

Select Committee Inquiry into Automation and the Future of Work (2018)

Written Submission



Overview of the British Safety Council

The British Safety Council is a not for profit membership organisation and a registered charity. We have over 5000 corporate members within the UK and across the world. These member organisations range from large multi-nationals, through to SMEs and micro-businesses, in a wide range of industrial, commercial, service sector, public sector and third sector operations.

The British Safety Council was established in 1957 by James Tye, with the vision that no-one should be injured or made ill at work. For over 60 years we have campaigned for improvements in workplace standards and attitudes toward health and safety.

The British Safety Council has established an excellent reputation, and has a proven track record for identifying opportunities to improve health and safety performance and drive change. For example, deregulation is an issue which has been of concern to us for some time, and we contributed briefing material ahead of the House of Lords debate on this subject in 2017.

For more information about the organisation please see www.britsafe.org.

The Consultation Process

This response is based on the knowledge, views and positioning developed through ongoing dialogue with our members, clients and other relevant stakeholders.

Future Engagement

The British Safety Council would welcome the opportunity to be involved in further discussion and to support development of the themes outlined in this Inquiry. Any queries should be addressed to:

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Executive Summary

We are calling on the Government to:

- Take steps to identify the opportunities that automation presents to improve work and create better-quality jobs.
- Act consistently to protect workers from any threats to their health, safety and wellbeing, including mental wellbeing, that automation may pose.
- Ensure education is relevant and forward-thinking, equipping all workers for the changing world of work.
- Maintain the regulatory system to reflect contemporary workplaces and activities.
- Extend the understanding of future risks to workers arising from automation and share information, so that employers, workers and others may act appropriately as its use increases.

Our Positions on the Key Issues

1. A major benefit of automation is the potential capacity to improve worker safety. Advancements in technology and the use of robotics in industrial operations can enhance working conditions and reduce health and safety risks: for example, removing the need for heavy manual labour and the associated risk of musculoskeletal or repetitive strain injury.
 - 1.1. Automated processes may go so far as to remove a worker from a hazardous environment altogether. The machine or robot undertakes the dangerous task itself, thereby safeguarding the worker and protecting his/her wellbeing.
2. 'There is general agreement that Immersive Reality and automation will offer improvements for health and safety at work as they provide improved guidance, and the opportunity to learn and practice hazardous operations in a risk-free virtual environment'.¹
3. Automation can also help to release workers from not only hazardous, but also monotonous, mundane and repetitive, tasks. This could enable employers to educate, retrain and upskill their workers in more challenging areas of the business and higher-quality roles.
4. Technological advances present potential opportunities for improving the way we work, allowing us the flexibility to work wherever and whenever we want.
 - 4.1. Many employers have already adopted technology which helps to facilitate remote working.
 - 4.1.1. Remote working offers greater flexibility for everyone, particularly parents and carers;
 - 4.1.2. It also reduces travel costs, whilst relieving some of the pressures on the UK's already overburdened transport systems, particularly in London. If workers are not having to make a journey into the workplace every day, not only does this ease a saturated transport network, but it also offers health benefits to workers. Remote working can offer better work/life balance and provide greater opportunities and flexibility.
 - 4.1.3. Remote and flexible working also offer the added benefit to employers of potentially reduced fixed costs by releasing valuable desk space.
 - 4.1.4. However, while it may offer gains for businesses and the economy, remote working also presents wellbeing concerns, especially around lone working. Workers may be isolated with no human interaction for long periods of time.
 - 4.1.5. Despite the benefits of rapid technological advancement, the availability of remote working and the rise of the so-called 'gig' economy, automation can also lead to increased lone working, a lack of separation between work and home, and feelings of greater stress, pressure and intensity.² The British Safety Council and RobertsonCooper's (2018) *Future risk* report cautions that 'the increasing pace of

innovation, insecurity and drive for efficiency' in the 21st century, changing world of work is putting more strain on people, which could ultimately lead to emotional and psychological issues.³

5. The use of automated technology in the workplace may result in worker displacement and some jobs becoming redundant. A worker might even have to relocate as a result of changes to his/her work brought about by automation, or to find another job. Both outcomes have the potential to cause a great deal of stress and anxiety.

Data from the Institute of Public Policy Research (2017) indicates that 'the total level of wages associated with jobs with the technical potential to be automated is £290 billion per annum'. The findings also suggest that lower-paid workers face the greatest threat from the growth of automation, artificial intelligence (AI) and robotics.

The Health and Safety Executive's (HSE) (2016) *Foresight Report* suggests that by 2025, AI could permeate daily life, and many medium skills jobs will disappear. It is also estimated that seven million jobs in the world's largest economies (particularly those associated with low skill and repetitive tasks) are likely to become superfluous due to automation over the next five years. It is therefore essential, that the government ensures that rapid developments in technology neither place vulnerable groups at risk, nor widen the UK's inequality gap.⁴

- 5.1. As mentioned, when establishing automated technology within their organisations, employers must seek to support, redeploy and, where possible, retrain their workers. This will help to avoid the emotional and financial distress which may arise when a worker's role is displaced by a machine.
- 5.2. As policy-makers capitalise on the potential for economic growth which automation offers and promote investment and innovation, the welfare and wellbeing of workers must remain paramount. The government must support organisations to help their staff adjust to the impact of automation. Policies on 'education and training, income support and safety nets' will need to be re-evaluated, and 'transition support' offered to those who become displaced.⁵

As the relationship between employers and employees changes with a rising gig economy, where the responsibility to provide education and self-development lies is also likely to change. Consideration of the Written Statement Directive means that the right to education and training may soon be extended beyond employees. Irrespective of this, employers have a responsibility to provide access to education in automation and robotics, and in a world where technological advancement threatens to replace human input in many jobs, workers themselves should be willing to embrace the changes brought about by automation, and participate in the education and training which new technology requires.⁶

PricewaterhouseCoopers's (PwC) most recent *UK Economic Outlook* (2018) identifies 'a number of policy areas where action could help to maximise the benefits of AI (e.g. boosting research funding, ensuring competition is adequate to ensure productivity gains are passed on to consumers) and/or mitigate the costs (e.g. a national retraining programme for displaced workers)'.⁷

Advancements in automation offer the prospect of a better standard of living for everyone. The government, employers and workers must act together to enable all sectors of society to benefit.

- 5.3. Another consideration for regulators and governments is around the ethics associated with robotic and autonomous systems, including driverless cars. As PwC argued last year, 'a clear discussion on the ethics of AI' must take place. 'Governments should engage with organisations developing the use of robotics and AI at all stages of policy making, to create a pool of thought leaders with a deep understanding of the interplay between technology and its effect on society'.⁸

6. The safe development and operation of robotic and autonomous systems will require effective

management and control of the risks associated with the deployment of this technology. The HSE (2016) emphasises the need for guidance, regulation and regulatory frameworks in this area, 'so that potential risks can be understood early in the technology life cycle and, if necessary, mitigation developed to enable the healthy and safe introduction of new technologies'.⁹

6.1. Industries need to assess the implementation and use of automated technology carefully, in order to diminish any risks to their workers. As the HSE (2012) has pointed out, while advancements in automation can lead to higher productivity and lessen the physical strain on workers, there may be cases where repetitive work actually increases. Automation can result in reduction in the variety of duties a worker performs, and s/he is left with 'residual tasks that cannot be automated'. Furthermore, risks may also arise from workers trying to keep pace with new machinery.¹⁰

6.1.1. Risk assessments must be carried out when the implementation of automated machinery initiates changes to a work system. Mechanisation and automation could eliminate or reduce the risk in one task or process, but then transfer risk to another. Equally, they could cause a new risk elsewhere.¹¹

6.2. The introduction of technological innovations and automated processes should always take place following consultation with workers, with their opinions, concerns and suggestions fully considered. Consultation and effective staff training will help to ensure that new machinery is used both safely and efficiently. It will also help to establish worker engagement and support.¹²

6.3. Before widespread use, it is important to trial a work process which has been changed by the implementation of automation, again helping to ensure both safety and efficiency.¹³

7. What impact has automation had on business productivity to date?

7.1. Automation is widely considered to have a positive effect on business productivity. Automated processes lead to higher output and productivity, as a result of improvements in the speed and consistency of product development, together with reductions in human error and lead times. The greater accuracy and consistency in compliance afforded by automation and robotics generates better product quality. There are also significant gains in terms of cutting waste and more efficient use of resources.

7.1.1. It has been considered that automation helps businesses to become more competitive and increase sales and profit. Labour costs and costs per part decrease, as mechanisation uses fewer materials to generate products quicker, more regularly, and with more precision than humans. Unlike people, machines and robots do not fall ill, or require rest breaks and annual leave. In most cases, they are able to work 24 hours a day, 7 days a week, with minimal supervision. It is even possible to install automated inspection systems, which 'automatically check products for defects and compliance with specification', 'using sensors and vision systems' 'at the end of a manual or automated production process'.¹⁴

7.2. The accumulated benefits of automation stimulate the wider economy and improve the country's GDP. In January 2017, McKinsey & Company estimated that automation could escalate global productivity growth by 0.8 to 1.4 percent per annum.¹⁵ Moreover, a 2017 study by PwC predicts that UK GDP will be up to 10.3 percent higher in 2030, due to AI. This equates to an additional £232bn, and the 'impact over the period will come from productivity gains at 1.9%, and consumption-side product enhancements and new firm entry stimulating demand at 8.4%'. Every region of the UK is set to benefit, 'with England, Scotland, Wales and Northern Ireland all seeing an impact from AI in 2030 at least as large as 5% of GDP, and extra spending power per household of up to £1,800-£2,300 a year by 2030'.¹⁶

7.3. Returning to the concern of the eradication of jobs by technology, current research (Autor Salomons, 2018) argues that while automation 'has *not* been employment-displacing' as yet, 'it has reduced labo[u]r's share in value-added. [...] Estimates indicate that the labo[u]r share-displacing effects of productivity growth, which were essentially absent in the 1970s,

have become more pronounced over time, and are most substantial in the 2000s. This finding is consistent with automation having become in recent decades less labo[u]r-augmenting and more labo[u]r-displacing.¹⁷

However, PwC (2018) argues that AI and related technologies 'should create as many jobs as they displace', estimating that 'countervailing displacement and income effects on employment are likely to broadly balance each other out over the next 20 years in the UK, with the share of existing jobs displaced by AI (c. 20%) likely to be approximately equal to the additional jobs that are created'.¹⁸

7.4. Investment in automation usually involves high capital costs to facilitate the design, manufacture and installation of new technology. Maintenance costs also have to be factored in. Furthermore, productivity can be affected when changes to the product or production process mean that certain automated machinery is no longer needed. Experts advise businesses to calculate the ROI of automation in detail, and to 'future proof' all types of automation they introduce so they can be modified accordingly. 'For example; by using standard flexible automation such as robots, these can be easily used somewhere else in a manufacturing process even if the existing process becomes redundant'.¹⁹

7.5. As the British Safety Council and RobertsonCooper's (2018) *Future risk* report demonstrates, advances in technology provide innovative ways both to improve productivity and protect people at work. The HSE (2016) highlights the use of the Internet of Things (IoT): specifically, wearable technology. This includes common smart devices (such as glasses, watches, mobile phones), smart clothes (gloves, helmets and shoes), and tiny cameras and sensors embedded in contact lenses and temporary tattoos. By gathering and analysing real-time health data (such as heart rate or chemical exposure), risks and accidents such as falls, musculoskeletal and manual handling injuries, stress and fatigue can be anticipated, identified and prevented. Additionally, such devices can provide tutorials and prompts which contribute to improved workplace health and safety.²⁰

However, in light of new General Data Protection Regulation (GDPR), it is more vital than ever that the use of technology and automation in the workplace takes full account of citizens' right to privacy. For example, Amazon's use of wearable devices to track workers' activities, and potentially measure the speed of their tasks, has been well documented, raising understandable concerns.²¹ Moreover, key findings from a new Trade Union Congress (TUC) (2018) report reveal that 'over half of workers (56 per cent) think it's likely that they're being monitored at work', and 'two-thirds of workers (66 per cent) are concerned that workplace surveillance could be used in a discriminatory way if left unregulated'. The majority of workers surveyed '(79 per cent) say employers should be legally required to consult their workforces and reach agreement before using surveillance'.²²

The British Safety Council therefore recommends that smart devices and monitoring technology should only be implemented in the workplace following effective consultation with workers and their representatives, with further legislative requirements put in place to safeguard workers' privacy if necessary.²³

8. Which sectors are most likely to be affected by a growth in automation? What sort of tasks are most and least likely to be replaced by automation?

8.1. Sectors such as accommodation and food services, manufacturing, agriculture, transportation and warehousing and retail are most likely to be affected by a growth in automation, as they include tasks which have high potential to be automated. For example, McKinsey & Company cites manufacturing, accommodation and food services, and the retail sector as involving 'physical activities in highly structured and predictable environments', which are the kind of activities most receptive to automation. The growth in automation will also significantly affect the collecting and processing of data, commonly undertaken in a wide range of industries.²⁴

Regarding AI, PwC's 'AI index' shows AI generating 'the highest potential for product enhancements in the health, automotive and financial services sectors'.²⁵ PwC estimates that

the UK sectors which will see the largest net increase in jobs due to AI over the next 20 years 'include health (+22%), professional, scientific and technical services (+16%) and education (+6%). The sectors estimated to see the largest net long-term decrease in jobs due to AI include manufacturing (-25%), transport and storage (-22%) and public administration (-18%)'.²⁶

8.1.1. The manufacturing industry has used robotics and cobotics for many years. This includes the use of autonomous/driverless cars, which may be on the roads by 2025. While such automation may well bring about business benefits, including higher efficiencies and improved productivity, it also introduces ethical implications and specific health and safety risks, which must be fully assessed and suitably managed.²⁷

However, there is evidence to suggest that some manufacturing businesses are starting to move away from automation and into robotic collaboration. Humans are being brought back into the production process. For example, it was reported in 2016 that Mercedes Benz was phasing out some of its automated processes and bringing people back to the production line, as this offered greater flexibility and customisation.²⁸ Fully automated robotics is most useful for standardised processes.

Repetitive tasks in factories, such as product assembly and packaging, are frequently undertaken by robots, and this will likely continue. In addition, some restaurants are in the process of testing out self-service ordering and robotic servers.²⁹

8.2. Although some roles may move close to 100% automation, knowledge workers are unlikely to be replaced. This will put an emphasis not only on supporting employees once they are inside organisations (whether as employees or contractors), but also on effective recruitment. In its report looking at the 'competing forces' in the future of work, PwC (2017) highlights the future need for pivotal people: individuals who contribute vast and critical value to their respective organisations. Workers who perform tasks which automation cannot, or may never, perform will become more pivotal, meaning that resourcing and retaining such people will become a challenge for businesses.

In a survey of CEOs, PwC found that whilst exploring the benefits of automation is already underway for just over half of businesses, increasing the headcount in the next 12 months was also on the agenda for the majority. They highlighted automation as something that would change the future skill needs for their businesses, and as such finding skills like problem-solving, adaptability, collaboration, leadership, creativity and innovation are paramount.³⁰

Sectors least likely to be affected by a growth in automation include management and education services. Research by McKinsey & Company suggests that the most difficult tasks to automate with today's technology include:

- those that involve managing and developing people (9% automation potential)
- those where expertise is applied to decision-making, planning, or creative work (18%)
- interacting with customers, suppliers, and other stakeholders (20%)

People skills, age and experience are effective in these areas, which may include tasks as diverse as 'coding software, creating menus, writing promotional materials — or advising customers which colour shoes best suit them'. McKinsey & Company calculates, for example, that 'less than 30% of a registered nurse's job could be automated, while for dental hygienists, that proportion drops to 13%'.

While McKinsey & Company's assessments of sector differences are based on examinations of US industry, they significantly inform our understanding of the impact of automation in the UK.

8.2.1. The knowledge, expertise and multifaceted interactions, which education and teaching demand, designate this sector as the least likely to be affected by a growth in automation.³¹ Nevertheless, as stated earlier, PwC has estimated a 6% net increase in UK education jobs due to AI over the next 20 years.³²

Although the technology is developing rapidly, tasks which involve 'physical activity or operating machinery in unpredictable', rather than standardised, environments, also present challenges to automation. For instance, it is still quite difficult to employ a robot to clean and tidy a hotel bedroom, or collect rubbish in public spaces, or operate a crane on a construction site.³³

9. Is there enough advice and support available for businesses who want to automate? Does the government's industrial strategy offer the right support to businesses for automation?

9.1. As automation, AI and robotics revolutionise the way we work, the advice and support the government and other institutions provide to businesses must continue to develop and innovate.

9.2. More support is needed for the manufacturing industry. The EEF/Santander *Investment Monitor* (2017/18), based on discussions with 328 companies, observes that 'industry is making only slow progress on automating manufacturing processes'. Uncertainty around Brexit is impeding manufacturing's confidence to invest in new plant and machinery. This caution further originates in 'challenges from the cost of technology', 'lack of skills' and 'uncertainty about returns and the capability to successfully implement change'. The survey argues that 'automation is potentially the solution to problems with skills availability and stuttering productivity – both of which are in evidence in the UK. And yet the international data [...] indicates that the UK has not yet taken a leading position in investment in new automation technology'.³⁴

It is encouraging that the government's industrial strategy names manufacturing as one of six business sectors to be prioritised by the Office for AI. However, the government must ensure sufficient investment in automated technology, to ensure that manufacturing is able to compete on the global stage.³⁵

9.3. As stated throughout, it is vital that the health, safety and ethical implications of automated technology in the workplace are subject to detailed research and risk assessment. Equally, any introduction of automation within the regulatory system itself also needs to be evidence-based. Businesses and stakeholders must receive sufficient guidance, advice and support on the changes technology might bring to regulatory and compliance systems. The British Safety Council therefore welcomes such studies as the Centre for Digital Built Britain's recently announced consultation on the future of automated compliance checking in the built environment.³⁶

9.4. One key future risk factor, which is already affecting businesses, is that of employees working with cobots. Research (Hollinger, 2016) shows that those already working with robotic and collaborative robots would continue to choose to do so, but this practice is mostly established in the car industry, for example. However, as working with cobots becomes more commonplace in other industries, it will be crucial that knowledgeable professionals are available to ensure effective implementation.

Educating people on the way to work and interact with cobots will be fundamental to their acceptance within society and workplaces alike. It is likely that such training will benefit from utilising Virtual Reality (Matsas et al., 2012).³⁷

10. Are there specific demographic groups most at risk? How far can these be mitigated by new roles in these industries?

10.1. 'Due to the changes to retirement legislation and the raising of the pension age, it is expected that people will be working for longer. Physical changes occur as we age; for example, bone density decreases, cardiovascular function and aerobic power reduces by up to 50%, there is a loss of lean muscle tissue and muscular strength, skeletal muscles become less flexible, level of stored water is reduced, and blood pressure

rises'. An ageing workforce leads to legitimate questions about risks to physical health and safety in the workplace.³⁸

10.1.1. Automation, AI and robotics may offer opportunities to mitigate certain risks to older workers. For example, training older employees to work with cobots could relieve them of potentially damaging physical exertions instigated by heavy manual labour. The worker controls the cobot to undertake the strenuous work.

10.1.2. Automation might similarly be used to support disabled workers. For example, individuals with reduced motor function may benefit from the addition of cobotics as assistive technology.

10.2. The advantages of remote working have already been outlined, as have the risks. Recent data on remote working, reproduced in the British Safety Council and RobertsonCooper's (2018) *Future Risk* report, 'shows that there are 4.2 million home workers, equivalent to 13.9% of the workforce. Of these, 1.5 million are employed people, working within their own home or grounds, and 2.7 million use their home as a base but also work from other places (ONS, 2014). This figure is expected to rise, due to the increase in the gig economy and the instability of work. Given that a sense of belongingness and social contacts are cornerstones of wellbeing, attention needs to be paid to those employees or workers who may be at risk of isolation. Particular attention may need to be paid to older workers; for those aged 16 to 24 the home working rate stood at 5.1%, compared with 13.9% for all workers; for those aged 65 and over, it was 38.3% (ONS, 2014)'.³⁹

10.2.1. Rapid innovation in information and communications technology (ICT) has created a host of positive benefits for people to work flexibly and remotely. The British Safety Council believes that such benefits have the potential to result in the needs of remote workers being overlooked: 'research on successful remote working shows that individuals need more, and not less, formal support than those working from an office base.

As Bentley et al. (2016) note, it is likely that the amount of informal training and support that occurs naturally in a fixed workplace is not realised. Greer and Payne (2014) give the following advice for remote workers: "Teleworkers need high quality reliable equipment to work, and online access to work materials, databases, and file stores; quick and effective communication systems with colleagues, and by implication good broadband connections. There is a need to help people to plan the activities that they will do whilst teleworking, to ensure their work role has boundaries. Ensuring individuals are not isolated and have social support is vital".⁴⁰

10.3. Experts have called attention to the ways in which today's world of work is transforming. 'We are seeing more contractors and people on short-term [and zero-hours] contracts with the rise of the gig economy, an increase in technology creating an 'always on' culture, an ageing workforce and, ultimately, a very different psychological contract between employers and employees for the future. As such, we are seeing loyalty between employers and employees decreasing, which means that retaining healthy, high performing employees is even more important.'⁴¹

As the recent *Taylor Review* (2017) observes, gig working is expected to increase rapidly. 'The number of 'on-demand' workers is anticipated to double by 2020, by which time the majority of the UK workforce will be more flexible. It is also anticipated that by 2030, jobs and organisations may become increasingly fluid, as people move from project to project or from one job to the next (HSE, 2016)'. Flexibility works for many people and an agile labour market is good for protecting employment. However, there is a risk that this type of working can lead to poorer outcomes for some. 'The main issue is in the imbalance of power that might lie between the employer and the individual. Where the employer holds more of the power, this can lead to little employment choice, poorer working conditions and lower wages'.⁴²

The working conditions and pressures faced by gig workers are issues of increasing concern. A new study published by University College London (UCL) (2018) concludes that 'gig economy drivers and riders are 'at heightened risk of traffic collisions'.⁴³ UCL undertook 48 detailed interviews with drivers, riders and their managers working in the gig economy. Additionally, an online survey was conducted, receiving over 200 responses. Among others, the researchers talked to self-employed couriers who delivered parcels and self-employed taxi drivers who received their jobs via apps.

The findings state that there are particular factors which 'may increase the risk of being involved in a collision or near miss for someone who ostensibly drives or rides for a living'. Such factors include:

- impairment through fatigue, distraction and speeding
- high exposure to risk, due to adverse weather conditions, long commutes, high mileage and circadian lows
- distraction by mobile devices (40% of online survey)⁴⁴

'Many of the couriers [...] interviewed admitted to having a collision and experienced near misses several times each day. From [the] online survey 42% said they had been involved in a collision where their vehicle had been damaged and 10% of the total sample said that someone had been injured as a result and this was usually themselves. Three quarters of respondents (75%) said that there had been occasions while working when they have had to take action to avoid a crash'.⁴⁵

'63% said that the company did not provide any training on how to manage risks on the road and 65% said they did not provide any safety equipment (such as a high visibility vest). Most of the survey respondents (70%) said they provided their own safety equipment'. When asked about where the responsibility for safety lies, 68% thought it should be shared between themselves and their employer.⁴⁶

While such companies as Uber and Deliveroo provide guidance, UCL foregrounds the fact that there are currently 'no working time directives or employment laws regarding health and safety that apply to working in the gig economy and workers have no accountability to an employer. There are no policies on health and safety and the onus is on the worker to ensure they stay within the law whilst driving or riding. However, the business model of gig companies works on incentivising people to drive or ride in ways which, from a road risk perspective, are most dangerous: for example, at night and in dangerous weather conditions, riding with a potentially unbalancing heavy back packs on their bike, [and] using a distracting work interface in an intrinsically pressured environment'.⁴⁷

The British Safety Council endorses several of the report's recommendations, which include:

- A person in the company should be responsible for managing safety of the people who provide an income for them. This should be provided at a local level to ensure that vehicles are road worthy with an up-to-date MoT where applicable, and properly insured for the job being done.
- Within the company collisions and severe near misses should be discussed and lessons learned.
- Companies should not incentivise vulnerable road users (those on two wheels) to take additional risks by paying a higher rate to ride in poor weather conditions.
- Personal safety equipment such as hi-vis jackets (fluorescent/reflective) should be provided freely to couriers.
- The health and safety implications of carrying large back packs on two wheeled vehicles should be tested and suitably controlled.⁴⁸

The government must ensure that the self-employed, gig workers, and those in precarious employment are protected from abuse and exploitation, with rights to information and representation.⁴⁹

10.4. As shown earlier, the introduction of automation and technology to enhance business

productivity also carries risks in terms of rights to privacy and data protection. Such risks affect all workers. They also stem from threats to cyber security. 'The HSE (2016) emphasises the need for guidance, regulation and regulatory frameworks in relation to ICT developments', pointing to the government's National Cyber Security Strategy, to deter and defend against cyber-security threats'.⁵⁰

The British Safety Council and RobertsonCooper (2018) highlight that 'remote technologies (e.g. Cloud storage) may increase the anxiety of some [workers], due to fear of how and where data is stored, and fear of being held responsible for the security of information'. As remote working 'takes staff to public places (such as coffee-shops), it will become necessary to provide specific training on cyber security: for example, in the use of closed WIFI for commercial communication, ensuring screens are not visible, and avoiding commercially sensitive telephone calls that might be overheard'.⁵¹

- 10.5.** The HSE has identified that for those working in conditions with nanotechnologies, there come uncertainties as to whether the unique properties of engineered nanomaterials pose an occupational health risk. Assessment of health risks arising from exposure to nanomaterials or other substances requires an understanding of the intrinsic toxicity of the substance, the levels of exposure (by inhalation, ingestion or through the skin) that may occur and any relationship between exposure and health effects. More data is needed on the health risks associated with exposure to engineered nanomaterials.⁵²

11. What are businesses doing to offer training to staff, either as a result of or in support of automation?

- 11.1.** Given the potential opportunities automation brings to an ageing workforce, as outlined above, it is concerning that a significant number of older workers feel left behind by the digital revolution. A Business in the Community (BITC) (2017) survey of almost 2,000 employees (56% of whom were over 50 years old) concludes that 'older workers do not feel they are being informed about the impact of automation on their workplace. They are less likely than younger workers to believe automation will affect their job and were the least likely to believe their role could ever be fully automated'.⁵³ While the BITC found that most employees do not feel adequately informed about the impact of automation and technology in their respective workplaces, such feelings are particularly prevalent among older workers.⁵⁴

BITC's research suggests that businesses 'are not training older workers in the skills that they need to succeed in the digital era, especially women and manual workers. Computer skills are the most common skills that older workers have been trained in, yet the numbers are still too low: only 38% in their 50s and 36% in their 60s have received training in this'.⁵⁵ 'In terms of digital and technology skills, the most sought-after training for older workers is for data analysis, report creation and writing, data organisation and storage - yet those respondents are still in the minority (fewer than 1 in 4)'.⁵⁶

Another study conducted by payroll and HR services firm, ADP (2018), concludes that 'UK employers are failing to prepare their staff for the impact automation will have in the workplace'. 'A third of workers feel that their job will be automated within the next decade, while one in 10 fear they will lose their jobs to automation within two years'. 'Half of those who feel they are at risk because of automation say their employer has yet to reskill them'.

While younger workers are more likely to feel more confident than older workers in learning new technological skills, ADP's research reveals that it is young people who are most anxious about the threat of automation to their job security: just under half of the workers aged between 16 and 35 surveyed expressed fear for their jobs in the next 10 years.⁵⁷

It is vital, as BITC argues, that employers 'clearly communicate the impact of automation and technology on the business' to all employees, and provide training and education to 'demystify key future skills, particularly technology and digital skills'.⁵⁸

11.2. As has been shown, the gig workforce is likely to require a different kind of training and development, with the introduction of technologies disrupting work as it is currently recognised. As the gig workforce grows, there will be changes in the ways in which people develop their careers, which will require significant changes in the skills and knowledge required. The British Safety Council has been a leading advocate of the importance of protecting the rights of gig workers. Providing access to training and education is also crucial.

'The gig economy and short-term contracts may affect most younger workers and their long-term career prospects. Many will already be carrying debt burdens from higher education'. While the gig workforce trains and upskills, 'expecting potential workers, who have unpredictable income, to pay for their own development, is not likely to be practical, and would require agencies or other organisations to hold information on the level of skill or knowledge that a person possesses'.⁵⁹

11.3. As indicated, businesses must seek to provide comprehensive training and support for their remote workers, to maintain efficiency and productivity, avoid loneliness and isolation, and safeguard against potential threats to cyber security.

12. What other actions should the government be taking to support those affected by automation, such as the 'Robot tax'?

12.2. Robots reduce the tax burden on businesses, which potentially enables income to be invested to promote the wellbeing and development of the human workforce. Robots do not require employers to pay wages, and national insurance and other human resource related taxation and payments are also not needed.

12.3. The notion that robots will replace humans entirely, rendering jobs obsolete, is both complex and unlikely. The costs of automation are often prohibitive, especially for SMEs. Moreover as shown, the 'human touch' in many jobs is indispensable.

However, if some jobs do become redundant, there must be a rigorous programme in place to ensure opportunities for retraining workers who have been displaced by automation and robots. We have already seen evidence of the fear and anxiety caused simply by the prospect of workers losing their livelihood in this way. As detailed within this document, the government must take steps to mitigate not only the financial, but also the psychological and emotional, effects of worker displacement by automation.

12.4. A 'Robot tax' could be counterproductive, as it would disincentivise innovation in automation, particularly amongst SMEs and small-scale entrepreneurs. Innovation is vital. It ensures the long-term survival of jobs, which benefits the wider economy and society as a whole.

The potential loss of tax revenue to the government, instigated by businesses employing robots rather than people, can be circumvented by concerted efforts to ensure, as PwC (2018) proposes, that AI, automation and related technologies 'create as many jobs as they displace'.⁶⁰ Workers must be equipped with the requisite future skills they need to work alongside, and in collaboration with, their automated counterparts.

13. Conclusion and recommendations

13.1. We need to identify the opportunities that automation presents to improve work and create better-quality jobs.

Though change is inevitable, how we respond to the changing world of work is not. Government and businesses need to establish suitable and appropriate policies to ensure that work is safe, healthy and rewarding. The issue of our workers' mental health in the UK continues to be of concern. Studies estimate that over 5 million UK workers could be suffering

from a mental health condition each year.⁶¹ There is compelling evidence to show that good work makes for healthier and more productive workers. New technology can add value and support, potentially reducing health and safety risks, giving workers more tools for self-determination and enabling older workers to remain healthier for longer. We urge businesses, trade unions and others to share good practice and their experience of the ways in which automation promotes good work and work design, as the government develops and implements its industrial strategy.⁶²

13.2. We need to act consistently to protect workers from any threats to their health, safety and wellbeing, including mental wellbeing, that automation may pose.

The government and businesses must collaborate with occupational safety and health professionals, to protect workers from risks arising from the introduction of automated and technological innovations. These risks must be fully researched and assessed. Examples include: loneliness and depression caused by the rise of remote and lone working, job insecurity arising from a growing gig workforce, the physical and mental strain on workers trying to keep pace with new machinery and processes, increased repetitive, residual tasks brought about by automation, and the implementation of cobotics in the workplace.

13.3. We need to ensure education is relevant and forward-thinking, equipping all workers for the changing world of work.

The British Safety Council has persistently called for the continued education and training of all workers. Extensive, creative and effective education is only way to help workers both adapt to, and benefit from, the groundbreaking changes that automation presents.

If we create a more insecure, fluctuating and inexperienced workforce, with workers more likely to suffer injury or ill health, then this means that innovative and sustained health and safety education is more crucial than ever. Risk education before work, along with induction and training at work, will become even more important. Schools, universities and training bodies need to address 'soft skills' such as collaboration, creativity and leadership, all of which help to boost resilience. Less prone to automation, workers can take these skills with them as they change jobs. Skills associated with new technology, such as working in collaboration with intelligent machines and robots, equally need to be fully integrated into the educational system. Occupational safety and health professionals, as well as safety representatives and HR professionals, should include such training within their development programmes, including increased emphasis on how to reduce stressors and promote wellbeing and resilience. Educators must have a flexible mindset, focused on supporting individuals, from school education through to workforce development, in order to thrive in an ever-changing environment.⁶³

13.4. We need to maintain the regulatory system to reflect contemporary workplaces and activities.

Changes to the world of work present challenges for how our legal and regulatory systems operate. With working networks between humans and machines, sometimes operating across borders, there is a question about where ownership of the risk lies. Who should take responsibility if something goes wrong? The cost of ill-health remains high. In 2013, a PwC survey proposed that sick days accounted for '£28.8bn of the UK's overall £31.1bn absence bill'.⁶⁴ As contracts between employers and workers become more diffuse, where people in the gig economy are often not classed as 'workers', businesses might increasingly avoid the costs of sickness absence or employer's liability insurance. The government should do more through its industrial strategy to enable gig workers to take certain social protections and rights with them, wherever they work. It may mean that the government needs to formulate better regulation on self-employment, to incorporate the changes that the growing gig workforce is initiating. Good work must be for all.⁶⁵

Regulation must continue to be re-evaluated as new technology emerges. This includes potential risks to people's privacy and personal data. The ethical implications of automation,

AI and robotics also need to be scrutinized, both in terms of their roles in workplaces and in wider society.

13.5. We need to extend our understanding of the future risks to workers arising from automation and share information, so that employers, workers and others may act appropriately as its use increases.

The research community and safety and health practitioners will play a key role in determining the future risks to workers which arise from automation. Evidence on the risks of new technologies, new materials and new ways of working is limited in some cases. For example, we need more understanding of the risks associated with real world applications of nanomaterials. Furthermore, examination of the impact on the mental and physical health of people working with cobots would also contribute to a more coherent view of current and future risks to worker health, safety and wellbeing. Research must progress alongside technological advancement, and best practice must be shared.⁶⁶



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