Will AI Technology

Replace Humans

In Talent Acquisition?

Literature Research

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Content

1   Introduction

Looking at the HR Barometer of 2019 (Figure 1-1) (Hudson, 2019), data analytics[1] driven activities of HR and the Talent Acquisition activities of HR are at the different end of the spectrum on priority as well as on mastery by the HR staff.

Figure 1-1: Priority vs. HR Mastery (Hudson, 2019)

2   Theoretical Analysis

2.1   Recent Evolutions in HR

Human Resources (HR) and Human Resource Management (HRM) have evolved over time like any other corporate function. Where in the 1930's the focus was strictly on corporate needs and social piece management, this changed in the fifties to skill-based recruiting and social negotiations. In the eighties employee management and development was the main occupation and this led to what we currently have i.e. career employee coaching, career guidance and corporate strategic alignment (Pandya, 2019).

Recent evolutions towards a gig economy based on flexible, temporary and freelance jobs, often organized using online platforms to bring suppliers and clients of skilled resources together, have increased HRM processes' frequency and speed. It has impacted the HR organization and more precisely the TA process. Around 60% of the work force in the US for example, is already a type of flexi-force and 20% to 24% of Americans change jobs every year explaining the increased work volume for HR in talent acquisition. Expectations for Europe are lower but, nevertheless, follow the same trend (Modugu M. , 2019).

In addition, technology has dramatically evolved over time. This affected not only the types of jobs HR has to source, but has changed the nature of HRM processes as well. The generation of millennials is entering the job market and being digital natives, their expectations of a recruitment process is disruptive compared to what we have seen in the past (Charlier & Kloppenburg, 2018). They are expecting to go through the full application process just using their phone as means of interaction. This also implies that talent acquisition is not a 9-to-5 process anymore, but became a 24/7 game (Fineman, 2018).

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[1] Although AI and data-analytics are not synonyms they are tightly related. Most-likely AI would be located in the same place in this diagram.

2.2   The Talent Acquisition Process

A traditional TA process (Figure 2-1) (Dijkkamp, 2019) can be divided into four stages and is presented like a funnel since the number of candidates going from one stage to next is gradually becoming smaller.
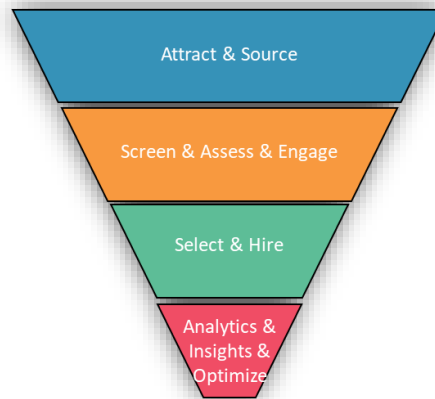

Figure 2-1: Four Stages of Talent Acquisition – Adapted from (Dijkkamp, 2019)

The first stage is Attracting and Sourcing candidates. Digital advertising, employer branding and social media activities are the areas where recently the most changes are to be found. The second stage is about Screening - Assessing - Engaging candidates. Changes in this area are replacing the face-to-face meetings and communication by electronic and virtual alternatives but still with the same goal of nurturing and creating a relationship with potential candidates. Selecting - Hiring makes up the third stage. Here, reference and background checks are becoming more and more important, related as well to the increased frequency in which people change occupations. Finally, there is the Analytics – Insights – Optimize stage, i.e. matching, during which data is gathered, analyzed and used to incrementally update the previous stages. Changes here can be found in the move from descriptive feedback to prescriptive and next to predictive feedback on the previous stages. In other words from a-posteriori analyses of the results of the process (e.g. the hiring of a candidate) towards a-priori predicting the best next change to be applied (Dijkkamp, 2019; Jobvite, 2019).

Technology is affecting all four stages of the TA process in one way or another, but it differs in the use of the type of technology: from basic technology to advanced technology. First, the technology touchpoints will be enlisted (2.3 HR Technology Touchpoints) and later the opportunities for Artificial Intelligence (AI) will be looked into in more detail (2.4 AI Opportunities).

2.3   HR Technology Touchpoints

In the first stage, Attract - Source, technology is being used to support HRM to do digital job advertising. This starts with basic integration of HR systems with job seeker platforms (e.g. Ladders) or professional networking platforms (e.g. LinkedIn). Advanced technologies go further by generating the job description automatically based on deduced best candidate characteristics and on the fly adaptations, based on a potential candidate looking at a job description (Geiger, 2019; Schweyer, 2016).

Related to the second stage, Screen – Assess – Engage, technology helps to filter large sets of candidates based on criteria. More advanced technology is available to go beyond traditional profile keyword searches as this has become a commoditized approach and does not give any competitive advantage anymore. Keyword search has become the Olympic minimum whereas new pattern recognition with regards to candidates raised the bar (Pandya, 2019; Fineman, 2018). Interaction with candidates has become electronic and the use of chatbot technology is new in this area (Butcher, 2019). Next, we have stage three, the Select - Hire stage, here technology is supporting the scheduling of interviews and quantifying candidates by checking backgrounds and conducting tests or assessments (Chen, et al., 2016; Saundarya, Umasanker, & Anju, 2018). Finally, the Analytics - Insights - Optimize stage contains technology to gather data on the candidate and the process to incrementally adapt and steer the previous stages.

Technology in HRM is still not very widespread compared to other corporate functions. On average only 37% is automated (Saundarya, Umasanker, & Anju, 2018).

2.4   AI Opportunities

Technology entering the realm of TA in HRM can be categorized in three groups based on the level of intelligence of the technology and the type of human-technology collaboration (Charlier & Kloppenburg, 2018):

1. **Assisted intelligence:** supporting humans via software robots, where technology takes over standardized, repetitive and time-consuming tasks.
2. **Augmented intelligence:** empowering humans via co-creating or co-deciding a.k.a. co-bots, where the human intellectual power is completed by additional, technology generated, insights but the final decision remains a human decision.
3. **Autonomous intelligence:** sole-creation a.k.a. humanoids, where technology is working alone and doing an end-to-end intelligent job, capable of dealing with information at the human sub-coconscious level, based on self-created insights and only supervised by humans.

AI technology sits in the co-creation and sole-creation category. It is the type of technology focusing on extending or replacing human intellectual tasks (Jobvite, 2019). AI is not involved in the repetitive tasks as existing technology is already more than capable of performing these activities as robots. Figure 2-2 shows the spectrum of activities where AI is taking over or supporting TA staff.
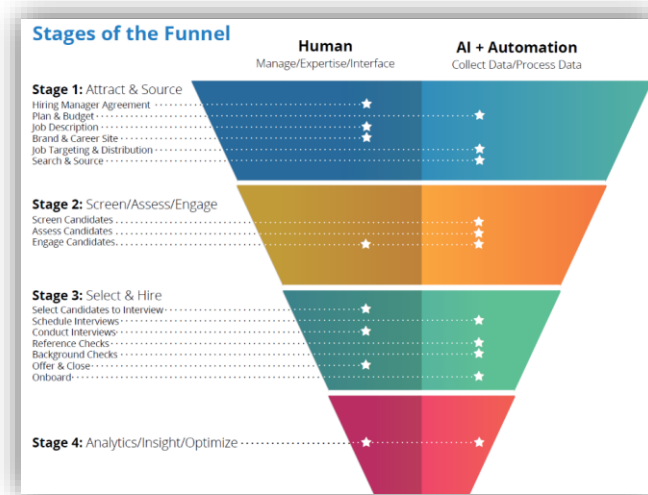
Figure 2-2: Human vs. AI Balance (Jobvite, 2019)

Zooming in on what AI could mean in the different stages of the TA process, following overview table was created (Table 2-1).

Table 2-1: AI Contributions in TA Process Stages

TA Stage	AI Contribution	
Attract & Source	• **Digital advertising**: the generation of job advertisement texts, based on characteristics of successful employees and the company's culture (Schweyer, 2016).	CA
	• **Job profile generation:** defining job profiles without bias or do A/B testing on multiple job descriptions, to validate which one is the most efficient to be used later on (Geiger, 2019).	CA
	• **Ad automation**: adaptive advertising, job profiles are adapted in real time to specific candidates looking at the job description, automated advertisement placement and retraction or adjustment, also known as Programmatic Recruitment Advertising (PRA[2]). Individualized job ads includes highlighting common interests and personal values in order to increase the perception of attractiveness of the job and the employer from the candidate's point of view (Schweyer, 2016).	CA
	• **Social candidate discovery**: social media screening, sourcing candidates by identifying or predicting intentions towards leaving a current job or searching for a new job i.e. the probability of leaving their current job, quality and fit of the candidate for the new job, predicting the function and industry evolution over time (Lexa, 2017).	CI
Screen & Assess & Engage	• **Selecting candidates**: selecting candidates without human bias, using alternatively deduced characteristics instead of the traditional keyword filtering on professional or social media (Pandya, 2019; Fineman, 2018).	CI
	• **Candidate discovery and rediscovery**: matching candidates, determining how good a candidate would fit or proposing alternative jobs based on the candidate's competencies and personality, resume filtering (Modugu M. , 2019).	CI
	• **Engaging chat-bots**: chat-bots to answer a candidate's initial questions and to continuously interact with the candidate during the TA process to keep candidates engaged (Butcher, 2019).	

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[2] programmatic Recruitment Advertising (PRA) is not to be confused with Robotic Process Automation (RPA)

	• **Supporting chat-bot**s: chat-bots being able to call and plan candidate interviews (Dijkkamp, 2019).	CE
	• **Assessing candidates**: using audio and video feeds and detecting micro-emotions to better quantify the candidate's responses and psycho-linguistic analysis of these responses (Chen, et al., 2016).	CI
Select & Hire	• **Detecting and removing human bias**: identifying and warning for bias by monitoring and detecting gender and racial patterns in the selection process that could be based on TA staff's subconscious (Talent Tech Labs, 2017).	CA
Analytics & Insights & Optimize	• **Job market forecasting**: predicting TA criteria and metrics i.e. predicting the time-to-hire, time-to-fill and cost-per-hire to optimize the TA stages and process including TA budgets and resources (Modugu M. , 2019).	CA
	• **Pattern recognition:** deriving characteristics of successful candidates by using previous candidate and job characteristics (Chen, et al., 2016).	CA
	• **Employee value estimation**: calculating added value, at present and in the future, of each employee and deciding to adjust the EVP (Employee Value Proposition) individually (Saundarya, Umasanker, & Anju, 2018).	CA

The table above can be categorized in three groups based on type of technology used (Fineman, 2018):

1. **Cognitive Insights (CI)**: the metrics and scoring models, pattern recognition models.
2. **Cognitive Automation (CA)**: the data mining and machine learning used on unstructured data, and to lower extent, the use of Robotic Process Automation (RPA) for repetitive tasks.
3. **Cognitive Engagement (CE)**: conversation agents and chat-bots.

All the technologies can be grouped into three systems (Butcher, 2019):

1. **Applicant Tracking Systems (ATS)** to track candidate inside out outside the company.
2. **Talent Acquisition System (TAS)** that extends ATS with recruitment marketing, on-boarding follow-up and real-time adaptations.
3. **Talent Relationship Management (TRM)** systems to manage all talent of company i.e. the current staff but also active or passive candidates.

Jointly ATS, TAS and TRM are focusing on new talent and form the Candidate Relationship Management (CaRM), equivalent to Customer Relationship Management, where the full life cycle of a candidate from discovery to onboarding is managed (Schweyer, 2016).

2.5 AI Advantages

AI in TA is all about efficiency and effectiveness. Technology has already taken the repetitive tasks away from HR, allowing to free recruiters and let them focus on the more important elements of the hiring process. AI goes a step further by supporting recruiters in intelligent tasks. This increases overall efficiency and as result lowers the time spent on each candidate. Whether it reduces the costs will depend on the trade-off of the costs to set-up and maintain the technologies vs. direct costs of recruiting staff (Schweyer, 2016).

Efficiency is gained by automating the sifting through candidate profiles and resumes based on binary keyword filtering but also on intelligently derived candidate patterns. A future candidate interaction can be something along these lines: (1) a candidate's profile is selected from LinkedIn based on the fact the candidate posted on social media that he is open for the next challenge, (2)

the profile is evaluated and screened to validate if it is in line with the minimal acceptance criteria, (3) a robot initiates a phone call or chat session with the candidate to propose the job and to invite the candidate into the selection process. In the engagement with candidate, (4) the system can respond to questions the candidate would have with regards to the job or the company the system represents. The system, if required, (5) plans follow-up calls with a recruiter to continue the process as well as initiates an automatic assessment (Geiger, 2019).

Typically sifting through profiles to identify candidates during the source stage, is a tedious job that humans dislike. Because of the workload, recruiters indicated they spent between 3 to 17 seconds on every resume, which introduces human bias, and fatigue into the process. An automated system could do a more thorough job because it does not get tired, fed-up or frustrated. Adding social media information to identify potential candidate enriches the set of candidates. Furthermore, they could already rank the shortlisted candidates by comparing them, increasing the efficiency of recruiters. If organized and built correctly this will reduce bias as systems are less likely to be prejudicial. During the further assessment, AI can take away bias and increase the quality of the assessment by enhancing the available information set for the recruiter with micro-behavioral information during one-to-one interactions and background checks. AI could even propose alternative questions in real time to measure the missing links or to remove the recruiter's bias. Often recruiters can fall into the confirmation bias trap where only information is looked for or used that accords with an initial perception of the candidate (Schweyer, 2016). During the hiring phase an AI could engage with the newly hired to increase the onboarding success typically in checking if the requires activities are completed and document verifications. Automating this process increases the throughput and reduces the latency for processing the same number of candidates.

Looking back at the TA process (Figure 2-1), this means such as system will be able to initiate and complete almost all steps of the process without human intervention. When companies still would feel uncomfortable hiring someone purely on automated system some of the step can be a joint effort or still be done complete by humans. This approach will also allow for a learning curve of limited system autonomy and decisions and growing into a fully automated model. Using technology is leveling the playing field for smaller and medium sized companies, as technology allows them to outsmart bigger companies through data driven techniques. The entry barrier for AI technology becoming lower and commoditization is going on.

2.6 AI Barriers and Limitations

Looking at the AI barriers, there is first a general ethical question whether applying AI in HRM is using the technology for doing good or whether it poses ethical issues. AI often induces fear in HR staff. Fear to lose control over the process and fear of losing their job over it (Figure 2-3) (Charlier & Kloppenburg, 2018; Brown, 2019). AI will reduce the FTE in HR or in companies in general by automating human intelligence, however, projections have shown this job-loss will be more than compensated over time. Believers in AI for TA, point out that the industrial revolution were laborers thought machines would replace all jobs and in fact we have seen a shift for humans to a different types of jobs (Brown, 2019). AI can be considered the constructive destruction of classic TA; it might be disruptive at first but will lead to something new in the end. The jury is out whether the new thing will be better. This AI scenario is both promising and scary. Promising, because there could be a net gain of jobs, but scary in the sense that some part of the society is likely to be rendered jobless for a period of time (Lexa, 2017).
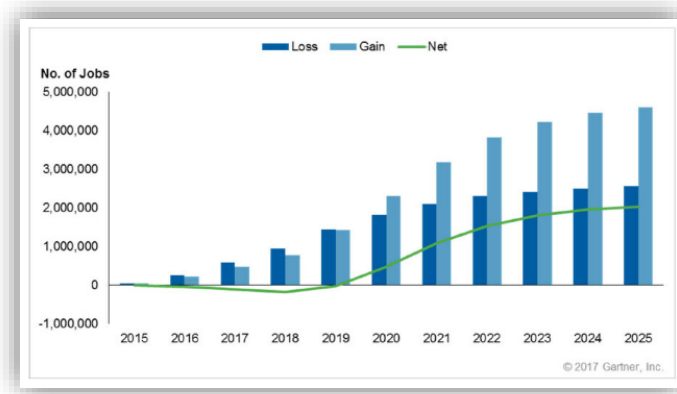
Figure 2-3: Project AI impact on Jobs – Losses, Gains and Net – Adapted from (Charlier & Kloppenburg, 2018; Brown, 2019; Lexa, 2017)

The second hurdle is that AI techniques require substantial datasets and data processing. Also, the data needs to be of the right quality to avoid the GIGO-effect i.e. garbage in – garbage out. This poses two issues. The first one is the availability of this data and whether or not the company has the candidates' consent to   use it. In GDPR and privacy driven times this might be a bigger issue than before. About 61% of people, HR staff and candidates, involved in the TA process indicate a preference for a face-to-face, human only evaluated process. A third problem is that storing and processing this information will require IT investment and this must be in line with the company's long-term strategy and vision of upper management. In other words, do we have management commitment and are they tech-savvy enough to understand the potential. Without the correct investments there is a high risk to fall in the "paying peanuts getting monkeys'"-trap. Bad AI in HRM will lead to sub-standard or wrong candidates to be selected and hired.

As indicated before, regulatory issues around privacy might be a hurdle. Another regulatory hurdle to take, is on how easily can the TA process' results be explained. Creating a human understandable audit trail for an AI decision is challenging. There is always a risk that some rejected candidate might go to court (Brown, 2019). It is rather hard to defend the result of trained AI algorithm and typically, the process will not be fully automated in order to have a final human decision in place to regain control and have a sanity check at the end of the process.

By using AI techniques to replace the laborious or mind-numbing activities like sourcing and CV screening, the possibilities of young HR staff to learn and build-up expertise is reducing or taken away. This might have a suffocating effect on their learning curve.

Because AI algorithms are trained using previous, human, selection process execution examples. There is a risk of the training not being done properly, the automated system might be trained in becoming the perfectly biased human or optimizing the imperfections to the fullest. Since by definition bias is unconscious or unintentional it is hard to remove completely from the equation. Another point of attention is that AI might limit the diversity of the work force if the training of the algorithms is done as one-shot solution. It will enforce elements of communality between the selected profiles that might converge to one perfect candidate profile. In the case a company's success is dependent on diversity, for example as a driver of creativity, we might get an opposite result compared to what was promised at the outset of AI technology.

A final element is trust. If AI in TA is not trusted it will be encapsulated in human driven processes. By doing that it will be hard to realize a positive business case as we are not reducing the human

activities substantially and on top of that the company incurs the cost of a new technology. It would be wise to mention a quote of Bill Gates: *"We always overestimate the change that will occur in the next two years and underestimate the change that will occur in the next ten. Don't let yourself be lulled into inaction."*

3   Conclusion

The role of AI in HR is emerging! Undoubtfully, the introduction of AI-enabled technology in HR processes is game-changing and disruptive to HR organizations, in particular in the field of TA. Implementing this technology further will maximize the efficiency and effectiveness of this HR process. For example, reducing bias through AI, will increase its effectiveness, whilst reallocating HR resources to more strategic activities, will increase its efficiency.

The speed of these changes (5 years, 10 years or much sooner?) will depend notably upon the speed of innovation and the democratization of the technology costs. As Jeffrey Joerres stated in an interview already back in 2016, "*as soon as you can get a robot for $5,000 instead of $100,000, as soon as you can get AI with better voice recognition, and as soon as you can get full contextual AI that can anticipate and answer questions without human intervention, that's going to throw the labor markets into a tizzy.*" (Joerres, 2016)

Organizations will have to manage changes and the resistance of their TA employees quickly. Employees will have to be (re)trained substantially to use the new technology. However, whether we like it or not whoever does not want to catch up with this technology will be left behind and the early adopters will benefit from an enormous competitive advantage.

4   References

4.1   List of Figure

4.2   List of Tables

4.3   Bibliography

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