

The Challenges of AI and Blockchain on HR Recruiting Practices

MARIA P. MICHAILIDIS¹

Abstract

Blockchain, artificial intelligence (AI) and other technological innovations are affecting all aspects of our societies and causing some profound changes in human resource (HR) practices in business and non-profit organizations. Critical to these high tech advances is how they will affect employment patterns and the way companies will hire their workforce, influencing HR practices and the way they will manage their employees. This paper, after a short introduction, consists of three parts. The first discusses how blockchain and AI are affecting HR practices. The second looks at hiring practices at firms, while the third discusses employment patterns in the emerging age of high-tech super-automation. There is also a concluding section, discussing the implications of the forthcoming AI on employment (or unemployment) and the inevitable income inequality that is bound to develop and affect our societies.

Keywords: blockchain technology, human resource management, artificial intelligence (AI), disruptive innovation

Introduction

Blockchain and artificial intelligence (AI) technologies are bringing some profound changes to the way human resource (HR) practices are performed in business organizations.² Critical advances in these areas have caused overwhelming transformations of our societies and have begun to affect employment patterns and the way companies hire and manage their workforce, influencing HR practices to a great extent. This paper, after a short introduction, consists of three parts. The first

1 Maria Michaelides is Professor, School of Business, Department of Management and MIS, University of Nicosia.

2 G. Wisskirchen, B. T. Biacabe, U. Bormann, A. Muntz, G. Niehaus, G. Jiménez Soler and B. von Brauchitsch, 'Artificial Intelligence and Robotics and Their Impact on the Workplace', *IBA Global Employment Institute* (2017), available at <https://www.ibanet.org/Document/Default.aspx?DocumentUid=c06aa1a3-d355-4866-beda-9a3a8779ba6eR>. 'The Impact of Artificial Intelligence on Human Resources: An age of Experimentation'. *Kerridge and Partners.com.* (2017), available at <https://www.kerridgepartners.com/blog/impact-artificial-intelligence-human-resources-age-experimentationE>. 'Top 5 ways to use artificial intelligence (AI) in human resources', *BigDataMadeSimple* (2017), available at <http://bigdata-madesimple.com/5-ways-to-use-artificial-intelligence-ai-in-human-resources/>.

discusses how blockchain and AI are affecting HR practices. The second looks at hiring habits, while the third discusses employment patterns in the emerging age of high-tech. There is also a conclusion discussing the implications of the forthcoming super-automation in employment (or unemployment) and the inevitable income inequality that is bound to develop and affect our societies.

There is considerable apprehension and even fear about the impact of automation on our future caused by artificial intelligence, blockchain and related technologies. Recent research was published at the end of 2018 by Forrester,³ one of the most influential research and advisory firms in the world, entitled *Predictions 2019: Automation and Predictions 2019: Artificial Intelligence*. It states that, in 2019, an estimated ten percent of jobs in the USA will be replaced by automation; however, new technologies will trigger the creation of roughly three percent of today's jobs. Forrester also estimated that over 40% of companies will employ robots and machines to substitute humans.⁴ And although the effects of automation on employment are debatable, caution is recommended for the many different challenges that will be created as the unemployed may have a hard time training to perform their new 'digital' jobs. Forrester (2018) highlights issues of the 'quality', 'explainability' and 'transparency' of decision-making. These issues will not only encourage companies to invest in information architecture but to also take into consideration the directives of the European Union's General Data Protection Regulation (GDPR), and Forrester states that 'explanations of the decisions reached' is a right for those affected that must be enforced, requiring organizations to invest in transparency.

Although overall the effects of new technologies on unemployment cannot be known, there is little doubt that the road toward digitalized and automated workplaces will not be without challenges and difficulties. Nonetheless, in terms of the recruitment processes of HR, Forrester forecasts that 'in 2019, AI-driven recruitment will become widespread, leading to unprecedented job match success rates'.⁵

Even so, Forrester (2016) predicted that by 2025, a net 7% of jobs (close to 9 million jobs in the United States alone) will be lost to robots and other intelligent machines. What is not clear is how many new jobs will be created and whether or not such jobs (e.g., robot specialists, data scientists, deep learning experts, monitoring specialists and

3 J. P. Gownder, C. Le Clair, B. Martorell, C. Gardner, G. O'Donnell, C. Condo, J. Thai, and D. Lynch, *Predictions 2019: Automation* (Cambridge, MA: Forrester, 2018), available at <https://www.forrester.com/report/Predictions+2019+Automation/-/E-RES144739#>; M. Goetz, B. Purcell, C. Le Clair, D. Lo Guidice, M. Gualtieri, S. Sridharan, J. P. Gownder, E. Hoberman, *Predictions 2019: Artificial Intelligence* (Cambridge, MA: Forrester, 2018), available at <https://www.forrester.com/report/Predictions+2019+Artificial+Intelligence/-/E-RES144617>.

4 Gownder et al., *Predictions 2019: Automation*.

5 Ibid.

content curators) will compensate for the ones that are lost. As Forrester forecasts, over eight million new jobs will be created in the USA by 2025 that could be needed to satisfy the demand for hiring in new technologies. However, this means a small decline in new jobs created in the US, but it could be much larger in less developed countries that are unlikely to be able to finance and implement new technologies. This would also translate into jobs lost to automation at the same time that new ones are not created in new technologies, as it would happen in advanced countries. Furthermore, the World Economic Forum reports that ‘double the number of jobs could be created as lost through the application of new technologies’.⁶ However, for these new kinds of professions to form, it will entail rigorous and collaborative efforts by employers, policy-makers and governments. Additionally, according to Gratton,⁷ these new jobs are expected to require different types of skills, such as people-centred ones. Besides, companies and HR teams need to take into account the time lag between these new jobs that are currently being created and the ones that will be lost. Consequently, HR teams should be intensely involved in ‘re-skilling’ and ‘up-skilling’ employees.⁸

Heric reports about HR’s new digital mandates, referring to the Bain survey, where three-quarters of the 500 HR executives participated.⁹ They stated that current technologies have not yet achieved the business results they require and that their performance was far from optimal. The main problems mentioned concentrated around the large number of digital tools that exist, which are dispersed, unintegrated, and unconnected. Furthermore, according to the same report, some of these tools have omitted critical functions and have interfaces that are not easy to understand. Thus, HR teams are now being challenged with integrating the new digital technologies while being concerned with how to deal with the complexity that is created by adopting them, as well as integrating them into the existing ones.

How Blockchain and AI Are Affecting HR Practices

Blockchain is revolutionizing the way HR practices are performed, as its decentralized nature automates the verification of information, resulting in more accurate approaches to hiring employees. Employment history can now be placed on public blockchain

6 World Economic Forum (2018)

7 L. Gratton, ‘Davos 2018: the imperatives for job reskilling’, *FoWLAB Blog* (2018, January), available at <https://lyndagrattontfutureofwork.typepad.com/lynda-gratton-future-of-work/2018/01/davos-2018-the-imperatives-for-job-reskilling.html>.

8 P. Illanes, S. Lund, M. Mourshed, S. Rutherford, M. Tyreman, ‘Retraining and reskilling workers in the age of automation’, *McKinsey Global Institute* (2018), available at <https://www.mckinsey.com/featured-insights/future-of-work/retraining-and-reskilling-workers-in-the-age-of-automation>.

9 M. Heric, ‘HR new digital mandate’, Bain & Company (2018, October 10), available at <https://www.bain.com/insights/hrs-new-digital-mandate>.

containing candidates' successes and failures, storing detailed performance indicators such as transfers, promotions, layoffs, and making employment management a different game for the HR teams. Thus, automated validations of CVs, records of contracts and cryptocurrency utilization for international payrolls have all disrupted the way of doing things in HR in a top-notch technologically advanced HR era. According to an article published in *Future of Work*,¹⁰ blockchain is likely to transform HR practices in several ways. Examples are given of Bitwage and Chronobank, which facilitate employee payroll since payments take a shorter and faster time to process without intermediaries such as banks. Bitwage, which is used for international employee payments, combines mobile, cloud and blockchain technology. With the use of bitcoin, employees are paid in their local currency and Bitwage facilitates the currency conversion. Additionally, Chronobank, facilitates payments of employees via the use of blockchain technology with no banking institutions involved. Furthermore, in the same article in *Future of Work*,¹¹ Smart Contracts are discussed as well as educational and career record verification systems. Examples of these are platforms such as APII and TechnoJobs.¹² APII is equipped with an 'Intelligent Profile', thus carrying an employee's information such as educational background, vocational training, work history and other career details, and it is also capable of facilitating the candidates to maintain their records by updating them. APII is assisting TechnoJobs (jobsite) in becoming the world's first jobsite to offer employers CVs verified by blockchain. Likewise, Jobeum, another blockchain-based recruitment platform, is creating a 'LinkedIn-like recruitment tool' using this type of technology, whereas HireMatch (an employment company specializing in talent acquisition), which is the first to offer decentralized blockchain-based HR solutions for recruitment purposes, finds talent, interviews and also hires candidates, thus significantly cutting costs of its users.

As noted earlier, the streamlining of routine HR tasks, such as contracts and payroll, is a way that blockchain improves HR work. This disruptive nature of blockchain will be more effective and less expensive in the long run. Several factors contribute in two ways to the upgraded value of this technology when used in HR practices: first, by how an employee's employment history is being kept; and second, by how information about current or prospective employees' qualifications can be obtained and maintained. These two advantages come from the inability to modify blockchain

10 K. Hartog, 'How blockchain could transform the core of HR', *Welcome to the Jungle* [website] (Paris: Recruiters, 2018, May 25), available at <https://recruiters.welcometothejungle.co/en/articles/how-blockchain-could-transform-the-core-of-hr>.

11 Ibid.

12 HRT News Desk, 'Oracle Considers Using Blockchain to Boost Employee Productivity', *HR Technologist.com*. (2017, May 4), available at <https://www.hrtechnologist.com/news/hr-analytics/oracle-considers-using-blockchain-to-boost-employee-productivity/>.

employment records and the fact that all employees' degrees and job qualifications can be obtained directly from the Internet, using the right blockchain key provided by the employee. Moreover, such trustworthy information can be obtained no matter where an employee has obtained his/her educational degrees and/or the country/region of his/her employment. This means that educational and employment qualifications can be trusted, allowing objective comparisons between applicants/employees. Furthermore, these new technologies can increase employee efficiency and effectiveness by being able to hire the most appropriate ones for the specific job. Similarly, hiring people by using advanced AI technologies can contribute to the development of employees who are highly devoted to their job and are strongly connected to their employer. This is a result of the 'best-fit' and 'non-fit' candidates that AI is able to select from, since best-fit candidates will contribute and develop, and feel connected and engaged with their place of work. Possessing best-fit characteristics will ultimately enhance the candidates' drive for innovation, leading their company forward by focusing on continued growth, and in the long run they will maintain meaningful and lasting relationships with their firm. Therefore, AI can help recruiters identify candidates with inefficiencies, appraise potential, and facilitate hiring the best-fit minds at optimized costs. Forrester forecasts that in 2019, AI-driven recruitment will become widespread, leading to unprecedented job match success rates.¹³

Hence, the impact of AI on HR practices is 'wide ranging', with applications and virtual application solutions all powered by AI, which have automated numerous HR processes, have helped improve decision-making, and have strengthened employee-employer relationships. Companies, such as IKEA, L'Oreal, Unilever and Amazon, that have used AI-led hiring systems like Robot Vera, chatbot called Mya, HireVue Assessments, have all helped in their specialized ways to enhance their candidate sourcing strategies from diverse hires to eliminating unqualified candidates, to evaluating potential recruits, to collecting data from body language and facial expressions.¹⁴ Furthermore, AI advocates believe that these types of intelligence can enhance employee selection by also using techniques that are intelligent enough to read 'microexpressions' and to perform 'vocal analysis', ways to single out traits that are equivalent to those traits that are processed by existing high-performing employees.¹⁵

13 Gownder et al., *Predictions 2019: Automation*.

14 C. BasuMallick, '3 B2C Companies Using AI to Transform their Candidate Sourcing Strategies'. *HR Technologist* (2019, January 10), available at <https://www.hrtechnologist.com/articles/recruitment-onboarding/3-companies-using-ai-to-transform-their-candidate-sourcing-strategies/>.

15 S. Buranyi, "Dehumanising, impenetrable, frustrating": the grim reality of job hunting in the age of AI. *The Guardian* (2018, March 4), available at <https://www.theguardian.com/inequality/2018/mar/04/dehumanising-impenetrable-frustrating-the-grim-reality-of-job-hunting-in-the-age-of-ai>Buranyi.

Nonetheless, the IT revolution discussed in this paper needs to harmonize its capabilities and features with human judgement, understanding and rationality, in order to stay realistic and be useful.

Hiring Practices in the Social Media Era

Attracting sufficient numbers of the right talent that have the most appropriate credentials in a timely manner, and then hiring the right person from that pool is one of the most crucial HR tasks. This is the essence of recruitment. Such recruitment, as discussed earlier in this paper, is being reinvented and reshaped by AI technologies. Where AI is being used for numerous aspects of HR, for instance in identifying job candidates and acquiring talent, interviewing and testing, blockchain is being used in sourcing verified candidate profiles, hiring pre-verified contract workers, creating smart (tamper-proof) contracts, and in securing faster payments. Therefore, this increased emphasis on automation is dramatically altering the way companies think about business processes in general, for example scheduling, data entry, resource management, IT support, and HR processes, such as selecting and recruiting talent, which certainly all translate to business growth. In examining the ‘automation of things’, we cannot help but look at how HR processes, specifically recruitment, were performed in the past. People in charge have been recruiting employees ever since there was a need for additional help. The only things that have changed between then and now is the speed and accuracy, which are the main reasons to invest in automation as suggested by the Bain survey.¹⁶ When did it all change and what shall be expected in the future is actually what excites and challenges HR teams.

Recruitment was not as easy, as fast and as accurate as it is now. It is a fact that successful recruiting is dependent upon finding the right candidate, the best ‘fit’ among the right people, at the right time. For this approach to work, the best possible job candidates must be identified quickly and efficiently, irrespective of where they are in the world. Thus, a Curriculum Vitae can be delivered to the prospective employer in a matter of seconds today, and it can also be screened and verified very quickly; however, not too long ago, it had to be printed out and sent by post with the hope that it would arrive before the deadline. Candidates used to be invited to the HR/Personnel manager’s office for a face-to-face recruitment interview. Candidates were screened for their ‘job fit’ by in-person communication and taking tests that were administered by individuals in HR who could possibly be biased and hold stereotypes. Once hired, all applicant tracking systems and new employee records were manually updated, tasks that took time to perform, and were vulnerable to occasional human errors.

16 Heric, ‘HR new digital mandate’.

According to a report by PwC¹⁷ on AI in HR and its reference research conducted on the use of AI in international companies, 40 percent of HR functions of international companies are currently using AI applications, making the work of HR more efficient and effective. One of these applications is Robotic Process Automation (RPA technology) by Maruti Tech Labs,¹⁸ which uses AI to automate business processes to human-like efficacy. RPA utilizes bots to replicate time consuming tasks and human activities, allowing users to organize bots to communicate with other business systems, to collect data and to also give prompt responses. Thus, HR functions have been transformed via automation to become faster and shorter. Additionally, RPA uses marketing recruitment campaigns which reliably communicate and engage with passive and active candidates and prospective employees in an automated way, by using job postings and strong talent hunting methods. Furthermore, RPAs support the HR team and the candidates with interview scheduling. When organizations utilize a video interviewing platform, automated emails with instructions on how to complete the video interview are sent by bots. Then the HR team can review interviews and select the ‘right’ candidates for the continuation of the recruitment process.

Today’s recruiting is mostly done through social networking, which has in fact become business networking. Many job openings can be found on Facebook and LinkedIn, which has over 450 million registered members, with thousands of new job offers made every single day. Now businesses ‘hunt’ people’s social profiles in order to recruit. Traditional face-to-face communication has been transformed to online, virtual conference calls and recruitment interviews through the likes of Skype, which have revolutionized the way people interact by abolishing physical space and conserving time and speed. All these indicate that, in the future, it will be even easier and faster to recruit employees, and similarly to find a job. What remains certain is that the businesses that adapt to the new era of digitalization and technology will be the ones that have a competitive advantage.

Employment Needs and Patterns

Currently, HR is witnessing a dramatic change in work patterns. Today’s employees are not ready to settle into a job forever. Instead, they are eager for growth-oriented roles, can move to new opportunities within two to five years, and are continually looking for ‘something better’. Remote workers, freelance operatives, and other forms of consultative workers are redoing recruitment for good. HR is now starting

17 PricewaterhouseCoopers, ‘Artificial Intelligence in HR: a No-brainer’, *PwC* (2017), available at <https://www.pwc.at/de/publikationen/verschiedenes/artificial-intelligence-in-hr-a-no-brainer.pdf>.

18 Maruti Tech Labs, ‘What is Robotic Process Automation? How is RPA Different from Traditional Automation?’, *Marutitech.com* (2019), available at <https://www.marutitech.com/robotic-process-automation-vs-traditional-automation>.

to search for talent among the Generation Z prospective employees. These are the new job candidates characterized as the 'Digital', the 'Independent', the 'Unafraid', the 'Global', the cohort that is also known as iGeneration (iGen), Gen Tech, Gen Wii, Net Gen, Digital Natives and Plurals. Certainly, HR is moving to a cognitive era using AI, blockchain, augmented reality, experimentation and cognitive thinking. Generation Z needs to be challenged enough to create, to innovate, and to succeed.

A study by *Fitsmallbusiness.com*¹⁹ refers to the gig economy's 10 highest paid jobs, starting with Deep learning/AI, blockchain architecture, Robotics, Ethical hacking, Cryptocurrency and ending with Instagram marketing, as the jobs that are in demand today. Thus, HR technology has transformed the employee experience; however, blockchain technology will take this experience even further, by accelerating the rise of the gig economy. HR is testifying on the trend of from recruitment to talent acquisition, and on the urgent need to adjust from intuition to intellect via Artificial Intelligence and blockchain which are the accelerators for these major changes.

In examining blockchain and HR, Jason Cassidy, the co-founder and president of Blockchain TV, commented that "The talent recruitment industry is one of the most opportune for positive disruption via blockchain technology". Recently they partnered with HireMatch, the first vendor to offer a decentralized blockchain-based solution for recruiting purposes, using an ERC20 token called iHIREi. Blockchain has the potential to transform recruitment by managing costs, reducing the cost of finding, interviewing, and hiring new employees, removing unnecessary impediments, and creating streamlined and efficient records resistant to modification.

Blockchain's database offers a host of benefits which include: transparency, since numerous computers can host specific information simultaneously, thus anyone on the internet can access the data it holds; immutable-hack proof since the network of a blockchain exists at a place of consensus and is self-auditing. Changing even the smallest part of this blockchain would take an enormous amount of computer power to take over an entire network. Additionally, blockchain usage is key in the recruitment industry since it can be used for verification of educational background, thus fraudulent claims of education could be a thing of the past. Today several higher education institutions are creating blockchain databases for their students. The issuing of such certificates is hard to tamper with and so, very easy to validate. This tool saves time, money and effort of searching through candidates' credentials.

Blockchain can gather data and then store it. Consequently, it can track a person from one job to another, providing data on the candidate's experience and skills to recruiters and HR personnel. Other key records include length of employment of

19 H. Kanapi, '10 highest paid Gig economy jobs in 2018'. *FitSmallBusiness.com* (2018, February 22), available at <https://fitsmallbusiness.com/gig-economy-jobs/>.

past jobs, wages, bonuses and set goals they have achieved for former employers. Blockchains can contain specific computer protocols to control the distribution of digital contracts. All these features can influence benefits, wages, retirement packages and bonuses. At the same time, there must be some safeguards of how the data is obtained to avoid negative consequences of infringing on one's privacy.²⁰

Conclusions

The impact of artificial intelligence and blockchain adoption on business and HR practices, particularly the employment recruiting industry, is clear. As both evolve, their value will only grow as HR professionals find more ways to use them in order to save money, time, and effort, while immensely improving the quality of the candidates being chosen. Today, AI is helping to improve the selection of a diversified pool of candidates through an algorithmic assessment platform, which can be set up to reduce biases and maximize objectivity. With the use of predictive analytics and neuroscience tools (Emotion Recognition software like Affectiva, Emotional Intelligence and Truthfulness Help), HR is assisted in the removal of human biases, conscious and unconscious bias, with the identification of emotional traits, soft skills and cognitive traits to be able to select the 'best fit' candidates. AI is increasingly becoming more valuable in automating repetitive recruiting tasks such as sourcing resumes, scheduling interviews and providing feedback. Furthermore, it can evaluate the current workforce and help the HR team to make better decisions on who to hire. CareerBuilder company, as cited by Biro,²¹ developed AI technology that can create a CV or a job description in less than a minute. The CEO of CareerBuilder, Irina Novoselsky, commented that 'Our research shows that more than half of HR managers feel AI will become a regular part of HR within five years', and also 'What is exciting is that we're just at the cusp of what this technology can do'.

As discussed, automation is one of the most popular emerging technologies currently being deployed in business that make it possible to enhance the human experience for both the organization and the employment candidate. Technology, especially AI and blockchain, are certainly transforming the human resource task. Although it appears expensive, the benefits, which include saving time, far outweigh the cost. Even though it is hard to find the right-fit candidate, the HR teams' targets on quality and efficiency are not about sacrificing meaningful relationships and

20 M. Cerrone, 'The Evolution of the Background Verification Industry In the Gig Era'. *HRTechnologist* (2018, October 26), available at https://www.hrtechnologist.com/articles/background-verification/the-evolution-of-the-verification-industry-in-the-age-of-the-gigworker/?utm_source=editors_pick.

21 M. M. Biro, 'Five Ways Technology is Changing the Face of HR'. *Talent Culture.com* (2018, December 11), available at <https://talentculture.com/5-ways-technology-is-changing-the-face-of-hr/>.

communication, but having the right balance aiming at the best possible outcome. Over time, both blockchain and AI will disrupt recruitment in its entirety. HR professionals will be able to leverage these tools to make hiring humans an agent for both individual and organizational growth and productivity. These radical changes that we are all witnessing in technology, with their potentialities and complexities, which result in innovation, are indeed creating their own challenges. There will be concerns to have greater security and higher levels of transparency, dependability and quality, as well as emotional capacity and a stronger moral code. Human beings will be behind these transformations, taking up opportunities and revolutionizing threats.

In closing, I express my own concerns about the feelings and moral codes of any form of technology including AI. I wonder when the day will come when we can answer Williams' question, 'How can you tell the difference between speaking to some form of artificial intelligence and an actual human being?'²² His response was, 'Ask them how they feel about dying'. Similarly, O'Shea stated that 'tech has no moral code'.²³ To Williams' and O'Shea's comments, I will add my own: 'Ask AI robots how they feel about starving children, catastrophes or wars'. Will the day come when AI understands these concepts?

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22 R. Williams, 'How dying offers us a chance to live the fullest life', *New Statesman.com* (2018, April), available at <https://www.newstatesman.com/culture/books/2018/04/how-dying-offers-us-chance-live-fullest-life>.

23 L. O'Shea 'Tech has no moral code. It is everyone's job now to fight for one', *The Guardian* (2018, April 25), available at <https://www.theguardian.com/commentisfree/2018/apr/25/tech-no-moralcode-racist-ads-cambridge-analytica-technology-ethical-deficit>.

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