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New technology and the world of work the winners and the losers

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Disclaimer

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Introduction

Speculating on what the world of work might look like in 2040, the economist Ian Brinkley said that new technologies "will help drive the rise and fall of industries, create and destroy business models, expand some jobs and eliminate others" ('The future of work and how we can change it'). The debate about how to minimise the adverse impact of new technology and maximise the positive has, until now, focused rather too exclusively on job losses. It's as if the Fourth Industrial Revolution was a hurricane and we were all trying to estimate how many trees will be uprooted and how many homes destroyed.

In fact, some commentators see new technology as far more cunning than a mere force of nature. Calum Chase describes automation as a 'shape shifter' in 'Robots will steal our jobs. Hooray?' (PDF, 797KB, 52 pages); having replaced our muscles in earlier revolutions, it is now coming for our brains. The doomsday scenario of massive job losses is hard to resist simply because it has happened before. After all, if 1915 was 'peak horse', as Chase says, (there were over 20 million horses in the US then, compared to 2 million now), then we are surely approaching 'peak driver' in the years to come, not to mention 'peak' for many other occupations. Of course, in previous industrial revolutions, more new jobs have always been created than were lost, though there are questions as to whether the same will be the case this time.

This paper aims to go beyond the numbers – important as they are – and identify some of the more surprising and sometimes nuanced winners and losers in the way that new technology may affect the world of work. For example, Acas's own research, carried out by the IPA ('Mind over machines: new technology and employment relations') found that "technology has shifted threats away from physical health and towards mental health" by replacing many dangerous or physically exerting tasks, but increasing stress through work intensification and social isolation. But what should we be doing now to protect exposure to technology stressors? Will we adapt to being 'always on' or should we start building secure pockets of 'sometimes off'?

Our research reinforced the view, held by many experts, that new technology is a double-edged sword. It creates modern work problems, such as isolation and work intensification, at the same rate as it creates efficiency gains and labour-saving advances. The nurses in our research, for example, were well aware of this real sense of plus and minus. They were given iPads to allow them to receive their daily schedules remotely and complete many of the forms and documentation while they were with the patient. They

welcomed the reduced paperwork and more time with patients, but were concerned about less time with colleagues, for information sharing and peer support, and a blurring of work and home life.

The numbers game

Looking at the evidence on job destruction versus job creation, there is simply no clear picture, although it is admittedly very tempting to start drawing up lists of jobs most likely to be at risk – the modern-day equivalent of candle-stick makers and silent movie stars ('Which occupations are at highest risk of being automated?'). A recent meta-review by MIT Tech Review ('Every study we could find on what automation will do to jobs, in one chart') has identified at least 18 different predictions about the numbers of jobs that might be lost and created due to automation, no 2 of which are alike.

However, while there is no consensus on the overall impact on employment numbers, there is agreement across sources on 2 key points:

1. The focus on employers and policymakers should be on the automation of *tasks* rather than entire *jobs*; a majority of employees are likely to see at least some of their daily tasks automated, changing the nature of their work significantly. Interestingly, a survey by the RSA ('Good work in an age of radical technologies', PDF, 1.7KB, 25 pages) found that workers were equally worried about 'losing the interesting parts of their job to technology' as 'losing their job to technology' (both 32%).
2. The kind of skills that are valued by the labour market are very likely to shift. Workers performing routine tasks such as driving and low to medium skilled workers in administrative, retail or manufacturing work may need to find a different skills base. In contrast, there will be a growing premium on interpersonal, creative, strategic leadership and high technical skills.

We are frequently told that although artificial intelligence (AI) can be a match for IQ it cannot compete with emotional intelligence (EI). According to Ravin Jesuthasan, author of 'Reinventing jobs', this means that more and more employers will have to start "deconstructing jobs and figuring out which tasks can be automated". The implication is that unless this is done in a structured, planned way, then the deconstruction will happen anyway and threaten job security.

This was evident in the strike last autumn of 8,000 Marriott International employees ('The quiet ways automation is remaking service work'). The employer reached an agreement with the workforce to offer 165 days' notice of any new automation and a guarantee of retraining for any workers whose hours might be affected by the technology.

This illustrates perfectly what Sir Brendan Barber called the 'human lag' that is often evident between the introduction of new technology and the time it takes for management and working practices to adapt. During the second industrial revolution, there was a 30 year gap between the invention of the conveyor belt and the creation of the moving assembly line that facilitated mass production. Nowadays, the rate of technological advance is much faster, but there is little evidence that the ability of management to undertake the necessary organisational change is keeping pace. So, whether it is whole jobs or parts of jobs that are being automated, sufficient time needs to be set aside for consultation and supporting people to retrain and reskill.

Left behind people and places

While any projections are problematic, we can at least be sure that a large disruption to the labour market is coming. While many new jobs are also going to be created, these will not necessarily be in the same locations, sectors or skillsets as those that are lost, meaning the transition may be jarring for many and risk leaving a large segment of the population behind.

There are clearly those who are likely to be left behind in the skills race. A report from the Corporate Research Forum ('The future of jobs, work and working') found that "advanced economies such as the UK may face a simultaneous shortage of skilled labour and a large proportion of left behind adults facing difficult employment prospects and lack of development opportunities." As the International

Labour Organisation has commented ('As tech disrupts our jobs, it's not too late to turn pain into gain'), the most important skill of all in the future will be an "aptitude for lifelong learning," given the expected high number of times millennial and post-millennial workers are expected to have to change occupations during their working lives. But will workers be given the opportunity and the means to keep learning? Older workers in particular often find it harder to access retraining and may struggle to transition into entirely new professions later in their careers.

Then there is the question of geography. The new jobs being created are most likely to be concentrated around tech hubs in cities like London. Jobs being lost, on the other hand, are more concentrated in already poorer areas and in particular in smaller towns across the UK. Many of the places likely to be hit hardest are the same places that suffered the most from deindustrialisation of the 1980s. Small towns often rely heavily on a single large employer; 40 years ago that may have been a steel factory or a coal mine. Today it is more likely to be a call-centre or distribution warehouse; precisely the kinds of jobs most likely to face automation in the next 5 or so years.

Even among cities there are likely to be winners and losers. The Centre for Cities' Cities Outlook 2018 forecast that northern cities like Sunderland and Mansfield face the loss of 29% of all jobs by 2030, compared with only 13% in Oxford or Cambridge or 16% in London. Will people simply be expected to move to the growing cities or can a way be found to protect these left behind locations?

Growth versus equality

One of the most telling summaries of the likely impact of new technology is contained in the IMF's publication 'Should we fear the robot revolution (the correct answer is yes)' which concludes that "automation is good for growth and bad for equality". Putting the productivity gap to one side for the moment, how is this inequality most likely to manifest itself?

There are legitimate concerns about the unequal sharing of the fruits of any productivity gains. The TUC report 'A future that works for working people' (PDF, 784KB, 38 pages) found that 51% of workers expect any benefits of technology to be "hoarded by managers and shareholders", rather than shared equally. This 'sharing' is often seen as trade-off between productivity gains for employers, on the one hand, and shorter working weeks for employees on the other. But how is this going? The early signs don't look encouraging. Although research by SMF, '4IR in the workplace: ensuring employers and employees benefit' (PDF, 856KB, 44 pages) shows that a 30% increase in productivity as a result of AI and robotics could allow the working week to fall to a 4-day working week, take-up by employers has so far been very slow.

More broadly the labour share of national income has been declining in the UK for the last 40 years, as it has in the United States and most other developed countries. As a report from the ILO, 'The labour share in G20 economies' (PDF, 1.2KB, 22 pages) states, "technological changes are often presented as the main culprit" in this growing inequality. Technology is a form of capital and where robots or other forms of automation replace human labour, a larger share of productivity gains goes to the owners. One of the reasons for a growing interest in the idea of a universal basic income, as championed by the RSA and others, is precisely the idea of combining productivity gains from technology with a reduced need or demand for human work. Even among wage earners, far more of the gains have been accruing to top earners than to the average earners. Median wages have been largely flat in the UK for over a decade while top wage earners have increased their salaries considerably. The growing employability gap between high and low skilled workers discussed above is likely to exacerbate this issue in the years ahead.

New technology has also meant that both capital and labour have begun to show signs of what Brynjolfsson and McAfee ('The second machine age: work, progress and prosperity in a time of brilliant technologies') call 'winner-takes-all' or 'winner-takes most' economies. Whereas in traditional markets the top performer will only be slightly more profitable than the second on third, leaving plenty of local niches for other competitors, in many markets for digital products the top performer captures almost the whole market. Writing a slightly faster piece of code or slightly better app will be enough to dominate the global market for that product, leaving little space for the ninth or tenth best. The top performing app in a category such as Action Games (Clash of Clans) produces over $2 million daily revenue, while the median performer produces merely $150.

The meaning of work

Despite the RSA's finding that 32% of workers feared 'losing the interesting parts of their job to technology', the reality may be that technology is more likely to take away the most boring parts of many jobs. Robots and AI excel at repetitive, routine tasks, be they manufacturing on an assembly line or data entry into an excel spreadsheet. The current wave of robotic process automation (RPA) sweeping many industries is taking away dull administrative tasks from many office workers, freeing them to focus on tasks that involve more human interaction such as employee or customer relations.

While some workers might find more fulfilling and meaningful work as a result, others might not be so well off; in particular those workers involved in 'reproductive' labour, often defined as "anything that people have to do for themselves that is not for the purposes of receiving a wage", and so-called 'bullshit jobs'. The writer Astra Taylor has said that "automation is both a reality and an ideology" ('The automation charade') and that it perpetuates the myth that work is only really work if it is paid. Caring and household domestic duties, largely carried out by women, are, she argues, likely to continue to be regarded as unproductive, suggesting that there may be a significant gender divide in the winners and losers from automation. That said, economists often regard the invention of domestic labour saving machines in the 1960s and 1970s as vital for enabling greater female labour force participation. As Ha-Joon Chang has put it: "The washing machine has changed the world more than the internet" ('23 Things They Don't Tell You About Capitalism'). While new technologies might further reduce the amount of 'reproductive' labour to be done, they are unlikely to eliminate it entirely. With an ageing population we are likely to see more care work for the elderly needing to be done in coming years; much of it probably still by family members and unpaid.

Taylor also suggests the recent waves of automation are little more than 'fauxtomation', the trick of using often fairly basic technology to convince people that high tech is always good: better, cheaper, more efficient. This is reminiscent of the Mechanical Turk; a famous chess playing 'machine' that toured the royal courts of Europe in the late 18th and early 19th Centuries and after which the eponymous gig economy website is named. In fact, however, the machine was an elaborate hoax, concealing a human hidden inside who directed its moves. Similarly, much of the work of the modern 'tech' economy is still, behind the scenes, unskilled and poorly paid (or unpaid) manual labour performed by humans; such as the customer who performs the cashier's job of scanning and bag-packing for free at the self-service checkout.

But what about work that is paid but meaningless? David Graeber ('Bullshit Jobs: A Theory') has identified 5 categories of 'bullshit jobs' – jobs that serve no meaningless purpose but act as corporate window dressing – including 'flunkies', who serve to make their superiors feel important, like receptionists and door attendants; and 'box tickers', who use paperwork or gestures as a proxy for action, like performance managers. If bullshit jobs are by definition meaningless then they may be more common than we think – a survey from YouGov found that only just over half of workers agree that their jobs provide their life with any meaning and purpose. Bullshit jobs, like reproductive labour, are likely to be left untouched by new technology because they are seen as 'faux' – imitations of work without ever being seen as the real thing.

Give me a soapbox and some sound mufflers

Part of the beguiling paradox about new technology is that it appears both empowering and enslaving. It allows us to work more remotely – the TUC estimates that remote working increased by a fifth between 2005 to 2015 to 1.5 million and forecasts based upon ONS statistics predict that half of UK workers will be working remotely by 2020 – but it also invades our privacy and sense of personal space. As the academic Veronica Hope-Hailey said (Mind over machines: New technology and employment relations), "the employer has in effect invaded the psychological space that used to be your own".

A survey by CIPD ('Employee outlook: spring 2017') found that a third of UK employees were unable to switch off in their personal time, with 40% checking their work mobile or emails at least 5 times a day outside of their working hours. Meanwhile another survey by

Thumbtel found that 6 in 10 younger people were experiencing "smartphone fatigue" as a result of being unable to separate personal communications from work-related messages.

This increasing reliance on virtual communication, particularly in the form of email, seems to reinforce the sense that we are all working more remotely, whether we work from home or in a more traditional working environment. Research from Kingston Business School, commissioned by Acas, ('Strategies for effectively managing email at work') found that it takes 64 seconds to recover from every email interruption. The compulsive need to regularly check for new messages interrupts normal work, increases anxiety and lowers productivity. The CMI has pointed to the dangers that smartphones in particular pose in workplace environments, recommending that employees switch them off or put them out of reach, particularly during meetings ('Five reasons you need to kick your email habit now'). Some workers are looking to examples like France, which recently passed into law a 'right to disconnect' that requires companies to negotiate with employees on their rights to switch off from email enabled devices and other communications out-of-hours. Flexibility clearly has its benefits, but it does need to be managed carefully with clear expectations about when staff should be on or off.

So who are the winners and losers in this struggle for work-life balance? While evidence suggests that for around half of workers who are natural 'integrators', a blurring of their work-life boundary is a positive thing that enables them to be more flexible and balance commitments, for the other half who are instinctive 'segmenters', this intrusion of work technology into their personal time is profoundly anxiety-inducing. The pressure to deal with the huge volume of emails that many professionals receive on a daily basis has become so overwhelming that some commentators have begun preaching a policy of 'inbox infinity' as an alternative to the vaunted 'inbox zero' ('Don't reply to your emails'). Instead of trying to read and respond to all emails, this alternative philosophy suggests workers embrace and accept the impossibility of ever doing so.

Inside the workplace

As Kissinger pointed out in his essay on the threats posed by AI ('How the enlightenment ends'), if we are to teach machines to make fair and just decisions on our behalf, we first need to reach a unified vision of what we think is fair and just. This may seem like a concern that we can park for the longer-term, but machine learning algorithms are already challenging our ethics in the fields of recruitment and the emerging area of what the RSA describes as 'algorithmic management'.

Use of these algorithms has the potential to remove human biases from recruitment, performance reviews and other processes if done carefully, eliminating some of the behavioural and perceptive bias that often skews the first impressions and judgements of new candidates or employees. However, if used without enough thought for the possible consequences, these algorithms could instead embed and magnify biases.

According to digital transformation expert Richard Skellett, "No matter how clever AI models become, they will never lose their reliance on human input. If the training data used in building an AI model is skewed in any way, reflecting not only conscious but unconscious bias on the part of those humans engaged in building and populating the model, this will show in the application." (See 'The future of work: HR's role in bringing ethics into workplace automation'.)

Another ethical debate revolves around employee surveillance and monitoring. According to a recent RSA and Populus survey 'Good work in an age of radical technologies' (PDF, 1,688KB, 25 pages), half of all workers fear surveillance in the workplace from their employer, while a TUC survey ('I'll be watching you: a report on workplace monitoring') found that 56% of UK employees thought their boss was already monitoring their actions in the workplace in some way. A number of companies have sprung up in the last couple of years, offering ever more intrusive forms of monitoring technologies.

As People Management reported in 'Has employee monitoring gone too far?':

> *"Humanyze, a biometric staff ID badge, uses microphones to conduct real-time voice analysis, contains sensors that follow where you are in the office, and charts your movements around the office with motion detectors, all with the*

purpose of measuring stress. Teramind – lauded in several business publications as the top tool of 2018 – uses a live analytics dashboard and livestreams of employee desktops to monitor everything from productivity to file transfers and instant messages; with a feature that also allows managers to record activity and play it back later."

Privacy and job autonomy may be a loser in the surveillance game, but employers may argue that employee wellbeing is likely to be a winner. Over past decades technology has done much to improve the physical health of workers; replacing physically straining work with robots and allowing more ergonomic design of office environments. In the future, technology offers more opportunities to improve our wellbeing, with fitness trackers, for example, promoting healthier lifestyles. One survey (Fourth annual AXA digital healthcare state of the nation roundtable) found that over half of workers would be willing to wear a device that can detect early signs of mental health problems, if the company provided it free of charge. These kinds of health-focused wearable tech devices could offer major improvements to employees' wellbeing and satisfaction, with a survey by Goldsmiths, University of London ('The human cloud at work', PDF, 1,101KB, 17 pages) showing an 8.5% increase in productivity and a 3.5% increase in job satisfaction as a result of wearable tech introduction .

Conclusion

Most of us are likely to experience a mixture of benefits and drawbacks from new technology at work. The paths we go down are unlikely to be linear or one-way. Taking the route towards physical health and safety, for example, has been a priority for working life for many decades – which partly reflects the shadows cast by previous industrial revolutions – but this does not mean we have to turn away from mental health and wellbeing. We just need to reach a much clearer understanding of what wellness means while living in an always on culture without boundaries.

Similarly, because new technology facilitates, and even encourages, individual employee voice, it doesn't mean that collective voice is a thing of the past. There are lots of promising signs of social network platforms, for example, being used to create faster more organic forms of consultation in workplaces ('Going digital? Harnessing social media for employee voice' - PDF, 1.1KB, 51 pages). Traditional unions are also learning lessons from the 'pop-up unions' that emerge through social media platforms to campaign on single issues.

Predictions about the future of work are often based upon extremes of what might happen – such as technology-driven job losses – and old templates of work organisation that are so familiar and comforting we can't shake them off. Nicolas Colin argues that old workplaces are like cathedrals, still beguiling us with their grandeur ('The fall of the cathedrals', PDF, 797KB, 52 pages). The problem with these cathedrals is that they are designed to "concentrate power on the inside, not to harness power from the outside."

As we look ahead, there is understandable concern about who will harness this power and to what end.