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How social and digital technology shape gender representation - The example of Amazon's AI recruitment tool

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Abstract

This study examines how social and digital technologies shape gender representations, using Amazon's biased AI recruitment tool as a case study. Through analysis of Amazon's algorithmic discrimination against female candidates, this research demonstrates how society and digital technology assign different workplace values to men and women based on biological differences, social roles, and business interests, creating gender representations where women are perceived as less socially competent than men. The AI recruitment tool, which penalized resumes containing female-related terms, reflects entrenched social biases that become embedded in digital algorithms, challenging the notion of "technology neutrality." However, the study argues that these gender representations are not irreversible. With the rise of feminist consciousness, legal protections for gender equality, and the development of social media platforms that provide new avenues for women's voices and entrepreneurship, society and digital technology are beginning to reshape traditional gender stereotypes. The findings reveal the dual nature of technology's role in gender representation: while it can perpetuate existing social biases, it also offers tools for challenging and transforming discriminatory practices.

Keywords: gender representation, digital technology, algorithmic bias, artificial intelligence, workplace discrimination, data feminism

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1 Introduction

Recent advances in technology and social inclusion have led us to consider the everyday practice in which gender and technology are intertwined, and as Cynthia Cockburn suggests technology cannot be fully understood in isolation from gender. At the same time the social relations of technology are gendered, and it is technology that enters into gender identity (Silverstone et al., 1992). Thus, it is clear that society, technology and gender are intimately linked and mutually influential. So how do society and digital technology shape gender representations?

Helen Thornham's research has demonstrated the irreconcilably close relationship between digital technology and gender (Thornham, 2018, pp. 1-21), however I argue that the dynamic changes in society are also a factor that cannot be ignored and that there is no single study on how society and digital technology shape gender representations, so this paper will use a representative contemporary example of the artificial intelligence recruitment tool that Amazon once employed to select resumes as a starting point to analyse in a small way how society and digital technologies shape gender representations from the perspective of the contemporary workplace. Through my analysis and argumentation, I hope to show that social and digital technologies have shaped gender representations of gender differences in social abilities by assigning different workplace values to men and women, where social abilities refer to an individual's ability to use interpersonal communication, organisational and stress-resilient skills in a given situation to accomplish goals and achieve their long-term development (Dirks, Treat and Robin Weersing, 2007). However, such gender representations can also be reshaped by social and digital technologies.

2 The artificial intelligence recruitment tool used by Amazon is biased against women

Machine learning experts at Amazon have found that the intelligent recruitment tool used by their company is biased against female candidates. The tool has been used by Amazon since 2014 to score job applicants and evaluate candidates. However, in 2015 the company realised that this system did not assess job candidates in a gender neutral way and even penalised Curriculum Vitae that contained 'female' related words (Dastin, 2018), which further exacerbated the imbalance in the ratio of male to female employees at Amazon. In fact, the gender imbalance is not unique to Amazon, as according to statistics, top US tech companies including Facebook, Apple and Google, to name a few, have yet to close the gender gap in hiring, with the gap being most pronounced among technical staff such as software developers, where men far outnumber women (Dastin, 2018). Amazon's hiring engine follows precisely the same pattern, with the system's algorithm observing that the majority of the company's resumes over the past decade have come from men, so the system has self-taught itself the characteristic that male candidates are more popular. Automation has been key to Amazon's e-commerce dominance, and the process used to assess CVs demonstrates a bias against female job candidates that maps to the 'mini-society' of the Amazon company's preference for gender in job candidates and reflects the hidden sexism of the workplace. In this case, Amazon is a miniature society, and the AI recruitment tool is a representative example of digital algorithms in digital technology. The fact that companies prefer to hire men shows that society and digital technology shape the gender representations of men and women as socially competent, and that men are perceived to be more socially competent than women, and that gender representation is achieved through the different workplace values assigned to men and women by social and digital technologies.

Specifically, society and digital technology assign different workplace values to men and women based on three main criteria: biological differences, social roles and maximising business benefits. Firstly, there are objective physiological differences between men and women. Women are biologically tasked with the

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responsibility of raising the next generation, which means that women's work status is less stable than that of men. At the same time, due to women's physical characteristics such as physiological periods and low strength, women's work areas are relatively narrow. Secondly, there is the social roles aspect, which is especially prominent in the Chinese social environment, where traditional Chinese thought is that 'The man goes out to work while the woman looks after the house.' The influence of the social environment has led to the assumption that women should focus their lives on their families rather than their careers. Of course this is not only found in China, but also in the United States, where NASA data analyst Darden, a black woman with technical expertise, was belittled at work because of her gender and race, and her mentor believed that women should not be placed in such important positions in engineering because they had families and children to care for (Kanarinka and Klein, 2020). Finally, the employment of female staff is to a certain extent contrary to the goal of maximising the interests of the company, which is a subject of the market economy. The cost of working hours and the special requirements of women can be contrary to the goal of maximising profit in the development process. Social and digital technologies are giving men a higher workplace value through a combination of biological differences, social roles and corporate interests.

This social consensus and the inequality of workplace values between men and women have shaped and entrenched the gender representation of women as less socially competent than men, leading to an imbalance in the number of men and women in the workplace, with black women being more heavily biased. proposes that there is a tension at the heart of the relationship between gender and technology that both influences and is generated by imagination, performance, practice and digital infrastructure (Thornham, 2018, pp. 1-21), but unlike Helen, she does not mention the important factor of social context, which, according to the analysis above, has an inexorable influence on people's development of digital technology can have a non-negligible impact on people's mindset when developing technology, and taking social factors into account would make this study more comprehensive, as technology is a product of social development. It is in this environment of social consensus and unequal workplace values for men and women that society has subsequently assigned different workplace values to men and women based on the three main factors mentioned above, thus shaping and entrenching the gender representation of women as less socially competent than men, which in turn has led to an imbalance in the number of men and women working in companies, with black women being more heavily prejudiced. Helen Thornham proposes that there is a tension at the heart of the relationship between gender and technology that both influences and is generated by imagination, performance, practice and digital infrastructure (Thornham, 2018, pp. 1-21), but what is different is that Helen does not mention the important factor of social environment, which, according to the analysis above, is a factor that has a significant impact on how people develop digital technology can have a non-negligible impact on people's mindset when developing technology, and taking the social factor into account would make this study more comprehensive, as technology is a product of social development. It is also because of this social factor that the stereotype of women as less socially competent than men has led to the emergence of issues such as algorithmic discrimination in the smart recruitment tool used by Amazon, which is not uncommon as the selection of technical solutions and datasets in the pre-development stage of the algorithm may reflect gender bias and systematic social bias against individuals and communities (Zhang and Song, 2022), and the entrenched social stereotypes are particularly detrimental to the 'technology neutrality' of digital algorithms. From a societal perspective, such gender representations may lead to the assumption that fewer women than men are employed mainly because women are less socially competent than men, and some small businesses may choose to follow the example of large corporations such as Amazon in reducing the proportion of female employees, leading to a vicious circle and exacerbating the inequality of resources between men and women in society. From a digital technology perspective, this gender representation can be a major obstacle to the 'technology neutrality' of digital algorithms.

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3 Social and digital technological developments - reshaping gender representations

However, I believe that it is important to note that note that such gender representations are not irreversible. First of all, there is no subjective malice in the shaping of such prejudiced gender representations by society and digital technology. From a social point of view, society and companies are driven by the goal of maximising the benefits and the efficient structure of society to give men a higher value in the workplace; and digital technology, such as digital algorithms, was actually invented to reduce the prejudiced thinking that humans themselves cannot ignore. But in leading to a situation that exacerbates the inequality of resources and status between men and women in society, the well-intentioned starting point of society and digital technology has been ignored. With the topic of gender equality gaining social importance and the awakening of female consciousness, the gender representation of women as socially less capable than men is beginning to be corrected. Society has realised that women's biological structure and their social roles make them inherently socially disadvantaged and that the criteria for assessing their social abilities should be adjusted accordingly, and that society should provide certain guarantees for women in socially disadvantaged positions to compensate for their biological structure and other disadvantages. In China, for example, a legal system has been established to promote gender equality, based on the 'Constitution' and the 'Law on the Protection of Women's Rights and Interests' (The State Council Information Office, 2015). The awakening of female consciousness of more women makes more women realize that they should fight for their equal rights. The wave of feminist movements has lasted for a very long time and under its progress has given rise to a data feminism led by women of colour. This intersectional feminism emphasises that the effects of privilege and oppression are not evenly distributed among individuals and groups, which include women, people of colour, immigrants, and other disadvantaged groups. For them, privilege and oppression become a common and inevitable part of their everyday lives. Digital feminism hopes to challenge and change the distribution of power through the data science (Kanarinka and Klein, 2020). In addition to this, social media has evolved as a voice for women, people of colour and other disadvantaged groups in society due to the social environment and feedback from feminist and egalitarian users. They use social media to post content about 'women's power', 'equal rights' and other issues to call for more people to participate in the fight for the rights of the underprivileged in society. Social media has also become a platform for feminists to develop social movements with hashtags, retweets and other functions to organise social campaigns such as '#Me Too'. Social media has become a tool for women to prove to society that they are not as weak as stereotypical gender representations. The development of social media such as YouTube and Instagram has also given women more freedom to start their own businesses, which means that women have more opportunities to break away from the traditional workplace because of the development of social media, and therefore women are able to demonstrate their social skills more directly. According to data, women outnumber men among the thirty most influential influencers on Instagram (Schaffer, 2020). Therefore, with the advancement of society and digital technology, the social ability of women to be less powerful than men is gradually being broken down.

4 Conclusion

Social and digital technologies have shaped the gender representation of women as less capable than men by assigning different workplace values to men and women, based on a lack of awareness of social equality, which has led to social prejudice against women and consequently to algorithmic discrimination in digital algorithms due to the social environment. However, it is undeniable that this gender stereotype has not completely disappeared, and many women are still discriminated against in the workplace because of this stereotypical gender representation, as well as the fact that digital algorithms are not completely 'technology neutral'. However, with the spread of education, the awakening of feminist and affirmative consciousness in society and the continuous development of digital technology, society and digital technology are reshap-

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ing the social value of women's identity by strengthening the legal protection of vulnerable groups such as women, by providing avenues for voice and by developing platforms.

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