



Shaping the Future of Recruitment:

A Survey on AI-enabled Hiring Tools

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Background

Technological innovations have transformed the landscape of recruitment and hiring for both employers and employees in recent decades. The rise of online job boards like Monster.com in the 1990s enabled cost-effective digital job listings, leading to an expanded pool of candidates. As the ease of applying for multiple jobs resulted in a subsequent increase of applicants, employers began adopting applicant tracking software to manage job postings, organize resumes, and monitor candidate progress throughout the hiring process. Most recently, the integration of artificial intelligence (AI) and machine learning (ML) into recruitment has allowed businesses to harness complex algorithms and data-driven insights in talent acquisition decisions. Yet, the increasing reliance on these technologies raised concerns among employers, employees, and policymakers regarding data confidentiality and privacy, transparency and fairness in decision-making, and the potential adverse impacts on underrepresented groups.

This study

AI in decision-making encompasses the application of algorithms and computational techniques to discern choices or forecast outcomes in complex situations. For this study, we focus on AI-driven hiring tools that utilize algorithms and computational methods from fields such as machine learning, artificial intelligence, statistical modeling, and algorithmic analytics. These tools aim to enhance or replace human decision-making in the hiring process, often referred to as predictive, robo, automated, or AI-powered hiring. Our definition excludes basic assistance tools like junk

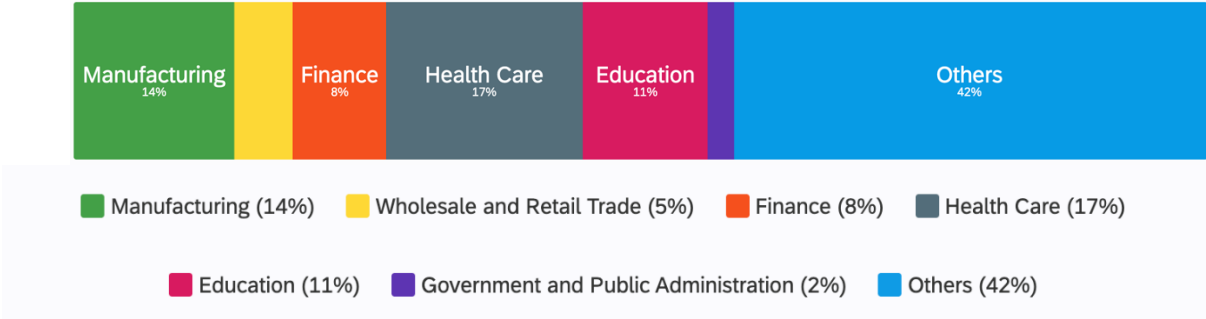
email filters, firewalls, antivirus programs, calculators, and spreadsheets that do not fundamentally alter human decision processes.

Our research aims to explore how firms employ AI-enabled hiring technologies at critical stages of the recruitment and selection process. Between March and June 2023, our research team contacted a diverse group of business professionals involved in recruitment and hiring decisions. This group included CEOs, general managers, HR directors, hiring managers, talent acquisition experts, and recruiters from industries such as manufacturing, finance, pharmaceuticals, healthcare, retail, and transportation. The effort yielded 233 valid and complete survey responses on the current trends and perspectives on technology-driven hiring.

Survey findings

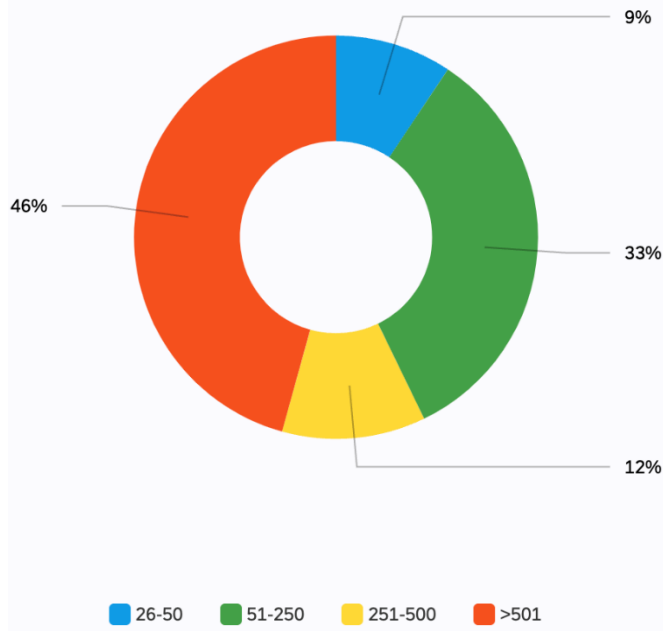
Organizations participated in this study

Our study sample of 233 organizations represents a diverse range of organizations across sectors, as indicated in the following graph. The manufacturing sector constitutes 14% of the participating organizations, while the wholesale and retail trades sector represents 5%. Financial institutions account for 8%, health care organizations represent 17%, educational institutions make up 11%, and organizations representing government and public administration account for 2% of the respondent pool. The remaining 42% of organizations fall under "other industries."



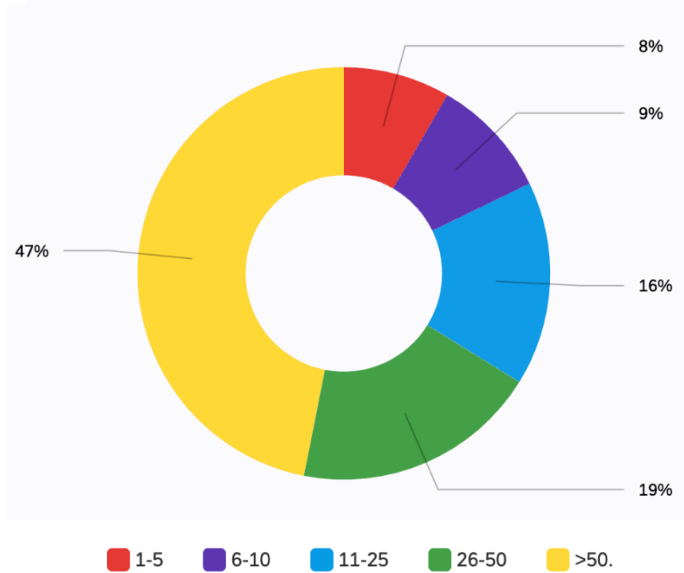
A typical organization in our sample employs about 400 employees, including both part-time and full-time workers. Specifically, 9% of the organizations have 26 to 50 employees, 33% have 51 to 250 employees, and 12% fall in the range of 251 to 500 employees. 46% of organizations employ more than 500 employees. Consequently, our findings are likely to reflect the adoption of AI-enabled hiring tools primarily in midsize and large organizations. The following graph illustrates the distribution of organizations based on total employment.

Total Employee Count (Full-time and Part-time)



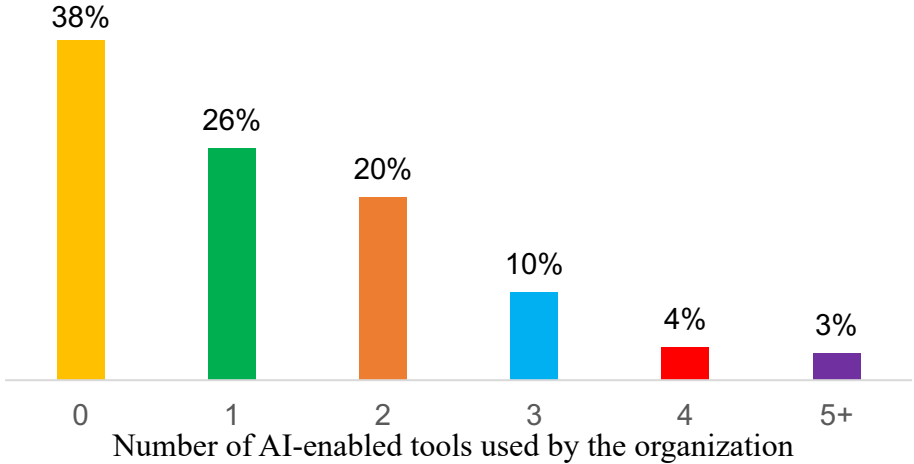
We asked respondents to provide information on the number of new hires their organizations made over the past 12 months. The median number of new employees hired stands at 38. However, the distribution of new hires is skewed, as shown in the following graph. The lower quartile of participating organizations reported hiring eight or fewer new employees, while the upper quartile reported hiring 150 or more.

Number of new hires over the past 12 months



The adoption of AI-enabled tools

In this study, we compiled a list of 31 prevalent AI-enabled hiring tools and then asked respondents to identify those currently in use within their organizations. The results shed light on the extent of AI adoption in recruitment. 38% of organizations have not adopted any AI-enabled hiring tools. In contrast, 26% use one tool, 20% deploy two tools, 10% utilize three tools, 4% engage with four tools, and a mere 3% harness five or more. Among the AI-enabled tools, the most frequently used are hiring software, platforms, or solutions provided by LinkedIn, Workday, ADP, Ziprecruiter, iCIMS, and Greenhouse. The finding suggests that, while the unique benefits of different tools encourage organizations to utilize multiple options – as seen with 37% using two or more – these organizations also face the challenge of handling the increased complexity and intricacies that come with managing multiple tools simultaneously. It therefore underscores the balancing act organizations face between harnessing the different benefits of multiple tools and managing the added complexity that comes with them. The following graph illustrates the distribution of organizations based on the number of AI enabled hiring tools currently in use.



For the rest of this report, we will focus on organizations that adopt at least one AI-enabled hiring tools.

Top priorities in talent acquisition

In order to hire effectively, organizations need to strategically manage a range of objectives. We view recruitment goals as pivoting around five core dimensions: Time, Cost, Quality of candidates, Equity, and Diversity.

First, the objective of reducing time to hire emphasizes the need to expedite the hiring process to fill vacant positions quickly and ensure operational continuity. Developers and vendors of AI-enabled hiring solutions assert that AI-driven tools aim to streamline application screenings by automating candidate communication, facilitating faster decision-making, and thereby boosting the overall efficiency of this process. Approximately 10% of respondents identified reducing time to hire as their primary focus in talent acquisition.

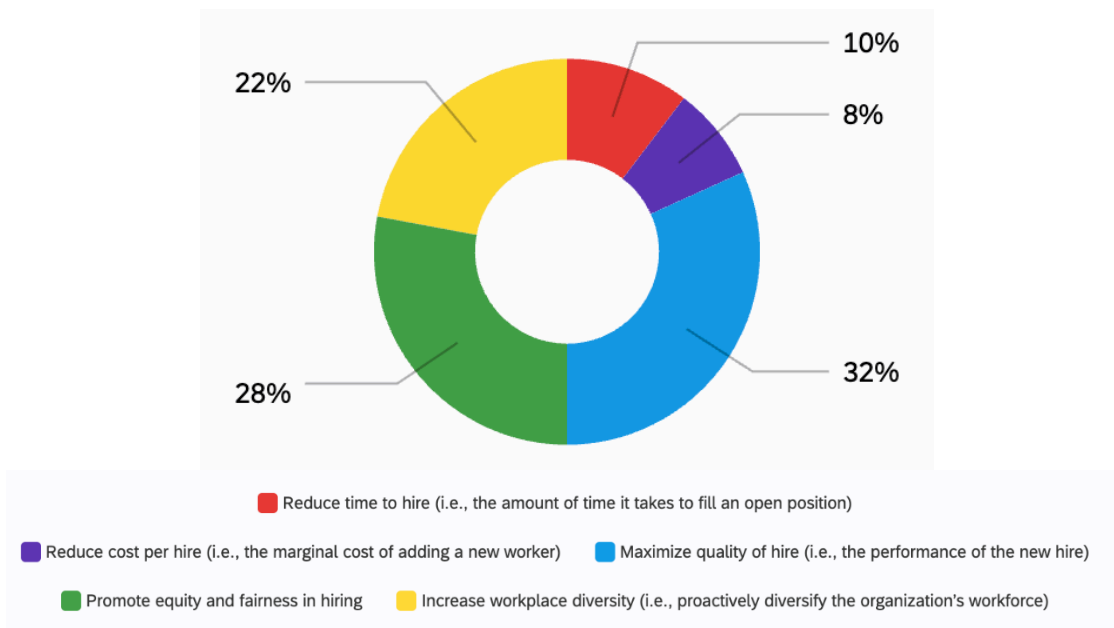
The goal of reducing cost per hire underscores the need to optimize financial resources associated with the recruitment and onboarding of new employees. Developers and vendors of AI-enabled hiring solutions claim that AI can help reduce costs by automating administrative tasks, such as resume screening and interview scheduling, thereby lowering the operational expenses of these processes. Around 8% of respondents reported reducing cost per hire as their top priority in talent acquisition.

Maximizing the quality of hire emphasizes the recruitment of individuals equipped with the requisite skills and competencies to excel in their roles. Developers and vendors of AI-enabled hiring solutions contend that these tools assist in achieving this objective by enabling data-driven candidate assessments and recommendations. These included matching algorithms that align candidates' profiles with job requirements and predictive analytics that evaluate candidates' performance potential. Approximately 32% of respondents reported this as their top priority in talent acquisition.

Promoting equity and fairness in the hiring process requires eradicating biases and creating an unbiased evaluation framework. Developers and vendors of AI-enabled hiring solutions claim that AI has the potential to enhance equity and fairness by mitigating both conscious and unconscious human bias involved in selection and assessment. However, many employers and workers have expressed concerns about transparency and potential algorithmic bias. Roughly 28% of respondents reported promoting equity and fairness as their top priority in talent acquisition.

Enhancing diversity in recruitment refers to the efforts aimed at attracting and incorporating individuals from various backgrounds, demographics, and identities within the hiring process and the resulting workforce. By leveraging AI tools, developers and vendors of AI-enabled hiring solutions suggest that employers can strategically disseminate job postings across diverse platforms, use inclusive language, and enhance sourcing strategies. This approach aims to attract a broader and more diverse pool of candidates, thereby fostering a more representative workforce. Around 22% of respondents reported increasing workplace diversity as their top priority in talent acquisition.

Overall, respondents in our survey suggest that the top priority for these organizations is maximizing the quality of hire, followed by promoting equity and fairness in hiring. The following figure summarizes these findings.



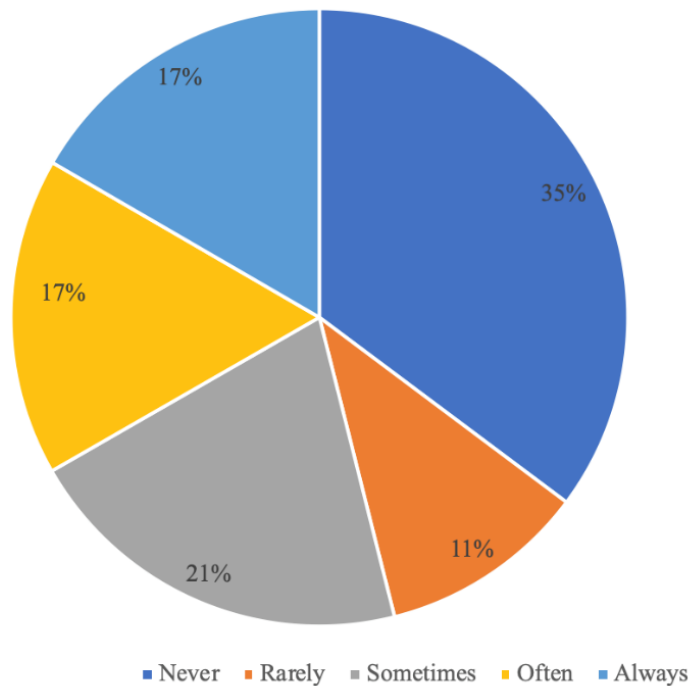
Sourcing

Sourcing in the context of hiring and recruitment, involves a proactive approach to identifying, attracting, and engaging individuals possessing the necessary skills and qualifications for specific job openings. This approach goes beyond traditional job advertisements. AI-enabled sourcing tools can extensively scan multiple databases, including professional networking sites like LinkedIn and social media platforms such as Facebook and Instagram, for targeted outreach. Hence, organizations may be able to identify passive candidates who are currently employed and not actively seeking a new job but could be open to new opportunities, improve targeted selection of candidates from diverse ethnic and socio-economic backgrounds, and proactively recommend roles that align with candidate profiles.

Furthermore, developers and vendors of AI-enabled hiring tools are exploring the incorporation of large language models (LLMs) into the hiring processes. Ideally, such technologies not only analyze comparable job postings to identify relevant keywords but also ensure the use of inclusive and unbiased language. The aim is to assist employers in crafting job descriptions that are more tailored, relevant, and compelling.

The data collected from our survey gives an overview of the integration of AI technology in sourcing activities. Specifically, 17% of respondents indicated always, 17% responded with often, 21% with sometimes, 11% with rarely, and 35% with never, as illustrated in the figure below. This distribution underscores the varied adoption of AI-enabled sourcing practices across different organizational contexts, reflecting an intricate mosaic of strategic priorities and technological proficiencies.

Using AI technologies in Sourcing



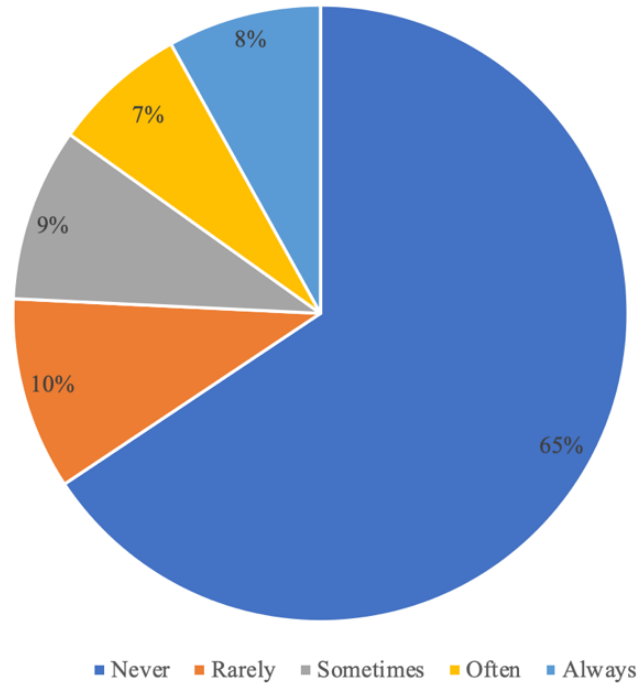
Collecting Job Applicants' Information

The integration of AI improves the process of gathering information from job applicants. It allows candidates to directly submit their details through online portals, initiating a series of automated actions driven by algorithmic models and textual analysis tools. These tools help to systematically extract, organize, and record the vast amounts of information provided by candidates, with minimal human intervention from the hiring organization.

We examined the use of AI-enabled tools across four activities of information collection. Firstly, AI tools might assist employers in detecting specific keywords and attributes in resumes, evaluating their alignment with job requirements. Secondly, employers might use AI to cross-reference candidates' details across databases, validating credentials, academic histories, and checking for any legal records. Thirdly, when interviews involve video cameras and microphones, AI tools might aid organizations in storing visual and auditory records. They can also transcribe interviews, automatically converting audio and visual data into codifiable textual information. Lastly, AI tools might assist in capturing and converting non-textual cues into data. For example, these tools could potentially observe vocal patterns such as speech pace or tone and non-verbal gestures. However, the accuracy of such functions remains to be validated.

Overall, respondents' reported usage of AI-enabled tools in information collection is as follows: always 8%, often 7%, sometimes 9%, rarely 10%, and never 65%. The summarized results are depicted in the following figure.

Using AI technologies in information Collection



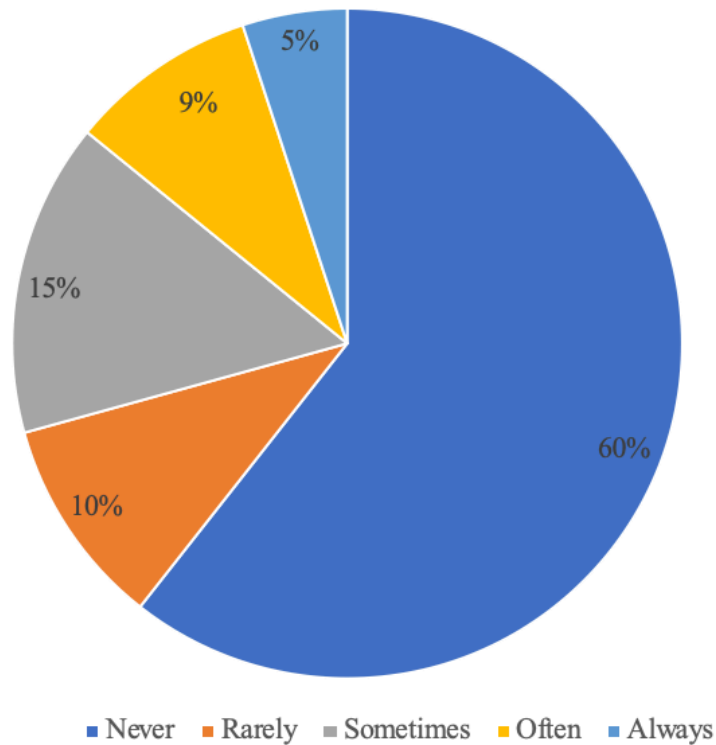
Analyzing and evaluating job applications

Developers and vendors of AI-enabled tools suggest that AI can help the examination of resumes, cover letters, and application statements, extracting relevant content and assessing the alignment of applicants' qualifications with job prerequisites. Beyond the assessment of a human practitioner, these tools can utilize linguistic pattern recognition, sentiment analysis, and content evaluation to analyze candidates' interview responses. These capabilities can provide insights into candidates' communication skills, problem-solving aptitude, and alignment with the organization's values and culture. Additionally, AI-enabled tools might facilitate holistic assessments by combining that gauge cognitive abilities, technical skills, and distinct personalities.

In addition, developers and vendors of AI-enabled tools claim that AI can play a pivotal role in developing and refining predictive analytics and performance criteria crucial for candidate selection. Ideally, by analyzing historical recruitment data against subsequent job performance, AI might enable organizations to establish more predictive and robust hiring standards, ensuring a better match between roles and candidates. As such, the multifaceted capabilities of AI have the potential to support data-centric decision-making and improve candidate evaluation and selection.

Our research delves into the extent of AI tool integration in the recruitment process. We surveyed respondents on their utilization of AI tools across various tasks, ranging from textual evaluation and interview response analysis to the development of bespoke algorithmic models for candidate evaluation. The distribution of AI tool adoption among respondents is as follows: 5% always, 9% often, 15% sometimes, 10% rarely, and 60% never.

Using AI technologies in analyzing and evaluating job applications



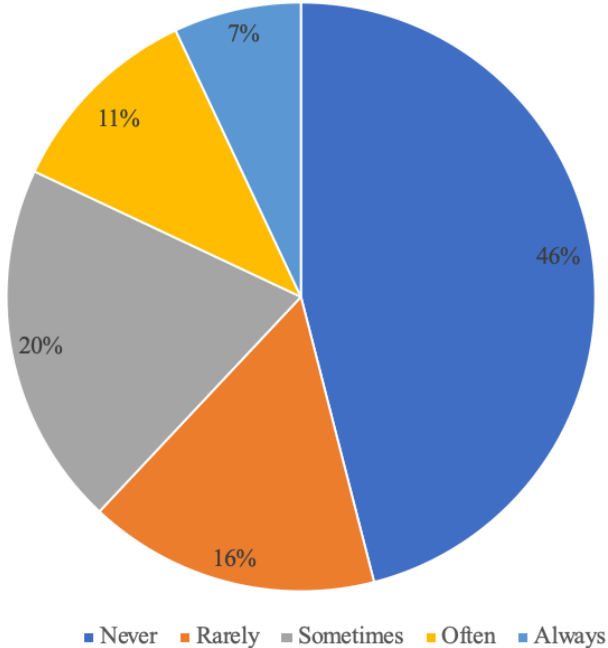
Scoring and ranking

Within the context of recruitment, the process of selection and ranking typically involves a systematic evaluation followed by the ordering of candidates according to their holistic qualifications. Many organizations employ a range of criteria when scoring applicants, including educational qualifications, professional history, reference letters, and interview performance. AI-enabled hiring tools might aggregate data about each candidate from various sources, factor in specific parameters and weights derived from predictive models, and then yield a singular numerical score for each individual. In theory, this method aims to provide a structured framework for evaluating and classifying candidates based on their individual attributes, potentially streamlining the decision-making process. However, in practice, both job candidates and hiring professionals might perceive the decision-making process as opaque, with the impartiality and accuracy of these methods still subject to scrutiny.

In our survey, we asked respondents to report their utilization of AI tools in various aspects of the scoring and ranking process. Specifically, they were asked to reflect on the extent to which these tools were employed in tasks such as generating a hierarchical list of candidates based on their qualifications and suitability for the role, assigning scores to individual applicants to quantify their suitability, and amalgamating diverse data sources to formulate comprehensive scores that holistically represent each candidate's potential. The distribution of reported usage among

respondents for AI-enabled tools in scoring and ranking is as follows: 7% always, 11% often, 20% sometimes, 16% rarely, and 46% never. These insights are summarized in the figure below.

Using AI technologies in scoring and ranking



Enacting decisions

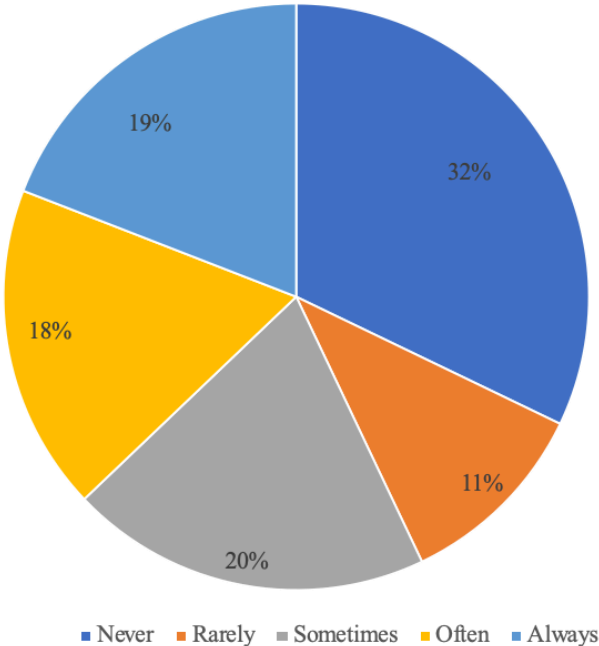
The phase of decision enactment represents a critical point in the recruitment process. It's at this juncture that employers finalize their choices and convey them to applicants. This phase often follows an extensive assessment and evaluation process, culminating in a decision about a candidate's perceived suitability for the position.

During this stage, employers carefully consider the outcomes of the evaluation process. They synthesize a wide array of data, scores, and rankings to arrive at a final decision. This consolidated data aids employers in recommending candidate acceptance or rejection. If a candidate is accepted, AI-driven hiring tools can suggest salary brackets and onboarding strategies, harnessing a wealth of labor market data for similar roles and applicants. This not only expedites the process but also simplifies administrative tasks.

Subsequently, applicants are notified about the results. Successful candidates receive employment offers, while those who don't meet the criteria are informed of their rejection. Throughout this phase, AI chatbots and automated systems can interact with candidates, offering prompt updates and feedback.

It's important to note that the final decision, be it acceptance or rejection, serves as a feedback mechanism for the algorithmic model. This continuous learning allows the AI system to continually enhance its decision-making capabilities. Based on our survey, the use of AI tools in decision enactment is: 19% always, 18% often, 20% sometimes, 11% rarely, and 32% never. The following figure summarizes this data.

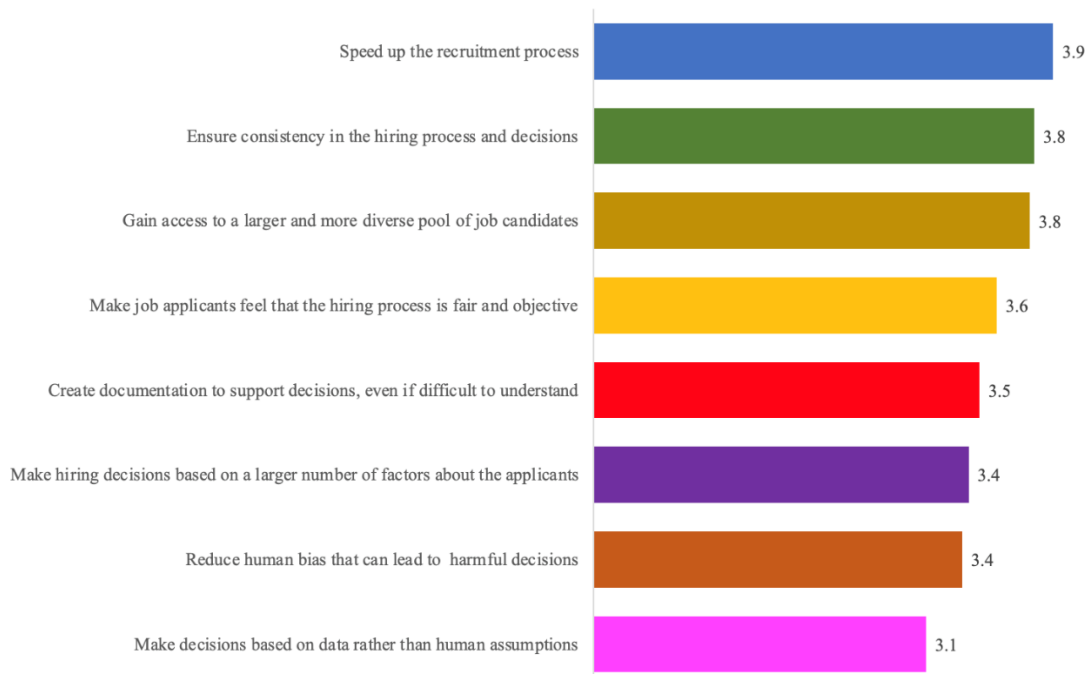
Using AI technologies in enacting decisions



Benefits of AI-enabled hiring tools

For organizations utilizing at least one AI-enabled hiring tool, respondents were asked to assess the benefits using a Likert scale (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree). The resulting insights are presented in the following chart.

Over half of respondents see AI-enabled tools as beneficial for speeding up recruitment, enhancing hiring consistency, and broadening outreach to diverse applicants. In terms of speeding up recruitment, 76% find algorithmic tools useful, with 8% in disagreement and 16% neutral. For ensuring hiring consistency, 70% consider these tools effective, while 12% disagree, and 19% neutral. Moreover, 69% support the idea that these tools enhance outreach to diverse applicants, while 12% disagree and 20% remain neutral.



In contrast, fewer than half (49%) agree that these tools facilitate the consideration of a broader range of applicant characteristics during hiring, while 19% disagree, and 30% are uncertain. Regarding bias mitigation, 46% view these tools as helpful, 20% do not, and 34% remain undecided. Additionally, 38% believe these tools support data-driven decisions over human judgment, 28% disagree, and 34% remain neutral.

These insights present a nuanced view of the perceived impact of algorithmic hiring tools in contemporary recruitment practices. While there is substantial agreement on the tools' potential to accelerate the recruitment process, implement procedure consistency, and diversify the candidate pool, respondents are more divided regarding their effectiveness in improving decision quality such as considering broader factors and reducing bias.

Concerns regarding AI-enabled Tools

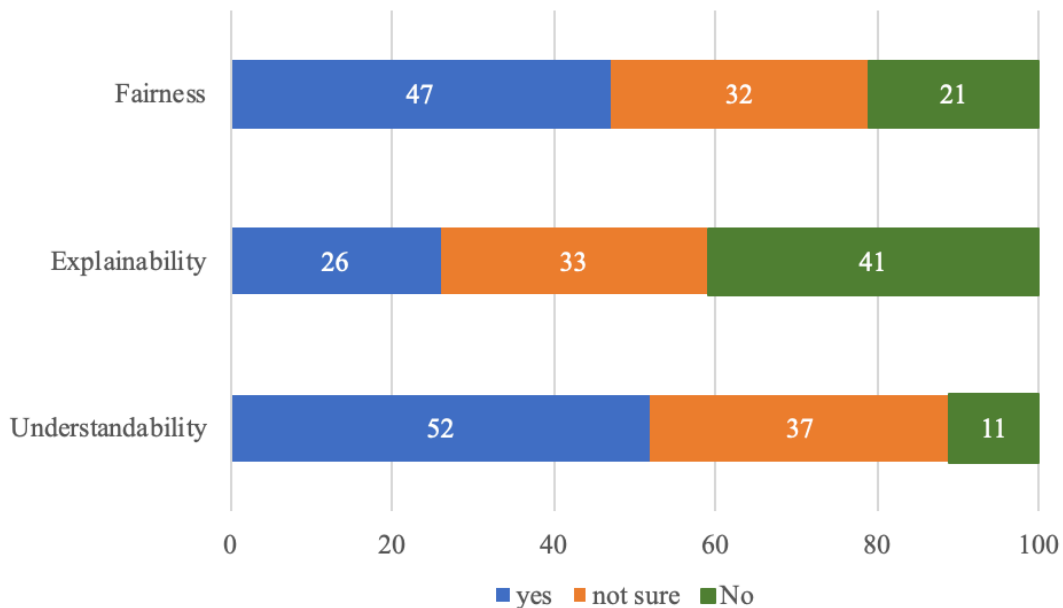
We asked respondents to assess their concerns regarding risks and negative outcomes associated with using algorithmic hiring tools. The survey results are summarized in the chart below.

Fairness in AI-enabled decision-making ensures that automated processes do not unfairly disadvantage specific individuals or groups based on attributes like gender, race, or socioeconomic status. 47% agreed that algorithmic hiring tools might lead to unfair outcomes, while 21% disagreed. 32% held a neutral view.

Explainability involves offering explanations that clarify how algorithms reach conclusions or recommendations in a way humans can interpret. Explanations can vary (operational, logical, causal), be global (whole algorithm), or local (specific results), and take different forms (decision

trees, histograms, images, text). 26% of respondents agreed or strongly agreed that explainability is a concern, while 41% disagreed. 33% were neutral.

Understandability pertains to providing clear information to job applicants about the decision-making process and the connection between their input and the AI-enabled hiring decision's output. 52% of respondents agreed or strongly agreed that this is a concern, while 11% disagreed. 37% remained neutral.



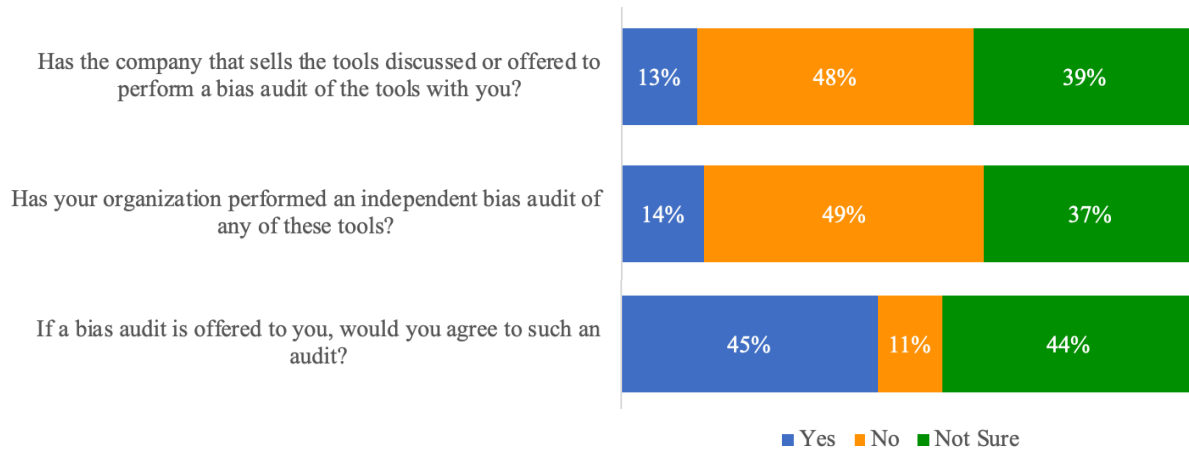
Bias auditing

A bias audit in algorithmic hiring involves a comprehensive assessment of algorithms, models, and tools used in the hiring process to identify and rectify any inherent biases that could unfairly influence hiring decisions. In this context, bias refers to systematic favoritism or prejudice towards specific candidate groups based on attributes like gender, race, ethnicity, or other irrelevant characteristics to job performance.

Bias auditing in algorithmic hiring begins with data analysis, carefully scrutinizing the data used to train and validate the algorithm to ensure its representativeness and lack of biases. The next step involves examining the algorithm's design itself, investigating variables, features, and their weighting for any underlying bias. Subsequently, the audit may test for disparate impacts using statistical methods, assessing if the algorithm treats different applicant groups differently. Evaluating how algorithm results are utilized in real decision-making can help to ensure unbiased outcomes. Ongoing monitoring and updating can mitigate emerging biases, aligning the process with legal standards and promoting workplace diversity.

In this study, we assessed respondents' current practices of and attitudes towards bias audits in AI-driven employment decisions. Results are summarized in the following figure. For vendor-initiated bias audits, only 13% reported such engagements, while 48% did not, and 39% were unsure. Independent audits by organizations yielded similar results: 14% confirmed, 49% denied, and 37%

were uncertain. Concerning willingness to participate in a bias audit, 45% were in favor, 11% opposed, and 44% uncertain about their inclination such an initiative.



Conclusion

The recruitment landscape has undergone a significant transformation due to technological advancements. Our survey findings highlight the variations in adoption rates for AI-enabled tools throughout the recruitment process, covering proactive candidate sourcing, information collection, analysis, scoring and ranking, decision-making, and even bias auditing. While many organizations are leveraging AI to lower costs, improve efficiency, and enhance workforce diversity, respondents consistently express concerns regarding transparency, fairness, and algorithmic biases. These concerns underscore the important of rigorous testing, validation, and refinement of the algorithmic models and computational methods employed by AI-enabled tools.

As AI continues to play a pivotal role in the domain of employment decisions, stakeholders need to approach this landscape with caution. Employers, policymakers, and technology developers all have crucial roles in ensuring the responsible and effective integration of AI in recruitment practices. While the integration of AI may hold the promise of an efficient, diverse, and sophisticated hiring process, it is not without inherent technical and ethical limitations. Stakeholders must possess a profound understanding of its capacities, limitations, and ethical considerations to navigate this transformative terrain effectively.

Acknowledgment

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