

Artificial intelligence and creative destruction: old and new jobs

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Is there a growing risk of robots replacing human work? If so, which jobs will be mostly impacted?

It is often argued that the first jobs to disappear will be low-skilled manual ones, but previous waves of automation show how this has mainly affected routine jobs, both manual and cognitive. The most significant distinction in determining vulnerability to automation so far has been the one between repetitive and non-repetitive tasks, rather than between manual and cognitive work.

This has led to the phenomenon of “job polarisation” [1], meaning an increasing demand for non-routine manual and low-skilled jobs on the one hand and for highly qualified cognitive jobs on the other. While middle-skilled jobs with a high content of repetitive tasks have been replaced the most.

However, with increasingly advanced forms of artificial intelligence the scenario seems to change further. In a 2017 study [2], the two economists Carl Benedikt Frey and Michael Osborne show how, thanks to artificial intelligence and Big Data, even non-routine jobs will increasingly be subject to automation.

Computers are better than humans at managing large databases, making calculations and collecting models in the data, scanning and extracting information from documents, and presenting the results graphically. Therefore, they can now replace human workers in cognitive activities such as fraud detection, healthcare diagnostics, some legal and financial services.

The absence of typically human irrationality, the so-called cognitive “bias”, can make computer systems more reliable than human beings in certain tasks requiring judgement or supervisory activities, as robots do not suffer fatigue and do not lose concentration. Machine learning algorithms are also able to find bugs in software and write code, thus partially replacing even software programmers.

Many non-routine manual jobs are also becoming increasingly replaceable thanks to improved sensors and manipulator robots. Frey and Osborne name several examples of non-routine manual jobs that are becoming computerisable: production, packaging, construction, maintenance and logistics jobs due to improved robot motion capabilities, sensitivity and the development of autonomous driving technologies.

On the other hand, two other economists, Daron Acemoglu and Pascual Restrepo[3], explain that artificial intelligence is much more than the simple automation of tasks, it can innovate and deeply reform production processes and give birth to new tasks that require human work.

Among the main areas in which AI could reallocate workers into new tasks the authors mention:

1. education, which, thanks to a better monitoring of data on students' learning styles, could facilitate a more personalized teaching
2. health care, where many technologies are already being introduced
3. augmented reality, which especially in the manufacturing sector can be used to improve human perception and the ability to monitor objects.

In all these examples machine work integrates human work and artificial intelligence becomes a powerful tool to enhance human potential, which remains irreplaceable in many ways.

In two whitepapers [4], the consulting firm Cognizant also imagines 42 new jobs that can emerge thanks to artificial intelligence: from the most realistic ones such as the "AI Business Development Manager", to the most creative ones such as the "Personal Memory Curator" that, with increasing life expectancy, will help the elderly to cope with memory loss by using testimonials, media and historical material to reconstruct a virtual reality environment that brings particular places or events to life.

According to the cited literature, human work will not disappear: **the jobs of the future will be already existing jobs transformed by artificial intelligence or new professions that will emerge to meet old needs in a different way and explore new possibilities. Artificial intelligence is thus expected to play a bigger role in transforming human work rather than replacing it, and human-machine cooperation will then be crucial. The actual impact of AI on work will therefore depend to a large extent on artificial intelligence management policies and strategies rather than on the technology itself.**

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