Economy, Infrastructure & Skills Committee - Written Evidence – Automation and the Welsh Economy

Purpose of Paper

1. The purpose of this paper is to provide written evidence to the Economy, Infrastructure & Skills Committee to assist their work in looking at the challenges and opportunities posed by automation in Wales.

Introduction

2. The increasing ability of machines to perform tasks once thought to be the preserve of people is widely expected to have far-reaching consequences for productivity, skills, income distribution, well-being and the environment.

Automation and the Welsh Economy

Current Context

3. In recent years, the Welsh economy has been performing strongly in a medium term context. The latest figures show that Wales was the fastest growing country in the UK, between 2015 and 2016, with GVA rising to nearly £60bn. Over the same period, GVA per head in Wales increased by 3.5%, the fastest rate of increase of all the UK countries and the second highest increase of all UK countries and regions.

4. The number of active enterprises in Wales is the highest since comparable records began (102,585 in 2017). Wales is maintaining an employment rate well above its historical average, with the level up over 242,000 since the start of the Assembly. At 73.4 per cent, the employment rate in Wales is well above the rate of 65-67 per cent experienced in the mid to late 1990s and the early years of the 2000s and in recent years has been at or close to record levels.

Automation and the Labour Market

5. Automation has long been a factor in eliminating jobs; however, the decreasing cost of computing power and other advances in digital technologies have the potential to accelerate this process over the next couple of decades. Computers have begun to replace humans in performing explicit (codifiable) routine tasks that follow precise and well-understood procedures such as clerical work (e.g. accounting) and some physical operations in production lines.

6. Historically, tasks that have been hard to describe as a set of steps or that are bounded to particular circumstances have been shielded from automation. These tasks are more abstract in nature and often involve problem-solving capabilities, intuition, creativity and persuasion. However, advances in machine learning and artificial intelligence are expected to expand the capabilities of task automation.

7. There are a range of forecasts for the number of the number of jobs that could be impacted by automation over the next two decades. However, accurate predictions about the future impact are difficult to make due to uncertainties regarding a number of factors such as the rate of technological development and rate of deployment.

8. The estimates presented are frequently gross estimates that do not take into account the new jobs that will be created due to new technologies e.g. developing, servicing or operating the next generation of software and machines.

9. Moreover, technological developments often change the type of jobs rather than the total number available.

10. Moreover in developed countries, increasing health care for ageing societies and investment in infrastructure and energy will create demand for work that could offset the displaced jobs.

Automation and Productivity

11. Automation has the potential to deliver significant productivity gains and improvements in the quality of goods and services that raise economic well-being in aggregate. In doing so automation has the potential to help address one of the long-standing weaknesses of the Welsh Economy – relatively low productivity.

Automation and Inequality

12. A critical challenge of automation is likely to be how these improvements in economic well-being are distributed. If the benefits are shared widely, automation can underpin a society where wealth, income and working-time are shared more equitably. In contrast, automation also has the potential to reinforce inequalities of wealth and income.

13. Evidence suggests that jobs with the highest potential for automation are often amongst the lowest paying jobs whilst technological change is expected to increase the incomes of highly skilled labour in roles which augment machines. Similarly, evidence also suggests that the impact of automation will vary between regions, industrial sector, race and gender.

14. As capital in the form of machines becomes more important in the economy, the ownership of capital is likely to become an important determinant of the distribution of prosperity.

Speed of Change

15. There are several factors driving the speed of this revolution. There are the changes that are already happening, the low hanging fruit based on low cost entry of the technology and the limited environment in which it will work. Recent experience suggests that these might be concentrated in particular sectors such as Retail and Wholesale as well as Tradable Services where Call Centres and transactional based back office functions are amenable to automation at low cost.

16. The more difficult areas of automation will be in the Manufacturing Goods and Engineering services, due to the high cost of change (large capital projects requiring longer payback) and the complexity of introduction. In the short term, this means that the impact could be delayed. However, in a global economy, slow productivity improvements could lead to a loss of competitiveness.

17. Over the short and medium term, it will be difficult to disentangle the impact of automation from other economic forces such as UK's exit from the European Union, decarbonisation and population change.

Digital Innovation Review

18. In March, the Welsh Government announced that Professor Phil Brown, Distinguished Research Professor at Cardiff University School of Social Sciences, would lead a review into the implications of digital innovation on the future of work and the Welsh economy.

19. The aim of the review is to ensure that the Welsh Government has the evidence base to respond to the fourth industrial age and the next phase of digital and data innovation.

20. The review's terms of reference have been shaped through dialogue with Professor Brown and the social partners including the CBI, FSB, Engineering Employers' Federation, Wales TUC and the Future Generations Commissioner. These have been circulated to Assembly Members and have also been published on the Welsh Government website.

21. An Expert Panel is being convened to support Professor Brown in conducting the review. Invitations to participate in the Expert Panel have already been issued and the first meeting is due to take place in early June.

22. As well as producing interim findings and final recommendations the review will have the scope to provide ongoing advice so that new ideas can be tested and lessons learned at the earliest opportunity.

Future of Skills

23. The Welsh Government is working on the assumption that jobs will be transformed, not eliminated by developments in automation and Artificial Intelligence and that, as a result of this transformation, the skills and competencies required by the workforce of the future will also need to evolve. The rate of transformation, and the subsequent impact on jobs and the skills required, will depend heavily on the scale and pace by which employers decide to adopt new forms of technology.

24. Recent skills surveys show that employers are requiring an increasingly complex mix of skills and competencies when recruiting. Their demands go beyond digital or ICT skills and focus on a combination of problem solving, analytical thinking and advanced communication skills.

25. The Welsh Government is working with the three Regional Skills Partnerships to integrate future employer demand into the planning of our skills provision. For example, as a result of extensive employer input, we have introduced new higher level frameworks into the apprenticeship system in areas required by employers.

26. The Welsh Government recognises that individuals currently working in certain occupations may be at risk from automation. The Welsh Government's Employability Plan sets out a range of measures to support individuals to upskill and to adapt their skills to the changing needs of the labour market.

Precision agriculture

27. The advent of precision agriculture offers farmers a way of improving productivity whilst reducing external inputs and costs. It is an increasingly important way of improving resilience in a farm business and will be addressed in the consultation document on 'Brexit and our land', to be published in early July. Precision agriculture needs to be embedded into every aspect of farming through use of better genetics, targeting inputs use and gathering and using data.

28. Technology and innovation, including the use of data, will help the industry modernise, become more resilient and competitive and address its climate change and environmental responsibilities. Precision farming should not be considered in isolation – instead, as part of a broader agriculture and land use strategy post-Brexit. Precision agriculture will help the sector address climate change and environmental responsibilities in line with the Economic Action Plan.

29. The Welsh Government is working with academic institutions to develop projects to do further work relevant to precision agriculture. The Welsh Government is also promoting precision agriculture through Farming Connect initiatives and provision of part-funding for technology through the Farm Business Grant. Making use of technical and business data is crucial for farms to become more resilient and profitable and we are monitoring developments in this area.

Autonomous vehicles (AV)

30. Autonomous vehicles have the potential to improve safety on our roads and increase mobility.

31. The UK Government is responsible for leading on legislative changes needed to allow fully autonomous vehicles to be tested on UK roads. We are engaged with them in potential legislative changes as AV technology develops, concentrating at present on driver assistance systems for travel on high speed roads, remote control parking and trials for vehicle platooning.

32. However, it is possible for certain autonomous vehicles to be tested on roads in Wales and the wider UK, and this could allow any technical problems that may occur in rural areas to be assessed. The Welsh Government is keen to explore and promote opportunities for technology to enhance the travelling experience across Wales.

33. The automotive sector is evolving rapidly and probably at a faster pace than originally anticipated, increasingly adopting new technologies as low emission, connected and autonomous vehicles are increasingly becoming part of the mainstream. These new technologies are today impacting on the plans of car manufacturers all around the World.

34. The Welsh Government is working to ensure that companies in the supply chain in Wales continue to adapt to a changing landscape that is being influenced by the need to improve safety, to broaden mobility and to reduce carbon emissions. The technological changes currently faced present Wales with an exciting opportunity and the Welsh Government will work with the Industry to build on Wales' USP to support this changing market:

35. The ten year, £100m investment in Tech Valleys will create an environment for the development and delivery of emerging technologies. Whilst its focus is future autonomous mobility, it is clearly inclusive to the adjacent industries/businesses that are data sectors, e.g. service providers, cyber security, protection and testing.

The Internet of Things (IOT)

36. The Welsh Government is committed to ensuring everybody across Wales has access to a world-class communications infrastructure. Innovation Point's development of a national strategy for 5G, on behalf of Welsh Government, will provide the opportunity for Wales to be at the forefront of this connected technology.

37. Wales is leading on some innovative initiatives to develop a highly-skilled work-ready pipeline of students such as undergraduate students gaining new IoT skills at Cardiff University's National Software Academy and University of South Wales' National Cyber Security Academy. In collaboration with Welsh businesses, they have delivered real-life IoT based projects.

38. Innovation Point, in collaboration with The Accelerator Network, bid for and won the funding from Innovate UK to implement an IoT themed business accelerator in Wales (IoTA Wales).

39. The venture-capital backed IoTA Wales programme, based in Cardiff, has invested £1m cash and expert business mentoring and support into 9 high-growth potential IoT companies, selected from across the UK, Europe & USA. Areas include SCADA security, health-tech, road-surface monitoring, airborne emission controls, smart city transport, parenting devices, smart brewery sensors and virtual reality.

40. The design of inbuilt security of IoT systems from the start is a critical success factor. Wales is well-placed with its globally recognised strength in cybersecurity ecosystem. This brings together business, academia, government and cyber defence creating an opportunity for collaboration and economic growth. Cardiff University and key industries have established an IoT Lab which provides world-leading R&D, including exploration of the security implications of IoT systems.

41. Within Wales there are opportunities and potential for demonstrator scale projects across industrial, public space, and consumer categories.

42. The IoT community in Wales are leading on key enabling themes: security and risk management, harnessing economic value and adoption and implementation.

Financial & Professional Services

43. The Financial and Processional Service industry is leading the way, with sophisticated applications of Artificial Intelligence already being adopted globally. An adaptable and highly skilled workforce will be essential to ensuring that our economy is adaptable to changes caused by the adoption of these technologies, and to seize the opportunities they bring.

44. The biggest obstacles to overcome for almost any customer service centre will be managing multiple customer interactions across many different channels, whilst also

providing a seamless experience for every single customer. A combination of skills involving data-science, cyber security and behavioural science all serve to build the talent pool of the future and Welsh Government and academia are strong supporters in these areas.

45. The opportunities of the data revolution and the advances in artificial intelligence are increasingly driving new collaborations across sectors. Our Economic Action Plan sets out to re-cast our support in a way that can help continue to build the industries of the future.

Customer Services Industry and Automation

46. Industry commentators predict that around 30% of low skilled contact centre roles will be lost over the next five years but the demand for medium skilled and higher skilled talent working on new ways of customer interaction will rise, with an overall net loss of around 10%.

47. South Wales is home to a significant cluster of customer service excellence, including the likes of HSBC, Admiral, TUI and UK Government's own shared service operations. These firms recognise that, as Artificial Intelligence and other emerging technology is adopted across the industry, they will need highly skilled people to deal with those more complex and sophisticated customer enquiries that technology cannot answer.

48. The Welsh Government, along with organisations such as the Wales Contact Centre Forum, work together to gather industry insight and intelligence to understand the future of customer services in Wales. The Wales Contact Centre Forum represents the customer services industry in Wales and supports the industry to develop plans to future-proof their operations.

Economic Contract and Calls to Action

49. Automation and digitalisation are one of the cornerstones of the five Calls to Action in the Welsh Government Economic Action Plan. The Welsh Government is focussing its financial support in order to support businesses to prepare for the challenges of tomorrow and to future-proof the Welsh economy and workforce.

50. Harnessing the benefits from automation will require an infrastructure that supports the interconnectivity of devices in an automated environment. This ranges from a multitude of sensors that are not only detecting and monitoring but also passing on data freely to allow the automated devices to respond and deliver different and appropriate outcomes. This level of interconnectivity requires a significant bandwidth and speed to allow such inputs, data and outcomes to be both timely and efficient.

51. The Economic Action Plan sets out the Welsh Government's commitment to deliver fast, reliable broadband across Wales and to enable the market roll out of fifth generation (5G) mobile networks. The Welsh Government will work with mobile operators and OfCom to bring about innovative solutions to rural areas in particular – where Wales' topology presents a major challenge.