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## Possible, Probable and Preferable Futures for Integrating Artificial Intelligence into Talent Acquisition

*Acquiring skilled employees is among the top five most important IT management issues. Artificial intelligence (AI) has the potential to transform talent acquisition (TA) and lead to a better future of work. However, not all possible futures are probable and preferable. Based on a Delphi study with C-level executives who are TA experts, we identify and evaluate AI opportunities and AI challenges, and recommend immediate and future actions organizations can take for integrating AI into TA.<sup>1</sup>*

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## Possible, Probable and Preferable Artificial Intelligence Opportunities and Challenges in Talent Acquisition

An organization's employees are among its most valuable assets and determine its overall competitiveness. The management of employees through an organization's human resources (HR) function is crucial for developing and maintaining sustainable competitive advantage.<sup>2</sup>

To develop a competitive advantage, an organization must acquire enough high-quality employees whose skills, experiences and values align with the requirements for their roles. An important area within HR is talent acquisition (TA), which encompasses the tasks involved in acquiring employees through recruitment and selection. TA is concerned with how to identify and attract employees. TA tasks include, for example, posting job advertisements, guiding applicants through the application process and selecting applicants based on their qualifications and interview performance. Many TA tasks are very labor-intensive, such as reviewing each résumé to find a match between the applicant specification and the job description, and HR professionals are often faced with an overload of work as well as the



<sup>1</sup> Fred Niederman is the senior accepting editor for this article.

<sup>2</sup> Barney, J. and Wright, P. "On Becoming a Strategic Partner: The Role of Human Resources in Gaining Competitive Advantage," *Human Resource Management* (37:1), Spring 1998, pp. 31-46.

challenge of finding new high-quality applicants in a competitive job market.<sup>3</sup> Newly hired employees affect the culture and productivity of the organization, so reducing the time and resources spent on TA can significantly impact the organization's overall competitiveness and health.

Given these difficulties for HR professionals, many organizations are turning to artificial intelligence (AI) for help.<sup>4</sup> AI provides resources to support HR professionals in TA tasks—for instance, by making them more efficient and decisions more data-driven. Integrating AI into TA allows organizations to better fill their talent pipelines by providing faster, more reliable and more targeted services to employees and applicants, potentially attracting higher-quality applicants across all areas of the organization. AI can also free up valuable time for HR professionals, allowing them to spend more time on value-adding tasks such as strategizing.<sup>5</sup> Accordingly, integrating AI into TA can improve work in multiple ways, such as relieving HR professionals of routine HR tasks and acquiring more and better-fitting employees through more efficient and effective recruiting.

However, to achieve these improvements and gain a competitive advantage, the effective integration of AI into TA is a key managerial issue that must be well planned, now and especially in the future. Although AI has recently become more accessible, organizations face many uncertainties in how to approach the integration of AI into their TA and may feel unprepared.<sup>6</sup> However, there is a sense of urgency as organizations rush to integrate AI into their TA—76% of HR leaders believe their organization will lag behind the competition if they do not quickly adopt AI.<sup>7</sup>

In this race to integrate AI into TA as quickly as possible, taking the right approach now and in the future is key to gaining a competitive advantage. Currently, there are many possible opportunities and challenges associated with using AI in TA, but not all of them are probable and preferable: *Possible* refers to what could happen, *probable* to what is likely and *preferable* to what organizations desire.<sup>8</sup> To achieve today's possibilities of AI in TA, organizations need guidelines on which current possibilities are preferable. Looking to the future, organizations need advice on actions they can take to make possible futures both probable and preferable.

Based on data from a Delphi study involving global C-level executives with extensive TA knowledge, we identify possible, probable and preferable AI opportunities and challenges in TA. We recommend actions that organizations can take today to implement AI opportunities that combine feasibility and strategic benefit based on the needs and goals of the organization. Looking toward future possibilities, we then recommend future actions for integrating AI into TA as organizations focus on implementing probable and preferable AI opportunities and mitigating probable and preferable AI challenges. The aim is to help organizations achieve a better future of work, gain a competitive advantage and solve problems in their current TA processes.

To set the scene for the remainder of this article, we first briefly describe the major trends that are shaping modern TA and provide an overview of how different categories of AI can be applied to TA.

## Talent Acquisition Trends

The primary purpose of TA is to identify and attract new employees. TA includes all practices and activities executed by an organization to achieve this purpose.<sup>9</sup> In this article, we define TA as comprising all the tasks an organization executes prior to the completion of a new hire. There are four stages of this TA process: candidate attraction, applicant management,

3 Tupper, H. and Ellis, S. "It's Time to Reimagine Employee Retention," *Harvard Business Review*, July 4, 2022, available at <https://hbr.org/2022/07/its-time-to-reimagine-employee-retention>.

4 Mirowska, A. and Mesnet, L. "Preferring the Devil You Know: Potential Applicant Reactions to Artificial Intelligence Evaluation of Interviews," *Human Resource Management Journal* (32:2), June 2022, pp. 364-383.

5 Roppelt, J., Greimel, N., Kanbach, D., Stubner, S. and Maran, T. "Towards Effective Adoption of Artificial Intelligence in Talent Acquisition: A Mixed Method Study," *International Journal of Information Management* (82), June 2025, Article 102870.

6 Roppelt, J., Greimel, N., Kanbach, D., Stubner, S. and Maran, T., op. cit., June 2025.

7 *AI in HR: Evolve to an AI-Infused HR Operating Model*, Gartner, available at <https://www.gartner.com/en/human-resources/topics/artificial-intelligence-in-hr>.

8 Gall, T., Vallet, F. and Yannou, B. "How to Visualise Futures Studies Concepts: Revision of the Futures Cone," *Futures* (143), October 2022, Article 103024.

9 Barber, A. E. *Recruiting Employees: Individual and Organizational Perspectives*, Sage Publications, 1998.

preselection and selection.<sup>10</sup> Additionally, there is a metalevel of HR strategy tasks (as described in Appendix A).

Three trends have shaped TA for decades and will likely be relevant in the future. The first trend is the evolution of practices for finding the best fit for roles within an organization. Identifying the best fit necessitates making future predictions about what skills will be needed and which skills are related to the on-the-job performance of applicants. Ideally, data should be leveraged to assess both performance and learning capacity, as well as factors like motivation to work and learn. Leveraging this data could make the relevant underlying variables more understandable and, as a result, more manageable. The long-term vision is a bidirectional matching process where organizations and applicants can better evaluate their mutual fit, including applicant/job fit from both a needs-supply perspective and a demands-abilities perspective. Achieving this will require rethinking the established practices in TA that are aimed at finding the best fit.<sup>11</sup>

The second trend is the digitization and digitalization of TA, which has resulted in both efficiency losses and efficiency gains. The internet has enabled organizations to use online job advertisements to reach a wider audience of potential applicants. The emergence of internet job boards and CV databases has been an important step in this development.<sup>12</sup> As a result, firms are receiving more applications, which has overwhelmed their established way of handling them. At the same time, efficiency can be gained by automating some TA tasks so an organization can still respond to applicant inquiries and applications in a timely manner.

The third trend is a fundamental shift in the job market related to attracting new applicants, as reflected in the so-called “war for talent,” with companies increasingly struggling to fill

vacancies.<sup>13</sup> At the root of the talent scarcity are demographic factors, such as a declining and aging population in many industrialized countries, and the changing skill demands needed to perform more complex and less routine tasks, making job profiles more demanding.<sup>14</sup> This trend is making it ever harder to fill vacancies with appropriately skilled employees.

## Categories of Artificial Intelligence in Talent Acquisition

AI is broadly defined as a machine’s ability to perform cognitive functions associated with humans, such as perceiving, reasoning, learning, interacting with the environment, problem solving, decision-making and demonstrating creativity.<sup>15</sup> There are several categories of AI algorithms, three of which are relevant for TA: 1) supervised and unsupervised machine learning (ML), 2) natural language processing (NLP), and 3) generative AI (GenAI).<sup>16</sup> ML, both supervised (i.e., using labeled data) and unsupervised (i.e., using unlabeled data), is used mostly for prediction tasks—for example, in recommendation agents. With supervised ML, the data is labeled beforehand so the model can learn to predict specific outcomes based on known input-output pairs. An example in the TA context is supervised ML predicting and recommending roles based on skills and experience, using labeled data on what skills (input) are relevant for the role’s requirements (output). On the other hand, unsupervised ML is more exploratory and is used to identify patterns that are not immediately obvious and emerge from the data. For example,

10 Muenstermann, B., Stetten, A. von, Laumer, S. and Eckhardt, A. “The Performance Impact of Business Process Standardization: HR Case Study Insights,” *Management Research Review* (33:9), August 2010, pp. 924-939.

11 Kaarst-Brown, M., Quesenberry, J., Niederman, F. and Weitzel, T. “Special Issue Editorial: New Approaches to Optimizing the Digital Workplace,” *MIS Quarterly Executive* (18:1), March 2019, pp. ix-xiv.

12 Weitzel, T., Eckhardt, A. and Laumer, S. “A Framework for Recruiting IT Talent: Lessons from Siemens,” *MIS Quarterly Executive* (8:4), December 2009, pp. 175-189.

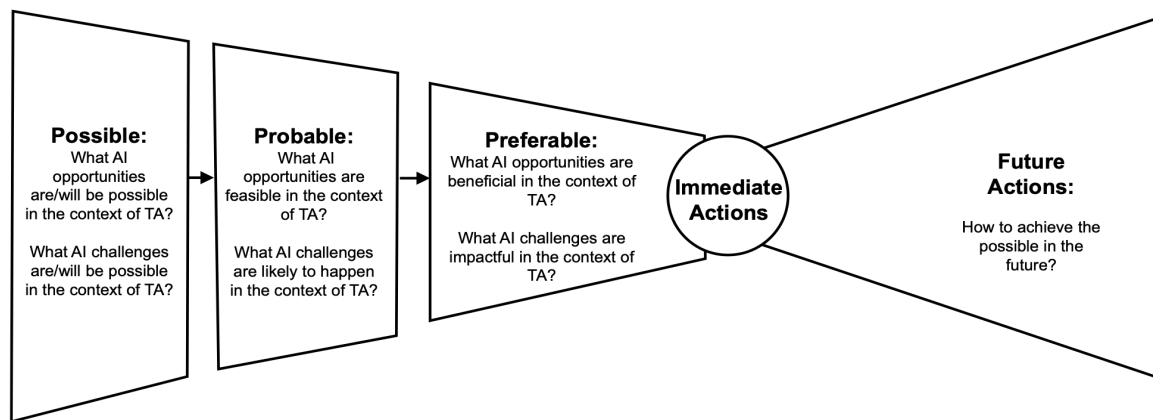
13 Johnson, V., Maurer, C., Torres, R., Guerra, K., Mohit, H., Srivastava, S. and Chatterjee, S. “The 2023 SIM IT Issues and Trends Study,” *MIS Quarterly Executive* (23:1), March 2024, pp. 83-124.

14 Weitzel, T., Eckhardt, A. and Laumer, S., op. cit., December 2009.

15 Rai, A., Constantinides, P., and Sarker, S. “Editor’s Comments: Next-Generation Digital Platforms: Toward Human-AI Hybrids,” *MIS Quarterly* (43:1), March 2019.

16 Nyberg, A., Schleicher, D., Bell, B., Boon, C., Cappelli, P., Collings, D., Dalle Molle, J., Feuerriegel, S., Gerhart, B., Jeong, Y., Korsgaard, M., Minbaeva, D., Ployhart, R., Tambe, P., Weller, I., Wright, P. and Yakubovich, V. “A Brave New World of Human Resources Research: Navigating Perils and Identifying Grand Challenges of the GenAI Revolution,” *Journal of Management* (51:6), April 2025, pp. 2677-2718.

**Figure 1: Possible, Probable and Preferable AI Opportunities and Challenges, and Current and Future Actions**



unsupervised ML can identify and recommend paths taken by similar candidates.<sup>17</sup>

NLP enables machines to understand and interpret text. In the TA context, NLP is used, for instance, for processing and analyzing text such as résumés. GenAI is a type of AI that creates new content, such as text and images, based on patterns learned from data. Text-based GenAI is often used in TA in the form of chatbots.<sup>18</sup>

## Identifying Possible, Probable and Preferable AI Opportunities and Challenges

Our research study set out to identify AI opportunities and challenges that are currently possible, probable and preferable and, from this data, recommend immediate and future actions (Figure 1) by looking at what might happen and what needs to be done to achieve a preferable future. In the context of TA, an AI opportunity is a strategic approach to finding, developing, motivating and retaining employees.<sup>19</sup> By integrating AI into TA, organizations can either improve an aspect of TA—e.g., making a task

more efficient or effective—or solve a problem that arises when AI is not used in TA, such as decisions being less based on data and affected by human bias. An AI challenge is a pitfall or risk encountered on the way to achieving such improvements.

While there are many possibilities for integrating AI into TA, not all might be appropriate for every organization or even realizable at all. An organization will likely fall behind its competitors if it is slow to identify the ways AI will make its TA tasks more efficient or if it loses its edge by not mitigating problems early enough. HR executives need direction on how to integrate AI into TA today and future actions they can take to realize the possible in the future.

To envision the future of work and future actions, we based our research on the foresight process framework of the futures cone.<sup>20</sup> The futures cone describes: 1) the possible futures—i.e., everything that could happen, even if unlikely; 2) the probable futures—i.e., what is likely to happen based on current trends and evidence; and 3) the preferable futures—i.e., what organizations want to happen, based on their values, goals and aspirations.<sup>21</sup>

We first identified what AI opportunities and challenges are possible. In this first step, we did

17 Hunkenschroer, A. and Luetge, C. “Ethics of AI-Enabled Recruiting and Selection: A Review and Research Agenda,” *Journal of Business Ethics* (178:4), July 2022, pp. 977-1007.

18 Nyberg, A. et al., op. cit., April 2025.

19 Beechler, S., and Woodward, I. “The Global ‘War for Talent,’” *Journal of International Management* (15:3), September 2009, pp. 273-285.

20 Voros, J. “A Generic Foresight Process Framework,” *Foresight* (5:3), June 2003, pp. 10-21.

21 Gall, T., Vallet, F. and Yannou, B. “op. cit., October 2022.



not want to be restricted by the feasibility of the opportunities or the likelihood of the challenges. Second, we analyzed which of the identified AI opportunities and challenges are probable—i.e., feasible and likely to happen. Third, we evaluated which of the probable AI opportunities and challenges are preferable by considering the benefits of the probable opportunities and the impact of the probable challenges. Based on this analysis, organizations can prioritize the most relevant opportunities and urgent challenges that are both actionable and aligned with their long-term vision.

Once the preferable opportunities and mitigation of challenges are revealed, the future cone can be “opened up” again to explore future opportunities and challenges that go beyond today’s constraints, imagining how TA could evolve as technologies, organizations and societal values develop over time. This will enable HR executives to identify how they can make the identified possible futures probable and preferable. In this way, as shown in Figure 1, what is possible, probable and preferable becomes both a lens for current prioritization and a tool for future planning.

To identify the current and future opportunities and challenges for using AI in TA, we conducted a Delphi study with a panel of TA experts.

## Delphi Study on AI in Talent Acquisition

Our Delphi study explored AI opportunities and challenges in TA from the perspective of C-level executives with extensive experience in TA. The purpose of a Delphi study is to reach a consensus among a group of panelists with expert knowledge of a specific topic using a structured process of repeated questionnaires with controlled feedback.<sup>22</sup> This approach can help to explore the range of ideas that a topic can generate and design responses within an organization. We used a ranking-type Delphi

study<sup>23</sup> to identify opportunities and challenges of integrating AI into TA and to reach agreement on how important each AI opportunity and AI challenge is, relative to each other.<sup>24</sup> Guided by the Delphi methodology, the experts shared their experiences and visions of what AI could contribute to modern TA, as well as the challenges of implementation, providing pragmatic expert insights on what to do next. The structured, anonymous Delphi process is suitable for gaining insights from the collective experience of panelists while avoiding biases that might arise from direct confrontation.<sup>25</sup>

Delphi studies have previously been used in information systems research for problem identification and prioritization in the context of IT managerial practices, IT capability issues, IT usage and diffusion, IT impact and success criteria, and IT artifacts.<sup>26</sup> For instance, one study identified and evaluated risk factors associated with the offshoring and domestic outsourcing of software development projects,<sup>27</sup> bearing similarities to our identification and ranking of AI challenges in the context of TA. In our case, the Delphi study allowed us to identify possible opportunities and challenges. Then, we subsequently assessed which of these are also probable and preferable. The resulting multiround consensus formed the empirical foundation of our recommended future actions.

## Panel Selection

As criteria for inclusion in our panel, we stipulated that individuals must have worked in TA for at least two years and be senior-level specialists responsible for making strategic decisions on the integration of AI into TA. We approached international companies with experience in the field that were also long-time project partners of the University of Bamberg. We then created a list of 15 C-level executives,

22 Okoli, C. and Pawlowski, S. “The Delphi Method as a Research Tool: An Example, Design Considerations and Applications,” *Information & Management* (42:1), December 2004, pp. 15-29.

23 Paré, G., Cameron, A., Poba-Nzaou, P. and Templier, M. “A Systematic Assessment of Rigor in Information Systems Ranking-Type Delphi Studies,” *Information & Management* (50:5), July 2013, pp. 207-217.

24 Okoli, C. and Pawlowski, S., op. cit., October 2022.

25 Paré, G., Cameron, A., Poba-Nzaou, P. and Templier, M., op. cit., July 2013.

26 Ibid.

27 Nakatsu, R. and Iacovou, C. “A Comparative Study of Important Risk Factors Involved in Offshore and Domestic Outsourcing of Software Development Projects: A Two-Panel Delphi Study,” *Information & Management* (46:1), January 2009, pp. 57-68.

**Table 1: Profiles of the Panelists**

Characteristic	Profile	n=8
Industry	Healthcare	2
	Consulting	3
	Pharmaceutical	2
	Financial Services	1
Gender	Female	1
	Male	7
Region	Germany	5
	Europe (excl. Germany)	2
	U.S.	1
Years of Experience	7 to 10	1
	More than 10	7
Role	Head/Director of Talent Acquisition	4
	CEO/Owner	2
	Engineering Lead	1
	HR Expert (specific role undisclosed)	1

who we invited to participate in our Delphi study. Eight agreed to participate, with the other seven declining due to time constraints. This response rate of 53% is in line with recommendations for panel sizes.<sup>28</sup> The panelists had backgrounds in the healthcare, consulting, pharmaceutical and financial services industries. Seven worked for European organizations and one worked for a U.S. organization. All but one of the panelists had more than 10 years of experience in TA responsibilities, with one having over seven years of experience (see Table 1). They all had important roles in the TA process, either as head or director of TA, CEO or engineering lead.

### Data Collection and Analysis

The Delphi study was designed, pre-tested and conducted through an online survey platform that allows respondents to remain anonymous. Throughout the process, established quality criteria were used to ensure the study's

methodological rigor. Guiding information was provided to panelists to ensure a consistent understanding of the concepts involved (see Appendix B). The data collection methodology consisted of three rounds: brainstorming, selection and ranking (see Appendix B). In the first round (brainstorming), data collection was based on free-form text so that panelists had to meaningfully engage with the questions. In this round, the panelists were asked to name all possible AI opportunities and challenges that came to mind. Three independent coders then consolidated all of the ideas into categories to avoid duplicate ideas. For instance, multiple panelists provided codes related to data privacy and security while explaining the challenges. Examples included: "CV assessment must be allowed by data privacy regulations" and "GDPR and many other local data privacy laws make this [collecting and storing data] highly complex to navigate." These codes were then consolidated into the "Issues with data privacy and security of AI systems" category. The consolidation led to

28 Schmidt, R., Lyytinen, K., Keil, M. and Cule, P. "Identifying Software Project Risks: An International Delphi Study," *Journal of Management Information Systems* (17:4), January 2001, pp. 5-36.

the formation of our “possible” opportunities and challenges.

In the second round (selection), the panelists were given the list of all identified possible AI opportunities and challenges and asked to evaluate whether they agreed that it was an AI opportunity or challenge. In the third round (ranking), the remaining AI opportunities and AI challenges were ranked by the panelists according to criteria that reflected how likely they were to be relevant currently or in the near future. For AI opportunities, the relevant criterion was feasibility. Panelists identified some AI opportunities as more feasible than others—i.e., they may be easier or more convenient to accomplish. For AI challenges, the importance ranking was determined by the likelihood of a challenge occurring. The rankings for both opportunities and challenges were scored on a scale of 1 to 5, where 3 indicates an average (i.e., neither high nor low) rating for a given criterion.

The “probable” lists of opportunities and challenges emerged from these feasibility and likelihood rankings. Everything ranked above 3 was more probable than average and therefore included. To arrive at the “preferable” AI opportunities, the panelists also evaluated the opportunities according to criteria that reflected their importance for the organization’s competitive advantage. The relevant criterion was the benefit of the opportunity. Some AI opportunities provide more benefits than others, thus better supporting the organization’s goals.

The importance of AI challenges was determined by how preferable—or rather “not preferable”—they were. AI challenges can have a high or low impact on hindering the achievement of organizational goals if the challenge materializes. Again, everything ranked above average, i.e., everything with a ranking higher than 3 was included. The result was a set of opportunities and challenges that are possible, probable and preferable.

To provide organizations with more tangible recommendations, we then analyzed the context to clarify the panelists’ primary goal for their organizations when describing the AI opportunities. In other words, we identified the underlying problem they were trying to solve. We assigned the resulting primary goals to AI opportunities and challenges.

We also collected data from the panelists on how to achieve each AI opportunity and mitigate each AI challenge. This data, in combination with a review of relevant literature, enabled us to formulate recommended immediate actions (the steps for implementing what is already possible) as well as future actions (what steps can be taken to achieve AI opportunities and mitigate AI challenges, even if they are not currently possible).

## Possible, Probable and Preferable Futures of AI in TA Identified by the Delphi Study

From the brainstorming round of the Delphi study, we first identified the AI opportunities for improving aspects of TA with AI and the AI challenges relating to problems and risks of integrating AI with TA. We then used the selection and ranking rounds to show what could happen (i.e., what is possible), what is likely (i.e., probable) and what organizations should aim for (i.e., preferable).

### Possible Futures of Artificial Intelligence in Talent Acquisition

To assess the possible futures of AI in TA—i.e., possible opportunities and challenges that might arise—we used the lists of possible opportunities and challenges identified through our expert interviews in the Delphi study. In curating these lists, we specifically did not focus on how easily or realistically achievable and likely the AI opportunities and challenges are, focusing instead on collecting a comprehensive set of possible opportunities and challenges. The 26 possible opportunities listed in Figure 2 show that there are many ways in which AI could be used to support HR professionals and job applicants and enhance different aspects of the TA process. For tasks related to employer branding and candidate attraction (i.e., at the earlier “applicant sourcing” stages of TA), AI can be used in the form of job description optimization software and in multi-database candidate sourcing.<sup>29</sup> Job description optimization software can optimize and tailor language to different target groups. Subsequently, targeted job advertising optimization can provide

<sup>29</sup> Roppelt, J., Greimel, N., Kanbach, D., Stubner, S. and Maran, T., op. cit., June 2025.



**Figure 2: Possible AI Opportunities**

O1: Support HR in interview scheduling	O2: Support HR in selecting the best channel for job posting	O3: Enhance diversity by attracting genders equally	O4: Support HR in applicant ranking	O5: Support HR in identifying and reaching out to cold talent
O6: Support applicants by suggesting fitting jobs	O7: Support employees in developing their careers internally	O8: Support applicants during application process	O9: Support HR in optimizing job postings content	O10: Support HR in identifying and eliminating unproductive HR tasks
O11: Support HR in filling skill gaps	O12: Support HR during interviews	O13: Support HR in developing a data-driven strategy for TA	O14: Support HR in collecting applicant information	O15: Enhance applicant communication
O16: Support HR in sourcing from external applicants	O17: Enhance identification of bias and discrimination	O18: Support HR in forecasting future skills and personnel requirements	O19: Enhance use of internal talent	O20: Support HR in applicant screening
O21: Enhance hiring decisions by removing human bias	O22: Enhance employer branding	O23: Enhance value of HR professionals by helping them become strategic business partners	O24: Support HR through one-click hiring	O25: Support HR through psychometric applicant profiling
O26: Support HR through providing hiring key performance indicators (KPIs) and quality analytics				

accurate recommendations to relevant job seekers.<sup>30</sup>

Such measures can be categorized as passive recruiting approaches, where an organization typically waits for applicants to apply for a published vacancy. But passive recruiting should be accompanied by active sourcing strategies. This more proactive strategy assumes that the best candidate may not be looking for a new position and thus needs to be actively approached. A multi-database candidate sourcing AI application can support active sourcing by searching through databases much more quickly and accurately than human recruiters.<sup>31</sup> When applicants have already applied, AI can also help by providing candidate engagement chatbots and automated scheduling and CV screening software.<sup>32</sup> Such AI applications are primarily geared toward freeing up HR professionals' resources. Detailed information on the identified possible AI opportunities is given in Appendix C.

The 19 possible challenges of integrating AI into TA identified in the Delphi study are presented in Figure 3. Study participants revealed that there may be resistance from stakeholders and employees who fear being replaced or losing control over decisions. Bias and transparency issues may further complicate adoption, as AI applications trained on historical hiring data can unintentionally replicate discrimination present in human decision-making. Moreover, many organizations struggle with poor data quality, including inconsistent, incomplete or unstructured applicant data, which can undermine the reliability of AI outputs. Compounding these issues is the fact that many commercial AI solutions are still immature, lacking the robustness, integration capabilities and explainability needed for responsible deployment in real-world HR environments. Detailed information on all the identified possible AI challenges is provided in Appendix D.

### Probable Futures of Artificial Intelligence in Talent Acquisition

Identifying probable futures means evaluating which AI opportunities and challenges will

<sup>30</sup> Barber, A. E., op. cit., 1998.

<sup>31</sup> Roppelt, J., Greimel, N., Kanbach, D., Stubner, S. and Maran, T., op. cit., June 2025.

<sup>32</sup> Ibid.

**Figure 3: Possible AI Challenges**

C1: Issues with data privacy and security of AI systems	C2: Stakeholders may exhibit distrust of AI	C3: Technical obstacles regarding IT integration	C4: Technical obstacles regarding data quality	C5: Issues with ethics of AI systems
C6: Employees may exhibit resistance to AI	C7: Issues with biases in AI systems	C8: Technical obstacles regarding high complexity	C9: High amount of change management and training for AI adoption	C10: Issues with transparency of AI systems
C11: Employees need many skills to maintain AI	C12: Technical obstacles regarding high data volumes	C13: Technical obstacles regarding the integration of external sources	C14: Issues with error-prone AI systems	C15: Issues with success measurement
C16: Issues with a lack of AI software portfolios	C17: Technical obstacles regarding language variations	C18: Technical obstacles regarding system maintenance and updates	C19: Issues with misleading AI marketing	

probably occur—i.e., identifying which AI opportunities are achievable and which AI challenges will likely occur. In our Delphi study, AI opportunities were ranked based on feasibility and AI challenges were ranked based on likelihood. These rankings therefore enabled us to reduce the opportunities and challenges from the possible to the probable.

In Figure 4, we eliminated AI opportunities O16 to O26 (see Figure 2) because of their low feasibility ranking. These AI opportunities included supporting HR in sourcing from external applicants (O16), enhancing identification of bias and discrimination (O17), forecasting future skills and personnel requirements (O18), enhancing the use of internal talent (O19), screening applicants (O20), enhancing hiring decisions by removing human bias (O21), enhancing employer branding (O22), enhancing the value of HR professionals by helping them become strategic business partners (O23), supporting HR through one-click hiring (O24), supporting HR through psychometric applicant profiling (O25) and supporting HR through providing hiring key performance indicators and quality analytics (O26). All of these AI opportunities were eliminated because their ranking scores were equal to or lower than 3.

There are multiple reasons why AI opportunities might not currently be feasible. Examples include sourcing from external applicants (O16), applicant screening (O20), one-

click hiring (O24) and psychometric applicant profiling (O25). Sourcing from external applicants and applicant screening both require seamless cross-system integration and high-quality data, which are not always a given. Another theoretical possibility is one-click hiring (O24), which requires minimal human involvement and steps—often just one action, such as clicking a button. Though extremely fast and efficient, evaluating soft skills, values and team fit is difficult to reliably automate in a single step. HR professionals might also resist the introduction of one-click hiring due to the fear of becoming redundant due to possible efficiency gains.

The AI opportunity of using psychometric applicant profiling (O25) in interviews is not currently feasible, mostly because of privacy and ethical risks combined with a lack of applicant acceptance. Accurately measuring constructs like motivation and then using this data to make assessments that are perceived as fair by applicants is difficult.

In Figure 5, we eliminated the possible AI challenges C14 to C19 due to their low likelihood. These challenges are concerned with error-prone AI systems (C14), success measurement (C15), a lack of AI software portfolios (C16), technical obstacles regarding language variations (C17), technical obstacles regarding system maintenance and updates (C18) and misleading AI marketing (C19). Each of these challenges is

**Figure 4: Identifying the Probable AI Opportunities**

O1: Support HR in interview scheduling	O2: Support HR in selecting the best channel for job posting	O3: Enhance diversity by attracting genders equally	O4: Support HR in applicant ranking	O5: Support HR in identifying and reaching out to cold talent
O6: Support applicants by suggesting fitting jobs	O7: Support employees in developing their careers internally	O8: Support applicants during application process	O9: Support HR in optimizing job postings content	O10: Support HR in identifying and eliminating unproductive HR tasks
O11: Support HR in filling skill gaps	O12: Support HR during interviews	O13: Support HR in developing a data-driven strategy for TA	O14: Support HR in collecting applicant information	O15: Enhance applicant communication

**Improbable AI Opportunities**

O16: Support HR in sourcing from external applicants	O17: Enhance identification of bias and discrimination	O18: Support HR in forecasting future skills and personnel requirements	O19: Enhance use of internal talent	O20: Support HR in applicant screening
O21: Enhance hiring decisions by removing human bias	O22: Enhance employer branding	O23: Enhance value of HR professionals by helping them become strategic business partners	O24: Support HR through one-click hiring	O25: Support HR through psychometric applicant profiling
O26: Support HR through providing hiring key performance indicators (KPIs) and quality analytics				

*Note: To qualify as “probable,” AI opportunities must have a high feasibility score ( $\geq 3.33$ ), with “improbable” opportunities having a score of  $\leq 3.00$ . Dark-blue shading denotes AI opportunities that are both probable and preferable, medium-blue shading denotes AI opportunities that are probable but not preferable and light-blue shading denotes AI opportunities that are not probable.*

deemed unlikely because its likelihood ranking score was 3 or lower.

For example, though AI systems need to be managed and evaluated (C18), most organizations use third-party tools from external vendors. Misleading AI marketing (C19) is also an unlikely challenge, and will become increasingly unlikely in the future, because many offerings that claim to use AI really use basic automation or rule-based systems. As AI systems are being more integrated into organizations and daily life, HR and TA professionals are becoming more educated about AI and can better evaluate AI tools.

### Preferable Futures of Artificial Intelligence in Talent Acquisition

Finally, from the sets of possible and probable AI opportunities and challenges, we identified those that are also preferable. Through the Delphi

methodology, participants evaluated probable AI opportunities in terms of their benefits and AI challenges in relation to their impact on their organizations. Note that encountering these challenges is not “preferable.” Rather, it is preferable to proactively mitigate challenges that are probable and likely to have a high impact, because they are likely to cause problems in the future.

Figure 6 shows that we eliminated AI opportunities O12 to O15 because of their low benefit. These AI opportunities include supporting HR during interviews (O12), by developing a data-driven strategy for TA (O13), by collecting applicant information (O14) and by enhancing applicant communication (O15). For example, supporting HR professionals during applicant interviews (O12) would not necessarily significantly reduce time and costs because HR

**Figure 5: Identifying the Probable AI Challenges****Probable AI Challenges**

C1: Issues with data privacy and security of AI systems	C2: Stakeholders may exhibit distrust of AI	C3: Technical obstacles regarding IT integration	C4: Technical obstacles regarding data quality	C5: Issues with ethics of AI systems
C6: Employees may exhibit resistance to AI	C7: Issues with biases in AI systems	C8: Technical obstacles regarding high complexity	C9: High amount of change management and training for AI adoption	C10: Issues with transparency of AI systems
C11: Employees need many skills to maintain AI	C12: Technical obstacles regarding high data volumes	C13: Technical obstacles regarding the integration of external sources		

**Improbable AI Challenges**

C14: Issues with error-prone AI systems	C15: Issues with success measurement	C16: Issues with a lack of AI software portfolios	C17: Technical obstacles regarding language variations	C18: Technical obstacles regarding system maintenance and updates
C19: Issues with misleading AI marketing				

*To qualify as “probable,” AI challenges must have a high likelihood score ( $\geq 3.33$ ); “improbable” challenges must have a score of  $\leq 3.00$ . Dark-blue shading denotes AI challenges that are both probable and preferable (to mitigate), medium-blue shading denotes AI challenges that are probable but not preferable (to mitigate) and light-blue shading denotes AI challenges that are not probable.*

professionals would still have to conduct the interview. The biggest reductions in time and cost lie in earlier stages of the TA process, not when applicants have already been selected for interviews. Supporting HR in collecting applicant information (O14) also ranked low on benefit because additional data through social media, which is often unstructured and context-dependent, is unlikely to meaningfully improve hiring decisions and may potentially introduce ethical and legal risks.

The following AI challenges were eliminated from the list of “preferable” challenges (see Figure 7) because of their low impact: employees needing many skills to maintain AI (C11), technical obstacles regarding high data volumes (C12) and technical obstacles regarding the integration of external sources (C13). For instance, given that many modern AI solutions are increasingly low-code or no-code, over time,

employees will need fewer skills to maintain AI (C11). And regarding challenge C12, though not enough data will likely lead to no further improvement in the accuracy of AI applications, it will not halt AI usage.

### **Setting Primary Business Goals for Preferable AI Opportunities and Challenges**

Which AI opportunities and challenges fall into the preferable category depends on an organization’s context. Setting a primary business goal for each preferable opportunity and challenge will help align the interests and focus of management and employees as they integrate the use of AI into TA. Goals will make results visible much more quickly and it will be easier to evaluate whether the integration was successful. Having a primary goal for each preferable opportunity and challenge can be critical for

**Figure 6: Identifying Preferable AI Opportunities****Probable and Preferable AI Opportunities**

O1: Support HR in interview scheduling	O2: Support HR in selecting the best channel for job posting	O3: Enhance diversity by attracting genders equally	O4: Support HR in applicant ranking	O5: Support HR in identifying and reaching out to cold talent
O6: Support applicants by suggesting fitting jobs	O7: Support employees in developing their careers internally	O8: Support applicants during application process	O9: Support HR in optimizing job postings content	O10: Support HR in identifying and eliminating unproductive HR tasks
O11: Support HR in filling skill gaps				

**Probable but not Preferable AI Opportunities**

O12: Support HR during interviews	O13: Support HR in developing a data-driven strategy for TA	O14: Support HR in collecting applicant information	O15: Enhance applicant communication
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To qualify as “preferable,” AI opportunities must have a high benefit score ( $\geq 3.33$ ); “not preferable” opportunities must have a score of  $\leq 3.00$ . Dark-blue shading denotes AI opportunities that are both probable and preferable; medium-blue shading denotes AI opportunities that are probable but not preferable

**Figure 7: Identifying Preferable AI Challenges****Probable and Preferable (to Mitigate) AI Challenges**

C1: Issues with data privacy and security of AI systems	C2: Stakeholders may exhibit distrust of AI	C3: Technical obstacles regarding IT integration	C4: Technical obstacles regarding data quality	C5: Issues with ethics of AI systems
C6: Employees may exhibit resistance to AI	C7: Issues with biases in AI systems	C8: Technical obstacles regarding high complexity	C9: High amount of change management and training for AI adoption	C10: Issues with transparency of AI systems

**Probable but not Preferable (to Mitigate) AI Challenges**

C11: Employees need many skills to maintain AI	C12: Technical obstacles regarding high data volumes	C13: Technical obstacles regarding the integration of external sources
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To qualify as “preferable,” AI challenges must have a high impact score ( $\geq 3.33$ ); “not preferable” opportunities must have a score of  $\leq 3.00$ . Dark-blue shading denotes AI challenges that are both probable and preferable (to mitigate); medium-blue shading denotes AI challenges that are probable but not preferable (to mitigate).



**Table 2: Three Primary Business Goals for Integrating AI into TA**

Primary Goal	Focus	Rationale and AI Integration
<b>Finding the Best Fit</b>	This goal focuses on integrating AI into TA to more effectively and efficiently identify the right fit of applicants for vacancies.	When receiving many applications, the main goal is to identify the applicants who are most suitable for working in the role. This goal focuses on an active recruiting approach. AI can help by, for instance, identifying and contacting the best-fitting applicants who would otherwise not apply for a vacancy.
<b>More Efficient HR Tasks</b>	This goal focuses on integrating AI into TA to free up time for HR professionals so that they can focus on more value-adding tasks.	As HR professionals face increasingly complex tasks, AI can help by making what needs to be done more efficient—for instance, by helping them evaluate applicant CVs for scheduling interviews.
<b>Attracting New Applicants</b>	This goal focuses on integrating AI into TA to increase an organization's attractiveness on the market and optimizing the content of job postings to increase the number of applications it receives.	Bigger firms generally receive an excessive number of applications for job postings, whereas smaller firms may struggle with poor visibility in a competitive job market. This goal focuses on boosting the number of applicants an organization receives. While this may go hand in hand with finding the best fit in many cases, organizations generally want to attract the right applicants. In some cases, they may struggle to find enough applicants in the first place, mostly when using a passive recruiting approach. AI can boost the number of applications received by optimizing job postings to get the most out of advertisements.

employee acceptance when many changes are implemented. Based on our data from the Delphi study and within the TA literature, we identified three primary business goals, which are given in Table 2.

For organizations to ensure that they are not overwhelmed by the number of possibilities for integrating AI into TA, they must evaluate which AI opportunities are most valuable. The evaluation involves determining the benefits and feasibility of the 11 preferable AI opportunities shown in Figure 6 and identifying how each one aligns with the three primary business goals of integrating AI into TA (see Figure 8).

Many organizations make the mistake of implementing solutions without allocating enough resources for the inevitable AI challenges of integrating AI into TA. The impact of these challenges could hinder the achievement of business goals, thus slowing down organizations at critical moments and eliminating any competitive edge they may have already gained through the successful integration of AI into TA. Organizations must therefore proactively mitigate

the 10 preferable AI challenges shown in Figure 7 for each of the three primary business goals (see Figure 9, which shows that some of the challenges are relevant for more than one goal).

## Recommended Actions for Integrating Artificial Intelligence into Talent Acquisition

Based on our analysis of possible, probable and preferable futures, we provide recommended immediate and future actions for integrating AI into TA.

### Immediate Actions

First, we recommend immediate actions organizations can take to achieve high organizational value in the short term. Organizations should prioritize selected AI opportunities that combine feasibility and strategic benefit. We provide a recommendation for each of the three primary business goals.

**Figure 8: Aligning Primary Business Goals with Associated Possible, Probable and Preferable AI Opportunities****AI Opportunities for Finding the Best Fit Primary goal**

O7: Support employees in developing their careers internally	O4: Support HR in applicant ranking	O5: Support HR in identifying and reaching out to cold talent	O6: Support applicants by suggesting fitting jobs	O11: Support HR in filling skill gaps
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**AI Opportunities for More efficient HR Tasks Primary Goal**

O1: Support HR in interview scheduling	O8: Support applicants during application process	O10: Support HR in identifying and eliminating unproductive HR tasks
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**AI Opportunities for Attracting New Applicants Primary Goal**

O2: Support HR in selecting the best channel for job posting	O3: Enhance diversity by attracting genders equally	O9: Support HR in optimizing job postings content
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**Figure 9: Mitigating Possible, Probable and Preferable AI Challenges for Primary Goals****AI Challenges for Finding the Best Fit Primary Goal**

C1: Issues with data privacy and security of AI systems	C2: Stakeholders may exhibit distrust of AI	C3: Technical obstacles regarding IT integration	C5: Issues with ethics of AI systems	C6: Employees may exhibit resistance to AI
C7: Issues with biases in AI systems	C8: Technical obstacles regarding high complexity	C9: High amount of change management and training for AI adoption		

**AI Challenges for More Efficient HR Tasks Primary Goal**

C1: Issues with data privacy and security of AI systems	C3: Technical obstacles regarding IT integration	C4: Technical obstacles regarding data quality	C7: Issues with biases in AI systems	C10: Issues with transparency of AI systems
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**AI Challenges for Attracting New Applicants Primary Goal**

C1: Issues with data privacy and security of AI systems	C5: Issues with ethics of AI systems
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**Recommendation for finding the best fit:** *Implement recommendation agents.* To support internal career development and suggest matching jobs to applicants, organizations can implement recommendation agents based on ML. In combination with NLP, which analyzes résumés and other text-based information provided by the employee or applicant, supervised ML can predict and recommend roles based on skills and experience. Unsupervised ML can identify and recommend paths taken by similar candidates.<sup>33</sup> Similarly, ML techniques can support applicant ranking, outreach to cold talent and fill skill gaps.

**Recommendation for more efficient HR tasks:** *Implement fully automated support systems and chatbots.* Interview scheduling can be automated by using a combination of rule-based systems, NLP and supervised ML. These AI systems need to have access to calendar data, which can easily be achieved with rule-based APIs, and then must learn to schedule preferences from past behaviors that enable candidates to self-schedule interviews.<sup>34</sup> Chatbots that leverage NLP and GenAI can handle routine applicant inquiries and provide real-time updates.<sup>35</sup> AI systems can also identify and automate unproductive repetitive tasks, such as extracting relevant data from paper documents using NLP or providing internal staff with information on compensation or HR policies via GenAI-powered chatbots.<sup>36</sup>

**Recommendation for attracting new applicants:** *Implement supervised ML for targeting and GenAI for text generation.* Supervised ML can help to identify the most effective job posting channels by analyzing historical features such as title and description, time of year, conversion rates or clicks, and predicting the most effective channel for new job postings based on this data. To enhance content quality and foster diversity, GenAI can be used to generate appropriate texts and job descriptions aligned with target applicant profiles.

## Future Actions

To prepare for the longer-term impacts of integrating AI into TA, we provide recommended

future strategic actions for each of the three primary business goals. These actions will shape TA over the next decade by enabling organizations to realize possibilities in the future that are not yet probable and preferable (see Figures 4 and 6).

**Future actions for finding the best fit:** These actions are concerned with the technical challenges of integrating AI into TA. Achieving an optimal applicant-job fit represents a major goal of AI-supported TA. However, realizing this potential is constrained by foundational technical challenges concerning data quality (C4) and data integration across systems (C3). An AI opportunity that is not currently probable because of these challenges is applicant screening (O20). Though this opportunity would deliver high strategic value, it remains largely unfeasible<sup>37</sup> due to its requirement for end-to-end decision-making based on highly variable and often unstructured input data. Compare this to the applicant ranking opportunity (O4), which builds on pre-screening by HR professionals. A similar problem arises in sourcing from external applicants (O16), as fragmented and incompatible data silos hinder seamless cross-system integration. If these issues are resolved, these technical constraints would enable AI to outperform human evaluation by processing a much larger range of behavioral data points at scale.<sup>38</sup> We therefore provide the following four recommended future actions for finding the best fit:

- **Recommendation 1:** *Standardize and structure internal TA data to ensure semantic consistency and system interoperability.* Organizations should define internal standards for how applicant data is stored. They should establish uniform metadata frameworks and use NLP techniques to extract an actionable structure from previously unstructured data.<sup>39</sup>
- **Recommendation 2:** *Translate organizational hiring needs into data-*

<sup>33</sup> Hunkenschroer, A. and Luetge, C., op. cit., July 2022.

<sup>34</sup> Barber, A. E., op. cit., 1998.

<sup>35</sup> Roppelt, J., Greimel, N., Kanbach, D., Stubner, S. and Maran, T., op. cit., June 2025.

<sup>36</sup> Ibid.

<sup>37</sup> Matos, A. "Transforming Talent Acquisition Through the Power of Automation and Artificial Intelligence," *Harvard Business Review*, August 16, 2023, available at <https://hbr.org/sponsored/2023/08/transforming-talent-acquisition-through-the-power-of-automation-and-artificial-intelligence>.

<sup>38</sup> Hunkenschroer, A. and Luetge, C., op. cit., July 2022.

<sup>39</sup> Ibid.

driven decision parameters. Organizations should define what a “good fit” means for them specifically so that ML algorithms can make more accurate predictions in the future. The underlying criteria for the prediction of job performance are still too vague and the associated AI tools have not been sufficiently scientifically validated.<sup>40</sup>

- **Recommendation 3:** *Invest in AI-ready platforms that unify applicant data across (internal and external) sources.* Organizations should develop or adopt AI platforms that aggregate and normalize applicant data from various sources. Specifically, they should implement databases that support longitudinal talent records across applicant tracking systems, CV repositories and external sourcing platforms.
- **Recommendation 4:** *Shift from short-term predictions to outcome-based AI modeling.* Organizations should incorporate longitudinal feedback loops to train AI models on post-hiring success metrics (e.g., retention, performance) and create predictive depth over time. This approach will be crucial for innovations related to skill gaps and data-driven TA.<sup>41</sup> HR professionals need to do regular ratings.

#### **Future actions for more efficient HR tasks:**

These actions are concerned with the human challenges of integrating AI into TA. Achieving efficiency through using AI in TA requires that employees trust the technology to handle a variety of tasks. The gold standard of efficiency and frequently mentioned vision is “one-click hiring” (O24), which is theoretically possible but remains improbable due to multiple barriers. AI systems are still perceived as opaque and potentially biased (C10), which makes it difficult for employees to trust that AI systems can manage critical decisions satisfactorily and autonomously, leading to distrust and resistance (C2 and C6). This skepticism is typically exacerbated by fears of being replaced and, additionally, by the lack of transparency around management’s intentions when implementing

AI.<sup>42</sup> Accordingly, to build trust and achieve the possible in the future, we provide three recommended future actions for more efficient HR tasks:

- **Recommendation 1:** *Use AI algorithms that can identify bias and create transparency.* Organizations should regularly check any AI technology used for data errors and biases—for example, in the model design principles, bias in the feature selection and bias in the training data.<sup>43</sup> They should use explainable AI to make the rationale behind automated decisions transparent and understandable to HR professionals.
- **Recommendation 2:** *Communicate with staff and involve HR teams in AI design.* Organizations should reframe the narrative from replacement to augmentation and emphasize that AI is a tool to enhance (and not diminish) human judgment and HR professionals. The impact of AI systems depends on employee perceptions of why the organization is using algorithmic HR systems, such as whether employees believe the organization is using automated systems to exploit or control them or whether it is intended to support their efforts and foster their commitment.<sup>44</sup>
- **Recommendation 3:** *Demonstrate and research the efficiency boost.* Organizations should determine the optimal allocation of time freed up for HR professionals by using AI.<sup>45</sup> Seeing examples of what a future workday without repetitive tasks could look like may further motivate HR professionals to agree to the integration of AI.

#### **Future actions for attracting new applicants:**

These actions are concerned with the regulatory challenges of integrating AI into TA. AI has substantial potential to increase employer visibility and attract new talent, especially via

40 Ibid.

41 Bernauer, D. *Queb HR Innovation Awards 2025: Shortlist & Highlights of HR Innovations*, Queb eV, May 14, 2025, available at <https://www.queb.org/blog/queb-hr-innovation-awards-2025-shortlist-highlights/>.

42 Nyberg, A. et al., op. cit., April 2025.

43 Hunkenschroer, A. and Luetge, C., op. cit., July 2022.

44 Edwards, M., Zubielevitch, E., Okimoto, T., Parker, S. and Anseel, F. “Managerial Control or Feedback Provision: How Perceptions of Algorithmic HR Systems Shape Employee Motivation, Behavior, and Well-Being,” *Human Resource Management* (63:4), April 2024, pp. 691-710.

45 Nyberg, A. et al., op. cit., April 2025.

data-driven targeting and personalization (O3, O9 and O13). However, such applications raise pressing ethical and privacy issues (C1 and C5). These issues are a problem for a lot of currently feasible AI opportunities but they also represent significant constraints on future applications, such as psychometric profiling (O25). Applicant data has to be processed in some way, and there is also the possibility of (un)intentional discrimination while targeting specific groups of people or platforms. For instance, prediction algorithms may forecast who is more likely to become pregnant.<sup>46</sup> To resolve regulatory challenges and achieve the possible in the future, we provide four recommended future actions for attracting new applicants:

- **Recommendation 1:** *Ensure transparency in both AI tool usage and decision-making processes.* Organizations should let applicants know about the use of AI tools in the application process and introduce an informed consent requirement.<sup>47</sup>
- **Recommendation 2:** *Establish clear lines of accountability for AI-based hiring decisions.* Organizations should assign clear responsibility for AI-driven decisions within the HR team or leadership and implement regular audits to monitor fairness, accuracy and impact on applicants. Since algorithm-driven recruitment processes are perceived as less fair compared to human-only or algorithm-assisted human processes,<sup>48</sup> keeping a human in the loop will reduce this effect until society has reached a consensus on the ethics of AI in TA.
- **Recommendation 3:** *Create an internal AI ethics committee for risk assessment and guidance.* Organizations should create a cross-functional AI ethics committee to assess risk and approve tools before deployment. The committee can also function as a point of contact for employees and applicants.
- **Recommendation 4:** *Advocate cross-industry standards and contribute to regulatory dialogue.* Organizations should be aware that the belief that AI is socially acceptable leads to greater trust in the organizations that use it.<sup>49</sup> In the future, there should be laws in place to cement a consensus on the use of AI in TA that adheres to ethical and privacy standards.

## Concluding Comments

In this article, we recommend immediate and future actions organizations can take to integrate AI into TA. These recommendations are based on data from a ranking-type Delphi study involving C-level executives with extensive TA experience. The Delphi study aimed to leverage the knowledge of these TA experts to assess the current state and value of AI efforts in a larger context. The core corporate function of attracting and hiring employees has long been supported by information technology and may be at the beginning of another fundamental shift as organizations increasingly deploy AI to support the TA process.

There are many ways in which organizations can integrate AI into their TA processes, and there is pressure to keep up with technological advancements and the competition. However, big changes always go hand in hand with make-or-break challenges that can be encountered in a rushed integration, potentially fostering future regret regarding how AI was integrated into TA. Our findings and recommendations can guide managers in pursuing efficient and effective integration of AI into TA that is right for their organizations' specific needs, enabling them to achieve a better future of work, decrease future regret and obtain a competitive advantage. Specifically, we identify AI opportunities and challenges that are currently possible—and probable and preferable in the future—and recommend immediate actions for integrating AI into TA as well as future actions for achieving possible AI opportunities and mitigating possible AI challenges that are not preferable.

46 Oswald, F., Behrend, T., Putka, D. and Sinar, E. "Big Data in Industrial-Organizational Psychology and Human Resource Management: Forward Progress for Organizational Research and Practice," *Annual Review of Organizational Psychology and Organizational Behavior* (7:7), January 2020, pp. 505-533.

47 Hunkenschroer, A. and Luetge, C., op. cit., July 2022.

48 Lavanchy, M., Reichert, P., Narayanan, J. and Savani, K. "Applicants' Fairness Perceptions of Algorithm-Driven Hiring Procedures," *Journal of Business Ethics* (188:1), November 2023, pp. 125-150.

49 Figueroa-Armijos, M., Clark, B. and da Motta Veiga, S. "Ethical Perceptions of AI in Hiring and Organizational Trust: The Role of Performance Expectancy and Social Influence," *Journal of Business Ethics* (186:1), August 2023, pp. 179-197.



## Appendix A: Meta-Level Talent Acquisition Tasks

Tasks Related to	Description	Examples of Tasks
<b>Candidate Attraction</b>	In contrast to employer branding, candidate attraction has a short-term focus on candidates. In this phase, the TA organization publishes job ads or directly searches for appropriate candidates. The main objective of candidate attraction is to generate applications.	<ul style="list-style-type: none"> <li>• Creating and optimizing job postings</li> <li>• Identifying the best channels for job postings</li> <li>• Manage targeted recruitment campaigns</li> <li>• Content development for marketing</li> <li>• Branding communication</li> <li>• Managing social media accounts</li> <li>• Maintaining databases for cold and internal talent</li> <li>• Promoting internal career development</li> </ul>
<b>Applicant Management</b>	Applicant management consists of all methods, tools, and processes that are needed to guide an applicant through the application process in an efficient way.	<ul style="list-style-type: none"> <li>• Request additional information from applicants</li> <li>• Answer applicant questions</li> <li>• General applicant communication</li> </ul>
<b>Preselection</b>	The preselection process includes reviewing received CVs to create a shortlist of suitable candidates. The CVs are compared to the job description and person specification to find a match.	<ul style="list-style-type: none"> <li>• Reviewing CVs and cover letters</li> <li>• Curating ranked lists of suitable candidates</li> <li>• Verifying employment history and checking references</li> <li>• Scheduling interviews</li> </ul>
<b>Selection</b>	In the selection phase, the shortlisted candidates are interviewed and the final hiring decision is made.	<ul style="list-style-type: none"> <li>• Conducting interviews</li> <li>• Applicant ranking</li> <li>• Make a joint decision on applicants</li> </ul>
<b>HR Strategy</b>	HR strategy covers all measures to either develop HR further or where HR plays a major role in further developing the entire organization.	<ul style="list-style-type: none"> <li>• Forecasting future skills and personnel requirements</li> <li>• Reviewing bias and discrimination in hiring decisions</li> </ul>

## Appendix B: Guiding Information for Delphi Study Panelists and Data Collection Methodology

The following guiding information was provided to the Delphi study panelists:

- *Study focus:* The focus of this study is specifically on the implementation and usage of AI in the talent acquisition context.
- *Perspective:* When answering the questions, please take the personal perspective of your role as an HR and AI expert.
- *Artificial intelligence:* AI is the frontier of computational advancements that references human intelligence in addressing ever-more complex decision-making problems. So, AI is more of an idea than a single technology. AI builds on machine learning or deep learning algorithms and does not only encompass simple automation (e.g., RPA). AI in our context is a learning algorithm that is trained based on available data and improves autonomously over time.
- *AI opportunities:* We ask you to think about AI opportunities—i.e., opportunities for your organization and its processes, as well as AI opportunities for people (managers, employees, job applicants).
- *AI challenges:* We ask you to think about AI challenges—i.e., challenges that arise before, during or after implementation. The AI challenges you brainstorm can be of a technical, organizational or human nature.

## Appendix B Table: Overview of Data Collection Process

Delphi Study Round	Step	Information on the Process
1. Brainstorming	1.1. Collecting initial data from the participants	<p><b>Questions asked:</b>  <i>What are the top 10 opportunities of AI in talent acquisition?</i>  <i>What are the top 10 challenges of AI in talent acquisition?</i></p> <p><b>Information on the process:</b></p> <ul style="list-style-type: none"> <li>• 10 free-text boxes to name up to 10 AI opportunities and AI challenges each</li> <li>• Participants were asked to briefly explain the items and how the AI opportunity can be achieved or how the AI challenge can be mitigated</li> <li>• Participants were provided with some guiding information on the topic (e.g., focus, definition of AI, definition of AI opportunity and AI challenge)</li> </ul> <p><b>Results of step:</b>            55 AI opportunities, 34 AI challenges</p>
	1.2. Consolidation of responses by researchers	<p><b>Information on the process:</b></p> <ul style="list-style-type: none"> <li>• Elimination of double entries</li> <li>• Logical combination of similar topics</li> <li>• Elimination of incorrect items (e.g., mixing up topics of automation with real AI per our definition)</li> </ul> <p><b>Results of step:</b>            24 AI opportunities, 21 AI challenges</p>
2. Selection	2.1. Handing back the items to the participants for alignment	<p><b>Questions asked:</b>  <i>I agree that this is an AI opportunity/an AI challenge: &lt;yes/no&gt;</i>  <i>If you agree but have additional information, or if you disagree and want to justify, please use this textbox: &lt;free text&gt;</i></p> <p><b>Information on the process:</b></p> <ul style="list-style-type: none"> <li>• Items were randomly ordered to avoid bias</li> <li>• Explanations for the items were provided to create mutual understanding</li> </ul>
	2.2. Examination of final items by researchers	<p><b>Information on the process:</b></p> <ul style="list-style-type: none"> <li>• Selecting the items if at least 50% of experts agreed that it is an AI opportunity/AI challenge</li> </ul> <p><b>Results of step:</b>            26 AI opportunities, 19 AI challenges</p>
3. Ranking	3.1. Collecting input values for the ranking from the participants	<p><b>Questions asked:</b>  <i>Please evaluate the benefit &lt;low/medium/high&gt; and the feasibility &lt;low/medium/high&gt; of the AI opportunity.</i>  <i>Please evaluate the impact &lt;low/medium/high&gt; and the probability &lt;low/medium/high&gt; of the AI challenge.</i></p> <p><b>Information on the process:</b></p> <ul style="list-style-type: none"> <li>• AI opportunities were evaluated regarding benefit (how well they can support the organization's goals) and feasibility (how easy or convenient to accomplish)</li> <li>• AI challenges were evaluated regarding impact (how badly could the challenge hinder the achievement of organizational goals if it materializes) and probability (how likely it is to occur)</li> <li>• Descriptions of AI opportunity, AI challenge, benefit, feasibility, impact and probability were provided</li> </ul>

- *Benefit*: The degree to which the AI opportunity supports the organizational goals.
- *Feasibility*: The degree to which the AI opportunity can be easily or conveniently realized.
- *Impact*: If the AI challenge materializes, the degree to which it can hinder reaching the organizational goal.
- *Likelihood*: How likely is an AI challenge to occur?

The Appendix B table provides an overview of the data collection process during the three

rounds of the Delphi study (brainstorming, selection and ranking).<sup>50</sup>

<sup>50</sup> Paré, G., Cameron, A., Poba-Nzaou, P. and Templier, M., op. cit., July 2013.

## Appendix C: Detailed Information on the Identified Possible AI Opportunities

AI Opportunity	Explanation	How to Achieve
O1: Support HR in interview scheduling	AI could support HR professionals by scheduling applicant interviews via email or chat.	AI needs to be connected to the calendar via APIs. Implement AI-powered assistants that can communicate with both applicants and recruiters via email or chat to schedule interviews. Data needed: Available times of hiring managers and applicants. Data source: Calendar API.
O2: Support HR in selecting the best channel for job posting	AI could support HR professionals by recommending channels that best match the content of a job posting or automatically placing a job posting on these channels.	Over time, recruiters build up experience of which sources are effective in attracting qualified candidates. This knowledge can also be built up by a self-learning AI algorithm, which learns and improves over time based on results. Data needed: To quantify the effectiveness of specific channels, the algorithm needs information on how well a job post performed (conversion metrics such as number of applicants, quality of applicants, time to apply, etc.).
O3: Enhance diversity by attracting genders equally	AI could provide value to the organization by increasing the diversity of talent—e.g., through learning and applying language patterns (messaging, keywords selected) in job postings, as the language and imagery (color, themes) used in job ads can have a big impact on who is more likely to be attracted to the job posting.	Gender decoders can help employers write better quality job descriptions that appeal equally to men and women. Data needed: Candidate demographic variables (gender, race, etc.). The system would also need to be able to run multi-variant tests on each job description to see live what difference each change makes. Data source: Candidate self-identification for demographics. Related challenge: Requires a very large number of applications as well as the need for applicants to self-identify (gender, race, etc.).
O4: Support HR in applicant ranking	AI could support HR professionals by assessing the level of applicant fit to a job posting and ranking incoming CVs based on this fit.	AI that evaluates applicants' level of fit compared to a job profile/job posting and ranks incoming CVs based on the level of fit. The ranking can then be used to prioritize further steps in the recruiting process. Data needed: Data on job position; applicant data (skills, experience, etc.). Data sources: Information from the job posting/manual input, and from applicant CVs.
O5: Support HR in identifying and reaching out to cold talent	AI could support HR professionals by screening already known applicant sources (i.e., cold talent such as former employees, talent from external events and former applicants), thus leveraging internal potential. Additionally, it can also support HR professionals by reaching out to them.	AI algorithms can search in large databases for suitable applicants based on the open position's needs. AI can automate the initial outreach message using templates, leveraging metadata (LinkedIn profiles, CVs) to personalize the message, experimenting with content and timing of the messages to improve the response rate. The human recruiter would only need to engage when the applicant responds. Data needed: Talent data (skills, experience) Data sources: Applicant tracking systems, applicant relationship management systems, internal employee databases. Related challenges: The data is often not transparent or in closed/proprietary systems. To be successful, the amount of available data in companies must grow, and data privacy regulations must be considered. The best solution might not be to have an AI that is capable of searching in different databases; a more efficient way is to have all data in one system, as only then is the search real-time, and the data sets are consistent. LinkedIn does not currently support the extraction of user data.
O6: Support applicants by suggesting suitable jobs	AI could support applicants by enabling personalized job advertising based on individual interests, motivation, personality and tone of voice.	AI can map related search terms to provide more relevant talent solutions to applicants. Similar to the Amazon style approach to marketing, where AI will identify you and approach you with a vacancy, including writing the communications. AI needs to align applicants' and employers' profiles (technical skills, specific knowledge, unique skills, leadership strength, diversity of experience, learning strength and, if possible, goals, aspirations and passion; professional interests, the existence and extent of certain skills and abilities, corporate cultural values and desires, time availability, life circumstances such as place of residence or family situation). Data needed: Data on vacancies in companies; data on applicants (skills, wishes and preferences—in which direction does applicant want to develop, what are the geographic wishes, etc.). Data sources: Required information is very specific and is usually not available in pure, typical cookie targeting, but needs to be collected proactively; CVs sent by applicant for other jobs/other applications to the company; applicant tracking system (ATS) and candidate relationship management (CRM).
O7: Support employees in developing their careers internally	AI could support employees by providing inspiration for unrealized talent solutions in their careers through an AI platform. It is often easier to find a new job externally than internally, which can lead to organizations losing valuable talent.	AI-based search/recommendation for new internal positions and offers (career path inspirations, gig projects, mentors, open positions, learning and training content). Such an AI platform can be achieved using algorithms developed by looking at the patterns of job changes for successful applicants. Experiences are broken down into skills that can be acquired in different types of roles to identify relationships between skill profiles that are sometimes not obvious. Developing data-driven career maps and options. Data needed: Skills, abilities, potential of the employee; information on job openings.

## Appendix C: Detailed Information on the Identified Possible AI Opportunities

AI Opportunity	Explanation	How to Achieve
O8: Support applicants during application process	AI could support applicants by instantly answering their questions about the application process, helping to handle high volumes of recurring applicant questions.	Implement applicant-facing self-learning chatbots.
O9: Support HR in optimizing job postings content	AI could support HR professionals by analyzing how previous job advertisements performed (e.g., in terms of conversions in different target groups) and by generating variations of the job postings that may attract more applicants or different applicant groups.	AI-based platforms can support building optimal job specifications in job postings, incorporating needed skills and experience, as well as company values. AI can be used to test different versions of job advertisements (different content, different presentation of content, different order of content and different tonality of the language used) to create versions that are optimized for the target group or target person.
O10: Support HR in identifying and eliminating unproductive HR tasks	AI could support HR professionals by minimizing the number of operational tasks requiring manual input and thus achieving the best outcome for the business at the lowest cost. At its most extreme, this could even be one-click hiring.	Use AI to identify unproductive tasks through data-driven insights, then automate these tasks by, for example, developing systems that scan and extract relevant data from paper documents. Data needed: Time needed for tasks and the benefits of the tasks. Related challenges: HR professionals can sometimes be very resistant when it comes to technical improvements and new methods. To overcome this resistance, the AI system must be completely and seamlessly integrated into the applicant tracking system. Moreover, the implementation and change process must be completed with a lot of energy and acceptance from the HR professionals involved in TA.
O11: Support HR in filling skill gaps	AI could support HR professionals by identifying skill gaps and suggesting ways to bridge those gaps.	Using AI, HR professionals could match gaps to training or mentorships to bridge the gap for potential hiring managers and applicants. Data needed: Access to a large volume of digital training resources and potential mentors to identify matches and, critically, feed back into the system how successful those methods are at bridging the gaps. The AI also has to evaluate skills that are close to the skills that are needed, taking into account the scoring. Related challenge: Measuring if the gap was filled successfully.
O12: Support HR during interviews	AI could support HR professionals by proposing the best interviewer for the context, recommending interview questions based on previous questions and providing a final rating to the interviewer. Providing this information would solve the problems of very standard decision-tree guides and inconsistencies in how interviewers rate each answer.	Implement a system that matches the interviewer and applicant skills for an interviewer recommendation. Using AI, suggested interview questions could be presented in real time, and suggested scoring offered based on each answer provided by the applicant. Data needed: Interviewer and applicant skills. Related challenge: Because current voice-to-text tools often make errors based on accents, they will impact the accuracy of the assessment. This is why it is important to keep human involvement so that the interviewer can correct for anything unusual. Detailed rubrics are required to define what makes a “good” answer. Probably, this also needs to be standardized across companies.
O13: Support HR in developing a data-driven strategy for TA	AI could support HR professionals by providing data points for more data-driven decisions. This includes information on what is critical for the organization when looking for a better-quality hire and suggestions on location strategies, such as where to build or sustain locations and why.	To create such an AI platform, a massive amount of data is needed, including position-specific data (roles and levels specific parameters), global data (where is available talent), region-specific data (compensation, benefits, tax and compliance, costs to employ), livability of the area (cost of living, housing, taxes, safety, region stability), inflow and exit of people to and from region, schools and infrastructure (strength/weaknesses).
O14: Support HR in collecting applicant information	AI could support HR professionals by collecting additional information about an applicant and incorporating this data into the decision process.	Using web crawling, AI can capture information about an applicant from websites, social media, etc., to incorporate into the decision process. Data needed: External (websites, social media, etc.) Data sources: Websites, social media Related challenges: Realizing this opportunity requires accounting for data protection and privacy issues. Collecting such data can be illegal or at least ethically questionable under specific conditions. Moreover, using AI when collecting information about an applicant could also increase unconscious bias by gathering personal information that applicants have no intention to share as part of their job application.
O15: Enhance applicant communication	AI could provide value to the organization by collecting data on the questions applicants ask, and thus gathering information about what factors are important to applicants and what may actually be influencing their decisions in the application process.	Collect valuable data from applicant-facing self-learning chatbots and analyze it. Data needed: Data from chatbot conversations. Data source: Applicant-facing chatbots.

## Appendix C: Detailed Information on the Identified Possible AI Opportunities

AI Opportunity	Explanation	How to Achieve
O16: Support HR in sourcing from external applicants	AI could support HR professionals by searching multiple external platforms and data sources to suggest potential external applicants. Unlike traditional searches (recruiters searching with keywords), AI can develop synonyms for keywords, infer data when explicit information is not available and refine the search based on feedback (i.e., which of the applicants received offers and were then hired)	Generating automated shortlists as recommendations for external applicants. Recruiters don't have to search through databases with keywords. AI can be used to map external applicants with internal recruiting data. An ML application could dynamically target applicants based on how successful they are likely to be in the recruiting process, automatically adjusting targeting based on the feedback loops. Data needed: job description/requirements, data on applicants, data on TA process steps. Data sources: Job description/requirements inputted by recruiter/hiring manager; Internal ATS and CRM. Related challenges: Connecting an AI advertisement placement tool to the internal ATS and CRM to see how targeted applicants flow through the recruiting funnel, which is constantly adapted based on the success or failure of applicants.
O17: Enhance identification of bias and discrimination	AI could provide value to the organization by unveiling bias and discrimination, making existing discrimination in the organization visible, thus sensitizing human decision makers to the issue.	AI looks for patterns of success in historical data. It is precisely the visualization of these historical patterns that can serve to identify the problem and thus actively counteract it. Data needed: Historical hiring and career data. Related challenge: Previous examples showed that, because of the way deep learning works, AI can become biased. This challenge is not yet resolved and needs special attention.
O18: Support HR in forecasting future skills and personnel requirements	AI could support HR professionals by accurately predicting future skills, helping with strategic workforce management (skill-associated roles and needed headcount) that will be needed, so that the organization can start to source and attract these skills.	AI could predict, analyze and deliver short- and long-term forecasts and make meaningful predictions about which business unit will need which skills, in what quantity and quality, and how this workforce can be provided at today's level. Data needed: Internal and external data (position- and level-specific data, technical skills, specific knowledge, unique skills, leadership strength, diversity of experience, learning strength, schools, companies, industries and geographies, social media (groups, associations, etc.), affiliations. To predict needed headcount, a lot of actual data has to be collected (e.g., current state—all roles, levels, skills, experience, knowledge—technical skills alignment, specific knowledge, unique skills, leadership strength, diversity of experience, learning strength, goal alignment, aspirations, and passion aligned to skills and experience across the organization). In addition, the future state has to be modeled (e.g., business needs (parameters around needs—skills, experience, knowledge, etc.—and whether extra headcount is needed to fill holes or can the current state suffice). Data from decisions of other market participants about other users, industries and markets would also be useful.
O19: Enhance use of internal talent	AI could provide value to the organization by accurately moving internal talent into the right roles at the right time.	Using AI to scout internal data and perform skills-matching. Data needed: HR data, behavioral data. Data source: Internal databases.
O20: Support HR in applicant screening	AI could support HR professionals by identifying suitable applicants for the next evaluation step from a very large volume of data by preselecting CVs based on the job description. The main goal here is to eliminate low-quality applicants quickly so that HR professionals do not waste time sifting through a large number of CVs.	Achieved by training an AI system with data from past CVs and past decisions so that the system can learn which CVs should be selected for the next evaluation step. Data needed: Past CVs and past decisions; recruiter information on why certain applicants were selected and why others were not. Data source: Search algorithms need to be connected to the ATS and CRM platforms so that there is a feedback loop. Related challenge: CVs from past hiring decisions very often have to be deleted (with external applicants, non-hires) or cannot be connected to performance data (internally) for data protection reasons.
O21: Enhance hiring decisions by removing human bias	AI could provide value to the organization by making hiring decisions free of human bias, meaning less “subjective” hiring and more focus on the likelihood of delivering in the role (job performance).	Applying AI whenever a hiring decision is required. AI algorithms can help to compensate for human bias. Data needed: Data about skills, personality and performance. Related challenge: AI is not, per se, bias free. This approach is feasible only if AI does not consider the diversity dimensions (nationality, gender, age, etc.).
O22: Enhance employer branding	AI could provide value to the organization by executing employer marketing and branding activities on social media.	Achieved by implementing AI bots and maintaining them constantly. Bots enable many parts of the TA process to be automated; nonetheless, at some point in the process, a skilled HR communication professional will have to take over because employer branding communication very often requires tact and sensitivity. Therefore, a bot will need constant monitoring and surveillance. Furthermore, the organization must ensure that the user experience is good and that the AI has enough data to have a high intent recognition. Dynamic content and cross-platform functionality are also important. And this functionality should not only be a link directory. Done well, such AI bots can provide great added value and a stable, consistent response and data quality, through 24/7 automation. However, for ethical reasons, the bot must identify itself as a bot and not simulate a human—this needs special attention.



## Appendix C: Detailed Information on the Identified Possible AI Opportunities

AI Opportunity	Explanation	How to Achieve
O23: Enhance value of HR professionals by helping them become strategic business partners	AI could provide value to the organization by helping HR professionals become consultants and not just internal administrative staff, thus extending their remit.	With the modern methods of data-driven decision support for recruiters, this information can influence meaningful and valuable decisions in the consultation process. Hiring managers always show great interest and start to trust HR colleagues and appreciate their judgment and decision-making capabilities, which happens through AI more and more. With this development, existing manager/HR relationships are elevated to a completely new level.
O24: Support HR through one-click hiring	AI could highly streamline the acquisition process through one-click hiring, where a candidate can apply and potentially be hired with minimal effort, often through a single interaction or click.	In one-click hiring, AI could deliver the “perfect” applicant for any vacancy almost immediately. Data needed: Access to an enormous amount of data. Related challenge: One-click hiring without the involvement of HR professionals lacks interpersonal capabilities. It might work if you are filling jobs where the stakes for both parties are relatively low, but not for white collar jobs in highly competitive talent markets.
O25: Support HR through psychometric applicant profiling	AI could be used to psychometrically profile applicants—i.e., assessing their behavior, motivation or preferences—through, for example, game-based assessments or on-demand video interviewing.	Use a game as a user interface for applicant interviews, which are recorded to collect data on applicant preferences, behavior patterns, body language and vocal patterns to produce a psychometric profile in addition to the content of the answers to interview questions. Experience has shown that the completion rate may tend to be higher among some diverse groups compared to conventional survey-based assessment instruments. The suggested explanation is that the experience is less stressful for applicants who experience “test anxiety” from conventional survey-based data collection instruments. Data needed: Applicants produce the data in interviews. Related challenges: Data privacy and security issues. Potential biases in the AI system might wrongfully discriminate against certain applicants.
O26: Support HR through providing hiring key performance indicators (KPIs) and quality analytics	AI could be leveraged to enhance the measurement, analysis and optimization of hiring effectiveness.	Data needed: KPIs such as time-to-fill, cost-per-hire, candidate quality and source effectiveness. Related challenges: Data privacy, as well as the data needed to measure KPIs; orientation values are also needed before AI integration. Usually, there needs to be an organization-specific catalog of what is critical for that organization for a better quality of hire.

## Appendix D: Detailed Information on the Identified AI Challenges

AI Challenge	Explanation	How to Achieve
C1: Issues with data privacy and security of AI systems	The use of AI raises issues around what data can be stored, for how long and where. To train AI systems, for example, to assess CVs, data protection regulations such as the GDPR must be adhered to.	Advocate cross-industry standards and contribute to regulatory dialogue. The organization should have experts to deal intensively with such, sometimes dry, topics. Privacy and security issues need to be addressed together with companies that develop the technology, not left to individual user organizations. Build AI systems so they always comply with all worldwide data protection regulations.
C2: Stakeholders may exhibit distrust of AI	Stakeholders such as workers’ councils may be more likely to trust human judgment than AI, which they may not understand and/or fear the consequences of.	Involve the workers’ council in a dialogue and the decision-making process from the beginning, and shape change together. Organizations also need to understand where the concerns are (workers’ councils are different in their assessment and concerns), so they can address all the areas of concern and collect the data to support answers to the concerns. Education and accumulated experience will support stakeholder confidence in AI in talent acquisition.
C3: Technical obstacles regarding IT integration	To provide value to the organization, AI systems need to be connected to internal systems and processes. However, in some organizations, there is a lack of or poor IT integration with legacy systems and existing IT infrastructure.	Talk to existing IT experts early on about smooth integration and interfaces, as well as data exchange and specifics. Even though this is a new era in HR that is transforming processes, it ultimately requires a stable and secure IT system to enable the transformation. There’s also a need for a big focus on compliance—organizations need to make sure the platform is 100% compliant so that it doesn’t become an additional hurdle to integration. This requires addressing privacy issues, access to data, where data is stored, etc.
C4: Technical obstacles regarding data quality	To provide value to the organization, AI systems need high-quality data sets. Poor data quality leads to bias and user distrust of the whole AI system.	Collect data and perform validity checks. Also, invest in training for HR professionals and support from vendors and consultants to make improvements.
C5: Issues with ethics of AI systems	The use of AI raises issues about when data collection and actions taken cross ethical boundaries.	Establish a dedicated unit and create internal capacity and resources to take the issue seriously and address it regularly. In addition, apply the industry code of ethics.
C6: Employees may exhibit resistance to AI	Employees, especially those in HR, such as recruiters or hiring managers, may be hesitant to embrace AI.	Apply change management practices and leverage learnings from the technology acceptance model. In addition, AI requires transparency and explainability to create acceptance.

## Appendix D: Detailed Information on the Identified AI Challenges

AI Challenge	Explanation	How to Achieve
C7: Issues with biases in AI systems	The use of AI raises bias issues. Early AI has produced many examples of human biases being amplified by machine learning.	Use tools produced by academia to assess the level of bias trained into the algorithms.
C8: Technical obstacles regarding high complexity	To provide value to the organization, AI systems and their parameters must be configured correctly, which can involve a high level of complexity.	Invest in experts who already have experience with AI. Take your time; do not plan projects with unrealistic or overly optimistic timelines; accept higher costs for AI implementations and maintenance; adopt a fail-fast-change-repeat mindset.
C9: High amount of change management and training for AI adoption	The use of AI in the context of talent acquisition requires a high level of change management and employee training.	Plan the AI investment carefully. Most likely, it will be much higher than originally anticipated.
C10: Issues with transparency of AI systems	The use of AI raises issues of transparency, as it must be able to provide explanations to mitigate legal issues (e.g., equal treatment).	Think about supervised learning and human-machine interaction to keep control of the process. Most likely, for the time being, there will be a need for a human in the loop, especially to ensure legal and ethical standards.
C11: Employees need many skills to maintain AI	Long-term maintenance of AI systems in TA requires knowledge and skills from HR and IT employees.	Deploy user-friendly tools, use vendor service packages and provide constant learning.
C12: Technical obstacles regarding high data volumes	To provide value to the organization, AI requires a large amount of data during training, which either needs to be generated internally or sourced from elsewhere.	Provide the very large data volumes required by AI applications, and recognize the need for applicants to self-identify (gender, race, etc.). The AI system also needs to run multi-variant tests on each job description to see in real time what difference each change makes. The algorithms must also be based on external market data.
C13: Technical obstacles regarding the integration of external sources	To provide value to the organization, AI systems should be connected to external sources (e.g., external applicant databases), but these sources are not yet ready to be integrated into potential AI systems.	Partner with, for example, LinkedIn to obtain user data (LinkedIn currently does not support extracting its user data into a separate system). Use existing tools to parse metadata from résumés that have some structure, and then create messages based on that parsed data. Focus on external data and the partners you need to connect with to enable better, stronger or deeper access to these data hubs.
C14: Issues with error-prone AI systems	The use of AI raises the issue of errors, which can sometimes go undetected or uncorrected.	Retain human involvement. Also invest in experts who have a deep understanding of AI in talent acquisition and listen to them. Even if it is sometimes uncomfortable, it pays off. And invest in internal processes/security and test scenarios to identify deviations early on so that they can be corrected and resolved before real damage is done. In practice, however, this is where things will fail if this is not mapped out very well. Decide exactly what you need (people who will do this work, how these people align with TA expertise and how much it will cost). Providing this level of clarity will mean that everyone understands that it will take xx people and cost \$xx to run the AI platform; adopting this approach may be even better than “just” investing in experts.
C15: Issues with success measurement	It is a challenge to identify the right criteria that are meaningful enough to judge the success of individual AI measures.	Systematically collect and analyze data. To make this exercise easier, TA/HR organizations need help in making decisions about what to analyze and why.
C16: Issues with a lack of AI software portfolios	Commercially available products that can be applied to TA processes are still limited and immature.	Look past vendor marketing hype to understand what an AI product can really do. This requires time to learn and gain experience, buyer education and the application of an industry standard. In addition, where AI is already being used, proof points that it works as said will help validate if the system is doing what it should.
C17: Technical obstacles regarding language variations	AI systems that are developed using Western languages (primarily English) do not always perform well in other regions (e.g., in Asian countries).	This challenge will eventually be addressed by the accumulated experience of vendors. In the meantime, organizations can provide training, documentation and support in the local language.
C18: Technical obstacles regarding system maintenance and updates	AI systems need to be managed by evaluating tool performance, updates and parameter tuning.	Regularly retrain, tune and test AI systems to ensure they remain accurate and relevant. Many organizations use third-party AI tools from external vendors to carry out these tasks.
C19: Issues with misleading AI marketing	Many offerings claim to use AI but do not.	Be skeptical about vendors’ marketing claims. Many position their products as “AI-powered” when, in reality, they use basic automation or rule-based systems. When tools are oversold as intelligent or autonomous, HR teams may either over-rely on them and have unrealistic expectations or fail to realize the benefits of the supposed AI system, resulting in resistance, which may persist when genuine AI systems are introduced.

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