

The Future of Work

The Global Challenge

The global challenge of work is two-fold. First, will automation, in its various forms, destroy jobs? And second, even if not, will workers be paid enough to sustain the global economic system? This is why the former US Treasury Secretary Larry Summers has said the problem of “good jobs” is the central problem of the richer economies.

The combination of economic stagnation, global competition and digital technology has created something of a social and public panic about work. We are losing “the race against the machine,” or reaching “the end of labor”. But there are two diverging stories about the future of work, one dystopian, one utopian, as Flipchart Rick has observed. On the one hand: it “will revolutionise the workplace ... and enable us to have more fulfilled working lives.” And on the other: a future “of factories without people, of vanishing jobs, of a hollowed out labour market and ... vast profits with few employees.”

Our present model of work is, broadly, a creature of the industrial revolution, dominated by the division of labour, the supervision of labour, and payment of workers for their time or their tasks. This includes so-called “new economy” models such as Uber, whose casualisation of its workforce would be recognised by any 19th or 20th century dock-worker. Some of the

big shifts shaping work reinforce this model. Others are starting to reshape it, potentially marking the start of a transition beyond it.

To understand how this is likely to change over the next decade and beyond, we need to understand the global landscape of work. These are a shift towards services, the globalisation of supply chains, the growth of ubiquitous technology, an increased squeeze on resources, and a shift in social values towards well-being. These pull in different directions.

Globalisation and digitisation take you towards rawer forms of capitalism, whereas resources and values take you towards more inclusive versions. The way you deliver services depends on which model of these two that you prefer. The version of the story about the future of work you subscribe to tends to depend on your assumptions about how these drivers will play out.

The shift to services: The deep shift in the global economy is in the long-term rise of services to “become the dominant economic activity” (UNIDO, 2009). The economists Timmer and Akkus (2008) describe this as a “powerful historical pathway of structural transformation,” which every country follows.

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Manufacturing vs. Services

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Peak Globalisation

Globalisation is reaching its limits. Wages in export sectors in both China and India are now relatively high (a pattern seen in other emerging economies in the past) and companies are moving their production closer to their markets, both anticipating rising transport costs and wanting to be able to respond more flexibly to demand.

Positive Immigration

More than 500 million people globally now live in a country they weren't born in. Economists generally agree that immigration is good for economies. Migrants tend to be younger, more enterprising, and economically active, and their effect on wages, economic growth and tax contributions is almost completely positive

Technology Takeover

There is a widespread fear that the rise of robots - or more exactly, a combination of computing power, algorithms and robotics - will destroy the labour market, even, possibly, the very idea of labour value.

the dominant economic trend for much of the century. Productivity growth and economic growth tends to fall as services become dominant, and the influence of trades unions, which are effective in maintaining the value of wages, tends to decline.

The globalisation of the supply chain:

Manufacturing is also tradable, meaning that it is open to export competition. The growth of the Asian economies, in particular China, has been extensively driven by manufacturing. Taking a long view, Asia's share of world production almost doubled between 1970 to 2008, from 15.5% to 28.5%, at the expense of Europe and North America. (Unido, 2009). This growth was driven largely by the development of containerisation, not digital technology, because it transformed shipping costs.

But globalisation is reaching its limits. Wages in export sectors in both China and India are now relatively high (a pattern seen in other emerging economies in the past) and companies are moving their production closer to their markets, both anticipating rising transport costs and wanting to be able to respond more flexibly to demand.

The other effect of globalisation, of course, is an increase in migration: more than 500 million people globally now live in a country they weren't born in. Economists generally agree that immigration is good for economies. Migrants tend to be younger, more enterprising, and economically active, and their effect on wages, economic growth and tax contributions is almost completely positive. However, in weak labour markets migration also tends to push down unskilled wages by increasing competition for such jobs; such competition is gamed by unscrupulous employers.

The growth of ubiquitous technology: There is a widespread fear that the rise of robots - or more exactly, a combination of computing power, algorithms and robotics - will destroy the labour market, even, possibly, the very idea of labour value. A widely publicised study by Oxford University academics Carl Benedikt Frey and Michael Osborne argued that for the United States jobs are at high risk of being automated in 47% of the

conventional occupational classifications (Frey and Osborne, 2013). In *The Second Machine Age*, Erik Brynjolfsson and Andy McAfee suggest a reason: that computing power is capable of exponential growth in performance over time, and that we're just at the start of that progression. If robotics did for blue-collar work, then artificial intelligence will do for white collar work.

This argument, however, tends to miss the fact that technological innovation, historically, has created new jobs, typically after a period of turbulent transition. In his analysis of the labour market, David Autor (2014) finds that between 1999 and 2007 "routine task-intensive" jobs were indeed largely removed by computerisation, while knowledge jobs ("abstract task-intensive") tended to survive or increase where human knowledge was complemented by computers. "Manual task-intensive" jobs, at the less-skilled end of the market, were much less affected by computerisation, and demand for them seemed to be rising. Yet their wages fell. His explanation: labour supply for these jobs increased because of the collapse in demand for "routine task-intensive" jobs.

The squeeze on resources: Population and consumption pressures mean that we are breaching many of the natural planetary boundaries. For capitalism this is a new game: traditionally it has been able to use resources without worrying much about the consequences. And after a century of cheap energy, the long-run trend is up, despite the current downward blip in the oil price. In our recent *Futures Company* report *The 21st Century Business*, Jules Peck and I argue that this resource shift is changing the way that companies behave; we are moving to post-sustainability (socially, economically, and environmentally). An important element is a shift from consumers to citizens, among both customers and employees, where the overall impact of a business matters. An example: it's argued that one of the reasons why McDonald's sales are slumping among Millennials is that eating there is depressing, because of "the feeling that the people behind the counter, flipping burgers and taking orders, have dead-end jobs where they're treated poorly."

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The shift to wellbeing: One of the long trends is a trend towards wellbeing, physical and psychological, individual and social. This complements one of the strong workplace trends: that significant competitive performance is typically produced only by empowered and engaged employees, who are intrinsically motivated to work for the business. This is true of lower-wage environments as well as higher-wage businesses.

Striking research by Zeynep Ton (2014) has found that companies such as Costco in the United States and Mercadona in Spain out-perform their sectors – by some margin - through a combination of better wages, significant investment in training, and appropriate technological investment to support staff. With such a “good jobs” strategy, increases in wages translate directly into far larger sales increases. High value work benefits individuals, businesses, as well as society as a whole.

Good Jobs

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Options and Possibilities

The current discussion about the future of work seems to be monopolised by the version of the future in which technology destroys jobs. It has gained an air of inevitability, as if it is the only possible future. NESTA's open minded report suggested that the “robots hypothesis” resonated because it connected “two powerful themes in popular culture: the rapid advance of IT, and the startling growth in inequality.” But there is a problem: it hasn't happened before.

Indeed, the idea that investment in more productive technologies leads to unemployment is dismissed by economists as “the lump of labour fallacy.” In the past, investment in the new technologies has created new capacity and new wealth, which was re-invested to create more, higher value jobs. If this time is different, we need to understand why this is so.

There are candidates. Brynjolfsson and McAfee's claim that digital technologies are different because they create exponential growth is one. Another is that companies can no longer draw on plentiful resources or cheap energy to drive new investment platforms. A third is that previous waves were driven by manufacturing, which generated new value through productivity gains and created the social conditions for trades unions.

However, it is also the case that this fear typically recurs after a crisis. It is not

coincidence that Keynes wrote his famous essay on the challenge of technological unemployment just after the 1929 crash.

So it is also worth considering reasons why it might just be a phase. The economic historian Carlota Perez has a model of technological development that describes five long waves, or surges, since the Industrial Revolution. Each is around 50-60 years and follows an S-curve pattern; the last quarter of each is marked by saturated markets, diminishing investment opportunities and declining returns. The first part of the 20th century was dominated by the oil and auto surge; the latter part by ICT. The ICT wave is now reaching the turning point at which returns start to fall.

On this model, finance is looking for new opportunities, and although it is too early to say what the next platform will be, and we're still 10-15 years away from it, it is possible to imagine that the next technological surge might be built around, say, a material such as graphene.

David Autor concludes that much of “the labor market woes” of the past decade are not down to computerisation, but to the financial crisis and reduced investment (starting with the dot.com collapse) and the impact of globalisation on labour markets. And he suggests that many middle-skill jobs will prove more resistant to unbundling than advertised; while computers can do specific

External Drivers

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tasks, turning collections of tasks into self-contained jobs, and then automating them, requires substantial investment. In the long run, people are both more flexible and cheaper.

One implication is that the question of the future of work may actually be about power in the labour market. This leads to broadly political interpretations of the future of working conditions, ranging from Guy Standing's formulation of the fragile "precariat", facing intermittent, insecure work,

David Weil's description of the "fissured workplace", in which many functions are sub-contracted, and the rise of campaigns for the Living Wage. Perhaps the dividing line is best-expressed in Alex Payne's widely circulated open letter to the tech venture capitalist Marc Andreessen: "You seem to think everyone's worried about robots. But what everyone's worried about is you, Marc. Not just you, but people like you. Robots aren't at the levers of financial and political influence today, but folks like you sure are."

Proposed way forward

The way forward depends on how you prefer to read this bifurcation between the technologists and the sceptics. We don't know which group is right: there are no future facts. But there are some observations that can help shape our perspectives on this.

The first is that these widely divergent views are a feature of this point in the technology cycle. The most the most excitable projections of the future of the car were seen at just this point on the oil and auto curve in the 1950s. The technology S-curve in Figure 1, based on the work of Carlota

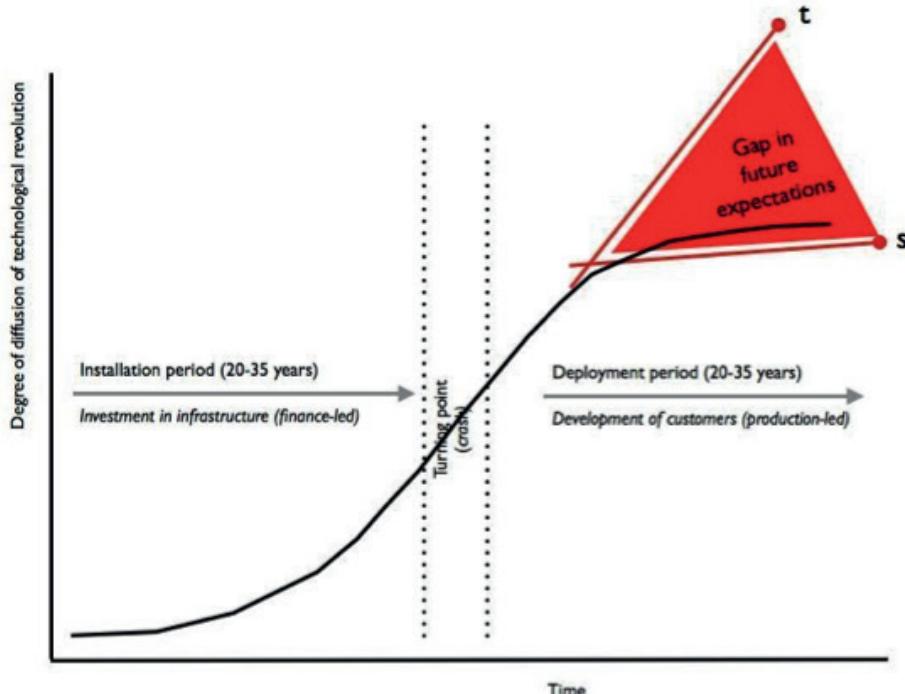


Figure 1

Source: Carlota Perez/ additional analysis by The Futures Company

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Perez, helps us to understand why. At this point, when the S-curve is at or approaching its second inflection point, people have been experiencing rapid technological change for the best part of two generations. The notion that "the only constant is change" has become a breathless platitude in the public discourse. So, the technologists' perspective (point 't' in Figure 1) is a projection of this steep ramp. The sceptics note instead sign of falling returns and declining customer utility - and see a flattening of the line (point 's'). The gap is large, and one's perspective on it is a matter of worldview, not evidence.

Second, almost all business innovation and new business value is driven by the application of knowledge, and the way it is embedded in individuals, teams, and systems. The Futures Company has explored this in recent research with the Association of Finnish Work on the idea of 'high value work'. The important point here is that this is true of a whole range of knowledge, including knowledge of service and customers, and knowledge of culture and place, as well as technological knowledge. The most successful businesses use technology to complement and enhance this knowledge, not to replace it.

Third, the trend towards is a deep and powerful one. If Millennials express a desire for meaningful work, this is also true more broadly. We are on the cusp of a transition to a world where, as Hardin Tibbs (2011) has argued, half of the populations of Europe and the United States subscribe to post-modern values (drawing on Inglehart) of autonomy and diversity. The workplace will not escape this trend. One way in which this is expressed is in a transition from consumer or employee to citizen. Increasingly, anyone with any degree of choice in the labour market is choosing employees who recognise them as a whole person, not just as a unit of labour. The evidence suggests that the engagement that the employer gets in return (even, say, in retail) is a powerful driver of performance and profitability.

Fourth, the bargain that businesses struck in the 1980s and 1990s, as they enforced flexibility and "downsized" headcount, may

turn out to be a Faustian pact. Shedding jobs and exerting tight control of labour markets increased short-run profits. But at the same time that same control squeezed out their sources of growth. And as both the OECD (Cingano, 2014) and the IMF (Ostry et al, 2014) have noted recently, wage inequality has been a further drag on economic growth. To regain growth, they are likely to have to increase wages and give back some control and power to their workforces.

My own best guess is that we are not headed for long-run technological unemployment. I have changed my mind about this over the past year as I have spent more time with the evidence.

The explanation that seems best to fit present state of work and labour markets is that it has been through a "perfect storm" of a globalised workforce, the deskilling of routine work (which was highly vulnerable to automation) and the shift of these workers into manual or service work, and aggressive deregulation of labour markets driven by a neoliberal political agenda.

The discourse around technological unemployment is not persuasive to me. The "abstract" jobs (using David Autor's analysis above) will be complemented by technology, and so, in a different way, will be the manual jobs. Meanwhile, the projected gains from Artificial Intelligence and analytics are going to be harder to achieve than currently anticipated. As an example, big data gets less useful as the data sets get larger, and the driverless car, the poster child for the tech future, is a far tougher proposition than Google lets on. Meanwhile, these tech scenarios never seem to include the new jobs that will emerge as we understand better the potential of the technologies, other, sometimes, than as a panic about the possible speed of change.

But, and it is a big but, we're only part of the way through the dislocation to work and to labour markets caused by this perfect storm. Things will not get better quickly.

Post Modern Workplaces

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Perfect Storm

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Impact and implications

Looking at the shorter-term impacts, then, it's possible to see a range of approaches to this turbulence in the world of work. Government have options, largely about whether to intervene in labour markets to influence work outcomes, or not. But employers are also moving to new strategies not out of goodwill but through self-interest.

These options, highly simplified, are shown in the matrix (Figure 2), which contrasts laissez-faire approaches with interventionist approaches.

The race to the bottom: This laissez-faire option operates on the principle that labour market flexibility is the secret to increased employment in a globalised labour market. In practice, nearly all countries have increased flexibility and permitted more casualised work over the past decade - even somewhere with a strong tradition of labour protection such as Germany. The evidence increasingly suggests, however, that the pursuit of low value jobs leads to a vicious cycle of low productivity, low investment, low growth, and low tax and social contribution from business.

This policy approach also involves government subsidy to employers, as low-paid workers are supported by state payments. In the United States, a study showed that the fast food sector was effectively subsidised to

the tune of \$6 billion because its low paid workers were dependent on food stamps and subsidised housing. Increasingly this looks like a political choice that is no longer supported by economic evidence.

Enlightened self interest: It appears that employers who pay better and create better working environments do better financially. Walmart is a relevant case. Over the last decade, its share price has been broadly stagnant, while Costco has outperformed it "by a considerable margin", in terms of sales, earnings or stock market returns. One reason: according to HBR, far lower staff turnover means knowledge is kept in the company - and drives customer engagement. Such employers also invest in technology to enhance the performance of their staff, using each to complement the other. The Spanish retailer Mercadona similarly invests heavily both in training and stock management systems.

Wages and labour performance are also becoming part of businesses' reputational capital. See, for example, the increasing success of the UK Living Wage campaign in signing up large companies as "living wage employers". The public sector can encourage this, for example by giving tax breaks or other forms of support to companies who deliver such commitments, and sharing evidence of business benefits.

	Market-led	Socially-led
Laissez-faire	<i>Race to the bottom</i>	<i>Enlightened self-interest</i>
Interventionist	<i>Managing markets</i>	<i>Not just jobs</i>

Figure 2

Source: Andrew Curry/The Futures Company

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Keeping the market honest: Turning to more interventionist approaches, the state can take the view that it wants to drive unscrupulous low-wage employers out of the market as a way of driving up standards and investment (because low-wage employers are unlikely to commit to training, and have little incentive to invest in capital equipment, which reduces productivity.) This leads to approaches such as enforcing (and increasing) minimum wages, both through regulation and legal frameworks, and also through public procurement rules.

Such a policy complements the “enlightened self-interest” approach by removing free-riders from the market. Although conventional wisdom has argued in the past that minimum wage legislation costs jobs, this seems to be a weaker effect than claimed.

Re-imagining work: Much of our intervention in the labour market is driven by a view that it creates social goods, both from an economic perspective and also from a social perspective (over a long period studies have shown that worklessness produces adverse psychological and physical effects). But it is possible that such findings are linked to a set of “modernist” social values that are rapidly giving way to “post-materialist” values. Certainly, people with some income and a degree of social capital who do not have to work find worthwhile things to do, including volunteering. This is part of the argument for the Basic Income: that as we move to the “post-industrial” world envisioned by Daniel Bell, in which skills are more embodied in personal knowledge, that

encouraging traditional work is no longer the only, or the best, way to get the social benefits from productive engagement.

The rise of the basic income: Until very recently, the idea of a basic income, a minimum sum paid to all people regardless of their work status, was right of the fringe of political discourse. But it has been moving rapidly towards the mainstream. The idea has deep roots: George Bernard Shaw promoted it as “a vagabond’s wage” a century ago.

The analysis in this provocation helps to explain why. It is a policy idea that helps to improve outcomes whether the technologists or the sceptics turn out to be right. And in the meantime it helps to shore up economies, and individuals, that are struggling in the slow readjustment of labour markets.

If the “robots” hypothesis is right, we’ll need a basic income to make the economy work (markets need people who can afford to buy products). If the market power argument is right, then basic income keeps employers honest, by ensuring they have to pay good enough wages, in good enough conditions, to attract and keep their workers. One interesting side effect is that it would mean that our fundamental notions of the value of paid work could be about to shift, for the first time since the Industrial Revolution. A recurring feature of the ICT era has been that questions of power and politics have frequently been diagnosed as issues of technology. The future of work is just the same.

Minimum Wage

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Lead Expert – Andrew Curry

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Lead expert on the Future of Work.

Andrew Curry is a Director at The Futures Company where he leads the public sector team, and specializes in futures and scenarios projects. His career began as a financial journalist, working for the BBC and Channel 4 News. From there he migrated into new media where among other activities, Andrew launched Britain's first interactive television channel in the 1990s. His interest in futures



partly developed from arguing with some of the more fanciful forecasters in the

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About Future Agenda

Context – Why Foresight?

In an increasingly interconnected, complex and uncertain world, many organisations are looking for a better understanding of how the future may unfold. To do this successfully, many companies, institutions and governments are working to improve their use of strategic foresight in order to anticipate emerging issues and prepare for new opportunities.

Experience shows that change often occurs at the intersection of different disciplines, industries or challenges. This means that views of the future that focus on one sector alone have limited relevance in today's world. In order to have real value, foresight needs to bring together multiple informed and

credible views of emerging change to form a coherent picture of the world ahead. The Future Agenda programme aims to do this by providing a global platform for collective thought and innovation discussions.

Get Involved

To discuss the future agenda programme and potential participation please contact:

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Future Agenda 1.0

The Future Agenda is the world's largest open foresight initiative. It was created in 2009 to bring together views on the future from many leading organizations. Building on expert perspectives that addressed everything from the future of health to the future of money, over 1500 organizations debated the big issues and emerging challenges for the next decade. Sponsored globally by Vodafone Group, this groundbreaking programme looked out ten years to the world in 2020 and connected CEOs and mayors with academics and students across 25 countries. Additional online interaction connected over 50,000 people from more than 145 countries who added their views to the mix. All output from these discussions was shared via the futureagenda.org website.

Future Agenda 2.0

The success of the first Future Agenda Programme stimulated several organizations to ask that it should be repeated. Therefore this second programme is running throughout 2015 looking at key changes in the world by 2025. Following a similar approach to the first project, Future Agenda 2.0 builds on the initial success and adds extra features, such as providing more workshops in more countries to gain an even wider input and enable regional differences to be explored. There is also a specific focus on the next generation including collaborating with educational organizations to engage future leaders. There is a more refined use of social networks to share insights and earlier link-ups with global media organizations to ensure wider engagement on the pivotal topics. In addition, rather than having a single global sponsor, this time multiple hosts are owning specific topics wither globally or in their regions of interest. Run as a not for profit project, Future Agenda 2.0 is a major collaboration involving many leading, forward-thinking organisations around the world.

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