

Harnessing Technology in Talent Acquisition: Opportunities, Challenges, and the Imperative for Ethical Innovation

Usha Rudradat

Department of Management, Texila American University, Guyana

Abstract

As technology continues to transform human resource (HR) functions, its role in talent acquisition has become increasingly critical. This paper explores how technology enhances recruitment by streamlining processes, increasing candidate reach, and reducing costs, while also addressing emerging challenges. Attracting Millennials, the largest and fastest-growing workforce segment, requires modern strategies such as personalized outreach, social media engagement, and a compelling Employee Value Proposition. Digital tools like video interviews, gamified assessments, and mobile-friendly platforms facilitate efficient screening and diverse candidate pools. Additionally, onboarding platforms integrate automation, socialization, and digital training, improving new hire experience and engagement. However, with these advancements comes the risk of algorithmic bias, which may reinforce pre-existing inequalities if not properly monitored. Studies show that algorithmic models can disadvantage certain groups, such as women or minorities, by relying on biased historical data. Case studies, including those involving Google job ads and judicial risk assessments, illustrate these concerns. To mitigate such risks, organizations are encouraged to audit algorithms and balance automated processes with human judgment. This paper concludes that while technology can revolutionize talent acquisition, it must be used responsibly. Leveraged correctly, it enables organizations to attract, assess, and retain top talent efficiently. However, companies must continuously evaluate these tools to ensure fairness, inclusivity, and alignment with organizational goals.

Keywords: *Algorithm Bias, HR, Millennials, Onboarding, Recruitment, Talent Acquisition, Technology.*

Introduction

As companies move to transform their HR function, the role of technology in talent acquisition has grown significantly. When used appropriately, it has the power to drive recruiting and attract the Millennial workforce. Additionally, technology can streamline the talent assessment process. Onboarding is another area in which companies are increasing their technological capabilities. Indeed, there are many benefits to implementing technology in a company's talent acquisition strategy. As these tools are increasingly used, however, it is

important to understand their risks and address them accordingly [13, 17].

Discussion

Attracting Young Talent

Millennials (people born between the early 1980's and late 1990's) are not only the largest segment of the work- force, but they are also the fastest-growing one; they are projected to make up 75% of all U.S. employees by 2020. HR teams are discovering that they need to revise their recruitment strategies if they are to connect with younger workers who appreciate different aspects of work than their older counterparts. Coaching Millennials, a

Washington, D.C. area consulting firm, points out that many companies do not understand the younger generation's expectations of which communication is expected to occur throughout the recruitment process [18].

To successfully attract young talent, companies must stop treating recruitment as a transactional process. Instead, recruiters must actively and continuously identify specific skills, search for talent through various social media platforms (LinkedIn, Glassdoor, Facebook, etc.), and reach out to candidates directly. While the more traditional avenues of attracting talent remain important in talent acquisition, the influence of social media in this space is growing.

Social Media in Recruiting

There are several ways to effectively engage job seekers through social media platforms. For example, social media can be used to promote a company's values and mission, highlight the company's top employees, and show-case company-led volunteer opportunities that support the local community. Partnering with universities' social media teams also helps organizations raise awareness of job openings, particularly those meant for graduates and prospective interns. Recruiters can also encourage colleagues to share formal and informal company events via social media that demonstrate the inclusion and values-based culture found in their workplace. Perhaps most importantly, social media is the medium of authenticity. It is therefore necessary for a company's activity and efforts on every social media platform to be authentic, rather than staged, and perceived to be executed by people in and outside of HR [18].

The Employee Value Proposition

Talent acquisition teams should integrate four categories of their organization to create a strong social media presence: Brand, Opportunity, Culture, and Purpose. Brand refers to the overall excellence and leadership

of a company; Opportunity involves challenging work, salary, and a clearly defined career path; Culture signals the authenticity and organizational climate; and Purpose refers to the missions, values, and global citizenship of a company. Known as the employee value proposition, these categories indicate to a job seeker whether he or she is a good fit for the company in question and vice versa. As Millennials follow prospective employers on LinkedIn, Glassdoor, Instagram, and company websites, HR and the talent acquisition group must integrate elements of their employee value proposition that will appeal to them. This can be done by creating photo and video stories on Instagram, featuring articles on LinkedIn, and updating the company website's layout and presentation [14].

As the composition of the workforce becomes more diverse, it is important that companies understand the evolved definition of diversity. Mike Rickheim, Vice President of Global Talent Acquisition, Engagement, & Inclusion at Newell Rubbermaid Inc., explains that "Millennials are not distinguished by gender or skin color; they are diverse in their attitudes, thoughts, perspectives, and styles" [16].

Looking in the Mirror

Lastly, as HR strives to advance its talent acquisition efforts, team members must evaluate their current recruitment capabilities, identify challenges and areas for improvement, and seek to make changes where necessary. The SHRM Foundation cites several challenges that companies are facing [4]. For example, applicants often withdraw their applications during the recruitment process. One way to address this is for companies to start their recruitment processes earlier and make timely job offers. Another issue that many companies are facing is that they lack employee referral programs, resulting in smaller, lower quality candidate pools. To overcome this challenge, companies can offer a referral bonus contingent

on retention for one year and on satisfactory new-hire performance. An additional issue is that some recruiters may have different yields in terms of the number and quality of their hires. A potential solution for this issue is to leverage those recruiters with the best yields and train the recruiters who may not be performing as well. While these and several other challenges may exist, it is important that the perspective of the Millennial (and every other job seeker, for that

matter) always be considered. In SHRM Foundation's study, one candidate summarized the implications of the recruitment process well: "I think a lot of people look at recruiting as reflective of the company, and in many cases, that's absolutely accurate. Despite the fact that other factors matter, people do make choices based on how they're treated in the recruiting process" [4].

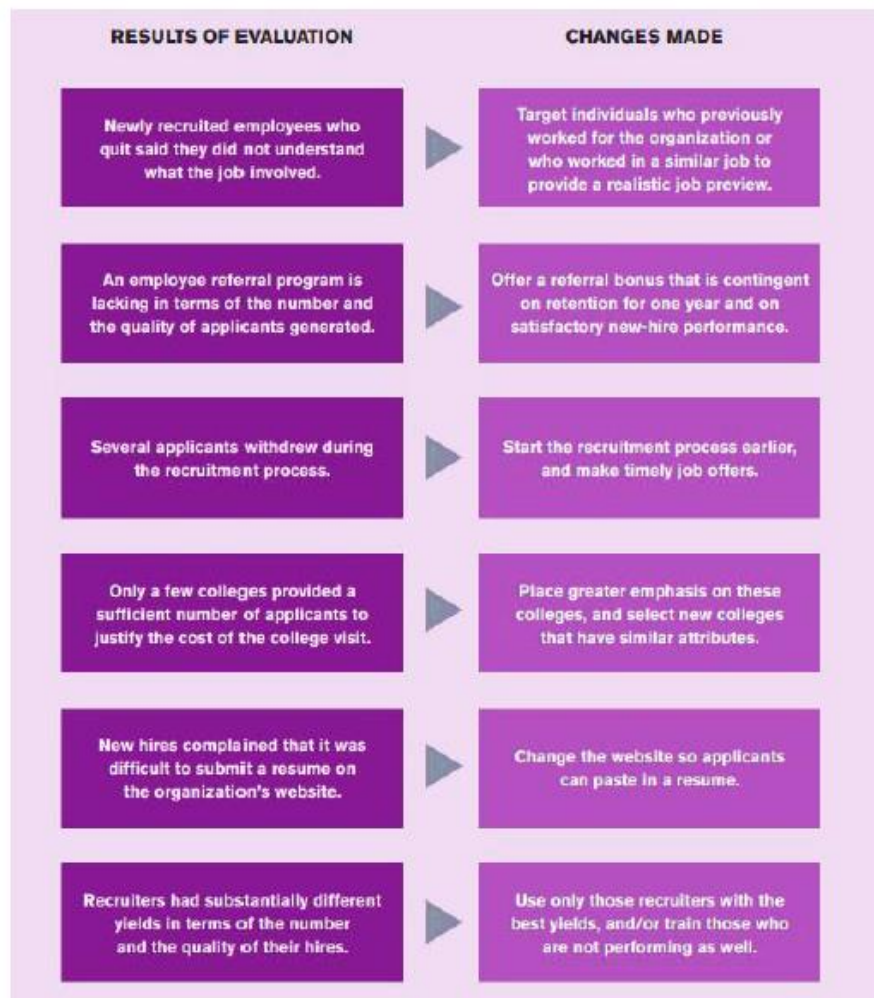


Figure 1. Possible Changes Based on Evaluation of Past Recruitment Activities.

Note: Adapted from [8]. Emma, 2020, Measuring and Evaluating Recruitment Results. TalentVis, <https://talentvis.com/en/news-and-insights/Measuring-and-Evaluating-Recruitment-Results%C2%A0>

Figure 1 highlights how organizations can improve recruitment effectiveness by evaluating challenges and implementing corrective measures. For instance, when new recruits quit because they did not understand the job, realistic job previews were introduced.

To address weak employee referral programs, referral bonuses tied to retention and performance were offered. Early withdrawals in the recruitment process were reduced by starting earlier and making timely job offers. Colleges producing better applicant pools

received more emphasis, while website difficulties in submitting résumés were solved by enabling applicants to paste them. Lastly, recruiter performance was standardized by using high-yield recruiters or providing training for weaker ones.

Analyses

Tech and Talent Assessment

The number of companies that are adopting new technologies and tools to assess candidates' skills before making hiring decisions is increasing. There are currently six major technological advances that these companies are using to assess candidates:

Unsupervised online testing. Unsupervised online testing has become the standard for assessment administration because it increases efficiency in the recruitment process by decreasing the time needed to fill vacancies while reducing costs. However, unsupervised online testing prompts two major concerns: test security and candidate integrity [15]. Saville, a research-based psychometric assessment tool, has the analytic capacity to build a uniform evaluation model to score candidates based on behavioral attributes [20]. This tool can more objectively predict candidates' possibility to succeed in the organization.

Computer adaptive testing. Computer adaptive testing allows for the dynamic selection of questions from a large set of potential items based on the way that an individual candidate responded to the previous question: If a candidate responds correctly, the next item will be more difficult; if a candidate responds incorrectly, the next item will be less challenging. Computer adaptive testing provides more insight into individual candidates by creating customized assessments with unique combinations of items and levels of difficulty based on each candidate's level of ability and knowledge demonstrated on prior questions [15]. Computer adaptive testing creates more secure and efficient assessments, with fewer items in less time, to meet the

demands of candidate-centric hiring [2]. To ensure candidate integrity, some organizations ask candidates who have progressed through the hiring process to complete a brief onsite assessment at a convenient point to verify the candidate's online score.

Mobile assessment. Mobile devices may be more readily available than computers to underrepresented groups, including African Americans, Hispanic Americans and women. Assessment administration on mobile devices can therefore result in larger and more diverse candidate pools. A new assessment that uses mobile-centric design principles has arisen to optimize the user experience [19]. There is currently a demand for innovative assessments that go beyond the more traditional multiple-choice evaluations and that look and feel more like games.

Low-effort assessment. Low-effort assessment uses machine learning to sift through large amounts of unstructured information, including resumes and applications, to collect predictive information about candidates. The information is coded and validated against work outcomes, such as job performance and retention, to produce algorithms that managers can use to inform their hiring decisions [20]. These techniques automate identification and scoring of predictive information so that large numbers of candidates can be screened in minimal time at a low cost.

Gamification. Unilever uses a gamification solution provided by Pymetrics. Applicants spend 20 minutes playing 12 neuroscience-based games. This provides Unilever with insight into candidates' various capabilities such as problem solving, personality and communication style [19].

Video solutions. More companies are using video interview solutions such as HireVue. HireVue records candidates' responses to preset questions and then analyzes and scores them based on tone, body language, and keywords [20]. Companies are also using video

job preview solutions such as Skill Scout to enable candidates to preview the actual tasks they will perform on the job, thus increasing the possibility of successful candidate-job matches. [19, 20].

Onboarding and Technology

There are many technological tools that help companies to use the time between the pre-

boarding processes and the actual starting dates of new hires more efficiently [9]. These tools are meant to leverage technology's strengths to provide better experience for new employees. A few examples of these strengths are automation, socialization, digital training, and metrics tracking.

Table 1. shows onboarding software systems.

System	URL/Phone	Customers	Features	Price
BambooHR Employee Self-Onboarding	www.bamboohr.com 866-387-9595	AppFolio, Nudge, Seward Community Co-op	<ul style="list-style-type: none"> Forms can be filled out, signed and stored online. "Getting to Know You" e-mail sends an introduction to team members that includes custom questions and conversation starters. New-hire packet with required documents. 	The onboarding feature is included in BambooHR's HR management platform, which starts at \$7 per employee per month.
Halogen Recruiting and Onboarding	www.halogensoftware.com/solutions/recruiting 866-566-7778	Fairbanks Hospital, SGT Inc., CPP Inc.	<ul style="list-style-type: none"> Identifies and attracts candidates. Provides consistent candidate experience. Speeds time to employee productivity. Puts feedback, collaboration and engagement at the center of the employee experience. 	Licensing pricing for a company of about 500 employees is \$10,000 a year when purchased with Halogen Performance solution.
iCIMS Onboard	www.icims.com 800-889-4422	Crunch, Kate Spade, New Balance	<ul style="list-style-type: none"> File library includes documents such as direct deposit, benefits and tax forms. Automated notifications of tasks based on job type, department, location and more. Candidate experience surveys. 	The monthly fee is based on products purchased and number of users. There is a one-time implementation fee.

Onboard Express	www.onboardexpress.com.au +61-3-9029-2907	Financial institutions, international construction company	<ul style="list-style-type: none"> • Candidate portal with secure login. • Audit trail of offer and policy acceptances. • Company video and welcome message. 	There is a one-time cost of \$5,000, plus \$35 per onboard.
Oracle Taleo Onboarding Cloud Service	www.oracle.com 800-392-2999	Ruby Tuesday, Logicalis, Barco N.V.	<ul style="list-style-type: none"> • Connects employees to HR systems so they can easily manage tasks online. • Personalized portal for all new-employee information and forms. 	Not available
SilkRoad Onboarding	www.silkroad.com/hr-solutions 866-803-9663	Lord Fairfax Community College, Tenet Healthcare, eBay	<ul style="list-style-type: none"> • Automatic e-reminders and triggers. • Customized automatic workflows. • Consistent new-hire experience. 	Not available
WorkBright	www.workbright.com 844-370-1783	Edible Arrangements, Avid4 Adventure, Geneva Glen Camp	<ul style="list-style-type: none"> • Designed for businesses hiring more than 50 employees per year. • Automated reminders. • Dashboard preloaded with all applicable forms. 	

Note: Adapted from [9]. Ferrazzi, K., 2015, Technology can save onboarding from itself. Harvard Business Review Digital Articles, 2–5, Business Source Complete, Ipswich, MA.

The adapted material presents a comparative analysis of various onboarding software systems. It highlights how technology is being used to streamline and improve the onboarding process, moving it beyond manual, paper-based tasks. The table 1 summarizes key vendors by detailing their target customers, specific features—such as digital forms, automated notifications, and personalized portals—and their pricing models. This aligns with the article's central argument that technology can rescue onboarding from inefficiency by automating administrative burdens, ensuring consistency, and enhancing the new hire experience, ultimately leading to faster productivity and better engagement.

Automation. Automated onboarding software and tools make it easier for new hires to authorize background screening, view benefit plan options, and sign various forms. Depending on the product, additional capabilities may include interfaces with third parties, such as business card vendors, as well as side-by-side benefit plan comparisons. Automated onboarding software can also be integrated with E-Verify, the federal government's online system for Form I-9 verification, which helps companies to comply with government regulations [9].

Socialization. Onboarding platforms have social networking capabilities to connect employees with other new hires, mentors, managers, and team members. Social activities

can be posted and organized through the platform. These in-house and outside events quickly familiarize new hires with the company's culture while they participate in social activities [10]. Some platforms even offer access to an ever-expanding catalogue of aggregated high-return practices (i.e., the assignment of an onboarding buddy, or taking a deep dive into the product with a new teammate) [9, 10].

Digital training. Onboarding platforms can be integrated with other HR systems including training and learning platforms and video

streaming. Companies can increase employee engagement through onboarding programs by providing new hires opportunities to earn certifications, to develop skills through cross-training, and to move laterally and vertically throughout the organization [10].

Onboarding metrics tracking. Advanced onboarding technology allows companies to configure reports and third-party intelligence into manager consoles for greater visibility, more interactive formats, and customized summaries [9, 10].

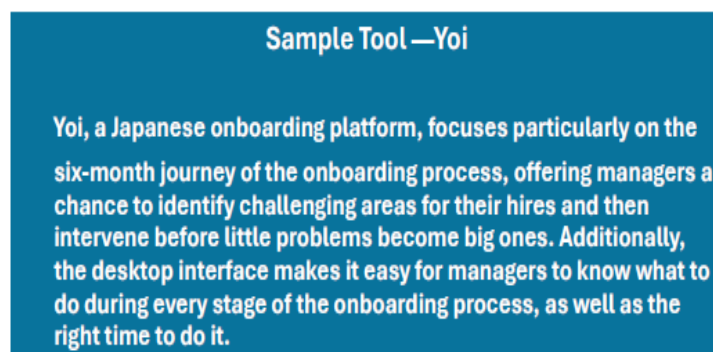


Figure 2. shows findings from onboarding a sample tool-Yoi.

Note: Adapted from [9]. Ferrazzi, K., 2015, Technology can save onboarding from itself. Harvard Business Review Digital Articles, 2–5, Business Source Complete, Ipswich, MA.

Figure 2 highlights the onboarding tool Yoi, a Japanese platform designed to support the six-month onboarding journey. The tool enables managers to identify potential problem areas early and intervene before they escalate. Its desktop interface further assists managers by providing clear guidance on what actions to take at each stage of the onboarding process, ensuring timely and effective support for new hires.

Results

Benefits of Using Technology in Talent Acquisition Strategies

Companies that integrate technology into their talent acquisition strategies reap many benefits. The predominant benefits that drive businesses to use technology are decreased costs, increased efficiency, and increased candidate reach. Technology implemented

during the different stages of talent acquisition will result in differing benefits.

Decreased Costs

Consistent onboarding. Companies can establish companywide onboarding programs to increase consistency in the new hire experience. Successful onboarding is shown to reduce costly turnover while also reducing the time it takes for new hires to become fully productive [9].

Travel expenses. Video interviews, early screening, and posting jobs online reduce the amount that companies spend on airfare and hotels for remote interviews and candidate sourcing [7].

Increased Efficiency

Targeted recruiting. Websites like LinkedIn and Glassdoor allow companies to seek out

candidates with desired talents and skills. In turn, it helps candidates self-select into jobs that best match their skills [7].

Early screening. HR and management can reduce the amount of time and resources that they spend screening and interviewing candidates by using online personality tests, aptitude tests and video interviews to eliminate unqualified or less competitive candidates [3].

Automated onboarding. Companies can reduce costs associated with onboarding by using technology during the onboarding process. This will reduce the amount of administrative work required by managers and team members, allowing them to spend their time on other tasks [3].

Increased Reach

Digital brand. Technology enables companies to create digital brands that can appeal to candidates and even give companies an advantage over their competitors. Dell and Heineken are two companies that have intentionally created digital brands to recruit talent [19]. Additionally, technology allows companies' job advertisements to reach thousands of mobile job seekers or social media users who may not have seen their opening via traditional sourcing methods [19].

Geographic reach. Using social media and job sites to post requisitions offers a way for companies to advertise their jobs across the nation or multiple nations immediately. This can be especially important when searching for candidates with specific or rare skillsets [19].

Risk of Technology in Talent Acquisition – Algorithm Bias

New technology brings great efficiencies and innovation to the talent acquisition process. However, technology also carries certain risks, most notably the potential for disparate impact. Firms must recognize these risks and treat them with the same scrutiny as their other HR related processes.

The concept of algorithm bias initially appears as a paradox. Data and algorithmic modeling are supposed to eliminate underlying human biases that can undermine impartial hiring decisions [15]. After all, as Indeed.com chief economist Jed Kolko phrased it, "humans are not as rational as economists would like them to be" [12]. Algorithms and data are supposed to compensate for human irrationality. Nevertheless, the functionality of algorithms permits these biases to exist, but with the danger of less internal and external scrutiny and oversight.

Algorithm bias occurs when algorithmic models place a certain category of individual (i.e., race, gender, age) at a disadvantage over others because of the predictive features of the statistical model. Given that algorithms are designed and modified by humans, they are susceptible to human fallacies. [5] That is not to suggest that there is explicit prejudice in the creation of said algorithms, but rather that they can highlight preexisting implicit biases [11].

The more concerning aspect of algorithms and machine learning is how they work. In talent acquisition, algorithm models are intended to take past data (i.e. qualities of high performers and successful new hires) to predict future success in prospective candidates. The problem is that the past success stories could have included preexisting biases such that the algorithm mimics a practice that is prejudiced to begin with [11]. Solon Barocas of the California Law Review explains, "...the algorithm will perpetuate implicit hiring practices because that is the only data it has to go off" [2]. The crux of the issue centers on the data mining process rather than overemphasizing the weight of variables [2].

Case Studies in Algorithm Bias

Google Job Ads for High Paying Jobs

A 2015 Carnegie Mellon study concluded men were shown ads for high paying jobs (\$200,000+) at a disproportionately much higher rate than women [6]. Researchers noted

that when they changed gender in Google Ad settings to female, they received fewer instances of career coaching services for executive positions – a disparity of 1,852 ads for men compared to 318 for females [6]. This example has significant ramifications for the push-pull talent acquisition process. If, from the onset, firms are skewing the candidate pool via these ads, they will inadvertently hire more men at higher rates and create additional pay disparity without being cognizant of such consequences.

Algorithms Designed to Predict Repeat Offenders

Non-profit newsroom ProPublica researched the use of algorithms in the judicial system to determine the likelihood of repeat offenders [1]. The study determined that blacks were 45% more likely to be designated as a higher risk than when compared with their white counterparts [1]. Although this is not technically an HR related issue, the implications certainly can be carried over, particularly in the process of screening resumes to select future candidates and high potentials. Furthermore, algorithms could inadvertently potentially screen out a protected class.

Taking Actions to Mitigate Algorithm Bias

Given the current lack of regulation and oversight, algorithm bias is currently a nebulous area of HR. Nevertheless, there are certain steps that firms can take to protect themselves from these biases:

1. Establish an audit committee. Assign an external or internal committee to formally audit the main algorithms to test for any biases [11]. By holding algorithms to the same rigorous standards as other human processes, companies can prevent

inadvertent prejudices. If companies hire third party software developers for their talent acquisition algorithms, they should seek proof of auditing or oversight, as well.

2. Combine algorithms and human forces. Data should be used to influence the decision making of companies, not be the sole determinant of decisions [11]. By using data and human critical thinking together, they function as error and mistake proofing practices for each other's underlying biases.

Conclusion

Talent Acquisition is during a technological revolution that is changing the dynamic of how companies attract and retain talent. Although experiencing drastic changes, the TA function is not disappearing, rather it is evolving. After all, technology is a tool that TA should use to accentuate and improve employee experience rather than using it as an escape rope to cut corners. Technology, like any tool, if used improperly can be detrimental to the business. However, if leveraged properly, it can streamline processes to create the ultimate experience for prospective employees.

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