

The problem

Technological change and the advancement of artificial intelligence present a great number of opportunities and challenges for economies across the world, including right here in Bristol. Many of us experience directly the benefits of technological change. It generally improves the quality of consumer products as well as making them more affordable. Examples of artificial intelligence at work around us include:

- 1) Self-service checkouts at the supermarket,
- 2) Robotic production and car manufacturing
- 3) Automated accounting software
- 4) Drone delivery
- 5) Driverless cars

We are able to harness technology to get better access to information and to improve our day-to-day lives. Equally, this rapid pace of technological change can cause big shifts in the balance of power in society and our role within the economy.

- 1) Taxi and delivery drivers replaced by drones and driverless cars.
- 2) Accountants and lawyers replaced by software
- 3) Cashiers replaced by self-service checkout....

As with any time of significant change, there are those that stand to benefit from the shifts brought on by technology and those that face the possibility of being left out of this new more automated economy.

The UK Government is responsible for the whole population, and so has to face the challenges of those negatively impacted by these changes, as well as to make sure to foster and develop the benefits they present. Civil servants have identified the following set of opportunities and challenges that come with the rise of the robots.

Opportunities

Challenges

Creation of new jobs

Loss of old jobs

Cheaper/better goods and services

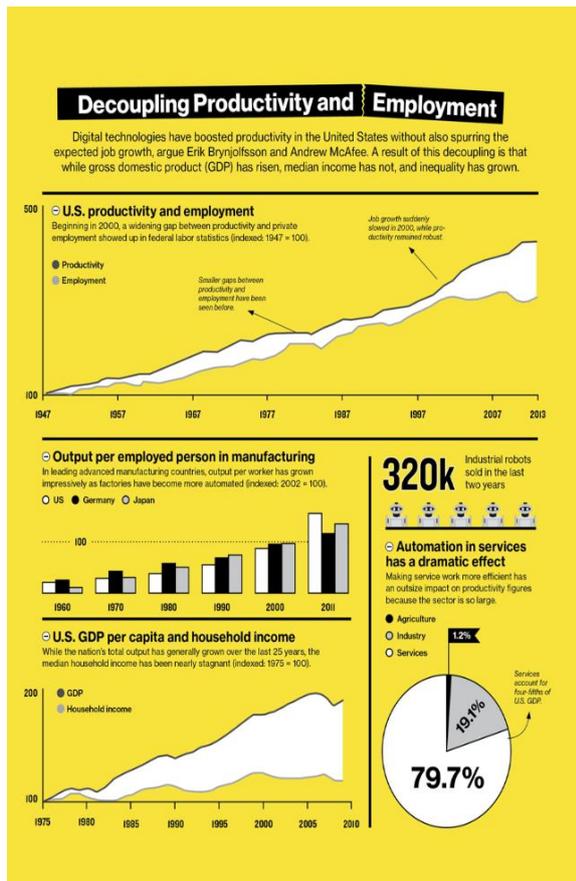
Concentration of wealth (who owns the robots?)

Greater Profits for firms

Greater need for government provided benefits

Can you think of any other benefits or challenges?

Civil servants have also presented the following challenges from an increased reliance on robots. This is based on a research report on the United States economy from the Massachusetts Institute of Technology (source: MIT Technology Review). Similar trends are generally observed in Europe and the UK.

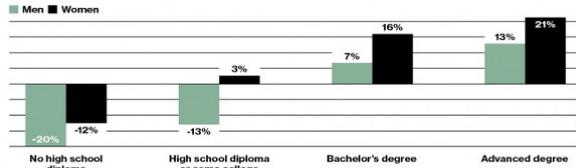


Disappearing Jobs

Automation and digital technology have replaced many jobs involving repetitive tasks in manufacturing and office work. The remaining jobs often require increasingly advanced skills.

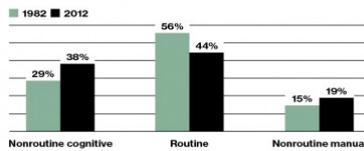
U.S. Median Real Earnings by Education Level, 1993–2013

Wages for men with a high school diploma have dropped as the number of production jobs has decreased and more men have taken low-paying jobs in food services, cleaning, and groundskeeping.



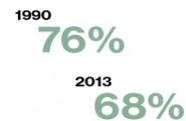
Share of U.S. Employment by Type of Occupation

Jobs are considered routine when they involve specific, repetitive tasks. These are the easiest jobs to automate.



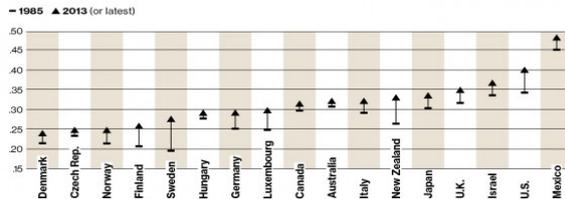
Who's Working?

Fewer American men with high school diplomas or some college are employed full time.



Levels of Income Inequality in OECD Countries

Inequality as measured by the Gini coefficient, reflecting income distribution; 1.0 would be maximal inequality.



MIT Technology Review

Some UK companies have heard that the Government is looking to address this issue and have compiled some information on the benefits of automation and technological innovation (source: Accenture):

Robotics drives efficiency benefits, along with improvements in quality, scalability and resiliency in a cost-effective way



Human	Robot
Wants paid holidays & weekends	Can work 365 days a year
Wants a wage, bonuses	Works for free
Can only work about 8 hours a day	Can work 24/7
Falls ill, negatively impacting productivity	Predictable availability
Has high expectations of his employer	No expectations whatsoever
A lot of administration	No administration whatsoever
Significant management (performance reviews, team meetings...)	Maintenance only
Quality fluctuations	Predictable and constant quality
Significant extra costs (company car, insurance, labor taxes)	Little extra costs

The Government would like to get this right. The future of our economy depends on being able to harness the power of technology in order to improve the lives of the population as a whole. Taking the wrong actions might hurt the development of future technology and make life more difficult for businesses in the country and for the average British citizen. Doing nothing may lead to an increase in inequality and cause many hard-working citizens to lose their jobs and careers.

Faced with this herculean task, the Government has turned to you for advice...the future of the country is in your hands!

Possible solutions

As you develop your proposals, keep in mind that the power of the government is limited and constrained. Your proposals should be based on realistic actions within the scope of a national government. Some of the tools available to the Government are presented here. Feel free to propose your own solutions.

- 1) **Taxation** – the government could introduce a tax on robots; but how would this be realised, and what would be the benefits?
- 2) **Education/training** – more education could be available for workers, but why would this be important, and how would it be funded?

- 3) **Government investment** – could the government provide investment in artificial intelligence and robotics, in such a way that it creates benefits for the whole of society? How?

Of course, there are many other possible solutions. It is your task to develop the best idea, and present it in the form of a poster.