



# AUTOMATION, ARTIFICIAL INTELLIGENCE, AND THE FUTURE OF STAFFING AND RECRUITING

*The Business Case for Upping Your AI IQ*

# INTRODUCTION

## Getting up to Speed on the Artificial Intelligence (AI) Landscape

It's hard to avoid the headlines—and marketing campaigns—promising a business revolution driven by artificial intelligence. Despite the saying that “AI is no match for natural stupidity,” staffing firms are by necessity getting smarter about applying AI (or more accurately, automation) to their business models.

AI may be the buzzword du jour, but a long and complex path lies ahead. In fact, AI and related concepts feature prominently on Gartner Inc.'s 2016 Hype Cycle for Emerging Technologies—especially in the “Peak of Inflated Expectations” phase.<sup>1</sup> It doesn't help that many people confuse automation and machine learning—characterized by data sets and algorithms—with true artificial intelligence—the capacity for machines to proactively and independently make decisions.

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DECONSTRUCTING  
THE LEXICON:

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***Check out the AI and  
Automation glossary  
on page 4***

To parse out the reality from the hype, enterprise staffing agencies hoping to drive efficiency and engagement through automation and AI must closely track the ecosystem. To that end, we're taking a closer look at use cases within the staffing and recruiting industry. In this white paper, we set out to explore the following questions:

***What's the difference between automation and artificial intelligence?***

***Where does the industry lie on the maturity curve for adopting these technologies?***

***What's the dynamic between human and automated elements of your workflow?***

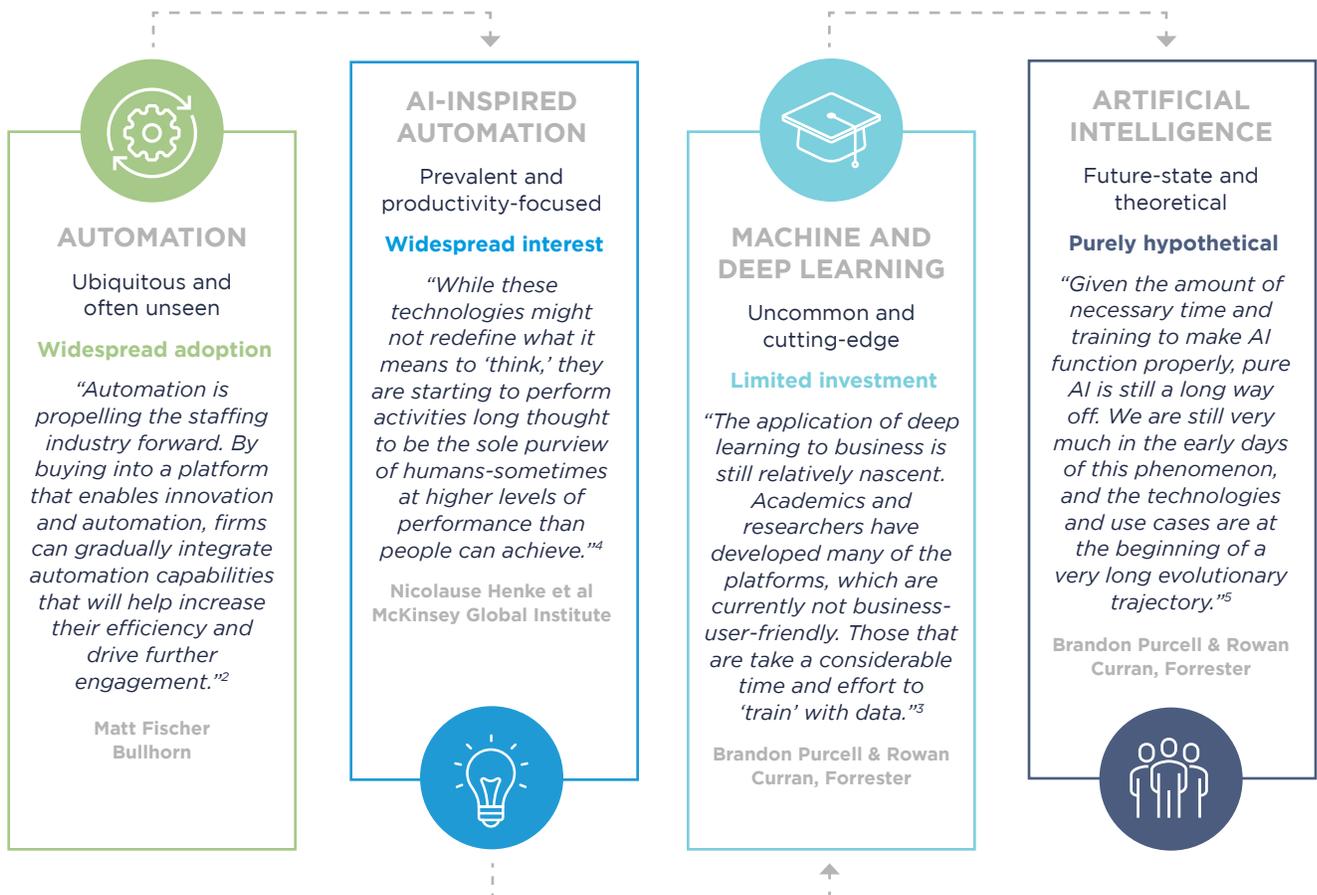
***What should firms be doing now to reduce barriers and promote adoption in their business?***

## The AI Spectrum for Staffing Firms

Automation is as ubiquitous as the email you get letting you know your meal delivery kit is on the way or a text alerting you to suspicious activity on your credit card. On the other end of the spectrum, AI is most dramatically embodied by the sentient humanoid robot whose intentions are both unprogrammable and unknowable. In between lies a huge grey area characterized by chatbots, predictive algorithms, Siri, Alexa, and self-driving cars.

A linear progression exists between automation and AI, and our industry falls somewhere near the front end of that progression. We've broken down the spectrum related to staffing into four phases to better illustrate the technology landscape and where true innovation is taking place.

### The AI Spectrum for Staffing Firms



# AI AND AUTOMATION GLOSSARY

A quick guide to common terms and tools.

## ALGORITHM

An algorithm is a specific set of mathematical or operational instructions that determines how a computer program analyzes and uses data to accomplish a task or solve a problem.

## ARTIFICIAL INTELLIGENCE (AI)

Artificial intelligence is the theory and development of computer systems that can independently perform tasks that normally require human intelligence, including the ability to reason, discover meaning, generalize, and learn from past experience.

## BOT

A bot (short for “robot”) is an automated program that runs over the Internet, either automatically or in response to specific input. Common examples include web crawlers, chat bots, and malicious bots.

## CHATBOT

Computer programs that conduct conversations with humans, chatbots simulate how humans would behave via natural language processing.

## DEEP LEARNING

A branch of machine learning, deep learning uses neural networks that mimic the interconnected neurons within the human brain. Deep learning platforms are used to solve problems of pattern recognition and automation across very large and complex data sets.

## MACHINE LEARNING

Machine learning is the process through which a computer system gets better at identifying patterns, associations, and insights through exposure to “experiences” (training data) rather than by being explicitly programmed.

## NATURAL LANGUAGE GENERATION

NLG technology transforms data into understandable written or spoken language. NLG is used to develop conversation agents that mimic humans as well as other automatically-generated content.

## NATURAL LANGUAGE PROCESSING (NLP)

NLP technology lets computers understand human languages as they are spoken. Applications include language translation, speech recognition, and text recognition.

## PREDICTIVE ANALYTICS

An application of machine learning, this term refers to the act of analyzing current and past data to look for patterns that can improve predictions about future events or performance.

## ROBOTIC PROCESS AUTOMATION (RPA)

RPA technology allows computer software or a “robot” to capture and interpret existing applications for processing a transaction, manipulating data, triggering responses and communicating with other digital systems.

## VIRTUAL PERSONAL ASSISTANT (VPA)

Also known as a digital assistant, a VPA uses natural language processing capabilities to complete electronic tasks that might have previously been handled by a human assistant.

# THE PHASES OF THE SPECTRUM

## AUTOMATION

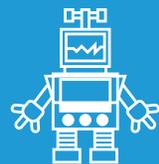
### *Ubiquitous and often unseen*

“What many people think of as artificial intelligence and machine learning is actually automation,” according to Bullhorn Founder and CEO Art Papas. “The concept and technologies behind automation are not new, but staffing firms are just now getting better and better at leveraging the technology that others have built.” That technology has very real implications for recruiting and every other industry, sooner than later.

At its core, automation involves minimizing human intervention and relies on discrete triggers: if X activity happens, deliver Y response. Within the recruiting industry, much of the action in automation lies in pragmatic tools, such as replies to job applicants and parsing of online applications. Often this automation is transparent to the end user, whether that is the candidate or the recruiter themselves.

### **Moving Data with Bots**

Bots aren't just for chatting. According to Harvey Nash's Group IT Director Gavin Wilkins, “We want to develop bots to fundamentally move data between databases so that we don't have clunky processes requiring administrators to oversee them. For example, moving a contractor from placement to timesheet processing and then to a managed service and finally to offboarding.”<sup>6</sup> Similarly, Cielo's Vice President of Global Technology Solutions Adam Godson touts the value of robotic process automation (RPA) to perform repetitive data transfer, such as when a hard integration with a client's HRIS platform isn't possible.



## AI-INSPIRED AUTOMATION

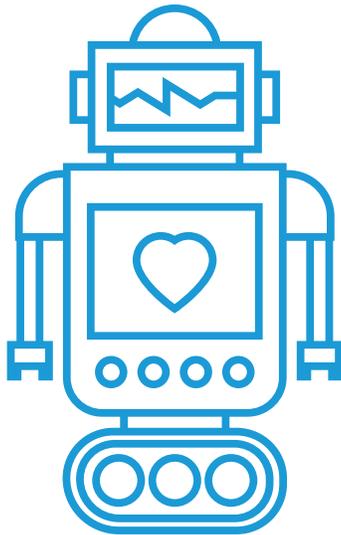
### *Prevalent and productivity-focused*

We're still talking about automation, but now we're edging into the space where functionality mimics human interactions or assumes routine and time-consuming recruiting tasks. Many of these technologies take on a "flavor" of AI while utilizing data and analytics capabilities. Think of a chatbot that screens candidates for eligibility to work in the U.S. or availability for different shifts.

#### **Example: The Virtual Personal Assistant**

"Who couldn't use a recruiting assistant to help with scheduling and responding to basic inquiries?" asks Art Papas. "Until now, it hasn't been cost-effective." Another example: Cielo has automated scheduling of

approximately 50,000 phone screens a month across its network by allowing candidates to self-schedule interviews.



In the near term, look for basic automated outreach and engagement tools—such as search and match, initial screening, and scheduling—to become table stakes in the industry. "We're still in the early adopter phase but the interest is tremendous. There's clearly a need for this and a huge appetite to give it a shot," says Eyal Grayevsky CEO and Co-founder of Mya Systems, the firm behind the development of "your team's A.I. recruiter."

## MACHINE AND DEEP LEARNING

### *Uncommon and cutting-edge*

Machine learning—the ability for computers to “learn” from data—lies at the heart of AI functionality. Deep learning is an extension of machine learning that leverages neural network algorithms, which mimic brain neurons. Machine learning detects patterns and delivers hidden insights, such as personalized shopping recommendations and at-risk credit applications.

In the recruiting world, machine learning is being used to optimize client and candidate interactions across channels by processing massive amounts of data and informing action in real-time. The applications are sophisticated and varied, and include back-end predictive analytics to evaluate pipeline profitability and front-end conversational experiences based on natural language learning.

***“Anything that automates repetitive tasks adds value right away. When you’re doing predictive work, adding value in a way that’s repeatable across different clients is more challenging.”***

***~ Summer Husband,  
Senior Director, Data Science  
at Randstad Sourceright***

### **Survival Analysis**

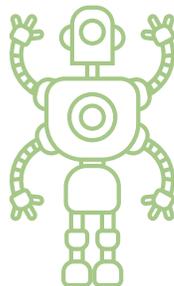
Randstad Sourceright is using survival analysis to test the applicability of machine learning techniques to profitability analysis and resource allocation. The term comes from medical research and predictions of how likely a patient is to be alive at incremental points after diagnosis, based on various factors. Replace “patient” with “open job” and you can see why the strategy can be used to evaluate recruiting risks.

## ARTIFICIAL INTELLIGENCE

### *Future-state and theoretical*

According to Forrester research, “Given the amount of necessary time and training to make AI function properly, pure AI is still a long way off.”<sup>7</sup> There’s some debate about semantics and whether being able to make predictions using machine learning constitutes AI.<sup>8</sup> However, the holy grail of true artificial intelligence assigns the capacity for machines to proactively and independently exhibit intelligence.

Stephen Hawking famously predicted that “I think the development of full artificial intelligence could spell the end of the human race.”<sup>9</sup> Earlier this year, he, Elon Musk, Google’s Demis Hassabis, and other leading AI researchers and ethicists pledged support for principles to protect mankind from machines and a potential AI arms race.<sup>10</sup> For the foreseeable future, we’re more likely to be discussing whether robots will take over staffing jobs than whether they’ll take over the world.



# LIMITATIONS AND CHALLENGES

It should be obvious, but applying advanced machine learning to recruiting is not easy to do, nor is it cost-effective at the average staffing firm's scale. ZDNet contributor George Anadiotis explains why this "operationalization" of data science is so difficult: "In modern organizations, there is an abundance of data sources with varying degrees of reliability, these sources may contradict each other, and the size and ingestion rate are also on a different level."<sup>11</sup>

Summer Husband of Randstad Sourceright knows that all too well: "As we build out our machine learning capability, we're constantly working to bring visibility to the data. We have a lot of data coming from different sources that we have to figure out how to fit together."

In the article "Artificial intelligence in the real world: What can it actually do?" Steven Hillion, Chief Product Officer at Alpine Data Labs, suggests that getting value out of automation lies as much in solving mundane data issues as it is in working with complex algorithms.<sup>12</sup>

## A Job-Centric Environment

In staffing, practical challenges are exacerbated by the "outdated" notion of searching for a job or candidate, instead of results based on data and past behavior, according to Felix Wetzel, Managing Director at zyx associates.<sup>13</sup>

GE's Global Employment Brand Leader Shaunda Zilich agrees: "All the processes, tools, and technologies are set up around jobs instead of candidates. There's an opportunity to shift to a university mindset, where a candidate is accepted based on their match to a company's culture and then they are plugged in where the work needs to be done."

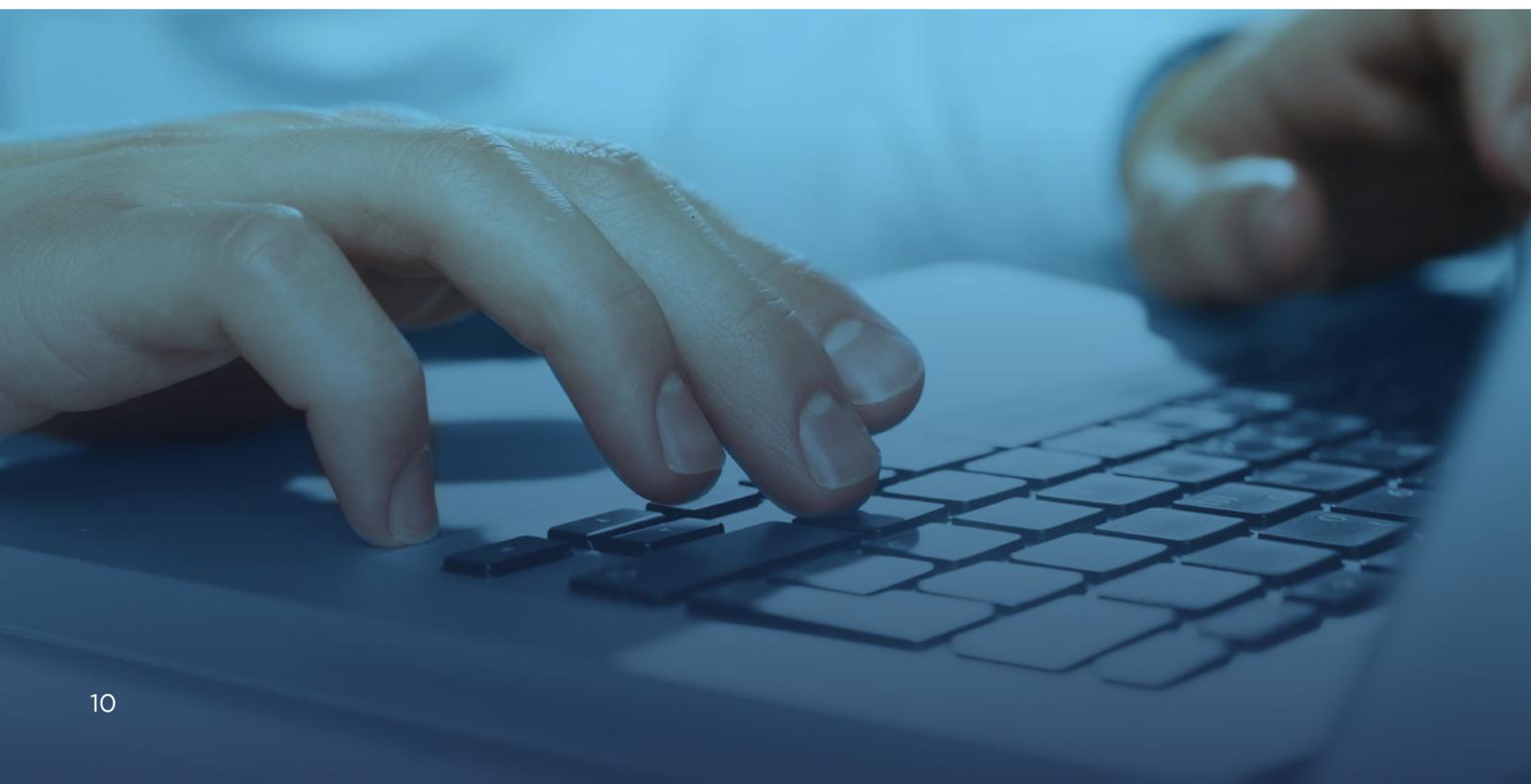
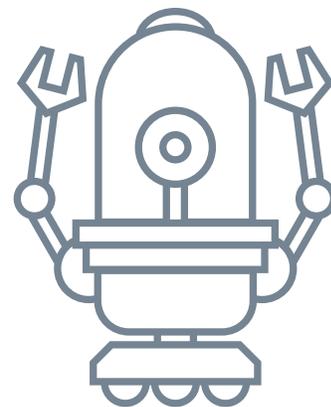


## Privacy-Based Roadblocks

A McKinsey Group Institute report on The Age of Analytics notes that “...the quantity and richness of data collected on candidates is quite limited; the typical individual has far fewer interactions in the labor market than they do on social media or in the course of online shopping. This potential of machine learning in the labor market could be constrained by this factor.”<sup>14</sup>

Art Papas concurs, “People are getting less willing to disclose what they’re actually doing on social sites.” He adds that privacy concerns may outpace innovation: “Privacy is going to beat automation. As automation increases, so will regulation to prevent you from using it to its full capacity.”

These issues are already impacting the recruiting industry; consider the General Data Protection Regulation (GDPR) taking effect next year for European Union citizens. Navigating opt-in requirements for candidate consent requires the compliant collection, maintenance, and retention of data, which many firms aren’t prepared for at this time. As Tania Bowers, General Counsel of APSCo explained in a Bullhorn forum, “It’s easy for people to ask for a GDPR statement, but you can’t get anywhere near that until you know your data.”<sup>15</sup>



# THE HUMAN TOUCH

Managing the interplay between human and automated elements of the recruiting cycle poses specific challenges. According to Accenture research, “Since AI is a form of virtual labor, it will interact with the workforce, contributing and adding value in the same way a human co-worker would. To fully exploit the potential of AI, human and machine intelligence must be tightly interwoven.”<sup>16</sup>

Determining when and where to insert automated touchpoints into a largely human process—and vice versa—takes deliberate process engineering and follow-up. According to Adam Godson at Cielo, “Not everything should be automated. We automate where we intentionally want to, and then we insert intentional human touchpoints in to get the job done more effectively.” The firm uses throughput measurement and web analytics to measure drop-off rates associated with automated tasks.

## Recruiters Must Adapt

Given that a majority of millennials would prefer to use chat technology vs. calling or emailing a company, the risks of disintermediating human recruiters may be overstated. However, as Gerard Hughes of Peoplebank says, “Recruitment involves emotion and empathy; machines cannot replace this. Technology can help us locate the correct people, but it cannot replace the value of human connections.”<sup>17</sup>



Art Papas seconds the notion: “What AI cannot and never will be able to do is predict if someone is willing to take a chance on hiring someone who doesn’t have the specific experience listed as a requirement.” The human component of recruiting will never go away... but it will change.

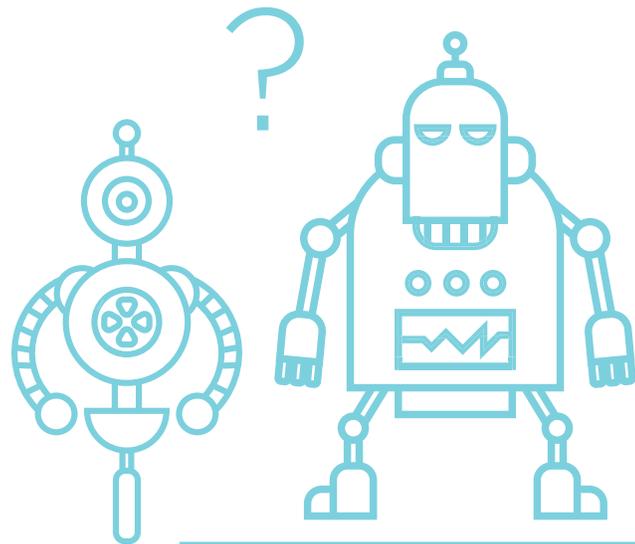
“The future of talent acquisition looks like a combination of branding plus data that funnels someone to the role they should be in. At that point, the recruiter takes on more of a career coaching role through the candidate’s entire journey,” according to GE’s Shaunda Zilich. Recruiters who used to spend half their time making calls and looking at resumes will now be expected to build deeper relationships. Those firms who are the most aggressive in transforming their workforce will have the most success.

## FRIEND OR FOE?

So how much will automation change the daily experience of recruiting? Recruiters spend an inordinate amount of time on non-value-added, transactional tasks. This is especially true for recruiters working on VMS accounts, whom Bullhorn estimates spend more than 50 percent of their available time on non-revenue generating activities, and only one-fifth of their time actually connecting with candidates.<sup>18</sup>

The value of automation for recruiting efficiency can’t be overstated, according to Mya Systems’ Eyal Grayevsky. “If we can solve for bottlenecks by automating the repetitive, routine work, we can enable recruiters to be more effective and focus on more meaningful interactions,” he indicates.

“The impact is tremendous, especially with high volume scenarios. If you can automate the first two or three steps of the process instantaneously while enhancing the experience and quality, it’s a no brainer.”



## Prepare, Don't Panic

That analysis aligns with the opinions of recruiting professionals who believe automation will help to promote (not eliminate) top talent. Recent Bullhorn research found that 67% of staffing leaders were eager to relinquish non-value-adding tasks such as scheduling and screening so they can grow their relationships.<sup>19</sup>

“AI can help you see things that a human can't, so it can make the eventual conversations with humans more productive,” says Summer Husband. “This is the future,” adds Cielo's Adam Godson. “Recruiters who are rock stars and constantly seek to add value are unafraid of automation.”

### The Case for Diversification

Instead of worrying about whether automation will make recruiting jobs go away, worry about whether it will make your clients obsolete. “Enterprise staffing firms need to think about where their business comes from. Are you servicing industries that could be automated entirely, such as truck drivers, payroll clerks, or light industrial? Don't overlook the obvious; that's where the impact is going to be,” say Bullhorn Founder & CEO Art Papas.



# EXTERNAL VALUE

In addition to the low-hanging fruit of reducing recruiting grunt work, automation holds practical implications for client delivery and candidate engagement. Felix Wetzel argues that the impact has not been all positive: “The combination of the two—well-matched [search] results thrown at humans faster—has resulted in a deteriorating customer and candidate experience.”<sup>20</sup>

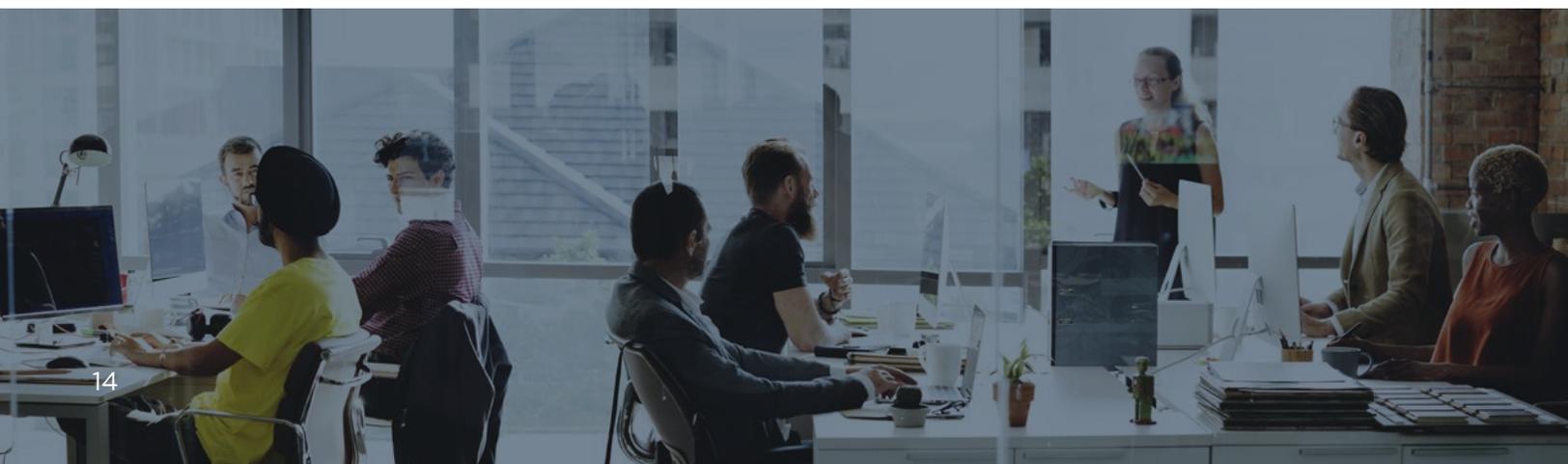
In contrast, most of the industry leaders we spoke to are focusing on the upside. For example, when search and match technology improves upon the limits of human-created search strings, candidates have a better shot at being “discovered.” Eyal Grayevsky notes, “Because of the size of the data set that we are able to aggregate and analyze, AI can surface candidate insights and predictors of performance that enable recruiters to make better hiring decisions.”

## Boosting Candidate Engagement

Automation tools may actually increase candidate satisfaction with the recruiting process by providing more responsive feedback loops and identifying other potential openings that may be of interest. Every interaction fills in a piece of the puzzle for better results, not only for immediate recruiting needs but for long-term loyalty-building programs.

## Staffing and Recruiting Client Impact

Given that a majority of millennials would prefer Clients also benefit from AI-driven innovation. “Its real potential from a business perspective lies in its ability to unlock insight from data to influence smarter decision making,” says Bullhorn’s International Managing Director Peter Linas.<sup>21</sup> Proactive firms will position themselves as experts to help their clients get the most out of their individual data. As Summer Husband at Randstad Sourceright notes, “More and more, clients are coming to us asking ‘how can we use our data to be more effective?’”



An article in Harvard Business Review cautions early adopters to “Remember that each interaction provides an opportunity for a customer to judge the AI system and therefore the brand and company’s performance. What’s more, the interactions with AI can be more far-reaching than any one-off conversation with a salesperson or customer service rep.”<sup>22</sup>

In other words, your chatbot isn’t just a tool for your recruiters, it’s a reflection of your company’s sophistication and service delivery. “Millennials identify this chatbot as the brand’s public face, one which converses with them in brand’s language,” argues Avaamo author Rahul Raju.<sup>23</sup> That’s why many firms choose to be transparent about when they are using bots and automated tools.

### **Is Your Robot a Racist?**

Because automation offers instant scalability, mistakes and missteps are quickly amplified. Perhaps the most infamous example in recent history is Microsoft’s Tay, a Twitter bot described as “an experiment in ‘conversational understanding.’” The title of an article on The Verge says it all: “Twitter taught Microsoft’s AI chatbot to be a racist [a\$\$(o%^)] in less than a day.”<sup>24</sup> Just as with your human employees, training via machine learning can lead to terrible habits, just at a grander scale.



# A BRAND NEW WORLD

Are staffing firms ready for the realities and requirements of pervasive AI-inspired automation? Reviews are mixed. “Automation is moving faster than you might expect,” says Art Papas. “If you think you have ten years before you need to evaluate it seriously, you’re wrong.”

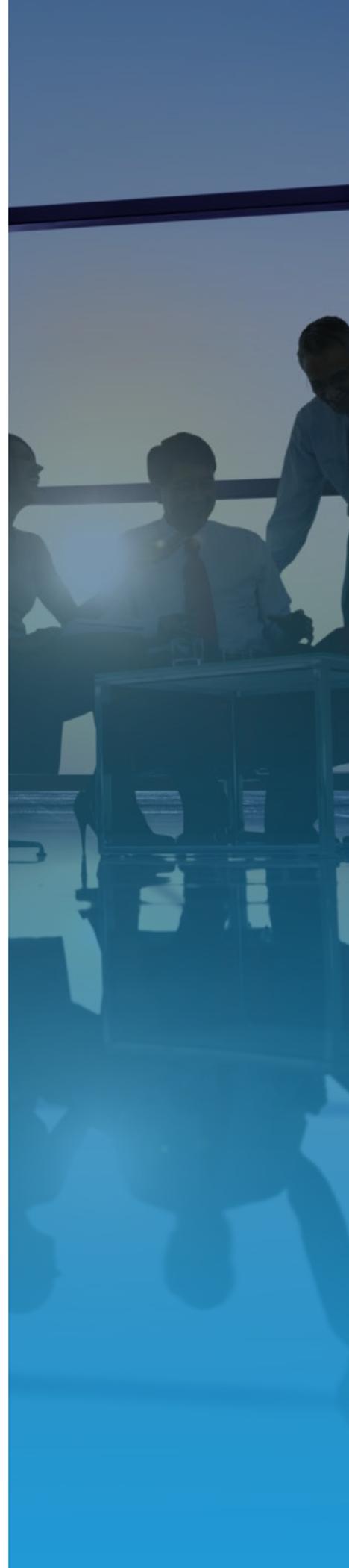
Much of the innovation in our industry is being driven by start-ups, and it can be hard to distinguish between clever marketing and visionary progress. Jamie Salvucci, Director of Operational Excellence at PEAK Technical, advises, “It’s one thing to fall in love with the idea of streamlining your workflows through automation and quite another to deploy a solution at scale. To get the most out of a tool, you must build a close partnership and carefully evaluate the resources and timeline necessary to effectively implement it across the board.”

Plus, many firms do not have the critical mass on their own to capitalize on universal learning principles. Innovation isn’t going to happen on a database hosted on a server in your supply closet. But that doesn’t mean you have to sit on the sidelines.

## **Don’t Wait to Engage**

Art Papas suggests, “The place to start is familiarizing yourself with the technologies that already exist. Most vendors are startups, but they will evolve quickly. You don’t have to implement today, but you have to be educated about what is out there and what your competitors are doing.”

Gavin Wilkins from Harvey Nash also advises, “You have to start small and show useful information and then encourage enthusiasm for the entire process. The worst thing you can do in this scenario, in my experience, is say ‘we’re going to build you an all-singing, all-dancing thing’ as you’ll never get there.”<sup>25</sup>



Some forward-thinking firms are already tackling one roadblock to higher adoption by promoting change in data gathering processes where the benefits are not immediate or obvious. Using contests and gamification strategies, Cielo has created artificial incentives to build a candidate marketplace. “The natural incentive is to hire for tomorrow, not six months down the road, so we incent for the long term strategies that we know are effective, but often get lost because the focus is on today.” says Adam Godson.

## A Team Approach

One thing recruiting leaders agree on is that automation requires cross-functional evaluation and support, from operations,

HR, IT, and finance. Randstad Sourceright’s Summer Husband says, “What’s really powerful is when people who know the industry and its challenges start building out a more in-depth understanding of how to work with data. You need the people who understand the business to play a substantial role in determining how machine learning and AI can help the business.”

Building a business case for automation requires an understanding of data science, a commitment to getting your data in order, and a continuous learning approach. But there’s one other critical requirement: the willingness to take a risk. Enterprise recruiting firms who jump in with both feet and eyes wide open will position themselves to outpace the competition.

*“With our new automation tools and technology, we’ve remained focused on user adoption and training; sometimes we have to pull back on the firehose to avoid overloading our team. But we’re always rethinking what is and isn’t working and we’re always willing to keep working on it.”*

*~ Michael Iandoli, CEO of PEAK Technical*



Visit [www.recruitmentix.com](http://www.recruitmentix.com) and follow [@RIXinsights](https://twitter.com/RIXinsights) on Twitter for more trends impacting the global recruitment landscape.

# ENDNOTES

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