How the most recent AI wave affects jobs

With rapid progress in natural language processing and image generation, AI now affects creative occupations, which were previously considered safe from automation. ***Cecily Josten*** *and* ***Grace Lordan*** *write that job displacement concerns are legitimate and new approaches to education and workforce development are needed. They say that addressing biases in AI and fostering reskilling are also necessary for inclusive adaptation to AI advancements.*

Artificial intelligence (AI) has been a widely debated topic of the past decades with new AI waves following previous ones rapidly. At work, AI has already replaced occupations and tasks within occupations, and will likely continue to do so (Frey and Osborne 2013). But for a long time, many experts argued that AI and automation more generally wouldn't affect occupations and tasks that involved intrinsically human skills such as creativity. Now though, we see Hollywood actors and writers, arguably a very creative breed, go on strike in fear of AI replacing their jobs (BBC 2023). With the introduction of the chatbot ChatGPT, it is not hard to imagine for it to become an excellent screenwriter or storyteller. Body scanning tools and digital cloning on the other hand create actors, if only background actors for now (The Washington Post, 2023).

This situation highlights the rapid advancements in AI technology, especially in natural language processing and image generation, which have enabled AI systems to mimic human-like performances and create original content. Consequently, concerns are rising among professionals that their jobs might be at risk as AI becomes more capable of mimicking what was once exclusively done by humans.

The debate about AI's impact on various industries, including entertainment, continues to evolve, and it raises questions about the future of work and the relationship between humans and technology. While automation has undeniably brought numerous benefits and efficiencies to various sectors, it has also given rise to legitimate concerns about job displacement and the need for new approaches to education and workforce development. One further concern is the impact it has on the remaining distribution of jobs and the diversity therein. In other words, it remains to be tested whether the jobs that remain are diverse and representative of our society as a whole.

Many aspects of the effects of AI remain unknown to us as of now, which highlights the importance of seeing this debate as a static snapshot of what we know now.

AI and jobs: the past

For the past decades, economists have been analysing the impact of automation and artificial intelligence. In their research, Autor and Dorn (2013) found that automation has had a significant impact on employment. They observed that automation has led to the displacement of jobs in certain industries, particularly those involving routine tasks. These jobs are often repetitive and can be easily automated, leading to a reduction in the demand for human labour in those sectors. Automation, however, has also created new job opportunities in other industries, especially those that require non-routine, cognitive, and interpersonal skills. As technology takes over repetitive tasks, human workers are increasingly needed to perform complex problem-solving, creativity, and social interaction. These findings are supported by Atalay et al. (2020), who analyse job adverts of the past and also find that between 1950 and 2000 tasks within occupations have shifted from routine cognitive and manual towards nonroutine interactive and analytic tasks.

These developments further implied a shift in skills demand with a combination of cognitive and social skills being increasingly demanded and rewarded (Deming 2017). High-skill workers, who possess the abilities that complement automation and work collaboratively with machines, tend to experience increased demand and higher wages. Meanwhile, low-skill workers, whose jobs can be easily replaced by machines, face decreased job opportunities and stagnant wages.

Building on Autor and Dorn's classification of job tasks into routine task-intensity, as measured by the level of routine, abstract and manual task content of a given occupation, and taking their classification of automatable jobs as given, in 2020 we took this debate to the future by looking at the introduction of patents. We analysed patents for occupations previously classified as non-automatable to reclassify them into either still being non-automatable or into being automatable or polarised automatable. Polarised automatable implies that those jobs will partly be automated with some aspects of the job still valuing human employees and others not so much. An example brought forward is the occupation of waiters: in a fancy restaurant we might still value a human

waiter who serves us whereas we accept robots or machines in a fast-food restaurant. Here, patents are available for robots or machines that can perform tasks by waiters, but society still values the human aspect of this occupation.

Taking this debate of the past years forward, from mere observation we can see that some of the findings have already changed with many tasks in occupations involving human non-routine tasks such as script writing being replaced by technology and artificial intelligence. Most recent waves of AI show that there may be more disruption than initially assumed.

AI and jobs: the present and the future

A report published by Goldman Sachs (2023) estimates that generative AI such as ChatGPT could automate 300 million jobs globally in the near future, which proxies to one fourth of our current workforce. Similarly, the OECD (2023) in its most recent employment outlook speaks of an AI revolution that is triggered by progress in generative AI, the falling costs of using AI and the increasing availability of workers with AI skills. They consider that 27 per cent of occupations are at risk of being automated. Tech layoffs have splurged recently with many companies in the tech sector and small start-ups laying off up to 50 per cent of their staff among them small start-ups and big companies such as Netflix, Google, Amazon, Microsoft etc (Techcrunch 2023). While these layoffs can partly be attributed to the current macroeconomic situation, AI and automation likely also play a role.

Academic literature largely predates the most recent developments in AI but it still offers some suggestions of what the recent developments imply for jobs (OECD 2023).

- *First*, it is important to highlight that negative employment effects may take their time to fully advance as firms adapt slowly to new technologies.
- *Second*, there will likely be productivity gains thanks to AI. Kanazawa et al. (2022) examine the impact of AI on productivity of taxi drivers and find that AI increases productivity particularly of low-skilled drivers by shortening cruising time. Such productivity effects for non-replaced workers together with lower costs of technology may positively impact economic growth by an estimated 7 per cent GDP increase globally (Goldman Sachs 2023).
- *Third*, there is evidence that the AI disruption aggravates the so-called skills-biased

technological change. Albanesi et al. (2023) find that employment shares increased in occupations across Europe that are exposed to AI shifting towards high-skills labour markets. This is also in line with a new McKinsey report (2023) that finds that workers in low-wage occupations are 14 times more likely to need to change their job following the impact of AI. Either way it is crucial to distinguish the heterogeneity of skills for the tasks that are replaceable within an occupation rather than blandly looking at occupations as a whole (Kanazawa et al. 2022).

- *Fourth*, there are skills that AI cannot (yet) perform such as complex problem-solving, high-level management or many social skills (OECD 2023).

Looking back at our job classification based on patents, the recent AI wave has important implications. Concretely, some classifications would change if they were to be classified today while others would not.

Classifications of, for example, service occupations such as waiters and barkeepers, or roles in higher management would still fall into the *polarised automatable* category. That is, aspects of the named occupations such as fast-food dining or specific management tasks (for instance, drafting PowerPoints) may already be automated, but others such as social and interactive skills needed to succeed in those roles may not be automatable. However, it certainly is the case that within these occupations the number of automatable tasks has still increased with the newest wave of automation.

Also, the classification does not consider the newly created occupations that have come on stream such as social media managers or AI roles. Finally, a number of occupations previously classified as non-automatable such as writer, composers or designers would now likely be classified as *polarised automatable* given the impact generative AI has already had on these occupations.

AI and jobs: implications for diversity

Not only is it crucial to distinguish skills and tasks within occupations and across, it is also important to highlight the differential impact AI has on occupations by demographic group. McKinsey (2023) highlight that women will be 1.5 times more likely to have to switch occupations away from those that are being automated than men. Further, as AI diffuses further across many aspects of work life, it is crucial to prevent biases inherent to AI in, for example, hiring decisions that exhibit gender or racial bias (Guardian 2023).

The OECD (2023) has a mixed view of the impact of AI on inclusiveness. On the one hand, they say that AI can be a helpful tool to complement the work of people with disabilities (e.g. workers with speech or visual impairments) and that of low-skilled individuals through, for instance, AI text generation or translation tools). At the same time, AI may also harm low-skilled individuals, women and older workers who lack the digital skills needed to benefit from AI, which emphasises the need for fostering reskilling and adult learning.

Such differential impact can also be seen when going back to the recent tech layoffs. They primarily affected women, thereby harming diversity and inclusion efforts. Concretely, of the tech layoffs between September and December 2022, 46.64 per cent were women who make up only 39.09 per cent of the industry as a whole (Reuters 2023). Part of the reason for this is that women are disproportionately represented in part-time roles, less represented in senior roles and work in roles such as marketing or HR that were the first to be laid off (Sifted 2023). Similar effects could be seen for ethnicity, culture, social mobility and age.

How the impact of AI on jobs is felt by different demographic groups differently and what this implies for diversity and inclusion efforts remains to be seen. Given the disproportionate automation among low skilled labour, it becomes crucial to make sure upskilling and education are provided to offset the potential negative effect for diversity and inclusion.
