



BEIS SELECT COMMITTEE – AUTOMATION AND THE FUTURE OF WORK INQUIRY

Issued 24 August 2018

ICAEW welcomes the opportunity to comment on the *Automation and the future of work* inquiry launched by the BEIS committee on 24 May 2018.

We believe that automation provides major opportunities for growth and increasing productivity and should be a natural focus of attention for government. We welcome the inclusion of AI within the flagship industrial strategy policy. In seeking practical actions that government could take to support businesses with automation we suggest that thought be given to the scope of 'automation' as many productive technologies will not be 'robots'. There could be usefully be a focus on finance, given that automation inevitably requires investment. We have identified some impediments to innovative businesses obtaining finance and these are documented in this letter. Equally, the effects of business rates should also be considered as this is becoming an increasingly significant tax on business and is levied on certain plant and equipment.

ICAEW is a world-leading professional body established under a Royal Charter to serve the public interest. In pursuit of its vision of a world of strong economies, ICAEW works with governments, regulators and businesses and it leads, connects, supports and regulates more than 150,000 chartered accountant members in over 160 countries. ICAEW members work in all types of private and public organisations, including public practice firms, and are trained to provide clarity and rigour and apply the highest professional, technical and ethical standards. More than half of our members work in business where they are often involved in investment decisions relating to technology. 78 of the FTSE 100 have an ICAEW Chartered Accountant on the board (Dec 2016) and 98 of the 100 global leading brands employ ICAEW Chartered Accountants (Dec 2017).

This response of 24 August 2018 has been prepared in consultation with the Business and Management Faculty, the Corporate Finance Faculty and the IT Faculty. Our faculties are recognised internationally as a source of expertise in their areas. Each provides a range of specialist resources to support members and is responsible for ICAEW policy on issues in their areas including submissions to consultations.

The Business and Management Faculty's members include CEOs, CFOs, Financial Controllers and a broad range of finance professionals in business. The Corporate Finance Faculty's membership is drawn from professional services groups, advisory firms, companies, banks, private equity, law firms, consultants, academics and brokers.

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MAJOR POINTS

1. We welcome this inquiry and wider government initiatives that consider how to support automation to boost productivity and growth and perhaps even encourage reindustrialisation. There is no doubt that remaining at the forefront of technological change and embracing disruption is crucial to optimising growth. The accountancy profession is eager to play our role in adopting and developing these technologies, both to support the many businesses that our members are involved in and to enhance the efficiency and effectiveness of our own profession. For example, our members will often be involved in investment decisions regarding automation.
2. In responding to this call for evidence we have answered each of the questions posed. However, we note that these are often rather abstract and the answers are already well documented in literature in the public domain. We therefore focus in this section on what government might tangibly do to encourage greater adoption of automation.

What might government do to help UK businesses achieve the benefits of automation?

Clarify what is meant by ‘automation’

3. There is a clichéd association between automation and humanoid robots. While it might be widely recognised that real life robots are typically more mundane than those depicted in science fiction, there is little clarity on what is meant by automation. This matters. The less policy makers, businesses and affected employees appreciate the applications and capabilities of automation the less they will be able to deploy it to their advantage. Debate on a ‘robot tax’ is just one indication of the misunderstanding of what robots actually are.
4. Very many hours of time are spent manually reproducing tasks that could be simplified, optimised or automated. The technologies to do this are often not new. But new technologies provide greater and additional opportunities for automation. Government needs to consider the policy boundaries of ‘automation’.
5. For example, spreadsheets have huge potential to automate accounting and management tasks that would otherwise be manually replicated each time they need to be performed. In many cases this potential is missed due to inadequate skills. The [European Spreadsheet Risks Interest Group](#) estimates that over 90% of spreadsheets contain errors. Moreover it is often more complex features of spreadsheets and databases that give the greatest automation potential – for example macros. New applications continue to be developed that remove the need for users to develop their own solutions and enable better control. Nevertheless skills remain a key limiting factor. ICAEW has made publicly available a range of resources to help enhance spreadsheet skills. Notably:
 - [Spreadsheet competency framework](#);
 - Financial modelling code (to be published in September 2018).

Support efforts to build skills and change readiness in the economy

6. ICAEW recognises the huge opportunities that disruptive technologies represent for the accountancy profession. We are progressing a programme to educate our members on technology and the implications it might have for them. We have identified four crucial technologies represented by the acronym ABCD: AI, Blockchain, Cyber-security and Data. We provide resources in each of them. We also have a range of other initiatives to provide training and support to members in these areas. Although commercial applications of these technologies might not yet be mainstream in accountancy (with the exception of cyber-security) we want to educate our members so they understand their potential and are positioned to take advantage of them as applications develop. Our resources can be found here:

- AI
- Blockchain
- Cyber-security
- Data

7. We believe that if initiatives like ours are being replicated across the UK economy the potential for developing skills and instilling a culture of change readiness are enormous. Government might have a role in assessing these various initiatives and identifying where synergies or gaps between them might benefit from government action. We stand ready to support this. Much of our content on these topics is already publicly accessible.

Review business rates

8. Business rates are a major and increasing cost for UK businesses. Of particular relevance is the fact that they are levied also on fixed plant and machinery, which might include robots. This could discourage some otherwise productive investment. Fundamental review of business rates is long overdue and such a review might include an evaluation of the extent to which rates may hinder innovation and productive growth. Our report **Business rates: maintain, demolish, rebuild or refurbish** explores the issues.

Support the provision of finance to innovative firms

9. Finance might provide the most fruitful area where the committee might make suggestions for government action. Large scale automation clearly requires significant investment and is therefore dependent on finance. Currently, financing gaps exist for innovative firms.

10. We believe the development of advanced new technologies has the potential to benefit society, the economy, business and providers of professional services. ICAEW therefore supports increased public and private-sector investment in R&D and innovation.

11. We have provided significant public policy and practical support for the UK government's Industrial Strategy, several parts of which involved potential investment in emerging technologies that will significantly affect the automation of organisations and therefore the future of work. As set out in ICAEW's summary report **Boosting Finance for the UK's Industrial Strategy**, this includes new R&D investment in economic activities as diverse as food production, clean energy, future materials for manufacturing, AI, robotics, food production and 'next generation' professional and financial services. These sectors all employ highly advanced technology, including automation.

12. In our responses to a number of government consultations, including the Industrial Strategy Green Paper and our responses **REP 102/17** to the HM Treasury consultation *Financing Growth in Innovative Firms* and **REP 41/18** to the Treasury Committee's inquiry on SME finance, ICAEW has argued that the provision of government investment (including £2.5bn British Patient Capital) should be targeted at economic sectors that are capital-intensive and may require longer-term funding than that provided by traditional venture capital and private equity investment models. These include several of the technologies identified in the Industrial Strategy and supported by the £1bn-plus Industrial Strategy Challenge Fund, as well as life sciences more generally and advanced engineering (as evidenced in **detailed research** by the Institution of Engineering & Technology and ICAEW in 2016). These emerging technologies have the long-term potential to support sustained, high-skilled and semi-skilled employment, as well as boosting the UK's economic productivity.

13. Fiscal incentives, such as Seed Enterprise Investment Scheme (SEIS), the Enterprise Investment Schemes (EIS) and R&D Tax Credits remain vital components of the funding structures of many businesses that are raising investment for expansion, including automation and the development and adoption of other new technologies.

14. ICAEW has welcomed that as part of the Industrial Strategy, the government also committed more investment to digital and construction training (via the National Retraining Scheme).
15. Access to appropriate expertise is also key. ICAEW members help businesses to prepare the financial statements and projections necessary to attract finance as well as helping to assess the productivity of planned investments. Our **Business Advice Service** enables businesses to access a free initial consultation with an ICAEW Chartered Accountant. The **Business Finance Guide** (online tool freely available to all) we published with the British Business Bank enables businesses to explore and assess the different sources of finance that might be available to them. We continue to seek opportunities to build awareness of these sources of advice.

ANSWERS TO QUESTIONS

Businesses

Q1: What impact has automation had on business productivity to date?

16. In the accountancy sector there has been lots of automation over the years – from service centres to wholesale automation of invoice processing, for example. We see many examples already in use today: highly automated cloud accounting software, with add-ons to integrate and automate all kinds of processes; use of robotic process automation in large firms and finance functions. Even basic spreadsheets provide huge potential for automation of repetitive manual tasks.
17. How that translates into productivity improvements across the sector is not necessarily clear, but we do see some leading organisations with fewer, leaner finance functions. There is also evidence that roles are changing to focus on higher value tasks such as analytics. For many Chartered Accountants their work has typically always focused on managerial or analytical tasks which have less potential for automation. Accountants' analytical skills often mean they are well placed to contribute to the design, operation and control of business activities outside of the finance function, which may add additional value to businesses they work for or advise. Automation of repetitive tasks may free up time to be able to participate more in these activities and in doing so skills are further developed. It is therefore a misnomer to some extent that work is displaced by automation; skills and opportunities are dynamic, time, conversely, has an absolute limit.
18. It is not clear what scope the inquiry has in mind for 'automation' (see paragraphs 3-5 above). Automation might commonly be associated with industrial robots, but the use of technology to replace manual tasks performed by humans is much broader than this. Often the tools to automate labour (to some extent) are already available. For example office software has huge productivity potential. But before these can be deployed a systematic understanding of processes and how they might be changed is necessary. To some extent this depends upon the skills to make effective use of tools available. More could be done here (see paragraph 5).
19. Another type of automation is self-service. Sometimes this merely transfers work from one person to another (who is typically not paid for it). Automated supermarket checkouts and online travel bookings are two examples. As these technologies reduce costs and hours worked they must have a positive mathematical impact on productivity but overall the economic benefit of shifting work from one person to another might be limited unless it allows us to become increasingly efficient or stimulates demand. Self-service might also involve the creation of new jobs, which while fewer in number might require higher levels of skills.

Q2: Could automation lead to reindustrialisation as processes and products become cheaper?

20. Business decisions are made on the basis of the lowest marginal cost. Therefore if it is cheaper to manufacture in the UK then goods will be made here. If production costs were zero then the cost of transport would militate toward producing as close as possible to the consumer. However, marginal costs do not only reflect labour. Excessive costs in any of these areas might mean it is more economical to manufacture overseas:
- Corporation tax – including the effects of transfer pricing on imported goods or inputs.
 - Land occupation, including the extent to which industrial land is restricted by zoning. Business rates also comprise a significant additional cost. In the UK business rates are levied on fixed plant and equipment, which might include robots. This might discourage productive investment (see paragraph 8).
 - Regulation and ‘red tape’.
 - Tariffs & quotas on import of intermediate inputs and on exports of capacity not utilised for domestic consumption.
21. It should be noted that the factors above might make foreign production even more competitive as these countries adopt automation to further their reduce labour costs.

Q3: 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?

22. Deloitte (working with researchers from Oxford University) has estimated that **35% of jobs in the UK** are at risk from automation. The BBC provides a calculator on its website to assess **whether a robot will take your job**. For Chartered Accountants the BBC estimates the likelihood of replacement at 95%. Research from **PwC** suggests that computational tasks are likely to be automated first, those involving physical labour or manual dexterity will be harder to automate.
23. In the accountancy sector, we are seeing compliance, bookkeeping and processing tasks increasingly being automated and human efforts focused on providing analysis, applying context and interpreting results. The big accountancy firms are reporting increasing demand for advisory services, some of which are provided by accountants some not. These trends are positive. They provide more fulfilling interesting work for people to do at higher value. This directly increases productivity. We are supporting our members to understand and explore the potential of technology so that they can harness the efficiency and effectiveness benefits it offers. This means we do not expect Chartered Accountants to be doing exactly the same tasks they do today in 20 years’ time. However, we do expect them to be fulfilling the same objectives in the economy – providing integrity and transparency to investment and financial transactions. This is what ICAEW was established in 1880 to do. Robots can offer powerful tools to enhance the provision of integrity and transparency, but these are human qualities.
24. There are also real limitations to the extent and pace of technological adoption. The bicycle and electric vehicle are nineteenth century innovations. One has changed little in basic design since then, despite alternative configurations being more efficient, the other until recently was restricted to very limited applications. There is not always a compelling business case for automation. It might be uneconomic – software is expensive to produce and maintain for specialised applications. Some clients might prefer a task to be done by hand. Legal and ethical implications will demand a level of human arbitration for many tasks. Many businesses will lack the capabilities to deploy automation due to lack of skills, poor data, unsuitable premises, etc. ICAEW has investigated **robotic process automation** in finance functions and the challenges to its successful adoption.

25. Nevertheless, over time demands in the economy, import possibilities and technological capabilities do change and therefore the work people are doing today should not be expected to be what they are doing in the future. Work is about meeting demands in the economy. The limits on demand might be relatively elastic; where it is economic individuals and businesses might be willing to consume many more or different things or demand higher quality.
26. Problems arise where a large number of jobs are displaced in a short space of time, making it harder for redundant workers to find new work; or where the economy becomes increasingly skilled, reducing opportunities for those with fewer marketable skills. This latter trend has already been apparent for some time and in some parts of the UK government will be aware that employment opportunities are mismatched with the skills that many unemployed individuals have. Automation might make this worse. One response often discussed in this context is a citizens income. ICAEW does not have a policy position on welfare benefits. However, to contribute to the debate in the public interest we commissioned a report from Dr Malcom Torry *How might we implement a citizens' income?* This explores in some details the practicalities of such a policy.

Q4: 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?

27. An increasing range of resources are available on automation, but where these are generic there is a cost to businesses in absorbing the information and assessing how it might be relevant to them. For business people with multiple competing demands on their time, this can be a significant barrier. For advice and support to be useful in producing action it needs to be appropriate to the specific circumstances and applications faced by the business. Different sectors will have very different potential for automation, which will also vary by business model. That means advice will often need to be bespoke. Obtaining appropriate professional advice at the right time is crucial for businesses to be able to take advantage of opportunities available. Our members are skilled in particular in advising businesses on obtaining finance and making productive investments. The **Business Advice Service** enables businesses access to an initial consultation free of charge. When considering automation or other technologies it is crucial that these are seen as part of a broader business strategy and not in a 'separate box' marked IT.
28. Helping smaller businesses to go digital and make use of new technology is a long-standing issue and previous government efforts have not necessarily been very successful. Small business in particular are likely to lack the time, resources and skills to engage with technology unless the specific benefits are clear. We have seen these issues with adoption of cyber-security products, cloud accounting software and analytics tools. There will be lessons from the adoption (or lack of adoption) of these technologies that could be studied.
29. It is encouraging to see automation as a focus in the government's industrial strategy. To deliver on this we suggest that there needs to be a focus on ensuring the finance is in place to support automation. In paragraphs 9 to 15 we explore issues relating to the access to finance for innovative businesses.

Q5: What opportunities are there for British tech businesses from a rise in automation? How can these opportunities best be exploited for the benefit of British industry?

30. There are lots of opportunities here which play to the UK's strengths. For example: Blue Prism is one of the world's leading robotic process automation providers; Deepmind, a leader in AI, is based in the UK; London is the #1 fintech centre, with lots of examples of automation in financial services; the UK also has strong universities and lots of technology talent. Clearly these strengths are influenced by government policy, not least in relation to migration of skilled labour. Doubtless other respondents will provide further examples. Government could investigate each of these strengths to analyse what sustains these factors.
31. Investment schemes such as SEIS and EIS have also played an important role by attracting more investment to early stage companies. Such investments are high risk, but this is significantly mitigated by the tax effects of these schemes. The UK tech eco-system is maturing and the emergence of some early stage tech companies with unicorn \$1bn values, together with a continued attractive tax environment can be expected to sustain investor interest in the sector.
32. Open data from the government has been an important factor driving innovation for some businesses and therefore increasing access to this could also be beneficial.
33. ICAEW recently held a conference **Boosting finance for the UK's Industrial Strategy** where these issues were explored. As mentioned above, we believe a major role for government here is in helping to address some of the barriers to finance. These are set out in paragraphs 9 to 15.

Workers

Q6: Are there specific demographic groups most at risk? How far can these be mitigated by new roles in these industries?

34. See the answer to question 3 above.

Q7: What are businesses doing to offer training to staff, either as a result of or in support of automation? Should Government have a role in retraining workers affected by automation?

35. We need to recognise that retraining will not always be effective in securing employment in the same area in which displaced employees currently work. For example, not everyone doing transaction processing work will be able to retrain with data analytics skills. Consequently, while businesses will do some retraining, the government will need to have a role too. This will require agility; opportunities might be in new areas and will vary from location to location and over time. Training needs to be able to adapt to this.
36. We have recognised the role of technology in changing roles and skills in our ACA qualification. The syllabus reflects a strong technology element. We are also offering courses through the ICAEW academy which are intended to be useful for members seeking to retrain.
37. Government may be able to build an evidence base on these factors, looking at where jobs and skills were changing to track the skills needed and where new jobs were appearing. It may be possible to do this historically to provide a proxy for how an economy adjusts over time.

Q8: What other actions should the Government be taking to support those affected by automation, such as a ‘robot tax’?

38. The idea of a robot tax is largely based on a misplaced conflation of automation with humanoid robots. In reality automation is more pervasive and difficult to define, it is therefore difficult to envisage what would be taxed. Some forms of automation, such as driverless cars, are easily identifiable and in theory might be taxed. However, it would not seem to be productive to tax some types of automation because they involved discrete ‘robots’ while leaving others untaxed. Other forms of ‘robot tax’ might be to reduce tax incentives for investments that involve automation or to tax profits from automation at a higher rate. Both would be very difficult to identify and would be at variance with the objective stated for this inquiry of encouraging investment in automation.
39. Automation can be expected to increase productivity and profits and should therefore naturally lead to additional tax income.
40. We explore the topic of a robot tax further in our article *How do you tax a robot?*

Consumers

Q9: What are the potential benefits and disadvantages for consumers of businesses increasing automation?

41. We should expect automation to deliver greater efficiency, lower cost and better services. It might also free up workers to enhance services and products in the economy or provide new ones. For example if a robot can replace basic manual tasks a human might be able to spend more time on finishing, presentation or customer services at no additional cost.
42. Government also needs to consider the ethics of automation. Some services might be able technically to be delivered automatically, but there may be ethical reasons why human oversight or intervention might be desirable. Investment advice is one obvious example. Human oversight might be necessary at the bespoke level of outputs (to ensure advice is suitable for the individual) rather than only at the level of programming inputs. AI makes these concerns even more critical. There might also be national security implications.