

Robots in Recruiting

The Implications of AI on Talent Acquisition



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Introduction

“ *Accelerating artificial intelligence (AI) capabilities will enable automation of some tasks that have long required human labor. These transformations will open up new opportunities for individuals, the economy, and society, but they have the potential to disrupt the current livelihoods of millions of Americans.* ”

—Executive Office of the President, December, 2016

Earlier this year, IBM added second opinion services to its employees' health plans. Most of the advice doesn't come from a doctor, however, it is provided by Watson, IBM's artificial intelligence (AI) system. Watson boasts one of the world's most advanced neural networks, enabling it to detect things like tumors long before physicians can.¹ Woodside Energy uses AI to manage three decades of organizational implicit knowledge so that technicians can get precise information just by asking. Amazon recently opened the first of many planned "Go" stores in which there are no employees and no check-out lines. AI tracks what you take and puts it in your online shopping cart.² GlaxoSmithKline and Toyota use AI to develop ads that tap real-time data and use natural processing language to interact with customers and answer their questions.³

Broadly defined, the term artificial intelligence (AI) is applied to machines and algorithms that mimic the cognitive functions of human beings, including sight, touch, speech recognition and problem-solving. But for the time being, AI augments and/or automates only specific tasks; for example, medical diagnoses or playing Jeopardy. It does not and may never possess a "general intelligence" similar to the human brain.⁴ AI machines are constantly improving though. This ability to learn creates unprecedented, even unlimited opportunities, as well as challenges, because the machines advance at superhuman speed and scale.⁵

Though they are often invisible, machines, robots and AI are now ubiquitous. They work behind the scenes, in warehouses and factories, and in computers that aid everyone from radiologists to data scientists. They assist "knowledge workers" in every almost every office, hospital and construction site. Already, AI-equipped machines operate entire restaurants, they drive cars and create works of art, all by themselves.⁶ At some point in the future, their capabilities—intelligence if you prefer—may surpass humans' by a factor of thousands or even millions.

The implications for the recruiting profession are immense, just as they are for professionals in almost every other discipline. While the impact on jobs for recruiters—on a large scale—may occur only gradually over the next decade or so, another major implication of AI in recruiting is already upon us. Namely, the myriad ways in which AI is changing the work of recruiters today—particularly in sourcing and initial screening.

AI in Recruitment Today

“ *Predictive statistical analysis, harnessed to big data, appears poised to alter the way millions of people are hired and assessed.* ”

—Don Peck, The Atlantic



Job Advertising

By 2017, it is expected that the majority of ad buying and placement in the U.S. will be automated. Machines will bid out ad space and other machines will buy it. Already, more than two-thirds of digital advertising is automated, rising to almost three quarters in 2017. Since almost all job advertisements today are digital, the rapid and full-on automation of recruitment advertising—programmatic recruitment advertising (PRA) is inevitable.

Yet, PRA is only in its infancy today. According to Chris Forman, founder and CEO of PRA provider Appcast, it cannot really be described as AI. Though sophisticated, the software and algorithms used in PRA models today are hard-coded—they don't learn on their own. Nevertheless, they optimize the placement of ads, increasing the odds that well-suited candidates will apply to positions. Ads are delivered based on what the algorithm knows about each person's profession, skills, interests, where they "hang out" on the web—even whether or not they are active in their job search.¹²

Amsterdam-based Recruitz.io employs technology like Appcast's to deliver ads to users of non-job platforms—social media and Google users, for example. The algorithms use rich user-profile information provided by social media sites and combine it with behavioral data to deliver highly targeted job ads. The technology learns, in a sense, by performing hundreds, even thousands of small experiments known as A|B tests in real time, to determine what is more likely to cause a person to click on an ad and optimize cost and quality.

The algorithms determine what sort of images appeal to each job seeker, what time of day they are most likely to be receptive and, of course, what job titles and content within the ad are more likely to get and keep their attention. Recruitz.io also employs a chatbot tool named Adam who interacts with recruiters. As a user-friendly interface to Recruitz.io's complex algorithms, Adam simply asks recruiters to describe the candidates they're looking for, and the AI does the rest.¹³

Programmatic recruitment advertising—though only emerging as a technology today—targets a component of recruiting that is ripe for automation. Even large teams of recruiters working full-time cannot effectively analyze all of the places their ads might appear, then determine the best places for each ad, the right amount to pay for those ads, and precisely when to place them, remove them, or adjust them in the midst of a campaign. Programmatic technology performs these calculations in microseconds, millions of times per day, saving significant time and money for recruiters, while also improving outcomes—the very recipe for automation.



Automated Matching

More than half of recruiters report that sifting through potential candidates is the hardest part of their work.¹⁴ There are hundreds of millions of candidate profiles and resumes across the internet. No recruiter, not even a Boolean black belt, can cope with those quantities.¹⁵ AI surpasses Boolean search in its ability to find matches that don't contain specific keywords. It does this based on correlations and through constant learning as it determines what skills and other attributes are similar, and/or often appear in combination.

Automated candidate search has made recruiting tools like LinkedIn powerful platforms for recruiters. LinkedIn's Talent Solutions group already accounts for the majority of its revenue, and recruiters form its biggest group of paying members. LinkedIn's recent AI offerings allow recruiters to match top performer profiles to the database to find others like them.¹⁶ One can easily imagine a future in which LinkedIn finds matches, converses with prospects, answers their questions, and confirms their interest—then sends hiring managers three or four top candidates for interviews.

Many other intelligent tools are beginning to filter whole populations for recruiters, as well. Joberate, for example, is a talent search and analytics technology provider that has devised what it calls the "J-Score" to assign those who use social media to look for a new career opportunity, a job seeking score. According to CEO Michael Beygelman, a higher J-Score, means a person is more active in their search. This helps recruiters find and target people who are most open to their message.

The J Score is generated in the background based on what employees and job seekers are actually doing—for example, changes they make to their online professional profiles, professional connections, career-related content they follow or like, etc. Joberate boosts application conversion to interview rates by as much as 90 percent by allowing recruiters to target their approach to candidates based on their J Score. Recruiters zero-in on potential candidates with high J-Scores, while managers might monitor aggregate team J-Score information to gain a sense of engagement and the need for retention interventions.¹⁷

“ *The J-Score is becoming a ubiquitous metric by which job seekers signal their willingness to entertain new opportunities without explicitly having difficult or awkward conversations with their boss or headhunters.* ”

—Michael Beygelman, Joberate



Candidate Experience

Just as recruiters dislike sifting through resumes and profiles, job seekers are exhausted by endless job postings. Today's programmatic recruitment advertising tools help candidates in much the same way they aid recruiters—through increasingly tighter targeting. According to Lars Wetemans of Recruit.io, PRA helps candidates pinpoint ads that match their skills, interests, level of experience, location, etc. He also points out that programmatic technology helps people see jobs they would not otherwise have found, much like it helps recruiters find candidates they might not otherwise have discovered.¹⁸

Dave Berthiaume of Goodwill Easter Seals MN uses PRA provider Appcast, and though he hasn't heard an applicant state explicitly that they appreciate targeted job ads (candidates may not know, after all, that algorithms are at work behind the scenes), he believes that many are pleased and surprised to receive ads that are so well suited to them. Berthiaume is convinced that better targeted ads result in more and better applications for Goodwill.¹⁹

Though wading through countless job ads is irritating, even greater aggravation occurs after candidates have applied to positions. More than half of candidates complain that waiting to hear back from a potential employer is the most exasperating part of looking for work.²⁰ Most recruiters genuinely want to manage the candidate experience but are often overwhelmed with other work. Again, AI and automated tools can help close this gap.

“Chatbots,” for example, promise to improve or even eliminate the “black hole” candidates face, by managing the experience and engagement of all applicants. At FirstJob, virtual recruiting assistant Mya augments the work of recruiters, acting as a bridge between them and the candidate. According to CEO, Eyal Grayevsky, Mya engages in intelligent conversations with each and every candidate. She reviews their application with them, answers questions about the hiring process, and—should she assess the candidate as qualified and interested—schedules their first interview. Mya rejects candidates gently, suggesting other job openings they may be qualified for and/or inviting them to register in the talent pool.²¹

Mya also learns. She becomes a better conversationalist with each candidate she encounters. As dozens and then hundreds of organizations deploy her—and as a few conversations per hour turn into hundreds or thousands—the data from every conversation she engages in improves her subsequent interactions.

Moreover, Mya and other chatbots are always available—candidates can chat them any time, day or night, to ask about the status of their application and where they stand. If a candidate doesn't initiate conversation, the tool can send them email updates and encourage them to check back.²²



Though Firstjob has only recently begun testing Mya with clients, it appears that she is off to a promising start. Mya persuades over 90 percent of applicants to go through initial vetting and matching with her, and she convinces more than 80 percent of candidates who drop off in the process to re-engage. Both numbers represent significant improvement on industry benchmarks according to Grayevsky, who describes Mya as an optimized, fully automated conversion funnel.²²

ThisWay Global takes a different approach to reinventing the broken system of job search and recruiting through machine learning/AI enabled platforms. ThisWay launched from ideaSpace at the University of Cambridge in England, following two years of R&D. Its goal is to provide advanced job matching that will address the hiring problems that businesses and individuals face. A key component of the solution is to create a complete ontology and taxonomy for the language of recruiting and job search, and to build machine learning on top of it in order to prevent AI from perpetuating the same biases that cause humans to make poor hiring and job choices.

ThisWay improves job matching by building on behavioral learning from users' interaction with the platform, combined with what they do at work and what they enjoy most in their personal lives.²³ It also uses game-like interactions with job seekers to generate more accurate assessments of their attributes and traits. A person who completes their profile (called a "passport") might see questions related to risk tolerance, such as: "If a spaceship landed in your front yard, what would you do?" According to CEO Angela Hood, when provided with these sorts of scenarios, most people know exactly what they would do, there is no middle ground. Thus, responses are more natural and accurate than the more direct and typical: "please rank your capacity for risk" approach.

Combined with knowledge of the candidate's leisure activities—for example, rock climbing versus mountain biking—and work behavior, ThisWay builds a more complete assessment of a candidate's risk tolerance and other essential human attributes that improve matching. This information matters depending on the position you're looking to fill—a salesperson versus an accountant, for example. In all, ThisWay's AI and predictive algorithms currently consider about 36,000 data points, risk aversion being just one. Ultimately, this benefits job seekers by allowing them to see a personalized universe of strongly matched positions without having to search. Recruiters benefit from having better matched candidates introduced to both their business and the job opportunity.²⁴



Initial Screening

Mya, the chatbot introduced above, performs the dual role of managing candidate relationships (at least in the early stages) and—if desired by the client—she performs a first level screen. In high volume recruiting in particular, AI can have a tremendous impact. One Mya user hires about 20,000 warehouse workers for the holiday season and processes over 140,000 applicants—all in three months. Mya automates the initial screen to decide whether each applicant should be forwarded or rejected, saving recruiters hours of manual candidate screening. This isn't dissimilar to the pre-screening questions many applicant tracking systems have featured for years, but it goes further because Mya conducts a dynamic interview with every candidate. She asks a wide range of contextual questions, generated in real time, in response to the ongoing conversation. This results in enhanced candidate engagement, deeper screening and greater qualification accuracy. As above, Mya then schedules qualified candidates into interviews.

Passive big data techniques are also worth considering. Transcom, a global operator of customer service call centers, for example, has been working with the assessment technology firm, Evolv (now owned by Cornerstone OnDemand) for several years. Evolv analyzes email, keystrokes and other “ambient” data generated by employees in the course of their work. Evolv's efforts to reduce attrition among Transcom's call center employees has resulted in 30 percent reductions so far.²⁵

This improvement has encouraged Transcom to expand its work with Evolv to find traits that predict which job candidates for other positions might stay the longest if hired. One effort, a pilot project using Evolv's data analysis technology, was conducted in 2012 to assess candidates for honesty. Transcom knew from prior analysis that honest candidates typically stay in their jobs almost a third longer than those who aren't. In a call center, this is significant. The Evolv system has helped Transcom uncover traits like honesty in very simple and elegant ways.²⁶

The Implications of AI in Sourcing & Screening

“*The current system is absolutely appalling for both sides, but there is so much money made in this chaos that it's self-perpetuating.*”

—Angela Hood, CEO ThisWay Global

Overcoming Bias and Fatigue

Aside from the enhanced speed and accuracy, lower costs and better candidate management described in Part One, AI has the potential to reduce or eliminate discrimination from the sourcing and screening process. Human bias and error often cause high quality applicants to be missed or passed over before the interview stage. AI assesses candidates purely on their merits—provided, of course, that bias isn't inadvertently built into the system.²⁷

Chris Forman of Appcast agrees that AI can address the issue of human bias but also overcome problems related to human fatigue. Forman refers to research that consistently shows people who apply to positions earlier in the process are more likely to be hired, simply because recruiters grow exhausted as they wade through applications. "AI isn't lazy. AI is self-taught and never forgets anything. You can fill it with the CVs of all of your high-performers and high-potentials then boil the ocean to find commonalities in applicants."²⁸

Still, according to Forman, the idea that you can always predict who will do well—at least in their first year—is flawed because so much depends on the manager and other variables. Combined with experienced recruiters and managers however, AI can tell you that "Joe does well working with female leaders, whereas Bob works better with financial people. In these ways, AI can offer exponential improvements in the existing hiring process."²⁹

“ *If Henry Ford had queried algorithms for what his customers wanted, they would have replied 'a faster horse.' In a world of big data, it is our most human traits that will need to be fostered.* ”

—V. Mayer-Schonberger & K. Cukier, Big Data

AI in Late-Stage Screening and Selection

If AI's performance bests recruiters where sourcing and initial screening is concerned, can the same be said for selection? Surprisingly, a 2015 Harvard Business School paper suggests it can. In a paper entitled 'Discretion in Hiring,' the authors go as far as to argue that managers should be prevented from making hiring decisions in low-skilled positions. The researchers' experiments pitted data and algorithms against experienced managers and found that the algorithms do a better job of choosing qualified applicants.³⁰



In a separate, 2016 study published in the American Economic Review, researchers conclude that for middle and higher skilled positions, machine learning and AI can enhance organizations' ability to make better hires. Importantly, though, they did not conclude that the decision should be left entirely up to the algorithms, only that the AI can help humans make better decisions. The researchers determined that in order for the algorithms to perform well, they need experienced recruiters to determine what they're looking for.³¹

Research and experience to date demonstrates that AI and machine learning can relieve recruiters of the entire task of sourcing (including ad buying and placement) and even initial screening. For the adventurous, it might be deployed further to make final selection decisions for high volume, low-skilled positions. In filling middle and highly skilled positions, however, the research suggests secondary screening, interviewing and the hiring decision should still be performed and made by humans, perhaps assisted by AI.³²

“ We like to work with recruiters by taking the first 70 percent of the hiring process —sourcing and screening, the part that is really fatiguing—and automate it. The last 30 percent—the interviewing and relationship-building—is the part the recruiters want to do and are better at than AI. AI and machine learning won't replace good recruiters who do that 30 percent. ”

—Angela Hood, CEO, ThisWay Global

According to Michael Beygelman of Joberate, machine learning and AI constantly improve sourcing and screening for certain types of positions. AI, however, can't yet outperform a recruiter or hiring manager when it comes to the question of “whether it is better to hire Bill or Surita for certain professional roles.” Beygelman warns that confirmation bias is often built into any system that tries to predict which person to hire. “It tries to get to a conclusion that isn't always there. The whole prediction game is still too nascent to put into production for all corporate use cases. For example, certain incarnations of AI-based predictions about a person's flight risk have already led to law suits. AI, in fact, sometimes creates one of the problems it's trying to solve—adverse selection.”³³

Due to these issues, Beygelman believes AI and Machine learning—beyond sourcing and initial screening—won't fully catch hold for years and perhaps even a decade or more to come, except among a few early adopters.



Eyal Grayevsky of FirstJob agrees. He points out that due to the wide range of nuances involved in hiring—including politics and the views and needs of stakeholders—humans must make the hiring decisions because AI can't yet understand and factor for the non-binary variables in many selection processes.³⁴ Lars Wetemans concurs as well, affirming that good recruiters are needed in the process. Whereas advertising across multiple media channels, and optimizing ads using mass A|B tests, simply cannot be done by hand, he says, "interviewing and selection is more effectively done by a recruiter."³⁵

Again, the state of the art in broadly-defined AI and machine learning today suggests that organizations should improve, accelerate and reduce the costs of the recruitment process by automating and using AI in everything from recruitment advertising and sourcing to initial screening. In interviewing and selection, however, AI should be leveraged to inform better decisions, not make them.

The Future of AI in Sourcing & Screening

Given the trajectory of past technologies, it seems likely that challenges such as processing limitations, data privacy, bias and other social issues surrounding AI will be resolved and it will continue expanding.³⁶ In the recruiting field, great progress in the application of AI and machine learning over the next few years would seem to be a safe prediction.

Chris Forman of Appcast predicts the rapid emergence of job ads that aren't just targeted and optimized by media and time of day but also timed to when people encounter life events that might change their receptiveness to the right ad. Forman notes that it's already possible to create ads with embedded chatbots, which hold conversations with those who encounter them. As described above with Mya, such ads used in recruiting will advise candidates on the match, answer questions, help with applications, and gently guide unfit candidates to better opportunities.³⁷

Of course, no discussion of the future of AI in recruiting can avoid the question of what it might do to overall employment. One thing is certain: AI and machine learning in recruiting will improve. Remember that smart and inquisitive software mirrors human evolution in the sense that genetic programming allows AI to improve itself through a Darwinian method of survival of



AI recruiting software already operates faster than humans, and it exploits advantages that arise and disappear in fractions of seconds. Eventually, it seems inevitable that it will understand the entire process—from sourcing to selection—well enough to displace all human sourcing, recruiting and hiring activity as we know it today.

In the short-term, recruitment automation appears likely to eliminate more jobs in the field of recruiting than it will create. Much of the intermediary role the recruiter plays between candidate and hiring manager, for example, may be rendered redundant by the ease of candidate and hiring manager self-service. Nonetheless, like the lawyer who used to spend enormous time researching jurisprudence but now performs more sophisticated client advisory work, innovative and creative recruiters will almost certainly have a place in the selection and hiring process for at least a decade or more to come.

Most agree that for today at least, AI can only improve decisions in the late stages of the hiring cycle, not make better decisions all on its own.

Conclusions

AI and machine learning, broadly defined, have made significant in-roads into the recruiting and hiring process in just the past five years or so. Already, organizations put themselves at a deep disadvantage in finding and hiring talent when they ignore or don't understand the advantages of automation and AI.

AI more than replaces the repetitive and time consuming work of sourcing, screening and early assessment; it dramatically improves it while lowering costs and enhancing the candidate experience. But the longer-term future is anyone's guess. As the story goes, Henry Ford once toured a brand-new, semi-automated assembly plant with the head of the United Auto Workers' Union, Walter Reuther. Feeling pleased with himself, Ford asked Reuther how he planned to unionize all the new machines. Without missing a beat, Reuther asked Ford how he planned to sell them cars. Indeed, if AI someday eclipses all human capabilities, who will be left for the robot recruiters to recruit?

Footnotes

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