Jesus College Cambridge

The future of work

In association with:

HARVEY NASH
The Power of Talent

KPMG

CONTENTS

THE RUSTAT CONFERENCES - INTELLECTUAL FORUM, JESUS COLLEGE, CAMBRIDGE

Founded in 2009, the Rustat Conferences bring together senior decision makers from government, industry and the media to discuss vital issues of the day with expert academics. From 2017, the new Intellectual Forum at Jesus College, University of Cambridge, will work with Rustat members and lead the conferences.

The Intellectual Forum provides a 21st century research environment. It is an outward- and forward-looking centre that fosters critical thinking and creative excellence and supports the growing importance of multidisciplinary activities and networking on a global level. Amongst its broad outlook, the Forum considers issues such as the future of work, how health and social care can be transformed, and what privacy means in a digital age.

Directed by Dr Julian Huppert and based in Jesus College, Cambridge's new state-of-the-art facilities, the Intellectual Forum will run a number of events to encourage robust debate about issues that affect everyone. It provides an opportunity to think deeply and for the long term about the questions that matter now and over the decades to come.

We are very keen to engage leaders from business, government, research and charities to identify topics important to our own time and the future, and build thematic programmes and discussions at the highest level. Please contact Dr Julian Huppert at if-director@jesus.cam.ac.uk if you'd like to be involved or attend one of our events.

We are delighted to have worked closely with KPMG and Harvey Nash on this Rustat Conference and report, and look forward to hosting future meetings to explore these important themes further.

www.jesus.cam.ac.uk/research/rustat-conferences

INTRODUCTION

Rustat Conference, Jesus College, Cambridge, 22 November 2016

The Rustat Conference on the Future of Work brought together leaders from business, government and research to discuss the challenges in the labour market – and not before time. The disruptive effects of technology continue to dominate headlines and ask big questions of leaders.

The proliferation of the gig or platform economy, where traditional modes of employment are replaced by ad hoc, informal working contracts, has caused high-profile labour disputes in the UK, Europe and the US.

Meanwhile, the development of evermore sophisticated robotics and AI means automation – once the preserve of factory and assembly line work – has started to impact on more and more sectors. The reduction in overall workload has already been problematic for businesses and individuals, but far greater is to come. The Bank of England estimates that 66 per cent of jobs in the UK are now at risk from automation, with the lower paid generally most at risk.

How business can profit from new economic opportunities, while safeguarding the wellbeing of employees, will be a major challenge, but by no means the only one. The Department for Business says that 15 per cent of the UK labour force is self-employed. By 2020, self-employment and casual work will cost the Treasury an estimated £3.5bn in lost tax revenues, according to the Office for Budgetary Responsibility.

The workforce is also getting older. Data from the ONS indicates that the number of over 65s in the UK will grow by 33 per cent between 2016 and 2030. The workforce may struggle to keep up. The Bureau of Labour Statistics predicts that, by 2024, the US will need to employ 43 per cent more occupational therapy assistants than it did in 2014, 41 per cent more physical therapy assistants, and 38 per cent more home health aides.

To discuss these topics Rustat Conferences worked closely with Harvey Nash and KPMG, two businesses with the global expertise and experience to lead thinking on these vital issues. We divided the conference into five sessions, each containing a moderated panel presentation, followed by a roundtable discussion among all participants. Those sessions have been consolidated in this report to reflect the key themes of the day:

- The history of work
- The worker today
- The gig economy
- The role of technology

The Rustat Conferences convene interdisciplinary expertise from industry, academia and government and our purpose in this report is to outline and identify the key challenges and questions facing leaders in the years to come. Harvey Nash and KPMG are already working with clients to deliver responses and solutions to these big questions, and we encourage leaders to engage with us on these vital issues to share expertise to develop ideas further.

Author: **Nathan Brooker,** *Rapporteur, Rustat Conferences*
Editor: **Jonathan Cornwell,** *Director, Rustat Conferences*

FUTURE OF WORK CONFEREN

THE HISTORY OF WORK

HOW EMPLOYMENT HAS CHANGED OVER TIME

Pre-industrial revolution - *Self-employed Guild member*
Present – *Employed by organisations*
Future – *Self-employed / flexible work?*

POPULIST UPRISINGS symptom of the times?

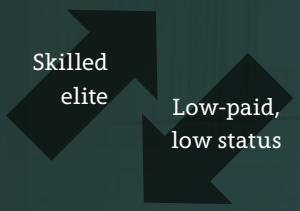
200 YEARS *labour markets have existed for two centuries*

SHARP DECLINE IN MANUFACTURING JOBS

1948 2017

Hollowing out of the labour market

TWO-SPEED EMPLOYMENT MARKET



EVER CHANGING, ALWAYS THE SAME labour market has always evolved, current changes are nothing new

WORK IS CHANGING

UNEMPLOYMENT LOW

participation rate in UK labour market

AVERAGE WORKING HOURS A WEEK UK

60 hours 1948

40 hours 2017

Technology advances mean we're working fewer hours

Hours worked does not equal productivity

GENDER DIFFERENCES

Pay - women still paid less than men

1 in 9 women forced out of labour market after maternity

REGULATION

Failed to keep up. Drawing the line between having a free economy and safeguarding workers' rights is going to be challenging.

QUESTIONS FOR LEADERS

1

How to seize opportunities of automation while maintaining workers' wellbeing and good labour relations?

2

Will less work lead to an unsustainable rise in unemployment? Is Universal Basic Income realistic? Can work be shared and 'part-time' destigmatised? How can career trajectories and standards be maintained?

3

How to promote a higher-purpose conversation between business and government that asks: in the future, how will individuals cope with having less work?

NCE - WHAT WAS DISCUSSED?

THE GIG ECONOMY

20-30%
working age population in US engaged in 'gig' work in some way

NOT JUST UBER
Traditional jobs in retail, healthcare, academia all impacted by gig economy

DOWN 6%
average commute distance in last 15 years. Much of this attributable to gig / flexible work

TWO VIEWPOINTS ON GIG WORK
Opportunity: freedom and chance to supplement income

Challenge: reduces workers' rights, reduces income

CHALLENGES FOR THE GIG ECONOMY
Are gig economy workers employed or self-employed?

Tighter immigration – could limit supply of gig labour in future

50%
Proportion UK jobs predicted to be affected by automation

THE ROLE OF TECHNOLOGY

TAKE OVER THE WORLD?
Is there evidence of existential risk of technology?

ROBOTICS AND AI
- Used in **manufacturing** for **decades**
- *Next sectors:* **healthcare** and **logistics**
- **Low wage jobs** will be **relatively unaffected** by robots
- **Main focus** will be on **high wage jobs**, like **train drivers**, **financial accounts managers** and **taxation experts**

DIGITAL LABOUR
probability of role being automated

95% accountant

0.4% publican

100 YEAR LIFE
50% chance of a child born today living to 100

We need to plan for this extra longevity

Technology will have a role to play

THE SHORTER 'CORPORATE' LIFE
50%
Life expectancy of a Fortune 500 company fallen by half

No more job for life

4
How can businesses be incentivised to improve the 'shape' of their workforce, rather than simply decreasing it? Should we tax the use of robots and AI, or lower tax for employing humans?

5
While we tackle the problems of reduced workloads, human lifespans are increasing. How to develop employees' intangible assets and promote the multi-stage life?

6
Given the importance of labour markets in recent political campaigns in Europe and USA, how can businesses better protect employees – both direct and indirect – from political decisions beyond their control?

1. THE HISTORY OF WORK - WHAT CAN THE PAST TELL US ABOUT THE FUTURE?

EXECUTIVE SUMMARY:

The history of the labour market is not a very long one. Thanks to the development of new technologies, it has been in near-constant change. The industrial revolution caused a complete restructuring of the labour landscape in the UK within a generation, but with the speed of technological advancement ever increasing, the pace of change today is unprecedented. How societies responded in the past to technological change is not how they will respond in the future.

Perhaps more than any other recent event, the financial crisis of 2008 – and the measures taken to limit its most damaging consequences – has been the most forceful actor in shaping today's labour market troubles. Austerity, quantitative easing and government bailouts have exacerbated an affordability crisis in developed nations such as the UK and the US, and increased globalisation has resulted in a seismic shift in our economic landscapes. With manufacturing jobs going to emerging markets, can services ever fill the void?

WHAT WAS SAID?

The labour market and the *end of work*
Labour markets have existed in their current form for perhaps 200 years. They are a recent innovation; and they have been in a state of near constant flux. If we are in an employment crisis now, with the rise of zero-hours contracts and the emergence of the gig economy, we would be mistaken to think we are simply moving from a period of stability to a period of instability. The next 20 years may bring great change to the labour market; but so did the last 20 years; and the 20 before that [1].

Before the employer-employee model of labour, which flourished in accordance with the industrial revolution, models such as the guild structure, consisting of masters, journeymen and apprentices, were the norm.

In certain respects we may in fact be returning to that structure. Some have pointed out the similarity between the guilds and the associations of technical workers who are banding together to own their technology.

Yet technology is unlikely to have the ability to transform the labour market by itself; other actors – economic and political – will be needed for that.

When we talk about labour it is important to ascertain what that term connotes [2]. In the past an employer would, in a sense, take care of their employees by investing in them and facilitating a clear career trajectory. In Undoing the Demos, Wendy Brown describes the slow transition of a society from one of human beings, to one of self-investing bits of human capital. With the rise of Uber, this concept is mirrored in the labour market.

The rise of Uber
Technology has historically been shaped by legal and economic systems [3]. Take the concrete example of Uber. It is a profit-seeking corporation that operates within a capitalist system. It is, in so many respects, entirely conventional.

The financial crisis
The ending of the gold standard in the US roughly coincided with the dawn of the IT industry. The huge expansion in credit that followed resulted in the financial crisis of 2008. In the years that followed, economies in the developed world have made tentative steps toward austerity in an attempt to limit the amount of sovereign, corporate and individual debt. These mitigating

"When we talk about the end of work, that's rather implausible. The end of employment is more plausible in a setting where the institutional forces which created the labour market no longer hold."
Professor Simon Deakin

1. Dr Brendan Burchell, University of Cambridge
2. Sally Davies, Aeon Magazine
3. Professor Simon Deakin, University of Cambridge

efforts, in no small part, have contributed to the state of the labour market, which in turn has helped fuel populist movements in the UK, US and Europe. An unintended consequence of both Brexit and Trump is that austerity measures are now being abandoned. How long can a regime of high debt continue?

The skills shortage
Big business tends to blame a lack of skills on a lack of available labour, a problem exacerbated by tighter UK immigration controls expected to follow Brexit. However, maybe the companies in question are at fault: either they are not paying enough to attract the right skills, or they are too lazy to implement a development programme dedicated to internal progression.

The apprenticeship levy
In recent years the Government has renewed its efforts to help improve the transition of young people from education into work and to promote the acquisition of work-related skills. For example, we are seeing the introduction of the apprenticeship levy and the commitment to 3 million new apprenticeships between 2015 and 2020. This partly responds to concerns about a long-term decline in employer-funded training of workers.

The 'Zombie' economy
Since the vote for Brexit, businesses in the UK are still unprepared for what challenges await [5]. Prior to the vote, high levels of uncertainty meant companies were not hiring new staff. But since the vote to leave, hiring has gone up again as – forced with the helplessness of the decision – firms return, however unwisely, to 'business as usual'.

A wake up call to policymakers
Since the industrial revolution, the institutional forces holding society together have ebbed and flowed. For the past 30 or 40 years, those forces have been ebbing away, and a very visible result of that is the Brexit vote and the election of Donald Trump. This should be a wake up call to policy makers.

> "I'm afraid it feels like we are entering a 'zombie' economy right now; people are just carrying on as if there's nothing they can do about it"
> *Albert Ellis, Harvey Nash*

5. Albert Ellis, Harvey Nash

WHAT DO WE KNOW?

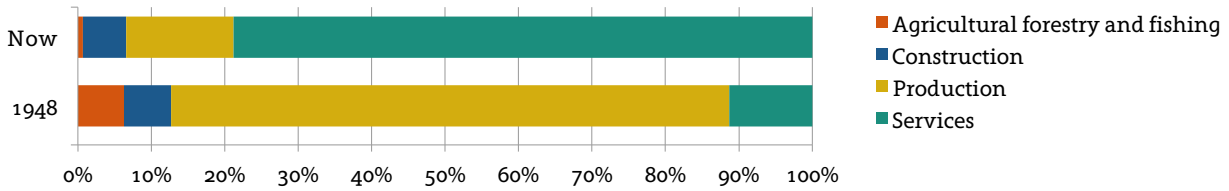
The employer-employee structure of employment that has been the norm since the industrial revolution is facing the most sustained attack in its history. New forms of work predicated on technology advancements have formed the root of this disruption. The development of new technology has caused some workers to band together into associations that in some ways mimic the historical guild structure. However, a wholesale rejection of current employment norms is unlikely in the short term.

The employer-employee model relies on a contract of mutual investment: investment from the employee in the employer's company in the form of time and labour; and investment from the employer in the form or training and wages. New structures of work, such as the gig or platform economy, do not operate on this basis.

People, in the main, are risk averse, and rely heavily on the extant structure of the labour market. While disruptive technologies may benefit the technologically minded or the entrepreneurial, these are small sections of society.

The landscape of the UK economy has shifted dramatically since the Second World War. Consider the following graph about GDP contribution from the Office for National Statistics:

GDP Contribution by sector: 1948 and now



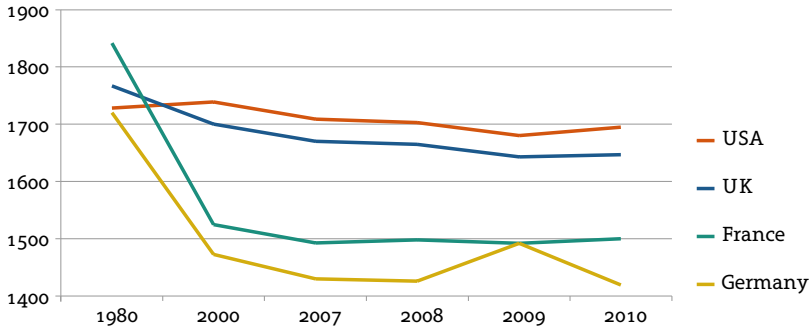
Decline in manufacturing

The sharp decline in manufacturing jobs has hollowed-out the middle of the labour market. In a services-based economy, there is a tight ring of well-paid elites at the top, and many more low-paid, low-status jobs at the bottom. This, coupled with an on-going affordability crisis has led to an increase in inequality. The populist uprisings in the UK, the US and Europe have been symptomatic of this inequality.

There is a skills shortage in the UK, and while tighter immigration controls post-Brexit might exacerbate this, government policy is not solely to blame. Over the past 30 years, big business has cut back on training budgets and today many companies are not doing enough – either in pay or in internal development programmes – to attract skilled workers.

Working hours in the UK have dropped from more than 60 hours per week at the beginning of the 20th century, to less than 40 hours now. However, that decline has not kept pace with the declines in other European economies – see graph from the New Economics Foundation. Business is yet to respond to the upheavals caused by Brexit and the election of Donald Trump in any meaningful way.

Average hours per capita 1980-2010



Source: New Economics Foundation

WHAT DON'T WE KNOW?

If this is the end of the employee-employer structure of work, we do not know what types of institution might replace it. Neither do we know what the role of government might be in helping that transition.

We do not even know for certain whether history can teach us about the future of work. It is not clear yet whether this period of destabilisation in the labour market is part of the natural ebb and flow of institutional power, or something else entirely. With the uncertainty of Brexit, a crumbling Euro and a Trump presidency, we might well be heading into a new era of protectionism, one where business norms and economic stability are forgotten or permanently replaced.

Could President Trump bring back manufacturing jobs from emerging markets? If he can't, what alternatives can be offered to ex-industrial areas in America's north midwest? Can service jobs ever fill the void?

How long will this period of low productivity and zero interest rates last? There are few viable options at present to get us out of it. If it is not stopped, the affordability crisis will be likely to continue. The impact on the labour market will be an increase in working hours, rather than a decrease.

A great deal of uncertainty remains about the consequences, both economic and political, of the introduction of new technology in the workplace. After all, who would have thought the expanded availability of GPS technology would have helped facilitate the rise of Uber, Deliveroo and other proponents of the 'platform' economy? The law of unintended consequences is, by its nature, unknowable, but impact should be a built-in component of R&D best practice.

Talking point

A 1930s depiction of a worker of the future first appeared in The Spectator, 12 November 2016

"One wall of the [Marx Memorial Library in Clerkenwell] is decorated with a 1934 mural by the Earl of Huntingdon — the 'Red Earl' — a pupil of Diego Rivera. The title of the mural is beyond parody: 'The Worker of the Future Clearing away the Chaos of Capitalism'. In the picture, a muscly Welsh miner tears down the Houses of Parliament, while Lenin looks on approvingly."
Harry Mount

QUESTIONS FOR LEADERS

- History has proved that taxation is an effective tool for encouraging good behaviour and discouraging bad behaviour; so how can governments utilise this to mitigate upcoming crises in the labour market? Would reducing current taxes on employment and adding taxes on transport and energy consumption help?
- How should business leaders cope in the short-term with the 'clouds of Trump and Brexit' on the horizon? If 'business as usual' is leading to a zombie economy, what constitutes best practice in a period of unprecedented uncertainty?
- How can we prevent the skills gap from widening in a lower immigration scenario? What incentives are there for corporations to re-invest in training programmes?
- How will businesses respond if guild-like associations start controlling tech IP?
- How might better relationships be struck between skilled workers and corporations in a period of weakening employment ties?

2. THE WORKER TODAY - THE CHANGING SHAPE OF THE LABOUR MARKET

EXECUTIVE SUMMARY:

Since the Great Recession, rates of unemployment have fallen steadily in both the UK and the US to under 5 per cent[6]. However, anxiety over job security has caused unprecedented political upheaval, helping secure Britain's vote to leave the EU and Donald Trump's shock election to the White House.

Technological advancement has led to the restructuring of traditional labour norms and, in many instances, a reduction in overall work. While work is naturally a powerful method of financial stability, it is also intrinsic to our psychological wellbeing. As we enter a new technological age, where machines will do far more of our work for us, we must reduce our working hours. Making under-employment and even unemployment more viable (and less stigmatised) will be a considerable challenge.

WHAT WAS SAID?

The labour market
The labour market affects many different areas of life. It affects the economy, social relationships, psychological wellbeing and politics. That means when decisions or actions are taken concerning it, many areas of government, academia and business will be affected by that change. Furthermore, those institutions will all have their own hardwired opinions about 'the way things should be' – the free market is considered good, for example, flexibility is good, competition is good. Implementing real change in the labour market can therefore be challenging.

While the participation rate in the UK labour market is at 74.5 per cent, the joint highest rate since records began, some groups are doing better than others [7]. The in-work poor, for example, have not benefited from recent changes in the labour market. Often called 'the JAMs', those 'Just About Managing' have done everything asked of them by the labour market, but have not seen their living standards increase.

There has been a significant rise in self-employment since the Great Recession. The government has yet to work out a line on this (other than saying "enterprise is good").

We have also seen a rise in the number of zero-hours contracts, and the emergence of more 'informal' modes of employment: the 'gig', 'sharing', or 'platform' economies.

These are signs, perhaps, of the fact that the formal economy is changing, and that we are entering a period of fewer jobs and more insecurity [8].

Why we work
Working has a huge impact on psychological wellbeing [9]. Its benefits include – but are not limited to – the following:

- Giving shape and structure to a day
- Social interaction
- Variation of activities and people you meet
- Status
- Perception of self
- Money

"Surprisingly, the evidence suggests that ***money is relatively unimportant*** to the wellbeing of unemployed people. Day-to-day activities are far more important. If we look at the differences in the experience of unemployment between northern European countries that have relatively generous unemployment benefits and other countries with relatively meagre unemployment benefits, there is hardly any difference with regards to the lack of psychological wellbeing."
Dr Brendan Burchell, University of Cambridge

6. According to the Office of National Statistics and the Bureau of Labor Statistics, UK unemployment has not increased since April 2015.
7. ONS and Iain Walsh, Department of Work and Pensions DWP
8. Anna Coote, New Economics Foundation
9. Dr Brendan Burchell, University of Cambridge

The dose effect
For most things that do you good, there is a required dosage. If you buy paracetamol from a pharmacy, it will tell you on the packet how many you need to take. With regards to paid work, however, no study has revealed how much you need to do to get the full benefits. It may be far less than we are used to doing now: perhaps 8-15 hours a week [10].

Working hours
The UK has some of the longest working hours in the developed world, but higher working hours do not guarantee increases in productivity. Consider the following graphs from the New Economics Foundation [11]:

A reduction in working hours could facilitate the following:

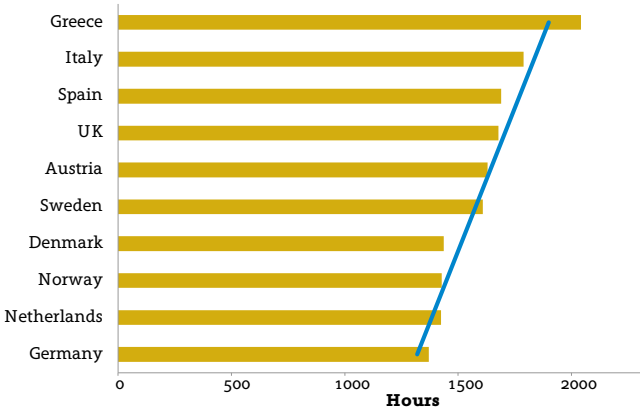
- Less unemployment
- Less stress and anxiety
- More control over time
- Time for caring, civic action, volunteering
- Making more of later life
- Environmental sustainability

As factory workers' pay increased in the 19th century, so too did absenteeism. The theory is that the men were voting with their feet: if they had more pay, they didn't need to work so many hours. Yet there is little evidence the same thing is happening today. Instead, as salaries rise, so too do working hours [12].

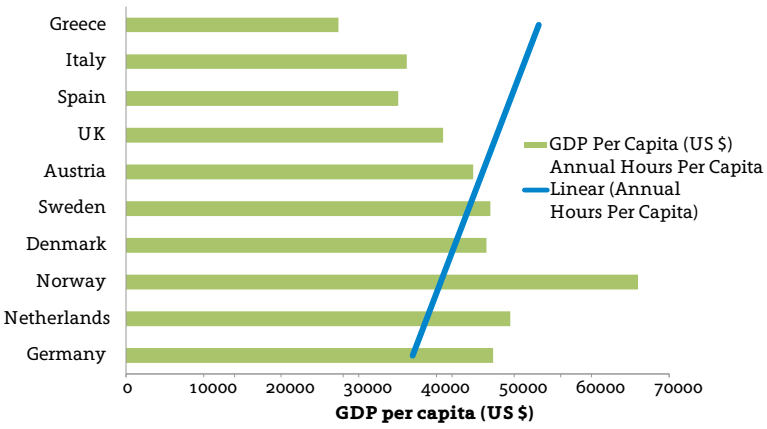
There are four leading theories to explain this discrepancy:

1. Pay structure: work tends to be salaried now, so it is harder to reduce hours and/or see the benefit of taking time off
2. Housing market: relatively high housing costs prohibit taking more leisure time
3. Consumerism: owning new phones and cars etc. has become part of our identity, so we need the extra money for that
4. International competition: the arms race during the Cold War, for example, prevented the reduction of working hours

Average hours per capita



Gross Domestic Product per capita



"There will be many people who want to work less, but some people might like to work more. One aspect of human nature is that we tend to rate our success relative to our peers. So even as living standards have risen dramatically in the past 100 years, many are still striving to keep up with their neighbours. Although this conference might suggest that working more is a negative, the human desire to strive for more has led to many great things."
Dr Adrian Weller, Machine Learning Group, University of Cambridge

10. Dr Brendan Burchell, University of Cambridge
11. Anna Coote, New Economics Foundation
12. Dr Brendan Burchell, University of Cambridge

Part-time work
Psychological wellbeing of people in part-time work is not considerably lower than those of people in full-time work. However, part-time work is bad for career progression, especially for women. It is also bad for pensions; and bad for the tax take [13].

Corporations say it is also bad for work [14]. High-skilled jobs require workers to be present in order to maintain standards.

The prevalence and status of part-time work varies between economies. In Greece and other Mediterranean countries the amount of people working part-time is less than 10 per cent, almost all of whom are doing so because they can't get a full-time job [15].

In the UK and the Netherlands, about 33 per cent of people are working part-time; and almost all of them describe it as a lifestyle choice. Critics have described this as a "constrained choice", because most part-time workers are women and part-time work fits in better with the domestic division of labour, where women do far more cooking, cleaning and care-giving tasks than men.

The gender imbalance
Women are still paid less and have lower career trajectories than men in the UK labour market. One in nine mothers report being forced out of the labour market after taking maternity leave [16].

Perhaps the way to reduce the stigma of working part-time or fewer hours would be to raise the status of domestic work, care-giving, child-rearing etc [17].

"The main reason for the intractable nature of gender inequality is that women tend to put in shorter hours of paid work than men, while most men do far less unpaid work in the home. We need a substantial shift in the climate of opinion and behavioural norms to reverse this imbalance. A slow but steady move towards shorter hours of paid work for all employees, men as well as women, would help to bring this about."
Anna Coote, New Economics Foundation

WHAT DO WE KNOW?

The labour market is in a moment of transition – perhaps unlike any it has seen in the past 200 years. New 'platform' economies are dismantling the old employer-employee structure, creating new economic opportunities in some instances and allowing new methods of exploitation in others. Regulation, in many ways, has failed to keep pace and deciding where to draw the line between having a free economy and safeguarding workers' rights is going to be challenge.

New technology will disrupt certain sectors of the economy and cause some jobs to become obsolete. It may create new jobs; but on what scale and how substantial is yet to be seen.

Participation rate in the UK labour market is at 74.6 per cent, the joint highest rate since records began [18], but some groups are doing better than others. The digital revolution of the past 10 years has produced winners and losers.

To counteract the reduction in work and stave off unemployment, work needs to be spread more evenly across the labour market. This might lead to the development of a multi-stage life, which does not rely on the same 'job for life' mentality. It will also lead to a shorter working week and more people working part-time. Corporations are concerned how such a transition could take place.

13. Ibid
14. Professor Lynda Gratton, London Business School
15. Dr Brendan Burchell, University of Cambridge
16. Large, A. (2016) Pregnancy and Maternity-Related Discrimination and Disadvantage, Experiences of Mothers, Department for Business, Innovation and Skills, and Equality and Human Rights Commission (p. 122). Available: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/509501/BIS-16-146-pregnancy-and-maternity-related-discrimination-and-disadvantage-experiences-of-mothers.pdf
17. Sally Davies, Aeon Magazine
18. UK Labour Market - February 2017, Estimates of employment, unemployment, economic inactivity. Office for National Statistics, ONS.

Though shorter working hours do not necessarily mean less productivity, there is little to suggest that it is a burning issue within the UK workforce. Trade union groups based in Britain are concerned almost solely with pay and conditions, while in continental Europe, such groups regularly lobby for shorter working hours. There is evidence to show that in the UK, as salaries increase, so do working hours.

Norms are incredibly important in shaping corporation and worker behaviour in the labour market. If flexi-time and job-sharing could be taken up by more companies, the transition to a shorter working week could be accelerated. Furthermore, de-stigmatising domestic and unpaid work might result in a smoother transition and could, eventually, lead to the embracing of part-time work as the new normal.

The argument for shorter working hours

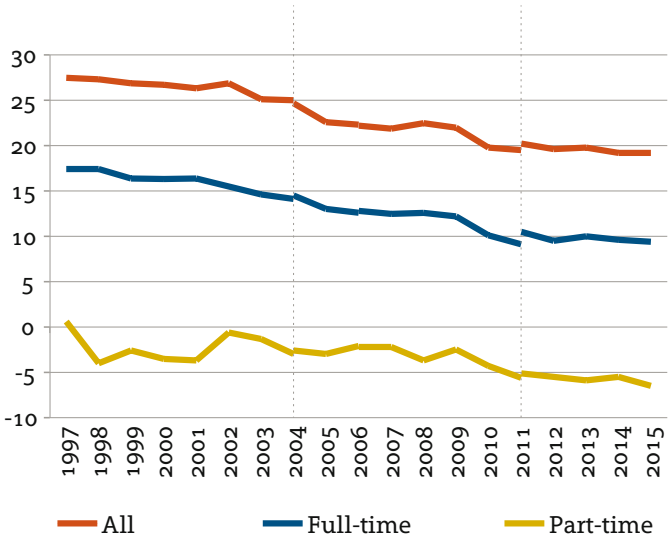
How the transition to shorter working hours might work:

- Negotiate small time increments with annual pay
- 30 hours for all new labour market entrants
- Older workers reduce week by 1 hour per year
- Employers' costs per hour not per employee
- Active training to fill skills gaps
- Regulation with flexibility to suit employees

Anna Coote, New Economics Foundation

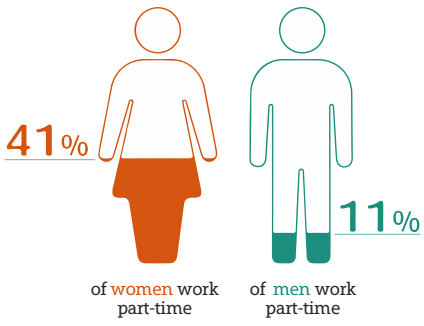
Since 1997 the gender pay gap has narrowed for full-time workers but widened for part-time workers. More women work part-time than men, leading to a larger overall pay gap.

How much more men earn than women, as a percentage of men's earnings



Source: Annual Survey of Hours and Earnings (ASHE)
Dashed lines represent discontinuities in 2004, 2006 and 2011 ASHE estimates.
Based on median gross hourly earnings (excluding overtime), UK, April 2015

Percentage of part-time workers by gender, UK, April to June 2015



Source: Labour Force Survey

Number of self-employed workers

Source: Office for National Statistics, Labour Force Survey Quarter 1 (Jan to Mar) 1993 to Quarter 1 (Jan to Mar) 2016

WHAT DON'T WE KNOW?

Despite broadly positive data about the labour market, the electorate in the UK and the US have voted – against government and expert advice – for huge economic upheaval. We do not yet know what this is telling us about previously held assumptions about work.

We do not yet understand why higher working hours do not lead to higher productivity. Is there a peak working duration – perhaps five hours a day – at which a worker is at his or her most productive?

There is a lack of clarity on how an economy would function with hugely reduced working hours. It is also unclear who would bear the brunt of this change: the individual, the state, or corporations.

We do not yet know if the country is even broadly in favour of a shorter working week. The EU Working Time Directive, which limits working time to 48 hours per week, has been bitterly opposed for many years in the UK.

We do not know what constitutes 'working time'. Many jobs – especially teaching – have a smaller number of formal hours, yet teachers are required to do so much after-hours work. Should time working at home count, or time spent on the internet, perhaps?

Fetishising work

If 30 hours became the new standard working week, for women and for men, across all kinds of jobs, from doctors to delivery drivers, from teachers to task-rabbits, there would be a lot less stress and anxiety at work and at home. We'd have more control over our lives, more time to look after one another. We could slow down and relax more – and rely less on carbon-intensive fast food and travel. We'd have more time to be active in our communities and in politics. We'd have more time to campaign for a new working culture that respects love, family and friendship instead of fetishising "hard work". We could build an economy that enables people to flourish, instead of one that is entirely fixated on growth. And we could safeguard the natural resources that make all our lives possible.

Anna Coote, The Guardian, 26 October 2016

KEY QUESTIONS FOR LEADERS

- How do we make less work pay more?
- What incentives are there from business and government that could help reduce working hours without making the affordability crisis worse?
- How do we de-stigmatise part-time work, under-employment and unemployment?
- How do we create career trajectories on a part-time work timescale?
- How do we better promote the role of women in the workplace and ensure that standard employment norms do not discriminate against them?

3. THE GIG ECONOMY - A NEW MODEL OF EMPLOYMENT?

EXECUTIVE SUMMARY:

In industrialised countries we have seen a shift from stable, standard modes of employment to non-standard precarious ones. Often called the 'gig' economy, it has largely been facilitated by new technology, but this is not exclusively the case. Traditional jobs in retail, healthcare, academia have all been impacted by the gig economy.

Owing to the role of technology – which evolves at a much faster pace than other social systems – legal, ethical and political institutions have had to play catch up. While some see the proliferation of short-term no-strings employment contracts as an opportunity to supplement their income, or work in a freer, more independent way, others have been forced into this mode of employment because it is all they could get.

How policy-makers will mitigate exploitation without stifling economic growth and entrepreneurial spirit will be the defining concern of the gig economy in the medium term.

WHAT WAS SAID?

What's the gig?
The 'gig' economy – often called the 'platform' economy (and less plausibly the 'sharing' economy) – is a mode of employment characterised by organisations contracting independent workers for short-term engagements. Workers have a high degree of autonomy, and payment is by task, assignment, or sales.

The most prominent proponents: Uber, CitySprint, Deliveroo, are all examples of companies whose business models are predicated on new technology. Traditional jobs in retail, healthcare, academia have also been impacted by the gig economy, where organisations use fewer employees and more freelance and contract labour.

The history of the gig economy
The roots of the gig economy are in the rise of the IT industry [19]. From its humble beginnings in the 1970s and '80s, where computer skills were scarce and poorly understood, the growth in tech-skilled workers has seen companies' IT departments outsize their finance departments.

The international appeal of technology
Whereas salaries for different positions alter vastly around the world, salaries for tech-sector workers stay relatively uniform. This has led to a huge growth in tech training in developing nations.

In Vietnam for example, tech sector workers are among the best paid in the labour market. The wider impact of this is that, while technology may be disrupting western markets, it is causing much more upheaval in developing nations, where it is altering the fabric of society.

A further effect has been the huge increase in the amount of immigrant labour in the UK tech sector. Immigrants make up 24 per cent of the UK technology workforce, and 40 per cent of the London technology workforce [20]. Despite uncertainty over Brexit, leaders in Silicon Valley still see Britain and Ireland as easy launch pads for global expansion.

Britain exports tech sector labour too. Harvey Nash reports that British immigrant workers make up almost one fifth of tech workers in Ireland and Germany.

"IT was very much a cottage industry. There were no skills; no qualifications. If someone could switch on one of those early PCs and demonstrate some ability they were given a job in the finance department."
Albert Ellis, Harvey Nash

19. Albert Ellis, Harvey Nash
20. Ibid

Machines versus Humans in the Media

"Journalists tend to overstate the extent of machine substitution for human labour and ignore the strong complementarities between automation and labour that increase productivity, raise earnings, and augment demand for labour.
"Cheer up. Far from a mass of unemployed Morlocks living miserably poor lives while the digital natives monopolise the few well-paid jobs, automation is granting us ever more time, as well as more goods and services."

David Autor in The Times, 21 November, 2016

Technology as a social system
When we are discussing the future of work we are implicitly discussing the future of technology. In line with Niklas Luhmann's Theory of Social Systems – which states that organisations such as the law, can be thought of as systems, with component parts, a structure and an environment – technology is a functionally differentiated system unto itself [21].

The role of technology in the future of work is to stimulate invention and help benefit other social systems. Except what benefits one social system may be to the detriment of others. A clear precedent is Bitcoin. From the individual perspective, Bitcoin has benefits: it allows anonymity and the obfuscation of transactions. However, from the perspective of the law, there is a detriment: transactions cannot be verified and it prevents the imposing of criminal or civil penalties.

"Where would Facebook be without the intellectual property protections that allowed Mark Zuckerberg to turn his dorm project into what we know today? Or indeed, where would Uber be without the regulations of bandwidths on the smartphones used to call taxis and route them effectively?"
Christopher Markou, Jesus College, University of Cambridge

The law and the 'legal lag'
Because technology evolves at a much faster pace than the legal system, we are left with an inevitable 'legal lag'. However, technology can only exist within an environment created by that same legal system.

The wrong question to ask is: how should law influence technology or vice versa? A better question is: which parts of our legal system today can be used to accommodate and catalyse changes in technology that might minimise negative social impact, such as mass unemployment?

Defining terms and the relationship to the law
Describing Uber as a member of the 'sharing' economy is inappropriate [22]. There is no sharing going on of any kind. Even the term 'gig' is highly misleading in this context.

When discussing the future of work, such terms are incredibly important. In a legal context, deciding whether an Uber driver is an employee, and therefore entitled to receive the minimum wage, is a complicated question. It is not simply about the application of a legal rule, but rather the adaptation of a legal idea, namely employment. It is both incremental and highly path-dependent.

The recent Uber [23] case is just one of dozens of such cases regarding companies that operate within the gig economy. And there will be many more to come as the legal idea of employment is adapted on a case-by-case basis.

"The legal system is adaptive and complex just as technology is. So the idea that the legal system can't adjust and can't evolve to a changing external reality is, I think, completely wrong."
Professor Simon Deakin, University of Cambridge

21. Christopher Markou, Jesus College, University of Cambridge
22. Professor Simon Deakin, Faculty of Law, University of Cambridge
23. Central London Employment Tribunal ruling, October 2016

The impact on cities
The reduction in the number of formal employees and the rise of contract labour also impacts travel to and from work. It has caused a reduction in the amount of distance the average worker commutes – down 6 per cent in 15 years [24].

Contract work in the tech sector
A significant majority of IT leaders staff their technology teams with mostly full-time employees – only 12 per cent source more than half of their staff from contracted labour [25]. However, there appears to be steady growth in the number of those that do. Since 2011, the amount of contract workers in IT teams has increased by 33 per cent.

In smaller organisations, the number of contract workers is far higher than in larger ones.

Necessity or design?
Perhaps the most fundamental question underpinning the ethics of the gig economy is whether the workers who are participating within it are doing so out of design or necessity.

In the IT sector, in instances where contractors are in control of their own destiny – i.e. where the company thinks they are valuable and wants to retain them – the most important factor determining the amount of hours they work seems to be the state of the wider economy.

These workers may be earning a good wage, but events such as the vote for Brexit has nevertheless damaged their confidence. They worry that they might not get a contract next year and so they tend to up their labour [26].

The experience of the Uber driver, for example, is considerably different.

"There are those instances where we can see a chosen flexibility among highly skilled technology workers who are using technology to construct their relationship with work. [This is opposed to] the experience of Uber drivers or Deliveroo drivers where the technology is being used by the employing enterprise to direct them."
Professor Diamond Ashiagbor, Institute for Advanced Legal Studies

24. Dr Ying Jin, University of Cambridge
25. Albert Ellis, Harvey Nash, the Harvey Nash / KPMG CIO Survey 2016
26. Ibid.

But certainties are hard to come by even within sectors and within companies. Not everyone working for Uber, for example, wants to take the company to court over the terms of their labour [27]. For some it is a way to work on their own terms.

Similarly not all Uber drivers come from the same section of society [28]. Some drivers are first-generation immigrants, or might not have good local language skills, and do it as their full-time job. Others could be middle-class students looking to earn some extra pocket money on evenings and weekends.

The gig economy can be broken down into formal constituent parts with four classes of worker:

1. **Free agents:** who actively seek independent work (30 per cent)
2. **Casual earners:** use it as a means to supplement their income (40 per cent)
3. **Reluctants:** who derive their primary income from it but who would rather not (14 per cent)
4. **Financially strapped:** who use it to supplement their income because they are desperate (16 per cent) [29]

"If we are to take the view that there is little we can do to defend the traditional social contract around employment, which was a bargain, a grand bargain struck in the 20th century between protection on the one hand and coordination and participation in a market economy on the other, and that grand bargain is simply abandoned in the face of an overwhelming technological force, then I think we would be making a major mistake."

Professor Simon Deakin, University of Cambridge

WHAT DO WE KNOW?

The gig economy is vast and expanding – estimates say that between 20 and 30 per cent of the working-age population of the United States and the EU-15 – some 165m people – engage with it to some degree [30].

Where workloads are seasonal, it is far easier to force out or under-employ those workers who are not on traditional salaried contracts. The impact this has on those workers' wellbeing and livelihoods needs to be studied in greater depth and better legislated against.

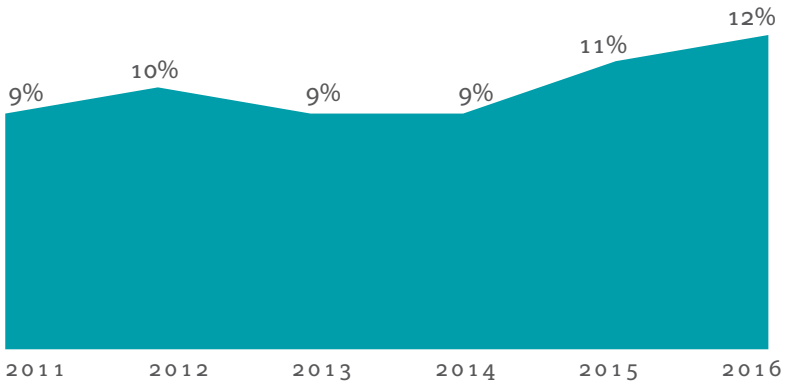
Like a lot of new technology, for some institutions and individuals the gig economy has brought benefits, and for others it has caused problems. We know also that the legal system has not managed to keep up with its development: a case is currently under appeal in the US courts regarding Uber drivers and if they are independent contractors or actually employees (and so liable to rights and protections). The Employment Tribunal ruling in October 2016 that they are employees is currently being challenged.

More work will be done and more cases heard on safeguarding those deemed to be oppressed by the gig economy. While it is clear that not all Uber drivers want to be classed as employees, for example, that does not mean that anyone should be exploited.

While still relatively small in the IT sector, contracted labour is on the rise, increasing by a third in five years. In this sector it is a skills-based problem, rather than simply a cost-based one. IT leaders have increasingly been looking at outsourcing as a means of accessing skills and capability. As project demands grow, the contingent labour force is probably the fastest way to train people on board [31].

27. Ben Dellot, RSA.
28. Albert Ellis, CEO, Harvey Nash
29. Independent Work: Choice, Necessity and the Gig Economy, report by McKinsey, October 2016
30. Ibid
31. Harvey Nash / KPMG CIO Survey 2016

PROPORTION OF IT LEADERS WHERE MORE THAN 50% OF IT DEPARTMENT IS FLEXIBLE/CONTINGENT LABOUR.



Source: Harvey Nash / KPMG CIO Survey 2016

Technology can be thought of as a social system unto itself, in the same way the legal system can be. Both are operationally closed systems: law creates law and technology creates technology. Thinking about technology in this way may be key to minimising 'legal lag' and help us write laws that are better at adapting to new external realities.

Drawing the line between being economically progressive on the one hand and protecting workers on the other will continue to challenge policymakers in the coming weeks. As the London Uber ruling is being appealed, lawsuits are pending for CitySprint, Addison Lee, eCourier and others.

What makes legal rulings harder in these cases is that the workers participate for different reasons. Conditions that could seem oppressive for some might be an excellent way to supplement an income for others.

WHAT DON'T WE KNOW?

The legal status of these modes of employment is still unclear. As the current case with Uber is less about the interpretation of a legal rule and more about the adaptation of a legal idea, we do not know how future legislation might affect the gig economy.

What new technology is next on the horizon, and therefore which areas of legislation will become important. Will driverless cars, for example, eradicate the need for Uber in its current form?

The resilience of the gig economy to wider economic or political realities - what will happen in periods of economic growth or slow down? In an era of tighter immigration, what will happen to those companies participating in the gig economy that rely on semi-skilled and immigrant labour?

QUESTIONS FOR LEADERS

- How should policy makers respond to the 'legal lag'? How will we avoid a situation where a raft of reactionary, poorly thought-out legislation has negative impacts on technological and economic innovation?
- When confidence in the economy wanes, how can companies ensure the wellbeing of their contract staff?
- What institutions can be championed that might protect workers in the gig economy? Might a new form of guild structure work? An anathema to many, might a return to stronger trade unions be a response?
- How can workloads be evened out over a 12-month period, minimising the shock reduction in hours that many contract workers report over, say, the Christmas period?
- What other ways are there for companies to close the skills gap other than simply hiring in highly skilled contracted labour?

4. THE ROLE OF TECHNOLOGY - HOW AI AND ROBOTICS ARE IMPACTING WORK

EXECUTIVE SUMMARY:

The disruptive effects of technology on the labour market can be split into two subsections: embodied and disembodied AI.

Embodied AI, perhaps best characterised as robotics, has been transforming the labour market for decades, and its infiltration will only continue as the cost of robot technology decreases and sectors such as healthcare and logistics become increasing dependent on IT and automation.

Disembodied AI is now part and parcel of everyday life thanks to the spread of smart technology in mobile phones and home appliances. As this technology evolves, digital labour will impact on white-collar jobs in the knowledge economy. This may make some jobs obsolete, but it will create others, so leaders must better 'shape' their workforce, integrating human labour with digital labour in ways which are productive to the organisation and the individual.

WHAT WAS SAID?

SECTION A: THE RISE OF THE ROBOTS

Existential threat
While a general nervousness surrounds our increasing reliance on robots, there is no evidence to suggest that they could or would take over the world [32]. But already automation has caused great upheaval in labour markets. If not managed correctly, automation and superintelligence pose serious threats.

The impact of automation
Up to 50 per cent of all jobs in the UK are forecast to be affected by automation [33]. Its impact will not solely be economic, but will affect the wellbeing, dignity and self-worth of workers.

The rise to the robots
The rise of the robots has been facilitated by three main factors: primarily, falling costs [34]. Prices of sensor technology, 3-D printing and rapid prototyping are all going down. Today even the casual hobbyist with £2,000 can create a rather significant robot. The second reason is the readiness of technology. Twenty years ago the computational power required for robotics was not readily available; today it is. Thirdly, connective and shared technology has greatly increased. Technology for even quite complex tasks, such as the driverless car, can be downloaded by any graduate student.

Which sectors are next?
Robots have been used in manufacturing for decades, in car assembly lines and in food production factories. The next sectors to be affected by automation will likely be healthcare and logistics. Robots that carry out surgery are already on the market, and the technology for driverless cars, once it is commercially available, will impact the work of lorry drivers and other methods of carrying freight. Two years ago Amazon bought a start-up company called Kiva Systems that develops robots to work in warehouses.

Edutainment
Other sectors in which robotics will play a role are education and entertainment. Movies, toys, educational materials and theme parks already rely on robotics technology to a greater or lesser extent. Looking further into the future, robotics will also be used in security, agriculture and cooking.

Healthcare
In the next 10-20 years there will be a significant increase in the application of robotics in caring for the elderly. How robots deal with soft structures, like the human body, and

"Journalists told me that new (AI) technologies are very scary for the general public. This surprised me, because we hadn't thought about it that way. But in fact, the more and more I think about it now, it is actually scary."
Dr Fumiya Iida, Machine Intelligence Laboratory, University of Cambridge

32. Professor Kerstin Dautenhahn, University of Hertfordshire
33. Dr Adrian Weller Machine Learning Group, University of Cambridge
34. Dr Fumiya Iida, Lecturer in Mechatronics, University of Cambridge

communicate with us will be crucial to their uptake, but robots such as Paro the seal are already being used in care homes to increase the wellbeing of the elderly. Studies have shown that Paro reduces patient anxiety, and boosts interaction with other (human) staff [35].

Robots have also been used in the care of children with autism. Experiments have shown they can be used to help improve communication and empathy skills.

In these cases, the robots are not designed to take the role of humans, or replace the healthcare worker, they are designed to complement the work, making their job easier and more effective.

Criticism
The use of robots in healthcare has been questioned because in some instances it relies on the patient being 'fooled' into forming an emotional attachment with a machine. There are also concerns that such measures are merely ways to cut costs and sideline the elderly and infirm all the more. That said, while there is uneasiness about the idea that robots could replace human carers, it is also true that patients embarrassed by conditions like incontinence might prefer not to have humans around at certain times.

Picking battles
There are some tasks that robots will find easier to do and others they will find harder to do. Computational ability, for example, is relatively easy; physical tasks are far harder. Therefore, robotics innovation will likely avoid those sectors that require the robot to move around too much, grasp or pick things up. Or, the robots that do infiltrate those sectors will, for the time being at least, operate with human workers to complement what they are doing.

Robots are also unlikely to replace those jobs with low wages. Ironically, the low pay of workers in the healthcare sector is likely to prevent those jobs from being automated. The higher wages that people enjoy working as train drivers, for example, make a far more compelling case for automation of these roles.

"If the use of robots is additional and it improves wellbeing, then it is difficult to argue that it is a bad thing. But if it is used to reduce even further the human contact that people get – and to an extent where potentially people are being cared for exclusively by robots – then although there might be an increase in wellbeing, is that really a route we want to go down?"
Joe Dromey, IPPR

SECTION B: THE RISE OF THE HUMANS

Disembodied AI
The impact of disembodied AI on the jobs market is likely to be even greater than that of embodied AI.

Advancements in computational capacity, nanotechnology, biotechnology and genetics are likely to revolutionise not only employment, but life outside of work too. Perhaps most fundamentally, they are likely to enhance the growth in human life expectancy we have been enjoying for several decades.

The impact of digital labour on employment
By 2030 it is estimated that some 15 million jobs will be lost to tech from the UK labour market [36]. Many of these will be white-collar jobs. If you take the scale developed by the Frey and Osborne study, the probability of automation of the role of accountant is 95 per cent. The roles of publican and hotel manager are 0.4 per cent susceptible to automation [37].

Employers are already feeling some of the influence of digital labour, reporting an anxiety

"What I'm seeing is organisations dipping their toes in the water. We're not seeing massive, widespread deployment of digital labour; we're seeing experimentation. In a way, you need to keep your employees engaged, so they understand the thinking of the organisation, if they are ever going to play a part in it."
Robert Bolton, Partner, KPMG

35. Professor Kerstin Dautenhahn, University of Hertfordshire
36. Robert Bolton, Partner, KPMG
37. Frey, C.B. & M.A. Osborne, Oxford University. The Future of Unemployment. How Susceptible Are Jobs to Computerization?

among new graduates entering the workplace who feel their job will one day be replaced by a computer.

Changing the nature of the job
Economists argue that the deployment of digital technologies will likely alter workers' jobs, rather than replace them. When ATMs where brought into banks, for example, there was not a huge net reduction in banking staff, but those staff retrained in more client-focused selling jobs.

Where we are now
Digital labour is being deployed in front, middle and back office roles – and has formed the basis of some important mergers and acquisitions. Perhaps the most high profile was Google's reported £400-million acquisition of Demis Hassabis's London start-up DeepMind in 2014, which developed the Go-playing AI machine, AlphaGo. The Royal Bank of Scotland is launching a new online chatbot in December based on technology from IBM's Watson, the AI machine that played Jeopardy.

The effect on managers
In some organisations, a manager who might once have looked after a team of 100 employees, has seen his or her team reduced to 10 human employees and 90 bots. In those situations, managers have questioned their role and worth within the company.

The personality trap
Companies interested in digital labour often start by exploring the chatbot, conversation agent software. The developers of computer programs such as Siri and Cortana have tried to give these agents an interior life or personality [38]. Yet, many users find this problematic because it sets up the expectation of a human interaction, which it ultimately cannot fulfil.

The 100-year life
Every 10 years life expectancy increases by two years [39]. Children born today have more than a 50 per cent chance of living to 100. Morbidity rates are in decline. Therefore, people will be working longer, so what will work look like?

Currently we have a three-stage life: fulltime education at the beginning, full-time work in the middle and full-time retirement at the end. Yet it does not make sense to carry this forward, especially with the advent of new technologies likely to disrupt the labour market again and again.

One response is to develop a multi-stage life, where people will choose to do many other things, perhaps taking breaks from work, re-training for different sectors, and working part-time for a spell. Will new technologies such as VR have a role to play in the working or social life of workers in the future?

Tangible vs intangible assets
In a relatively short working life, tangible assets (property, capital, etc.) are important because they help you to retire. In a longer working life, intangible assets (which aid productivity, vitality, etc.) will become more important because they will help you work longer.

> Intangible assets come in three major sources. The first is productivity - building skills, reaching out to mentors, creating a strong reputation. The second is vitality, health and also work life balance and long-term friendships. The third is the capacity to transform, be that by self-insight or through diverse networks.
>
> *Professor Lynda Gratton, London Business School*

Integrating human and digital labour
The opportunities that may arise in the future from the coupling of human and digital labour fall into three categories [40]:

1. The leveraged professional: where the human is not replaced but their role is augmented.
2. Human leaders of a digital labour frontline: such as in call centres, where a human manager is brought on when problems arise.
3. Proactive organisations: which realise they need to invest in start-ups and help incubate new business or someone else will.

The shorter lives of corporations
While human life expectancy is increasing, the life expectancy of the top 500 companies in the US has fallen by half [41]. In the future, the 'job for life' idea would not work, because you could only work for a corporation for a portion of your life. Technology is the chief disruptive factor in the labour market. How we utilise and legislate for new technology is the most important challenge facing leaders today.

38. Professor Abigail Sellen, Microsoft Research
39. Professor Lynda Gratton, London Business School. Life expectancy at birth has increased by 2.5 years per decade since 1980-1982 in the UK for males, and by 2 years per decade for females.
40. Robert Bolton, Partner, KPMG
41. Clodagh O'Reilly, IBM Workforce

WHAT DO WE KNOW?

The role of technology in the future of work largely falls into two categories: embodied AI, or robots; and disembodied AI, which refers to computer programs, conversation agents, smart phones, the internet of things and managing big data sets.

The use of robotics and automation has been reshaping the labour market in developed nations for decades, especially in manufacturing and production. However, the potential effects of robotic and digital labour could be far wider reaching and the potential negative effects on the labour market, if not properly managed, could be profound and catastrophic.

The rise of the robots has been facilitated by falling costs. According to a report by KPMG, the cost of a software robot can be around a tenth of a full-time worker in the USA, United Kingdom or Australian, and roughly a third of a full-time worker in India. Added to this is close to zero marginal cost of additional software robots [42].

However, while falling costs have pushed automation technology into more and more sectors (healthcare, agriculture, education and entertainment), costs are not so low as to incentivise their deployment in other areas.

Certain occupations with low wages are protected from automation because building a robot is still significantly more costly than hiring and training a low-paid employee. If you add to this a proposed robot tax, the costs of automation relative to human labour could be driven up further and expected productivity gains postponed [43].

As digital labour is deployed to a greater and greater extent, many economists argue that technology will more likely alter most workers' jobs, rather than replace them. The concept of 'reshaping' the workforce will become increasingly important [44].

While human life expectancy is increasing – and major tech players like Mark Zuckerberg, Bill Gates and Google's Calico have all announced plans to combat disease and death – the life expectancy of companies is decreasing. If these trajectories continue, then previous employment norms (the concept of a job for life) will be untenable.

KEY FIGURES

- Between now and 2025, up to two-thirds of the US$9 trillion knowledge worker marketplace may be affected.
- The Bank of England estimates that robotic automation will eliminate 15 million jobs from the UK economy in the next 20 years.
- Digital technologies will conceivably offset the jobs of 130 million knowledge workers — or 47 per cent of total US employment — by 2025. Across the OECD some 57 per cent of jobs are threatened. In China, that number soars to 77 per cent.

KPMG report: The Rise of the Humans

"Robert, I have the right size workforce, but it is the wrong shape."
A client to KPMG's Robert Bolton after the deployment of digital labour

42. Rise of the Robots, KPMG, 2016.
43. Economist, Feb 25th 2017
44. Rise of the Humans, KPMG, 2016.

WHAT DON'T WE KNOW?

The impact of technology on the labour market is certain, but how employers respond is as yet unclear. What will be the net impact? Organisations will likely retain core staff and outsource an increasing amount of work to digital labour. This could result in huge job losses, so how will that be counterbalanced? Will reshaping workforces play a role? Or will an explosion in entrepreneurism be the answer? What are the new jobs that may arise from new technology?

While we can predict to some degree how the evolution of robotics technology will play out, we do not know how human societies will evolve in the meantime. In the future, the societies that will welcome the arrival of new technology may be very different politically and ethically to our own.

While scientists may have some idea as to the functionality of a certain piece of tech, they have little control over what happens when a company commercialises that tech and takes it to market.

It is still unclear which side of history robotics technology is on. Will these machines be used by powerful, asset-rich elites to better control populations; or will they benefit the working man and woman, making their lives easier and more profitable?

QUESTIONS FOR LEADERS

- What will it mean to have a career in your organisation? How can you balance the embrace of these new technologies while not neglecting the pastoral care of your employees?
- How can leaders better shape their workforce? And how can we incentivise a reshaped workforce over a diminished one?
- Can policymakers place a tax on bots, or will this just hold back productivity by delaying the deployment of automation? Maybe taxes should be reduced for employing human labour instead? Or should the expected gains in profits to the largest market participants benefitting from automation be the target of taxation?
- How can leaders promote entrepreneurism and agility within their organisations? Failure to invest in innovative business models or incubate start-ups will mean other companies get there first.
- How can we promote a "higher-purpose" conversation between business leaders and government that faces up to the fundamental problem of the labour market: namely, how we cope with having less work to do?

REAL CHANGE IS COMING

If you were a skilled textile worker in Nottingham, England in 1811 you could be forgiven for being worried. New weaving technology would be threatening the very livelihood of you and your loved ones. You would feel threatened, powerless, even fearful. It is no wonder you may have felt compelled to resist this change, sometimes with force and violence, and join what became known as the Luddite movement.

Fast forward 200 years and it is easy to look at the monumental changes that are happening today in technology and work patterns and sense a whiff of 'revolution' in the air. Daily news reports show film clips of robotic production lines whirring quietly away in state of the art, sparklingly clean, manufacturing facilities. Even labour intensive customer call centres are beginning to see the potential in using 'bot' technology, and as computers have now passed the Turing Test there is a genuine sense this technology will increasingly replace human interaction.

However, let's just pause for a moment. Whilst we are clearly witnessing major changes in technology and the workplace, the 'revolution' consists of many strains, and not all are moving at the same pace or even in the same direction.

- Take **robotics and artificial intelligence** (AI). Whilst cost cutting might be a driving force for this automation, cost itself has also proved to be a limiting factor. It is very expensive to develop robots, and so investment has so far been limited to where budgets are significant, such as security and defence (military), medical applications (surgery) and factories (production lines).
- The **'Gig economy'** which has used software and machine learning to facilitate new ways of working, whilst much talked about, has been limited to pockets of the economy where labour and assets are available relatively cheaply, and where margin is made by savings in taxation and regulatory costs associated with employing people.
- Computers, whilst strong on computational applications and predictable tasks such as factory assembly lines, remain weak in matters of **human judgement** and the creative industries. Ethics, religious values, morality and justice are areas which remain beyond the scope of current automation software.
- A large and growing pool of **cheap labour** particularly in Asia and Africa which is young, healthy, mobile and prepared to work for low wages competes quite effectively in restraining automation in areas where there is no pricing power. A good example is the proliferation of hand car washes in the areas of large-scale migration despite the availability of automated car wash facilities for decades.

However, there is one area where perhaps a more revolutionary scent hits the air. Last year Harvey Nash asked over 3,000 technology professionals how they feel their role will change over the next ten years. And the response from these highly skilled, technically literate people surprised even us: almost half expect their job to be replaced by a machine.

And they are not alone. Digital labour is beginning to have a wide-ranging effect in a variety of sectors, from accounting to recruitment to law. The impact on the job market is likely to be significant: job roles will change and evolve, some will disappear altogether, new skills will need to be learnt. Routine scrutiny of standard legal documentation, computer-assisted auditing processes, forensics and investigation, medical diagnosis, these are all able to be passed on to intelligent machines which are programmed to perform the basic tasks and then learn how to use big data and the analytics tools to improve on the human equivalent.

But if that sounds threatening, it shouldn't. As recruiters we witness the birth and death of job roles all the time. And as technology begins to do what humans currently do, we are freed up to take human achievement to a new level. After all, the world is not short of problems to solve.

And the winners in the future world will be the people who have the very attributes computers do not have: creative, innovative, comfortable with uncertainty, people oriented. Not to mention highly digital-savvy. A positive development is that automation can free humans up from the mundane and low value, to focus on what humans do best: creative thinking and problem solving. In other words, far from being replaced, the worker of the future will be free to be more digital, more creative.

In short, more human than ever.

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RISE OF THE HUMANS

Hardly a day goes by, it seems, without apocalyptic warnings that robots in the workplace will create a dystopian destiny. It's true that many jobs will be reconfigured and redesigned, and employees will be required to learn new skills. Certain jobs will be replaced, possibly many. But it's also true that new jobs will be created.

Key challenges

For decision makers concerned with the role of people in organisations, the key question seems to be, "should we be pessimistic or optimistic?" The answer depends in part on how leaders tackle the following challenges:

- The 100-year life. Organisational consultant and academic Lynda Gratton points out that we're going to be living and working in an age of longevity. A 100-year lifespan won't be uncommon for today's school-age children. People will be economically active for 60 to 70 years – far longer than they are today – at the same time that the world of work will not necessarily require them.
- Disrupted markets. Whether buffeted by technology, geopolitical risks or unexpected economic events, out-of-balance markets can have an outsized impact on workforces. Human jobs can be replaced faster than we have been used to along with compelling return on investment statistics. This said, people can be freed up to perform higher value tasks. Organizations must have a flexible workforce strategy in place to manage the transition.
- The need for innovation. There's a pressing need to become more agile and innovative to take full advantage of the digital world. However, 86 per cent of leaders say they don't have the time to think strategically about the forces of disruption and innovation shaping their company's future, according to KPMG's 2016 global CEO survey. Rapid changes in technologies, markets and customers demand faster responses. The answer may lie in partnering with suppliers, clients, start-ups and universities in an innovation ecosystem. The small and medium sized enterprise sector needs to grow in order to take up the human capacity that will be released from large organisations. Organisations will need to think again about their innovation practices and culture before new digitally dominant entrants to their marketplace "eat their lunch".

NAVIGATING THE FUTURE

When the future appears to rush towards us it's easy to forget that we can choose what it will look like. At this point we see a continuum of three possible scenarios:

- A dystopian future, where increasing numbers of economically active people can't find work, especially hollowed-out middle management and those low to middle skilled roles doing strongly rules and procedure based jobs.
- Greater state intervention, requiring a radical rethink of fiscal policy. Perhaps now is the time to plan for a reduction in the working week allied with a Universal Basic Income that would be paid to everyone when permanent, full-time employment is more difficult to attain? State funding of this option would require governments to tax differently, perhaps taxing bots as well as people.
- A reinvigorated gig and "traditional" economy, where retrained workers make a living wage off a portfolio of gigs as organisations innovate, create new start-ups and employ people in new lines of work.

It is already clear that those who lead organisations and people functions such as HR will need to develop new and enhanced capabilities in workforce analytics; agile workforce shaping and planning; rapid and lifelong skill building and employee value propositions that address multiple workforce types (contingent, permanent etc.).

THE RISE OF THE HUMANS

Despite the questions over the rising role of robots in the workplace, we believe a counter-balancing dynamic will take hold. Job creation will be on the agenda after all, along with an imperative for innovation and agility. As new businesses and offerings are developed, people will be needed to build, lead, maintain, and market them. Whichever future unfolds it will be better for us all if we steered towards a preferable future as opposed to the one that just happens to us. This will require leaders to think differently about their organisations, the roles within them and how people are reskilled throughout their lifetime.

This, then, becomes the call to arms for the leaders of organisations and governments: to lead the conversation, pre-empt, understand and manage the changes, and – above all – get ready for the rise of the humans.

Robert Bolton,
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KEY QUESTIONS FOR LEADERS

- The destabilising effect new technology has had on the labour market has manifested itself in two key patterns: firstly, increased automation has reduced the overall amount of work available; and secondly, the emergence of new digital platforms has dismantled traditional employer-employee working structures. How will businesses benefit from new economic opportunities while maintaining the wellbeing of their workers and good relations with them?
- How will we ensure this reduction of work will not lead to an unsustainable rise in unemployment? What are the pros and cons of a Universal Basic Income? Should work be shared out more evenly across the workforce, and if so, how can working fewer hours be destigmatised? How can career trajectories and standards of excellence be maintained?
- How can we promote a higher-purpose conversation between business leaders and government that faces up to the fundamental question: in the future, how will individuals cope with having less work to do?
- How can businesses be incentivised to improve the 'shape' of their workforce, rather than simply decreasing it? Can policymakers place a tax on the use of robots and AI, or should taxes be reduced for employing human labour?
- While we tackle the problems of reduced workloads, human lifespans are increasing. What can businesses do to develop employees' intangible assets and promote the multi-stage life?
- Dealing with these issues is in business's own self-interest. The labour market has routinely been used as a tool for propaganda, not least in recent political campaigns in Europe and the US. So, how can businesses better develop their workforces – both direct and indirect employees – while protecting them from economic and political decisions beyond their control?

RUSTAT CONFERENCE AGENDA

FUTURE OF WORK
Rustat Conference
Jesus College Cambridge - Tuesday, 22 November 2016

09.30-09.40 WELCOME - UPPER HALL
Jonathan Cornwell, Director, Rustat Conferences, Jesus College, Cambridge
Dr Julian Huppert, Director, Intellectual Forum, Jesus College, Cambridge

09.40-10.10 SESSION 1
INTRODUCTORY TALK: WHAT CAN HISTORY TELL US ABOUT THE FUTURE OF WORK?

Chair: Professor Anna Vignoles, Professor of Education, University of Cambridge; Fellow, Jesus College

Dr Brendan Burchell, Reader in Social Sciences, Department of Sociology, Fellow, Magdalene College
Historical comparisons with past labour market shocks – will the future be qualitatively different? Impact of future of work scenarios for individual wellbeing. The relationship between employment, precarious work and unemployment on mental health. What are the possibilities for maintaining individual wellbeing when paid work becomes scarce? What will people do if not working? How important will lifelong learning become and where are the critical skill shortages?

10.10-11.20 SESSION 2
FUTURE OF WORK IN THE GIG ECONOMY. THE QUALITY AND FRAGMENTATION OF WORK.

Chair: Professor Diamond Ashiagbor, Director of Research, Institute of Advanced Legal Studies, University of London

Albert Ellis, Chief Executive, Harvey Nash plc
Challenges of the competitive market for skilled labour in post-Brexit environment.

Professor Simon Deakin, Director, Centre for Business Research, and Professor of Law, University of Cambridge, Faculty of Law and Judge Business School
Christopher Markou, Faculty of Law, University of Cambridge and Jesus College, Cambridge
Law, Work and Technology: A Systems Approach - a model of the evolution of law and technology to understand the likely impact on the legal system and the world of work of digitalisation, online platforms, and AI. Application of the model to contemporary issues arising at the interface of law and new technologies, including the recent decision of the London Central Employment Tribunal on the minimum wage rights of Uber workers.

Dr Ying Jin, Senior University Lecturer, Department of Architecture; Centre for Smart Infrastructure and Construction, University of Cambridge
New research on how people travel to work in the UK. Comparison of how disadvantaged the emerging pool of workers (women, part-time, single adults in the city) are relative to the traditional full-time commuters.

11.20-11.40 BREAK, GALLERY, UPPER HALL

11.40-12.40 SESSION 3
THE SECOND MACHINE AGE - ARE ROBOTS A THREAT TO WORK & WELLBEING?

Chair: Dr Adrian Weller, Machine Learning Group, University of Cambridge

Dr Fumiya Iida, University Lecturer in Mechatronics, Machine Intelligence Laboratory, University of Cambridge
Will robots steal our jobs? If so, is this a good thing?

Professor Kerstin Dautenhahn, Professor of Artificial Intelligence, University of Hertfordshire
Robots are useful tools – they're not about replacing people and reducing the workforce. Robot companions to support and assist humans.

12.45-13.40 LUNCH, PRIORESS'S ROOM & MASTER'S LODGE

13.45-14.45 SESSION 4
THE INTEGRATION OF HUMAN AND DIGITAL LABOUR IN THE ORGANSIATION OF THE FUTURE. LONGEVITY AND WORK - ARE WE IN CONTROL OF TECHNOLOGY OR IS IT CONTROLLING US?

Chair: Dr Stephen Cave, Executive Director, Centre for the Future of Intelligence, University of Cambridge

Robert Bolton, KPMG, Partner, HR Global Centre of Excellence
Rise of the Humans – integration of human and digital labour in the organisation of the future. Are predictions of huge job losses premature? Will automation combine fairness with efficiencies? Does the human workforce stand to gain or lose? Training and re-training agenda. The role of leadership in organisations deploying digital.

Professor Lynda Gratton, Professor of Management Practice, London Business School
The 100-Year Life: Living and Working in an Age of Longevity. As many of us will live longer than previous generations and we imagine the future, should we let technological developments be the major framing?

14.45-15.05 BREAK, GALLERY, UPPER HALL

15.05-15.55 SESSION 5
GOVERNMENT PERSPECTIVE ON THE FUTURE OF WORK. ACHIEVING A WORK-LIFE BALANCE

Chair: Dr Julian Huppert, Director, Intellectual Forum, Jesus College, Cambridge
Iain Walsh, Director, Labour Market Strategy and International, Department for Work and Pensions
Current government priorities on work and benefits. The international issues affecting UK. What more should the government be doing?

Anna Coote, Principal Fellow, New Economics Foundation
Taking back control of the workplace - the precariat, work-life balance, and restructuring the working week to tackle long hours.

15.55-16.10 AREAS FOR FUTURE DISCUSSION & CLOSING COMMENTS

Dr Julian Huppert, Director, Intellectual Forum, Jesus College, Cambridge

CONFERENCE CLOSE

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We are grateful to the Rustat Conference members to Harvey Nash and KPMG, sponsors of this conference and report.

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ABOUT RUSTAT CONFERENCES

The Rustat Conferences is an initiative of the Intellectual Forum at Jesus College, Cambridge, and chaired by Professor Ian White FREng, Master of Jesus College. The conferences provide an opportunity for decision-makers from the frontlines of politics, the civil service, business, the professions and the media to exchange views on vital issues of the day with leading academics. Since 2009, Rustat Conferences have covered a variety of themes including: The Economic Crisis; The Future of Democracy; Cyber Security; Financial Technology; Inequality; Manufacturing in the UK; The Future of Research-Intensive Universities; The Geopolitics of Oil and Energy; Drugs Policy; Organisational Change in the Economic Crisis; the Revolution in Cyber Finance; the Understanding and Misunderstanding of Risk; Food Security; Transport and Energy; the UK North South Divide; Superintelligence and Machine Learning; and Blockchain - Beyond Bitcoin.

In addition to acting as a forum for the exchange of views on a range of major and global concerns, the Rustat Conferences provide outreach to a wider professional, academic, student and alumni audience through the publication of reports. The conferences are held at Jesus College, Cambridge, and are named after Tobias Rustat (d.1694), a benefactor of Jesus College and the University.

We thank our sponsors Harvey Nash and KPMG for their support of the conference and report. We also thank the Jesus College Development Office, Helen Harris, Leonora Chance, Rob Grimsey and Phil Shakespeare.

Rustat Conferences Foundation Members
The Rustat Conferences are supported through a mix of sponsorship and a membership scheme that was launched in 2013. We thank the members for their generous support:

Dr James Dodd - James's career has concentrated on the founding, financing and governance of companies in the areas of telecommunications and technology. He studied physics at the universities of London, Oxford and Cambridge, and began his career in the areas of scientific and financial analysis for both government and industry. He serves on a number of boards and is active in supporting academic projects and charities.

Harvey Nash is an executive recruitment and outsourcing group. Listed on the London Stock Exchange, and with offices across the world, we help organisations recruit, source and manage the highly skilled talent they need to succeed in an increasingly competitive and innovation driven world.

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McLaren Technology Group has a reputation for efficiency and professionalism. Working within a fast-paced environment and to the highest standards, our highly skilled workforce operates primarily in the areas of manufacturing, engineering and race team as well as logistics and support.

Mr Andreas Naumann is a senior executive in the financial industry. Outside the professional sphere, he is keenly interested in subjects like urbanisation, youth unemployment, education and foreign policy. He supports the Rustat Conferences as a private individual.

Sandaire - Sandaire and Lord North Street came together in April 2014 to combine their businesses, both of which specialise in looking after the investment assets of very wealthy families, charities and endowments.

PARTICIPANTS - RUSTAT CONFERENCE ON THE FUTURE OF WORK

JESUS COLLEGE, CAMBRIDGE - TUESDAY, 22 NOVEMBER 2016

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Kristin Bayne, *Deputy Development Director, Jesus College, Cambridge*

Mr Ben Bell, *Public Policy Manager, Uber*

Jonathan Berry, *Director, Camrose Management Ltd*

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Professor Kerstin Dautenhahn, *Professor, University of Hertfordshire*

Sally Davies, *Senior Editor, Aeon*

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Dr Ying Jin, *Senior University Lecturer, Department of Architecture, University of Cambridge*

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