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# People versus Machines: *Automation, the Fourth Industrial Revolution and the Labour Force*

Grace Lordan and Cecily Josten

Automation and technical innovation are currently shaping global labour markets. Research on the future of work has brought contributions that seek to determine the exact jobs that have been lost in the past, and those that may be lost in the future. Overall, this research indicates that the winners and losers of the Fourth Industrial Revolution are determined by skills. While low-skilled individuals performing routine tasks remain at high risk of being replaced by automation, individuals with abstract thinking and people skills will continue to be in high demand. Understanding the differential impact automation has on people with different skills helps organisations prepare for the Fourth Industrial Revolution. It also helps policy makers determine what should be invested in when considering the stock and flow of skills, so that all citizens have some opportunity to be included in the gains from technological change.

Around 47% of today's jobs are at risk of being automated and could be replaced by some form of automation in the near future (Lordan and Josten, 2020). However, these estimates are based on static models. When firms automate it should stimulate growth. Assuming that some of the rents from this new technology are recycled back into the economy, it is reasonable to expect other occupations will expand in number as people consume more goods and services. Recall that jobs such as app developers and chief behavioural officers did not exist twenty years ago! So new jobs, that we cannot perceive now, will likely be created as a direct result of automation.

While it is hard to say what new occupations may come on stream, Lordan and Josten's (2020) work clearly suggests that people skills (the ability to engage with people, determine and cater to their needs, deliberate and integrate their ideas) and thinking skills (the ability to problem solve, think strategically and navigate problems) are the ones that will hold value for the Fourth Industrial Revolution. As the skills demanded in the labour market shift, it is crucial to understand who will thrive in this new environment and who will need extra support. Labour market policies, such as minimum wages, also need to be evaluated in the context of new work.

### **Minimum wage increases can crowd out automatable low-skill jobs**

As human labour becomes relatively more expensive with the implementation of minimum wage policies, automating job tasks with machines becomes more attractive to firms. This is particularly the case for low-paid low-skilled jobs. Taking a closer look, Lordan and Neumark (2018) in the US and Lordan (2019) in the UK found that minimum wage policies actually lead to a lower share of employment in automatable jobs by low-skilled workers. They also increase the likelihood that low-skilled workers either become unemployed or switch to worse (i.e. lower paid) jobs.

Both papers highlight that certain worker types are more vulnerable to these changes, with the most vulnerable group being older workers. While the impact is smaller in the UK, compared to the US, the adverse effect of minimum wages on reduced employment in automatable jobs has been increasing over time (Lordan, 2019). We hence need to ensure that low-skilled workers that are disproportionately hit by technical advances have a solid safety net available, or opportunities to retrain and acquire new skills.

The findings of interaction effects between minimum wages and automation on the availability of low-skill employment are very relevant, given that many more jobs will soon become automatable. These include, taxi drivers, cashiers, and bricklayers (Lordan and Neumark, 2018). Hence, it is important to understand which jobs will be automated in the future and the type of skills that are needed for the jobs that will withstand automation.

### **The type of jobs that will survive automation are likely those requiring people skills**

Studies by Lordan (2018) and Lordan and Josten (2020) distinguish between jobs that are fully automatable, those that are polarised automatable and jobs that are non-automatable, by looking at how many patents have been filed for a job-replacing technology. Fully automatable jobs are

those where a respective technology has already been implemented (e.g. driverless cars) and is about to be rolled out. Fully automatable jobs are hence most likely to lead to a replacement of employees with technology. Polarised jobs are those where part of the job can be automated in the next decade and other parts cannot (e.g. lawyers). Occupations that remain non-automatable are jobs for which there is no replacing technology (yet).

Whether an occupation is automatable or not (according to this classification) depends crucially on the level of social interactions involved in the respective occupation. For some jobs, people do not necessarily care who carries them out. For other jobs, such as that of a waiter, people might care depending on the context. They might want to be served by a waiter in a fancy restaurant, but do not care about using a cashier machine at a fast food restaurant. There are also jobs where people really care about whether they are carried out by a human or not, such as that of a psychologist. Those jobs tend to also involve thinking skills.

In line with this intuition, occupations involving abstract thinking skills combined with people skills are less likely to be automated (Lordan, 2018; Lordan and Josten, 2020). Both studies emphasise that abstract thinking skills alongside people skills (i.e. those involving social interactions) are at the lowest risk of being automated. This development highlights that specific types of people benefit from automation, whilst low-skilled individuals working in routine-tasks will continue to struggle.

### **But labour markets are dynamic and new jobs may be on the rise**

Given the dynamic nature of labour markets, increasing innovation will likely be accompanied by growth that stimulates the creation of new jobs or the increase of some existing occupations. While it is difficult to estimate which jobs will be on the rise, Lordan and Josten (2020) teach us something about sought-after skills for the future. Their research on automation and the development of patents shows that particularly people skills (i.e. the ability to interact socially) coupled with thinking skills (i.e. the ability to problem solve, think strategically and navigate problems) will become relevant.

Organisational leaders and policymakers need to be aware of the type of people that will be at risk of unemployment as a result of automation and technical innovation. This is even more true today, as we go through and come out of the COVID-19 lockdown, the benefits for automation as an alternative for labour are more salient than ever. Similarly, it is important to foster the skills that will become ever more important, particularly people and thinking skills. As the analysis of the interaction between minimum wages and automatable jobs highlights, it is crucial to weigh labour market policies as well as firm-wide policies against potential negative implications for sub-groups. Whilst such policies may be necessary, it is important to simultaneously support those who might lose out, particularly low-skilled individuals, so that the gains of the Fourth Industrial Revolution do not exclude those who are most vulnerable to income insecurity.

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## About the authors



Grace Lordan is an Associate Professor in Behavioural Science at the London School of Economics, and director of the [Inclusion Initiative](#).

You can find her on Twitter: [@LSE\\_TII](#) [↗](#) and [@GraceLordan\\_](#) [↗](#)



Cecily Josten is a PhD candidate and researcher at the Department of Psychological and Behavioural Science at the London School of Economics.

You can find her on Twitter: [@JostenCecily](https://twitter.com/JostenCecily) 

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