific nuances that are beyond the scope of quantitative data. From their conversations

with human resource managers, recruiters, and policy implementers, the research will investigate the perception of AI across various organizational cultures, industries, and the degree of automated systems resultant trust among stakeholders. Along with other participants, others will elaborate with potential ethical or legal issues such as concern about bias or privacy issues. This understanding can help with precise modifications to the framework that uphold compliance with local labor laws, Emiratization policies, and recruitment best practices in the UAE, ensuring focus on the region's specific needs.

At the same time, the surveys will gather more diverse quantitative data from a larger group of job applicants and HR professionals. The responses will contribute towards understanding broad AI hiring perception, including the viewpoints of whether candidates consider the processes as transparent or whether HR teams feel that AI takes over tedious administrative functions. The survey will contain questions measuring satisfaction and fairness on a Likert-type scale, as well as open-ended questions allowing participants to articulate UAE-specific contextual issues that they uniquely face. These data will enhance the interview findings with a macro-perspective capturing dominant attitudes and concerns, which will be beneficial when merging machine learning and human-centered AI analysis.

V. PROPOSED FRAMEWORK

A hybrid AI recruitment framework proposed for electronic recruitment platforms created and operated in the UAE such as JobX.ae that can employ LLMs, RAG, and ML within the recruitment platform to simplify, optimize, and provide a fair the recruitment process, while addressing the issues and implementing XAI for transparency. The sequence of logical implementation of the framework for JobX.ae is as the following:

The framework explores the capability to implement processes for one of the platforms being used in the UAE, while laying out the preprocessors of the current logic in the back end. This visualization helps to better implement the AI technologies hence this provides the viewing of technical integration and capability to have numerous applications in the back end. One of the suitable applications which are operating in the UAE is JobX, which has the following logical flow of data:

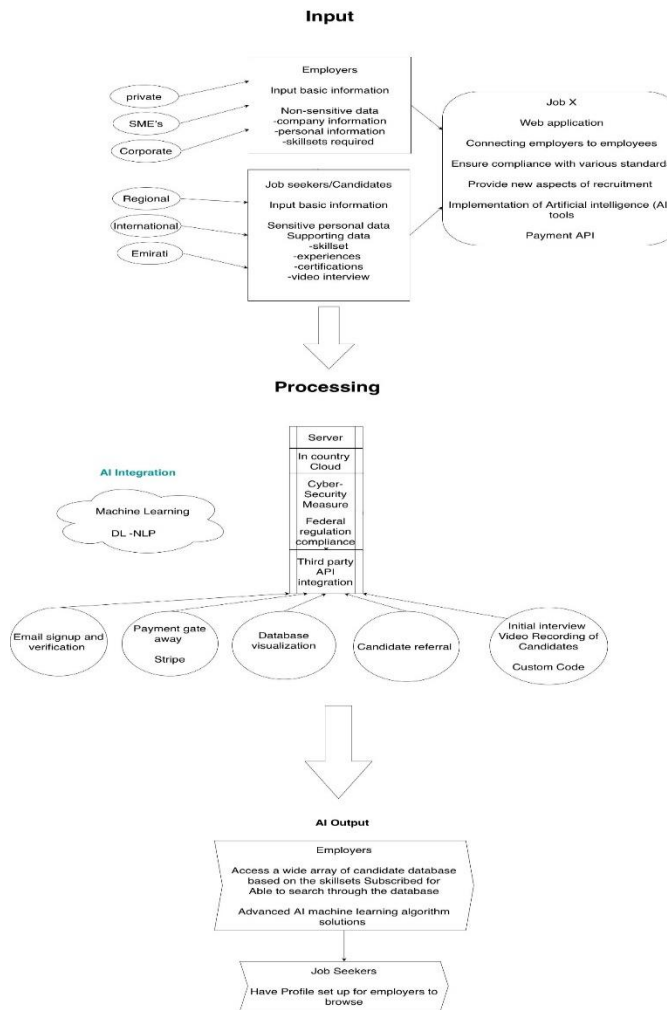


Figure 2: System internal Design, JobX.

VI. CONCLUSION AND FUTURE OUTLOOK

This study shows that integrating current Artificial Intelligence (AI) technologies, like Large Language Models (LLMs), Retrieval Augmented Generation (RAG), Machine Learning (ML), and explainable artificial intelligence (XAI), fundamentally improves e-recruitment processes in UAE. The proposed AI as a service framework thus alleviates human recruiters from operational tasks (candidate sourcing, screening, and matching) to strategic ones (being a human interface, influencing cultural fit, and making strategic decisions) through intelligent automation. In addition, the model provides transparency, fairness, and compliance with the UAE's Federal Decree-Law No. 45 of 2021 on data protection, ensuring high levels of candidate trust as well as protecting their privacy in the recruitment process.

In addition, the framework makes Emiratization efforts possible by placing policies in the algorithmic logic such that the national workforce development criterion is given priority without compromising merit-based hiring. The system achieves a balance of organizational performance with wider social and regulatory goals through a blend of operational efficiency and ethical governance. Additionally, incorporating XAI gives

explainable pathways to the decision-making process for both recruiters and candidates for career selection, thereby meeting the rising demands for AI bias and accountability.

All the same, the proposed framework is a conceptual framework the study recognizes to be a foundation that calls for real world testing and refinement. Moving forward, the pilot implementation of the hybrid AI framework in live e recruitment platforms like JobX.ae would be a major future research direction to assess practical factors like system usability, recruiter and candidate satisfaction, fairness perception, and whether it will result in improving time to hire. Such models and transparency measures will need to be iteratively refined using real-world user feedback.

Further inquiry into the long-term impacts of AI on hiring and organizations' performance should also be conducted. Longitudinal studies could measure, for instance, changes in diversity, equity, and inclusion, candidate (and employee) performance, retention, and opportunities for advancement over several years for candidates selected with AI. Furthermore, it would be important to understand whether AI-optimized recruitment leads to sustainable but positive outcomes to provide robust validation of the system's effectiveness after the initial hiring phases.

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