

How Artificial Intelligence Affects Workforces: The Impact of Biased Recruitment and Job Displacement Risk

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Abstract. With the development of Artificial Intelligence (AI), AI systems has been used in many organisations. The relationship between workforces and AI systems has been a frequently discussed topic. To demonstrate in detail, this article surfaces two most significant ways of influencing workforces by AI, explaining why the misuse of AI is inequitable and socially harmful. While knowing that the application of AI could have negative influences on employees, this article seeks to explain that further with cases, and provide suggestions for firms to use AI in a more appropriate method that will not hurts employees' interests and cause their uncertainty.

Keywords: Artificial intelligence (AI), Workforces, Biased recruitment, Uncertainty, Job satisfaction, Job displacement.

1. Introduction

Artificial Intelligence (AI) has made significant improvement during the COVID-19 [1]. It is a flexible tool that enables organisations to re-evaluate how to combine information, analyse data, and make use of the insights gained to enhance corporate performance [2]. It is transforming the way businesses operate by automating business processes, enhancing decision-making capabilities, and staying ahead of the competition [3]. Nevertheless, AI has the potential to occasionally produce biased judgments or impose stress on employees, resulting in unjust outcomes or reduced job satisfaction [4]. Presented as the CAS structure, the cases of Amazon, self-checkout machine, and ChatGPT are used to reveal why the AI systems in organisation make employees feel uncertainty. The significance of the study is to provide companies with suggestions on how to properly apply AI systems without affecting employees' job satisfaction and happiness, so as to provide a fair workplace and continuously improve employees' wellbeing and work efficiency. It also aims to enhance comprehension regarding the influence of AI on employees and the workplace as a whole, with the ultimate goal of assisting organisations in overcoming challenges related to AI adoption [5]. Two problems that AI is going to influence workforces will be examined: firstly, the biases of AI in recruitment and secondly, the risk of AI replacing human employees. These two aspects will be analysed individually, considering specific cases, and subsequently, recommendations will be provided to help organizations effectively prepare for the integration of AI systems.

2. Analyse on the Biases of AI in Recruitment

Recently, many Human Resources (HR) sector has embraced AI for various functions, including forecasting employee turnover, implementing chatbot systems for HR services, and conducting background checks to assess applicants' resumes [6]. Data from Predictive Hire indicates that approximately 55% of companies are currently investing in recruitment automation, with the belief that it will improve efficiency and facilitate data-driven decision-making [7]. AI can help an organisation reduce spending by automate expensive and time-costing tasks, particularly during extensive recruitment efforts for non-managerial positions [8]. However, the integration of AI into hiring processes can give rise to several challenges and issues, such as unfair recruitment. AI bias refers to a situation where a machine learning model's output can result in discrimination against particular individuals, such as those who have been historically marginalised due to their gender or race [9]. Because AI relies on the human created data, so any biases or prejudices of humans will

enter the AI systems, and even be amplified due to the complex sociotechnical systems [10]. AI biases in recruitment can exert a dual impact on workforces, manifesting both short-term and long-term consequences that affect multiple facets of the workplace. This sector will explore the factors that could contribute to the biases of AI in hiring process with an example of Amazon, and the implications of biases.

2.1. Case Study of Amazon

In 2017, Amazon encountered a widely documented instance of bias within its AI-driven recruitment system [11]. The company had implemented an AI algorithm to aid in the hiring process, but it was discovered that the algorithm displayed considerable bias against female candidates, resulting in discriminatory results [11]. The resumes that contained “women’s” were neglected by the system [11]. Although Amazon said that they have never taken the advice of the hiring tool, the HR managers’ opinions was affected by those recommendations. Therefore, to some extent, the biases will be perpetuated by using AI in a business and cannot be easily eliminated.

The algorithm's bias was caused mostly by an insufficient representation of female candidates within the initial training dataset used to build the model [6]. The AI system was trained using past resumes that were sent to Amazon over a decade [12]. Since the technology industry has traditionally been male-dominated, the training data was skewed towards male applicants, leading the AI algorithm to associate male candidates with successful hires [11]. As a result, the AI system exhibited a preference for male applicants, even when equally or more qualified female candidates were available, thereby perpetuating gender bias in the hiring process. Moreover, the low transparency of AI hiring process can also cause AI bias. Frequently, applicants are unaware that they will undergo an automated process and are uncertain about the criteria used to evaluate them within that process [8]. This means that candidates and hiring managers are unable to have a comprehensive understanding of the factors that influence hiring decisions. Consequently, candidates remain unaware of how to improve their chances of gaining access to the organisations they aspire to work for. And the accountability will be very weak which means hiring managers are not responsible for outcomes of the biased hiring process. Therefore, it is difficult to ensure that their obligations are fulfilled in a fair and just manner.

In addition, there is disparate treatment within the process which is an internationally discriminatory practice aimed at individuals due to their protected attributes [6]. Although the company can exclude protected attributes such as gender from the training data, there are situations where this alone may not prevent unfair decisions. An example of this is evident in natural language processing, where the model can deduce a candidate's gender based on their name and educational background, leading to indirect discrimination – discrimination through implicit features present in the dataset [6]. For instance, if someone’s resume includes terms like “women’s tennis club captain,” it indicates that she is female. Therefore, fair cannot be achieved by solely remove the protected attributes. Besides, since AI relies on unconscious and prejudiced selection pattern such as language [13], it can make unfair and unreasonable decisions during the hiring process. According to Natalie Sheard, a lawyer and PhD candidate at La Trobe University, whose doctoral research focuses on the regulation and discrimination in AI-based hiring systems, Messenger- style AI that operated on the foundation of natural language processing often show bias [8]. Because the training data for such systems typically consists of the words or vocal sounds of individuals who use standard English, they are more likely to favour native speakers and perceive non-native English speakers as lacking communication skills [8]. Therefore, those candidates will be treated worse compared to native speakers who may have relatively lower abilities.

The presence of biased AI systems may lead to the unjust exclusion of qualified candidates from underrepresented groups. Workforces from marginalised communities may face barriers in accessing quality jobs and advancing in their career. In the short term, employees who perceive unfair treatment or hiring practices during the recruitment process may be prone to leaving the organisation, which make it more difficult for managers to retain workforces. In the long term, such an unfair and biased

hiring process can make the organisation lack of diversity. The absence of diversity will surely impede innovation and creativity since diverse viewpoints are crucial for propelling progress and questioning conventional practices [14]. Moreover, the biased hiring process will also create a perception of an inequitable work environment, which adversely affects employee morale and overall job satisfaction. Amazon's biased AI hiring process stands as a cautionary example of the potential risks and challenges associated with depending on AI algorithms in the recruitment process. Organisations' managers are in urgent need to take actions to this issue.

3. Analyse on Employees' Risk of Being Replaced by AI

Amidst the constantly changing technology landscape, the swift progress of AI has left employers and employees struggling to cope with the significant transformations it introduces to the workplace. Employees risk losing their jobs as AI algorithms become capable of performing human tasks, especially those unskilled and low-educated labours, such as cashier and cleaner [15]. This situation has been even serious after the COVID-19 pandemic. During the global disaster and worldwide quarantine, contactless service developed rapidly [16], which is considered a rise of AI.

One of the downsides of implementing AI within organisations is the negative attitudes and lack of trust exhibited by both managers and employees towards automation and intelligent technologies [5]. Many individuals within these organizations are apprehensive about AI potentially jeopardizing their jobs, leading to heightened employee stress, decreased organizational commitment, and diminished productivity as a result of AI adoption [5]. According to a latest research conducted by Raj and Seamans [17], the use of RAIA (Robotic, Artificial Intelligence, and Automation) necessitates significant restructuring and reshaping of organisations, leading to shifts in the skills required of employees and their responsibilities. This high skill-demand transition pressure may even result in mental health concerns, affecting the health of staff members [18]. Employees with low skill levels, such as factory workers, are more likely to be laid off [18], their job satisfaction decreases inversely with uncertainty. Although there are some employees that are less fearful of AI implementation such as managers, professionals, and highly educated individuals, AI will eventually impact most job roles in the future [19].

3.1. Case Study of UK's Retail Industry

The uncertainty surrounding the introduction of AI poses challenges for employees, potentially leading to negative effects on their commitment, career satisfaction, and increasing turnover intentions, cynicism, and feelings of depression. Job insecurity will also be reported by employees as there is the sensation that one cannot keep the required continuity in a job that is threatened [20]. This is because of an estimation of jobs becoming obsolete in the future. One of the most common examples is the self-service checkout machine.

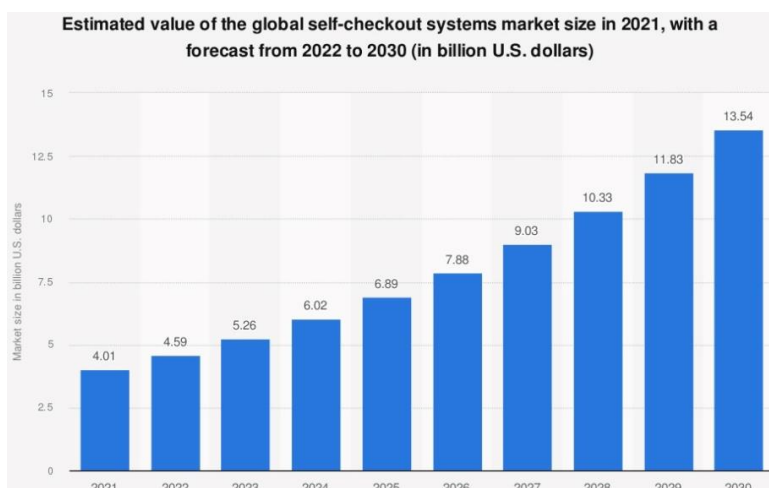


Fig. 1 Self-checkout systems market size worldwide 2021

According to Fig.1, in 2021, the global market value for self-checkout systems was slightly above four billion U.S. dollars [21]. However, with the development of AI and consumers increasingly seeking efficient and contactless checkout options, self-checkout systems have gained traction across various industries, including supermarkets, convenience stores, and retail outlets. The projections indicate that between 2021 and 2030, the market size is expected to surge significantly, reaching 13.54 billion U.S. dollars [21].

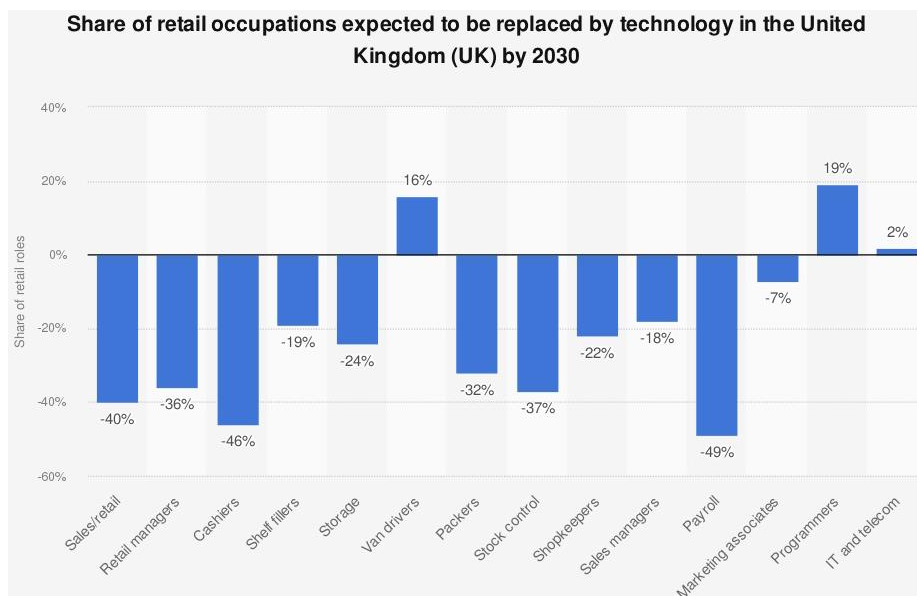


Fig. 2 Retail roles expected to be replaced by technology in the UK by 2030

As shown in Fig. 2, due to the rapidly increase and widespread of self-checkout technologies across the world, the retail cashier roles are projected to have a 46 percent decline by 2030 [22]. In addition, by the year 2030, the swift advancements in artificial intelligence and automation technologies are projected to displace not only cashier but also a substantial number of positions within the retail industry in the UK [22]. For instance, floor robots are widely used in storage and is predicted to replace 24 percent of warehouse employees [22].

However, although these AI improvements can bring convenience and reduce organisation costs, this will further hurt employees’ satisfaction at work. Job satisfaction is characterised as a cheerful or positive emotional state resulting from an assessment of one’s employment or working experiences. [23]. But when employees encounter changes in their responsibilities and face the possibility of layoffs, they may start questioning their significance and value, leading to a possible detrimental effect on their self-esteem and general level of happiness with their lives [24].

4. Suggestions for Biases in AI Hiring Process

In order to counteract the impact of AI biases on workforces, organisations should take proactive measures to tackle biases in their AI recruitment systems. The Amazon case provides valuable insights for organisations aiming to incorporate AI into their hiring processes.

Firstly, inclusivity issue should be considered when designing AI algorithms to make sure that the minority groups will not be hurt [25]. Organisations should make sure that the training data utilised for AI algorithm is divers and reflective the candidate pool, including candidates from various demographics, educational backgrounds, and experiences. To further avoid discrimination, organisations can conceal certain words that might lead to biases, such as gender and race, or replace them with neutral alternatives. For instance, “women’s tennis club captain” and “men’s tennis club captain” can be replaced with “student’s tennis club captain”. In addition, the transparency of AI recruitment demands full disclosure, allowing employees to know the selection criteria. Transparent AI systems are crucial for understanding and addressing potential biases because it ensures candidates

receive fair evaluations based on their qualifications and experience. Moreover, employers must also monitor the entire process to identify hidden biases or potential points of re-emergence [13]. Therefore, accountability will also be enforced, holding human resources managers responsible for any outcomes resulting from the hiring process. Furthermore, it is essential to conduct regular audits and monitoring of AI systems to identify any potential emerging biases. Conducting periodic evaluations help maintain the fairness and effectiveness of the hiring process and allows organisations to intervene and correct biases promptly. Firms have to also analyse the effectiveness of AI systems in making decisions and decide whether to abandon the tools like Amazon did [11].

However, it is difficult to define fairness. Different problems need to use its own measurement of fairness when collecting databases. Although the improvement of data collecting process and the definition of fairness can help reduce AI biases, human being is needed to make the final decision with the help of social science and ethics [26]. Therefore, in addition to the accountability system, conducting regular fairness impact assessments is crucial to prevent a biased hiring process. This is frequently evaluating the influence of the AI hiring system on diversity and inclusivity within the organisation and monitor shifts in the workforce composition over time and modify the AI algorithm as necessary to align it with diversity objectives.

5. Suggestions for Relieve the Risk of AI Replacing Employees

In terms of the employee management, taking employees' suggestions and perspectives into account can help alleviate the repercussions of technological changes in organisations [24]. It is useful to promote transparent and open communication between management and employees regarding the potential effects of AI on the workforce. Through open communication, employers can provide employees with transparent information about the organisation's plans for AI integration, allowing them to address any concerns they may have. Both employees and employers should adopt a more flexible and open-minded approach towards AI, accepting that AI developments may affect the duties and functions of employees [24]. Organisations need to engage in effective communication regarding the upcoming change, promoting AI awareness and urging staff to accept it with a positive attitude to ensure a smooth transfer throughout this industrial shift [24].

Moreover, it is necessary for managers to identify irreplaceable human skills and recognise the distinct abilities and attributes that set humans apart from AI. For instance, the essence of "human touch" and the value of "soft skills" are irreplaceable and cannot be duplicated by AI [24]. These may include emotional intelligence, creativity, critical thinking, and the ability to solve complex problems that should be further developed in the workplaces. Managers can also promote job rotation and internal mobility, allowing employees to explore various roles within the organisation. This approach can enrich their skill set and offer a broad spectrum of experiences. Therefore, as employees acquire a greater proficiency in various skills, they will also encounter a decrease in uncertainty regarding their job responsibilities. Organisations should aggressively include labours when implementing new technology innovations into company procedures to create widespread cooperation. In addition, it is important for organisations to explore ways to maximise the potential of their workforce and prioritise investing in retraining employees rather than resorting to redundancies.

Organisations need to ensure that they develop and deploy artificial intelligence technologies in an ethical and responsible manner. They should establish guidelines for the use of AI to prevent biases and ensure fairness in decision-making. Moreover, such advancements should be carefully evaluated and not driven solely by technological trends [24]. Organisations should form highly qualified teams, use impartial algorithms, and assure correct AI implementation to avoid any negative repercussions [24].

6. Conclusion

This study delved into two of the most crucial aspects of the complex relationship between AI and workforces: the biased hiring process and the stress of being replaced by AI. This paper aimed to give information on how AI may affect workers through the past research, identify ways to mitigate the negative influences on employees, and foster a harmonious coexistence between humans and technology.

Firstly, the examination of biased hiring processes in the context of AI revealed that despite the potential for objectivity, AI-driven recruitment systems can perpetuate biases present in historical data. Vigilance in addressing these biases becomes paramount as they undermine diversity and inclusion efforts. It is necessary for organizations to actively audit and refine AI algorithms to ensure fair and equitable hiring practices in the future. Secondly, the analysis highlighted the growing apprehension among employees regarding the spectre of AI replacing their roles. Organisations must actively engage their workforce in reskilling and upskilling initiatives, preparing them to embrace new opportunities arising from AI integration.

This study underscores the need for a balanced and thoughtful approach to the integration of AI in the workforce. By addressing biased hiring practices and alleviating employee concerns about job displacement, we can build a future where AI is a collaborative ally rather than a disruptive force. As we look towards the horizon of technological advancements, it is imperative for policymakers, businesses, and individuals to unite in shaping a future where AI serves as an enabler of progress and not a barrier to human potential. By fostering a human-centric AI implementation, we can build a resilient, inclusive, and dynamic workforce that thrives amidst the challenges and opportunities of the AI revolution. Together, we can forge a path towards an enlightened era of human-AI collaboration, where collective ingenuity propels us towards a more prosperous and harmonious future.

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