

# The role of AI in mitigating bias to enhance diversity and inclusion

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Artificial intelligence (AI) is expected to affect all of our working lives.<sup>1</sup> Computers that are able to simulate intelligent behavior<sup>2</sup> may not only affect the work we do; they may also be able to help reduce unconscious bias within organizations. Today, AI solutions are being developed that have the potential to mitigate biases and, as a result, enable more diverse and inclusive workplaces.

In this paper, we examine the nature of diversity and inclusion (D&I), explore biases as an inhibitor to more diverse and inclusive workplaces, and provide insights into the role that AI can play in mitigating biases. We then offer practical recommendations to organizations who are looking to adopt AI in their HR practices.

## Understanding diversity

Diversity in the workplace initially attracted widespread attention in the 1960s with a focus on protected classes of gender and race. Since then, the interpretation of diversity has expanded to include more demographic characteristics such as disability and sexual orientation, and individual attributes that are less salient such as education, values, and attitudes. An even more recent view of diversity includes any compositional differences that lead individuals to perceive that others are similar to, or different from, themselves in a work unit.<sup>3</sup> Differences may be about beliefs or attitudes (known as separation diversity), about knowledge, networks and experiences (known as variety diversity) or about access to resources like privilege, status, pay and position (known as disparity diversity).<sup>4</sup>

## The benefits and challenges of diversity

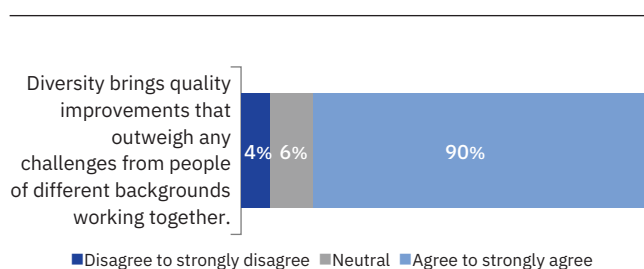
While we may instinctively feel that diversity is a good thing to aim for, empirical research into the impact of diversity has found a range of results. For example, some studies indicate that diversity is associated with positive outcomes such as improved innovation and productivity,<sup>5</sup> while some show that diversity is related to negative outcomes such as conflict and turnover.<sup>6</sup>

We can understand these varied outcomes better when we think about what it's like to work with people who we perceive as similar to or different from ourselves. The following perspectives and theories help explain the mixed effects of diversity in a work group:

- **Cognitive resource perspective.** Improved performance can be explained by the perspective of cognitive resources, which says that people with diverse backgrounds, experiences, and expertise bring with them unique cognitive attributes (e.g., perspective, capability). These attributes can stimulate creativity and innovation and improve problem solving, which in turn can enhance organizational performance.<sup>7</sup>
- **Similarity-attraction paradigm.** Increased conflict in a diverse group can be explained by the similarity-attraction paradigm. This paradigm indicates that people tend to prefer to work with people who are like them. A 'like-minded' group has less conflict, easier communication, and more interactions because of shared characteristics (e.g., personality, attitudes) of group members, while a diverse group tends to have more conflicts.<sup>8</sup>
- **Social identity theory.** The social identity theory also offers explanations of some of the negative outcomes associated with a diverse group, such as increased turnover of employees. The social identity theory indicates that people tend to classify themselves and others into various demographic categories, based on attributes like religious affiliation, gender and age. This social identity categorization results in 'in-groups' and 'out-groups.' In-group members tend to get along with each other and experience positive outcomes, while out-group members do not.<sup>9</sup>

While academic research continues to try to disentangle the effects of diversity,<sup>10,11,12,13</sup> HR professionals generally express positive views of diversity in organizations. For example, a recent survey of HR professionals conducted by IBM and UNLEASH found that nearly all (90%) believe diversity brings quality improvements that outweigh any of the potential challenges arising from people of different backgrounds working together (Figure 1).

Figure 1. Most HR professionals believe the benefits of diversity outweigh challenges



Source: 2018 IBM and UNLEASH HR professional survey (n=182)

### Towards inclusion

As understanding of the nature and the effects of diversity evolves, the importance of inclusion has attracted increased attention from researchers and practitioners.<sup>14</sup> In the last decade, inclusion has been viewed as distinct from, but related to diversity.<sup>15</sup> For example, viewing exclusion as a major problem associated with a diverse workplace, the concept of inclusion-exclusion was introduced. Inclusion-exclusion refers to a continuum of the degree to which an individual feels that he or she is part of the organizational system, both formally in terms of access to information and decision-making, as well as informally, in terms of social gatherings, lunch meetings, etc.<sup>16</sup>

A more recent and well-accepted view of inclusion is focused on an individual's two fundamental countervailing needs: a need for belonging and a need for uniqueness.

According to the optimal distinctiveness theory (ODT),<sup>17</sup> individuals seek to balance their needs for similarity to others and their needs for uniqueness, through an optimal level of inclusion. That is, it is the simultaneous sense of uniqueness and belonging, working together, that create a feeling of inclusion in a work group. Given this, inclusion is achieved when an individual perceives that he or she is valued and respected in the work group and has a sense of belonging while maintaining his or her uniqueness.<sup>18</sup>

Today it is well recognized that creating an inclusive environment makes it possible to overcome the challenges associated with diversity and unlock its potential benefits.<sup>19</sup> In an inclusive environment, all individuals have access to information and resources, are involved in teamwork, and participate in decision-making.<sup>20</sup> All are treated as 'insiders' within the work group, while maintaining their own unique characteristics.<sup>21</sup>

*"Today when I think about diversity, I actually think about the word 'inclusion.' And I think this is a time of great inclusion. It's not men, it's not women alone. Whether it's geographic, it's approach, it's your style, it's your way of learning, the way you want to contribute, it's your age - it is really broad."*

– Ginni Rometty, Chairman and CEO, IBM

## The benefits of inclusivity

Creating an inclusive workplace with a diverse workforce opens organizations to a number of critical benefits:

- **Increase access to desired skills.** By embracing D&I in their hiring processes, organizations are able to include all candidates regardless of gender, age, ethnicity, etc. This creates a wider talent pool of potential candidates that offers organizations better opportunities to hire top talent and address skill needs. Furthermore, as diverse individuals bring unique perspectives and knowledge that promote creativity and improve problem solving, organizations can benefit from improved productivity and adaptability to fast-changing markets.<sup>22</sup>
- **Improve organizational reputation.** An inclusive culture and a more diverse workforce can improve how an organization is viewed. Research indicates that gender diversity of board members leads to better firm reputation<sup>23</sup> and creates a positive impression on customers<sup>24</sup>. Furthermore, a good reputation makes a firm more attractive to talent who are attuned to D&I issues. For example, women and ethnic minorities rate organizations with diversity messages as more attractive as potential employers.<sup>25</sup>
- **Ensure compliance as a minimum.** Complying with Equal Employment Opportunity (EEO) requirements is the minimum action that an organization should take. An effective D&I program extends beyond EEO classifications (e.g., age, gender, ethnicity) by including more individual attributes (e.g., personality, attitudes).
- **Create better customer experiences.** A diverse organizational climate has been linked to increased customer satisfaction<sup>26</sup>. This may be a result of a diverse customer service team having a better understanding of diverse customer needs and being better able to serve those customers.

The impact of inclusion can also go beyond these business benefits. Inclusion brings people with different backgrounds and perspectives (diversity) together and leads to greater social cohesion and well-being.<sup>27</sup>

## Bias as an inhibitor to D&I

Organizations looking to benefit from a more diverse and inclusive workplace should be aware of the impact of conscious and unconscious biases. Conscious and unconscious biases, also referred to as explicit and implicit stereotyping (a type of cognitive bias), have a clear negative impact on formal employment decision-making processes and an employee's daily work life. As such, bias is a topic that demands HR attention.

### Bias in formal employment decision-making processes

Bias can adversely influence decision making across the entire employee lifecycle including in talent attraction, hiring, promotion, training, performance appraisal, compensation, and even termination. Here are some examples:

- **Talent attraction.** Bias may be present in job descriptions. Research reveals that job advertisements in male-dominated fields (e.g., electrician, engineer) use more masculine wording such as 'competitive' or 'dominant' than job advertisements in female-dominated fields (e.g., nurse, early childhood educator). As a result, these more male-oriented job advertisements appear to be less appealing to women.<sup>28</sup>
- **Hiring.** Bias occurs in selection processes. Research has found that white applicants received 36 percent more job callbacks than black counterparts and 24 percent more job callbacks than Latino applicants with identical resumes.<sup>29</sup> Not only that, but an experimental study found that applicants with disabilities that do not limit their productivity received 26 percent fewer responses from employers to their job application than non-disabled applicants with identical job applications except for disability status.<sup>30</sup> If all workers were treated equally, without bias, we would not expect to see such differences in responses to job applications.
- **Career development.** Research shows that people tend to describe good managers in masculine terms, and that "stereotypically male qualities" are described as necessary to be a successful leader,<sup>31</sup> even though

the managers were unaware they were doing this. While this is just one example of gender bias, it is known that generally women do not secure promotions as readily as men. A study by McKinsey and LeanIn found that entry-level women were 18 percent less likely to get promoted to manager than men, even though they were asking for promotions and negotiating pay at the same rate as their male colleagues.<sup>32</sup>

- **Performance appraisal.** Performance reviews based on supervisor subjective ratings are also prone to biases. One study found that although older workers were as productive and as capable as their younger peers, older workers received lower performance scores for similar work.<sup>33</sup> Another study found that women were 1.4 times more likely to receive critical subjective feedback than men.<sup>34</sup>
- **Compensation.** According to US census data, women earn considerably less than men in nearly every occupation. On average, women earned 80.5 cents for every \$1 earned by men in 2017.<sup>35</sup> Besides personal choice (e.g., women choosing to work part-time to take care of children), pay discrimination is one of the factors that causes the gender pay gap.<sup>36</sup> A meta-analytic study on the gender pay gap reveals that although women perform equally, their rewards (e.g., salary, bonuses, promotion) were significantly lower than men particularly in prestigious occupations such as law and academia.<sup>37</sup>
- **Termination.** Conscious or unconscious biases may even lead to wrongful employment termination. For example, physically attractive people are perceived as more sociable, more intelligent and more successful than unattractive people.<sup>38</sup> As a result, unattractive people are more likely to find their jobs terminated than attractive counterparts.<sup>39</sup>

The above research evidence shows that biases, conscious or unconscious, inhibit an organization's ability to hire, promote and reward diverse employees, and even expose organizations to compliance risk (e.g., discrimination against a job applicant or an employee due to that person's race, age or gender).

### What are cognitive biases?

Cognitive biases occur when people make systematic irrational judgements in thinking and reasoning.<sup>40</sup> Here are a few examples of cognitive biases in the workplace:

- **Stereotyping** is an over-generalized belief about a certain group of people.<sup>41</sup> That is, people tend to think that a member of a group will have a certain characteristic without having actual information supporting that belief. For example, someone may believe men are less capable of undertaking care-related jobs such as nursing. Explicit stereotypes, also referred to as conscious biases, are the result of intentional and controllable thoughts and beliefs toward certain groups of people.<sup>42</sup> Implicit stereotypes, also referred to as unconscious biases, are thoughts and beliefs toward certain groups of people that we are unaware we hold.<sup>43</sup>
- **Confirmation bias** is the tendency to search for and/or interpret information in a way that confirms someone's preconceptions.<sup>44</sup> For example, if a hiring manager likes one job applicant based on something they have seen in their resume, the hiring manager may then seek out information during a subsequent job interview with that applicant that confirms the hiring manager's initial impression.
- **Self-serving bias** is the tendency to blame external factors when bad things happen and give oneself credit when good things happen.<sup>45</sup> For example, an employee may attribute the success of a project to his own effort, but a failure to the difficulty of the project.
- **Halo effect** is the tendency to use an impression or personality trait of a person to make an overall judgement of the person.<sup>46</sup> For example, physically attractive job applicants are more likely to be hired because hiring managers associate good physical appearance with higher intelligence and capabilities.<sup>47</sup>
- **Like-me effect**, also called the 'similar-to-me' effect, refers to people's tendency to favor a person who is similar to themselves.<sup>48</sup> For example, a hiring manager may choose a candidate over others because the candidate has similar interests or background.

### Bias in everyday work life - microaggression

Conscious and unconscious biases not only have negative impacts on formal employment decision processes but they may also manifest in behaviors like microaggression. Microaggressions are everyday verbal or nonverbal slights or insults, whether intentional or unintentional, that communicate hostile, derogatory or negative messages based on identities (e.g., gender, ethnicity, disability status).<sup>49</sup> For example, when people ask Asian Americans or Latinos what country they're really from, they automatically assume they're foreign-born. Although microaggressions are subtle, they deliver inappropriate or even insulting messages that do not just hurt someone's feelings, they prevent a company from building a truly diverse and inclusive workplace.<sup>50</sup>

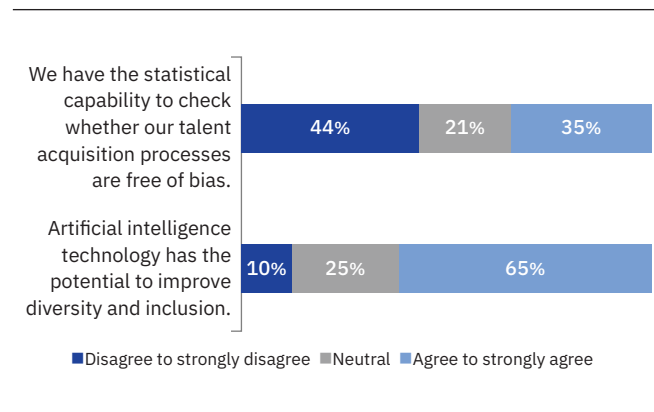
In sum, whether evidenced in formal employment processes or in the day-to-day experiences of employees, previous studies suggest that biases can be a significant barrier to D&I. Mitigating these biases can help organizations to operate ethically, compliantly and, ultimately, to their full potential.

### Current and future ways to detect and mitigate bias across the talent lifecycle

Despite the importance of mitigating biases, our recent IBM and UNLEASH survey reveals that only about one third (35 percent) of HR professionals think that their organizations have the statistical capability to check whether their talent acquisition processes are free of bias (Figure 2). Statistical analysis can provide an objective means of determining the extent to which bias is present, but newer technological developments, such as AI, may now offer an additional way forward.

HR professionals are optimistic that AI solutions will be able to support their D&I efforts by mitigating bias. The same IBM/UNLEASH survey reveals that a majority (65 percent) of HR professionals believe AI can help enhance D&I (Figure 2).

Figure 2. HR professionals' views on current and future ability to detect bias



Source: 2018 IBM and UNLEASH HR professional survey (n=182)

### AI as a tool to mitigate bias

Unlike human beings, machines do not have inherent biases that inhibit D&I. Rather, they are subject to the choices of data and algorithmic features chosen by the people building them. When appropriately developed and deployed, AI can remove the attributes that lead to biases and can learn how to detect potential biases, particularly those unconscious biases that are unintentional and hard to uncover in decision-making processes. Following detection, AI can alert HR or managers to the presence of the biases. In short, AI has great potential to help with bias if it is carefully designed.<sup>51</sup>

AI can play a critical role in two critical areas: ensuring all qualified candidates have equal access to job opportunities and supporting HR and managers in making fair employment decisions.

### Equal access to opportunities

A first step to increasing workplace diversity involves making job opportunities known to a wide range of qualified candidates. Job-seekers need to be aware of job openings to which they can apply, and the descriptions of those openings should encourage (versus deter) a broad range of people to apply.

- *Awareness of job opportunities.* Equal access starts with equal awareness of job opportunities. According to information asymmetry theory, information gaps exist between work seekers and potential employers in the labor market.<sup>52</sup> AI can increase awareness of opportunities by recommending jobs that job-seekers might not have considered for themselves through traditional job search mechanisms. For example, technology designed to interact with candidates and learn about their skills and interests can then match those attributes to job openings, rather than relying on keyword searches driven by the job-seeker. In this way, AI has the potential to increase talent pool diversity and improve D&I in internal and external hiring.
- *Inclusive job descriptions.* Once a job seeker is aware of a particular opportunity, the job posting can indicate to them whether they are suited to the role. In fact, a job posting is often the first way that a potential candidate learns about an organization. It can be a challenge to write the perfect job posting that represents an organization and the job, while also attracting the best qualified candidates and ensuring a diverse candidate pool. AI-enabled job posting review technology can detect bias in draft advertisements before they appear in front of potential candidates. The AI technology can highlight gender, age and ethnicity biased language to enable re-wording for a job posting that will appeal to as broad a spectrum of qualified candidates as possible. AI can also improve job postings through guidance on tone, voice, and length to reduce biases.

Furthermore, we know from research that men are more inclined to apply for a role when they feel competent in some or most of the skills listed, compared to women who are less likely to apply unless they feel competent in all the skills listed.<sup>53</sup> AI technology can help with the curation of skills and competencies across jobs to ensure that job postings only contain those skills which are critical to the role.

### **Fair employment decision-making**

Removing or minimizing bias at the candidate attraction and hiring phases addresses part of the problem. However, decisions are made about people throughout the employment lifecycle, with near-term and long-term implications for individuals' wellbeing and livelihood. The potential for bias, and the means to address it, exist throughout these decision-making processes.

- *Masking job-irrelevant cues in applicant information.* During recruiting processes, hiring managers rarely have complete information about job applicants, and thus rely on signals and cues in applications and CVs.<sup>54</sup> Personal attributes such as gender and ethnicity are among those signals and cues that can lead to biases, which in turn can skew hiring managers' judgement. Hiring managers may not be aware that they are doing it, but they may overestimate or underestimate the skills and abilities of candidates. For example, a hiring manager in an advertising agency may de-prioritize all older applicants because they think older workers are less capable of the work. In this case, AI that is trained with appropriate algorithms can highlight and make recommendations to either remove, or replace with neutral terms, any wording that may lead to biased judgments (e.g., indicators of age, gender, ethnicity). AI solutions can also provide a blind, unbiased ranking of applicants by matching the applicants' skills and experience, irrespective of age, gender, or ethnicity, with job postings. As a result, organizations can not only significantly reduce time to hire by freeing hiring managers from detailed resume screening, but they can also ensure any initial evaluation and ranking of candidates is bias free.
- *Detecting and minimizing bias across the talent lifecycle.* For other areas of HR practices such as promotion, rewards, and termination, AI-enabled solutions such as an adverse impact analysis tool can detect potential discrimination across different groups

and provide analytics and reporting to HR during the decision-making processes. If adverse impact is detected, organizations will likely want to take steps to address that, and AI-enabled solutions can help in areas such as promotion, by providing open and unbiased access to career pathing opportunities.

AI solutions use data, pattern recognition, and natural-language understanding to gather insights into employees and roles. By matching employees’ skills and experiences with the skill needs of organizations, AI-enabled solutions can suggest roles that are suitable for employees that they may not have been aware of. This can help to increase internal mobility within the organization. Previous studies found that having open positions filled internally can be more cost-effective than onboarding new talent,<sup>55</sup> and those internal hires are found to get up to speed faster<sup>56</sup> and perform better than external hires.<sup>57</sup>

AI solutions can also provide personalized learning recommendations which help employees continuously develop their skills. Perceived career and skill development opportunities can bring employees a sense of belonging, an important element of inclusion.<sup>58</sup>

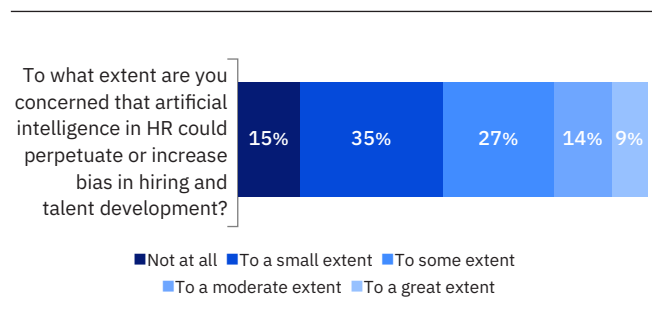
**What is adverse impact?**

Adverse impact is defined as “a substantially different rate of selection in hiring, promotion or other employment decision which works to the disadvantage of members of a race, sex or ethnic group.”<sup>59</sup> When “a selection rate for any race, sex, or ethnic group is less than four-fifths (or 80%) of the rate for the group with the highest rate”,<sup>60</sup> adverse impact is established and organizations may face challenges in the form of discrimination lawsuits.

**A cautionary word on AI and bias**

Despite the great promise of AI, one in five (23 percent) of HR professionals surveyed are concerned that AI in HR could perpetuate or even increase biases in hiring and talent development (Figure 3). Given recent headlines about bias in AI tools (e.g., some AI-based hiring tools showing biases against certain groups of job applicants), their concern is understandable. Artificial intelligence is judgment neutral at the outset, but AI relies on data that are collected and selected by humans, and AI is trained with machine learning (ML) algorithms that are created by humans. Given that the development of AI solutions requires humans to make decisions (e.g., about how data are collected and what samples to use to train the machines), it is essential to continuously test datasets and model outcomes for bias and make adjustments as necessary.

Figure 3. One in five HR professionals are concerned that AI could perpetuate or increase biases



Source: 2018 IBM and UNLEASH HR professional survey (n=182)



## Evaluating your journey to inclusivity

Creating an inclusive organization requires providing equal access to opportunities and making equitable decisions throughout the talent lifecycle. These actions should enable a diverse and inclusive organization, in which everyone can contribute to their fullest potential. As we have discussed in this paper, AI technology can help to achieve this goal by mitigating bias.

The following considerations can help organizations evaluate progress on their journey to inclusivity:

- **Ensure equal access to opportunities.** Ensuring internal and external job applicants have equal access to job opportunities is the foundation of D&I. Organizations should ask themselves:
  - Are our HR practices compliant with legislative requirements?
  - Where are our jobs posted? Who sees them? Are we targeting specific groups, or are they broadly available?
  - Is the language in our job ads inclusionary or exclusionary?

AI solutions can support HR professionals in ensuring jobs are posted appropriately and job ad language is free of biases.
- **Make fair employment decisions.** Organizations should verify their employment decision processes are free of bias by asking themselves:
  - Is there statistical evidence of bias in our decisions (hiring, compensation, promotion, etc.)?
  - Are the datasets on which predictive models are based limited to (or dominated by) certain groups?
  - Are features/predictors in the models highly correlated with factors such as age, gender or race?

AI solutions can help organizations avoid bias in HR decisions.

- **Build a diverse organization.** The foundations of equal access and fair decision-making should enable organizations to build a diverse workforce. This can be evaluated by asking:
  - Does the demographic profile of our organization reflect the communities in which we operate?
  - Does our demographic profile reflect the communities we serve?
- **Create an inclusive organizational culture.** As research has established, the benefits of diversity can only be fully realized when everyone feels included and able to fulfill their maximum potential. To evaluate this aspect of culture, organizations should ask:
  - What is the work experience of different groups in our organization?
  - What is our procedure for reporting and addressing harassment?
  - Does everyone in our organization have the opportunity to be heard?

While these considerations will help evaluate progress, organizations looking to adopt AI should also be mindful of the critical success factors for such a project.

## Recommendations: three critical actions for success in using AI to enhance D&I

AI holds great promise for creating more diverse and inclusive workplaces given its ability to reduce biases and add objectivity into employment decision-making. However, if AI solutions are not appropriately developed, they can result in biased outputs which can damage D&I.<sup>61</sup> When organizations consider adopting AI in HR to enhance D&I, there are three critical actions:

- **Bring in the right expertise.** When it comes to training AI, it is very important to involve both experienced industrial-organizational (I-O) psychologists and data scientists. I-O psychologists bring expertise in data collection and legal requirements, so the data used to train machines can be free of biases and meet EEO requirements; data scientists bring their expertise in model building and algorithm creation to reduce any biases in models and algorithms.
- **Adopt frameworks for fairness.** Using standardized job descriptions and competency models can help organizations eliminate personal subjectivity by focusing on skills and behaviors rather than other potentially biased attributes. An AI-enabled framework can provide clear, core leadership and technical skill requirements and proficiency descriptions that may be used across functions, systems and geographies to ensure a consistent and objective benchmark for assessing employees and job candidates alike.
- **Use the right data and the right algorithms.** Biases can occur in data selection as well as algorithm creation. It is important to first collect a high-quality dataset and then test for and mitigate bias in the data being fed into the AI machine. Algorithm outputs should also be checked, with model features adjusted as needed to mitigate bias.

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