

The Future of Work: Automation and Job Opportunities: Analyse how automation and advancements in technology are changing the job market. What skills will be important for future careers, and how can young people prepare?

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Automation stealing jobs. A rogue digital assistant. A robot apocalypse. Science-fiction pop culture has illustrated many depictions of what the future may look like with technological advancements. It is clear that change in society, especially in the job market, is inevitable, yet what the change will be is less certain. This essay looks at how automation has already integrated itself into every industry, from medicine to retail and finance, how we can work with it and the skills young people will need to prepare for this change. With the exponential growth of technology which has been assisted by globalisation, automation presents itself as an incoming threat to the job market. A study by Deloitte predicted that 33% of jobs in the UK are at risk of automation by 2030 ^[1]. However, automation will also generate new jobs that will compensate for its associated job losses. So will automation destroy the job market or nourish it?

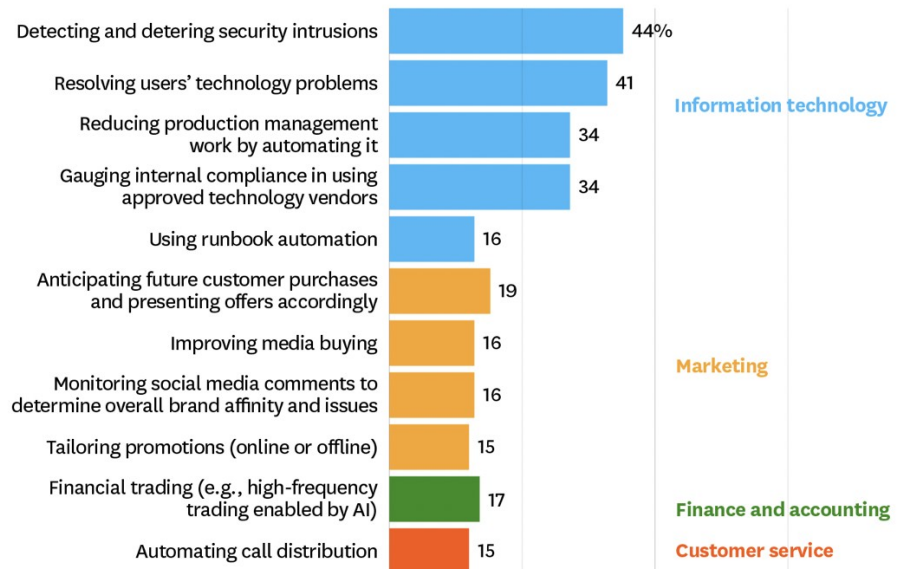
Humans are constantly developing, from prehistoric times to the medieval era and now, the technologically dependant species we are today. Advancements in technology have altered society many times in history and will continue to do so in the future. In many of these circumstances, people were worried about the impact of the innovation on their lives, yet it helped develop society rather than hinder it. For example, during the industrial revolution, workers protested to stop machinery replacing manual labour jobs ^[9]. However, the shift ended up making manufacturing processes more efficient and created new job opportunities to compensate for the lack of physical labour, which helped the development of society and improved people's quality of life.

The autonomous shift is no different. Automation is already used in many aspects of work. Artificial Intelligence or AI, the most advanced form of automation, is used for data analysis in various fields such as medical and financial data, as well as detecting fraud, carrying out quality control and predicting maintenance needs in manufacturing. There is already evidence that AI will enhance workplaces rather than replace the workforce. A great example is Joseph Sirosh. In 2004, Sirosh joined Amazon and introduced AI for reducing fraud and incomplete transactions. When he left Amazon 9 years later, he had employed around 1000 people to use machine learning, which increased the efficiency and therefore productivity at Amazon, contributing towards a 10-fold increase in revenue ^[2].

Many companies have had similar experiences with Artificial Intelligence and other forms of automation. The IT industry currently has the highest AI usage (Fig. 1), most

How Companies Around the World Are Using Artificial Intelligence

IT activities are the most popular.



SOURCE TATA CONSULTANCY SERVICES SURVEY OF 835 COMPANIES, 2017

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frequently in detecting fraud and defending against cyber attacks ^[2]. However, a study by HBR showed that AI was making IT security professionals more valuable to their employers rather than replacing them ^[2]. Given that the IT industry is predicted to grow by 6.2% this year ^[4], it is a safe assumption that automation will not be directly correlated to job loss, as opposed to many stereotypes.

Fig. 1: How Companies Around the World Are Using Artificial Intelligence

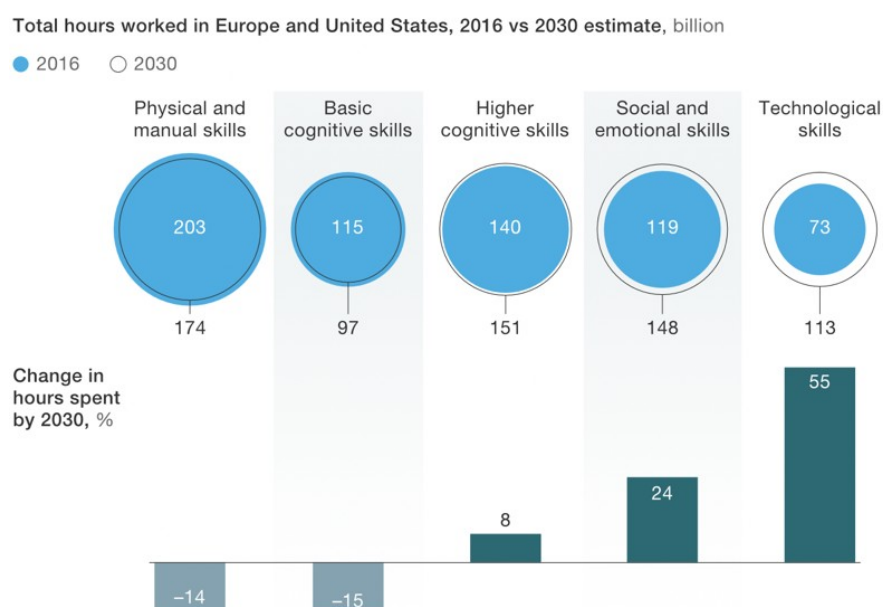
So rather than a threat, automation can be used as a tool. Learning how to work with automation instead of against it will prove vital for success. Automation can increase productivity levels which will improve the performance in many workplaces, increasing the wealth of the economy. For example, it can help increase energy efficiency in machine mining and transportation which will save money and reduce CO₂ emissions. Autonomous vehicles can be used for transportation and delivery services which will quicken delivery times and increase the convenience of ordering online. Automation can solve problems, improve economies and change lives if we allow it to.

Much like all great things, automation has its own downfalls too. Technology can only benefit those able to afford it. Automation will be unevenly distributed due to uneven financial distribution, further increasing global polarisation. Those using such technology will grow and expand their businesses and economies, widening the wealth gap even further, and taking money away from those unable to afford it. Global inequality will increase, which increases tension between nations, a problem which even the smartest AI cannot solve.

Rapid innovation will continue to change the job market. In a world full of automation, digital literacy will become a baseline skill. Digital literacy is defined by Amazon as the term used to describe an understanding of basic technology, including computer software, applications, and digital devices ^[5]. For young people, learning basic computer skills themselves, or taking courses and qualifications in relevant computer skills can help them optimise their own abilities in preparation for an automated workforce. For instance, learning how to master AI can serve as an advantage by multiplying efficiency in the workplace.

While automation will never reach the point where it has replaced a large proportion of jobs, due to the masses of new jobs it will generate, constant change is inevitable. By 2025, technology is forecasted to create at least 12 million more jobs than it destroys ^[3]. However, many of these jobs are unimaginable today. 65% of children entering primary school today are predicted to work in jobs that do not currently exist ^[3]. Young people need to be ready to adapt to these changes. Fast learners who can adopt new practices and upskill themselves will be extremely highly valued. Transferable skills will also be very useful as these provide agility to be used across different jobs and fields. These include problem solving, leadership and adaptability, which are all important to keep up with the rapidly growing automation.

Additionally, soft skills will become essential for young people to develop in preparation for the emerging automation. Defined as character traits and interpersonal skills that support the pursuit of personal and organisational goals ^[6], soft skills will become incredibly important because they are the hardest skills for automation to learn and replicate. Businesses will look for candidates with skills such as empathy, advanced communication, entrepreneurship and initiative talking. Learning and practising these skills early on will help students in the real world. For instance, in order to successfully collaborate with a team, communication, teamwork and leadership will be highly important skills. Yet when automation can carry out repetitive, numerical jobs, they become essential. Soft skills have been described as ‘the most important skills people need to hone and develop today’, and the numbers agree. In the figure below, social and emotional skills are predicted to increase from 2016 to 2030. These are skills that young people can learn and develop, by practising and cultivating them. They are the skills of the future.



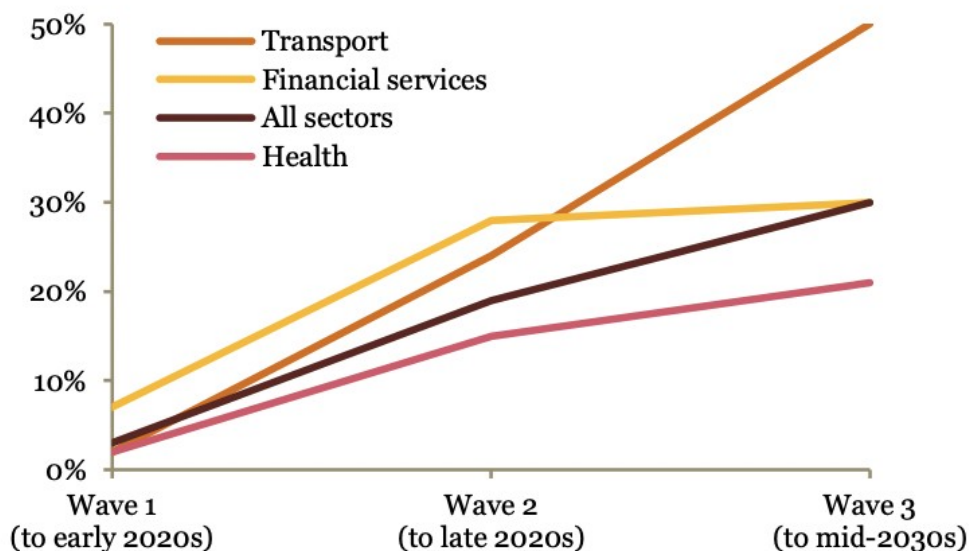
Source: McKinsey Global Institute Workforce Skills Model; McKinsey Global Institute analysis

Fig. 2: Total hours worked in Europe and United States, 2016 vs 2030 estimate

Although automation will integrate itself into every industry, some jobs will be more affected by this change than others. Continuing to analyse Figure 2, physical and manual skills, as well as basic cognitive skills are predicted to decrease, as these can be easily replicated by technology. Jobs requiring data input and processing will be amongst the first to be replaced by automation, therefore heavily impacting the financial-service sector. Figure 3 shows financial service jobs are the most at risk of automation until approximately the early 2030s, when transport overtakes it. These jobs require basic cognitive skills which can be easily replicated.

However, other skills will increase in demand, including technological skills. As the demand for technology grows, so will the demand for technological skills. Every field will use automation, so computer science jobs such software engineers, IT professionals, automation engineers and many others will see an increase in demand. There will also be growth in new jobs that will appear as automation changes the structure of the workforce. Other industries will be more resistant to automation, such as healthcare. Care providers are likely to continue to see growth as the global population continues to increase. Automation will not be able to provide human interaction with a sick patient, at least for a while. In Figure 3, health consistently remains the least at risk of automation. Yet this doesn't mean any industry is completely immune to automation. Administrative jobs in the healthcare industry will decrease, and new technology such as robotic surgeries will continue to be introduced, integrating the most 'human industry' with robots. So while almost 30% of existing jobs across all sectors are at potential risk of automation (Fig. 3), choosing an emerging industry rather than a diminishing one will help young people succeed.

% of existing jobs at potential risk of automation



Source: PwC estimates based on OECD PIAAC data (median values for 29 countries)

Fig 3: % of existing jobs at potential risk of automation

No one will have to prepare for the digital revolution alone. Businesses are realising the effects of automation on workplaces and making changes to prepare. Udemy described the purpose of a job to carry out effectiveness, efficiency, innovation and expertise^[7]. Automation can carry out tasks of effectiveness and efficiency, however it cannot replace innovation and expertise. Employers are realising these facts and are helping retrain their own employees to adapt. Similarly, educational institutes have and will continue to develop to prepare students for the future. Pupils are learning skills other than simply 'textbook learning'. Digital literacy is also being encouraged. Basic computer skills are being taught across primary schools and young people are significantly more technologically advanced than others were only ten years ago. The number of schools offering GCSE computer science has increased significantly, with nearly 80% of Year 11 pupils having this option open in 2022^[8]. The job market is changing, but so is the rest of society, which will help guide young people into the future.

Overall, understanding technological advancements will help young people prepare for the integration of automation into the job market. Every industry will be affected by emerging automation. While for now, the skills in demand are technological and soft skills, the most valued ability is agility. Being able to adapt toprecedented and unprecedented change is the most important skill in life. As Heraclitus, a Greek philosopher, once said, 'the only constant in life is change'.

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