Jobs of the future

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Edited by Jason Clout: jclout@fairfaxmedia.com.au

Fourth industrial revolution here now

Technology Profound changes are occurring rapidly.

Ian Grayson

Powerful technologies such as robotics, autonomous vehicles and machine learning are rapidly changing the world of work, yet many people remain unaware of the long-term implications this will have for society.

Dubbed the "fourth industrial revolution", the trend builds on the digital revolution of the past 30 years and will fundamentally change the roles of workers across every industry sector. While the end result might be uncertain, it is clear the impact will be profound.

At the recent Jobs of the Future roundtable conducted by *The Australian Financial Review* in conjunction with the Australian Computer Society (ACS), participants agreed more attention needs to be placed on the ramifications of the seismic changes that are taking place. Any failure to act now could lead to significant societal disruption in coming years.

ACS president Yohan Ramasundara says it can be difficult for many people to come to terms with the immediacy of the changes that are taking place in workplaces. Rather than seeing the shift as something happening now, they tend to consider it still to be some way off.

"If it's in the future, people will think that means it's in 10 years' time or 50 years' time," he says. "It's just like smoking because you don't really see the effects of it instantaneously or in the short term. We need to make it real for people."

Others at the roundtable agreed, citing examples of where technology is already changing the nature of jobs. Automation in areas such as accounting is leading to large numbers of low-level jobs being replaced by machines. Similar trends are taking place in the legal sector where case law searches that would once have been completed by a junior staffer are now being completed by artificial intelligence software.

ANZ's general manager of digital transformation and performance, Jennifer Scott, says autonomous vehicles are an example of a change that is happening much more quickly than many people realise.

"It's pretty clear to me that people think driverless vehicles are something that will happen one day," she says. "I don't think that they're fully aware that, in Singapore, it's happening in 2022."

Scott points out driverless trucks are already being used in some Australian mines and the technology will quickly move into use on the nation's highways. With many thousands of people currently employed as professional drivers, the flow-on impact will be massive.

Ed Husic, shadow minister for Employment Services, Workforce Participation and the Future of Work, says he has noticed a shift in awareness and attitudes during his time in his current portfolio, but acknowledges there is still some way to go.

"I've noticed the awareness has increased but I'm still nowhere near comfortable with the level of preparation," he says. "I think this spans across government, business and the community.

"In terms of workforce development, and having the [necessary] structures in place, I don't think we are anywhere that we can be proud of [and] I think that's something we should be really concerned about."

Greg Miller, director and co-founder of predictive analytics firm Faethm, agrees there has been a shift in thinking about the future of jobs that has already happened, but more still needs to be done.

"Even 12 months ago I'd walk into a large enterprise and I'd have to start the conversation with, 'Let me define what I mean when I say the future of work, or the fourth industrial revolution, or what these impacts are'," he says. "Now I walk into those same large enterprises, and I'm talking to the head of the future of work."

While this is encouraging, Miller says there appears to be little agreement on what actions need to be taken and what the result of technological change will be within many organisations. While some people believe new technologies will create millions of new jobs, others fear it will make millions of existing workers redundant.

"They're not sure where to start, [but] know it's a problem and know they need to do something about it," he says. "Some companies have formed teams, so that puts them in the leader bracket, but now they need to go and take action."

Sandy Abrahams, executive head of managed services at Avanade Australia, says leadership on this issue needs to come from the senior executive management within organisations, but this is not something she is currently observing.

"CEOs and boards need to really look at what it means for their businesses and really take action," she says. "That's the biggest thing, and I'm not seeing it. It might be happening and I'm glad to hear that they're getting some titles that look at the future of work, but I'm not seeing it yet."

When it comes to making progress and preparing people for the changes that are occurring, roundtable participants emphasised that it will require a long-term strategy that comprises short-term goals.

Dayle Stevens, divisional chief information officer, PT3 and Growth, AGL Energy, says when you talk about emerging technologies and their impact on the future of work, it can be difficult for people to imagine what this will mean for them in the years ahead.

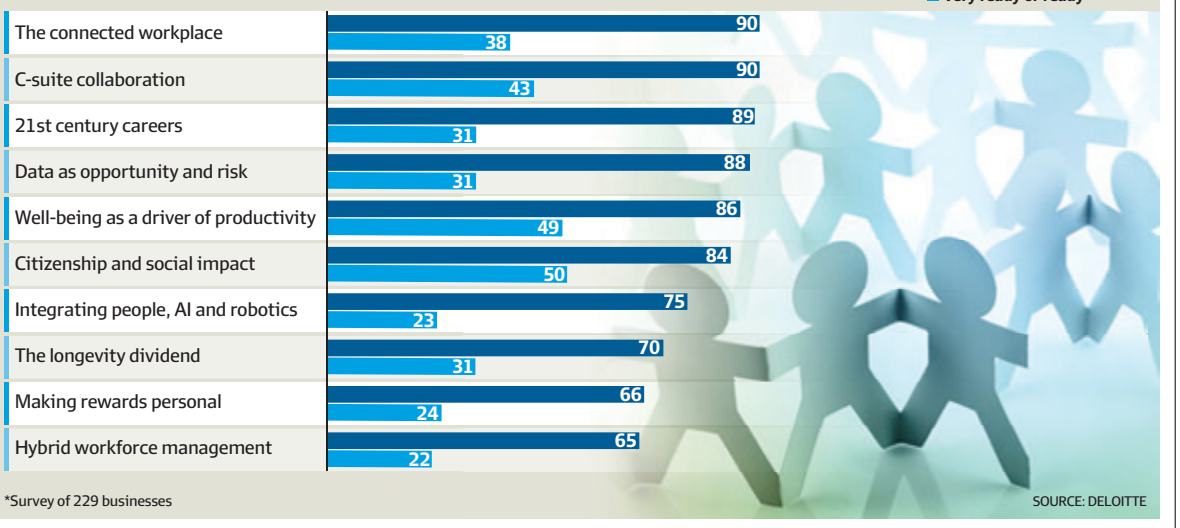
She says it is a matter of explaining to them the small steps they can take now that will eventually lead them into a new working environment. "It's not something they're going to be doing in 20 years time. It is the job they're doing today and what they're going to be doing next week. Trying to break it down and make it simple for people so they don't back away is really important."

Ramasundara also stressed the importance of strong leadership if Australia is to survive and thrive as a country during this period of rapid and fundamental change in workplaces.

"Certainly, there is increased awareness," he says. "But as a country, I think some people think the government should be leading, or the private sector should be leading, or somebody else – there's no real collaboration. Everybody really needs to come together on this one so there is a more coordinated, collaborative means to actually address the issue."

Just the job

How Australian businesses rate 10 trends in human capital in terms of importance and readiness (%)* ■ Very important or important ■ Very ready or ready



*Survey of 229 businesses

SOURCE: DELOITTE

People think driverless vehicles are something that will happen one day. I don't think they're fully aware that, in Singapore, it's happening in 2022.
Jennifer Scott, ANZ (left)

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Focus required where we have the lead

Industry policy
Australia needs to identify its differential.

Mark Eggleton

One of the great criticisms of Australian industrial policy is governments should not be in the business of picking winners, but in the digital age, it might be the best way forward, a number of participants suggested at the recent Jobs of the Future roundtable co-hosted by *The Australian Financial Review* and the Australian Computer Society (ACS).

Drawing on the example of Switzerland and its reputation for precision engineering and manufacturing, ANZ's general manager, digital transformation and performance, Jennifer Scott, said Australia needed to find its brand identity and one of the best ways might be to concentrate on industries where we already had a strong reputation.

"Switzerland actually has a really clear brand statement and I think Australia really needs to start defining what economy do we want to create? Then you can start to think about it in this world of technical skills, what are the areas that we think are really important?" she said. "What is Australia's differential? Where do we want to win, what's our brand? Instead of tackling technology at a macro level, we actually concentrate on agricultural, health, mining or educational technology."

Shadow minister for employment services, workforce participation and the future of work, Ed Husic, agreed we already occupied a position ofleadership in certain sectors globally and he suggested the wheel was turning and people were beginning to suggest "maybe we do need to actually apply a bit of specialisation in areas where it matters most".

Husic suggested economies such as China, Singapore and the United Arab Emirates were making deliberate decisions to be world leaders in AI and while Australia probably would not rival China on the AI front, we could rival other countries in areas where we already had a lead.

He said it came down to allocating the right amount of resources, effort, people and capital in the right industry sectors. "It is a challenge to an orthodoxy that has existed here since the 1980s, which is we don't pick winners, but other countries are now actively examining their economic strengths and acknowledging that if they apply themselves in a particular way, they will actually do better," Husic said.

Furthermore, if we get it right we can become powerhouses in the region considering where other countries are on their digital journey. For example, in developing countries that have ridden the boom in outsourcing globally over the past decade, increasing automation is putting a strain on their economies, particularly in India, Vietnam, Cambodia and the Philippines.

Ed Husic says Australia should capitalise on its strengths. PHOTO: WAYNE TAYLOR

In a recent presentation given by International Monetary Fund managing director Christine Lagarde in the US on global trade, she said: "Increasing automation is making it easier for companies to repatriate some of their operations – effectively, reversing some of the 'outsourcing' and 'offshoring' of the past two decades".

For many of the business processing companies in nations, such as India, this increasing automation is destroying parts of their developing economies.

Roundtable participant Greg Miller, director and co-founder of workforce analytics firm Faethm, suggested low-level jobs such as those performed by business process companies in India had been early casualties in the move to automation and they were "really struggling, and it's crushing that economy".

He said the good news for Australia was these countries now presented an opportunity for Australia. "For example, most of these economies haven't automated their farms yet, whereas you don't see any people on our farms. It's an opportunity where we could go and be the service provider. If we look at our trading partners in the region we can assist them on their journey." For example, in Bangladesh, where automation of the textile industry could wreak havoc with its economy, Australian educational exports could assist them retool their workforce and agricultural technology could help them move from a boom-and-bust industry reliant on monsoonal rains to one that is more sustainable.

Instead of tackling technology at a macro level, we actually concentrate on agricultural, health, mining or educational technology.
Jennifer Scott, ANZ

Importantly, our educational and agricultural technology exports help to address one of the huge challenges confronting the region. International Labor Organisation figures indicate roughly 140 million people across five south-east Asian countries (or roughly half of the salaried workforce) will be affected by automation, and Australia picking winners here will not only be a future boon to our own economy but the region as a whole.

Education system needs reinvention

Learning STEM programs are 'barely scratching the surface'.

Mark Eggleton

Australia needs to reinvent its education systems for the digital age and this is not just about adding a few more STEM courses in schools or teaching every child how to code. This was the consensus among participants at the recent Jobs of the Future roundtable co-hosted by *The Australian Financial Review* and the Australian Computer Society (ACS).

Yet while business and government continue to make these grand proclamations about reinventing education, roundtable participant Greg Miller wondered aloud whether he has made a dent in furthering the future of education in eight years of working with education ministers as well as schools at all levels.

Miller, who is the director and co-founder of analytics firm Faethm, said while Australia had an array of STEM programmes in schools, he believed only about 10 per cent of students were really gaining any long-term benefit.

Part of the problem was schools might have a digital curriculum which had taken a long time to formulate but it was a formal course. While it might be great a school offered a robotics class, the sad fact was a specialised class missed the point. He said it was great for the 10 per cent who loved technology but STEM learning was "barely scratching the surface" when it came to the other 90 per cent of students.

Miller said the digital curriculum needed to be embedded "in the English class, in the maths class and in the science class".

"It should be embedded in everything they do and we're nowhere near that curriculum yet," he said.

Miller's point was also raised in a recent speech delivered in the United States by International Monetary Fund managing director Christine Lagarde who said, "all countries need to reinvent their education systems for the digital age".

"This is not just about adding a few more coding lessons. It is about fostering critical thinking, independent problem-solving, and lifelong learning that can help people adapt to change. It is about investing in human capital," Lagarde said.

She also said the digital economy was putting further pressure on those workers who were less well equipped to compete – whether in advanced, emerging or developing economies.

It was a point raised by ANZ's general manager of digital transformation and performance, Jennifer Scott, who mentioned the dangers of a bifurcated society. She worried that an already stratified society might become more so if educational opportunities were not presented equally to all.

Scott warned of continual bifurcation if the people furthest away from technology now, such as many service and vocational trades, fall further behind and the impact that might have on their children.

For Avanade Australia's executive head of managed services, Sandy Abrahams, the key was ensuring Australia's children have "the qualities they will need to continue to learn in the future".

She said understanding technology was one aspect but also having the mindset to understand and solve problems. Moreover, she emphasised the importance of continuous learning for people already in the workforce.

"People understand if they don't continue to learn or rotate skills, they might be left without a job, especially when the full impact of artificial intelligence and automation work their way further into workplaces."

Sandy Abrahams emphasised the importance of continuous learning for people already in the workforce. PHOTO: WAYNE TAYLOR

Dayle Stevens, AGL Energy's divisional chiefinformation officer, PT3 and growth, suggested education was clearly going to change and she was heartened by what she was seeing already with her own children.

"It is not just all about reading, writing and arithmetic," she said. "It is about leadership skills and collaboration skills, communication and creativity. It is actually quite innovative, I think, and it's about keeping people's options open. Keeping them interested and helping people understand that what you learn now isn't the end product. It's about being able to adapt, deal with ambiguity and be curious about what is happening in the world so that you can continuously adapt yourself to whatever the future of work might be."

Digital curriculum should be embedded in everything students do.

Fellow participant Robert Hillard, managing partner consulting at Deloitte Australia, highlighted that the huge change in education would be felt deeply as we transition to a system more befitting the digital age.

He said one of the tensions in our modern education system was its origins in an industrial age and that it had not actually changed as yet.

"Our system was designed to create obedient workers for a defined career path and one of the reasons why there is a natural tension at the moment in how much we invest [in education] is there's a natural inefficiency in the sector," Hillard said. "If you can address the inefficiency in education and create greater flexibility, you immediately free up a lot of resources to be applied in different ways."

One way to better apply resources was to future-proof the workforce by making a commitment to lifelong learning which goes well beyond schools and into tertiary and vocational learning.

Unfortunately, most organisations' corporate learning and development teams are completely understaffed, so it is the universities and TAFE colleges who will bear the burden. Yet they do not have the capabilities as they are still geared for vocational training or multiple-year degrees.

For Miller, the best bet is the TAFEs and universities coming up with a curriculum that fits the skills gap that people need. But that will take a major change in how governments, educational institutions and businesses work together.

AI replaces and creates roles at the same time

Employment **It's early days, but implications are substantial.**

Ian Grayson

Of all the technologies shaping the future of jobs and the workplace, experts agree one of the most significant is artificial intelligence.

Benefiting from billions of dollars in investment by companies around the world, AI is poised to replace many existing positions and create others that have not previously existed.

Participants at the recent Jobs of the Future roundtable, conducted by *The Australian Financial Review* in partnership with the Australian Computer Society (ACS), discussed the extent to which AI will have an impact within workplaces. They recognised that, while it is still very early days, the implications for the future are substantial.

At one end of the spectrum, some people fear AI will result in a significant reduction in the number of jobs available. As tasks traditionally completed by staff become automated, there will be fewer opportunities for humans.

Other observers, however, take a different view. Rather than AI removing humans from jobs, they believe the technology will augment what they are able to achieve. For example, rather than an accountant having to spend hours reconciling transactions, they can instead spend their time providing business advice to clients.

"It's about having constructive dialogue about automation," says Greg Miller, director and co-founder of analytic company Faethm. "We tell our clients that you've got to be looking at automation to stay competitive. But there are also a number of roles that are going to be augmented by these technologies for a productivity gain."

Miller says that in workplaces of the future there are essentially going to be three categories of jobs. There will be those people who work "for" the machines, those who work "on" the machines, and those who work "with" the machines.

"If you are able to design automation in such a way that more and more of those jobs are working with the machines, then their ability to do things for their stakeholders, their customers and their people grows," he says.

Participants discussed a trial of AI technology in a hospital designed to improve patient care. When a patient presses a nurse call button, the call is answered by AI software which can assess the type of request being made and assign the most appropriate staff member. Rather than replacing nurses, AI is making them more efficient and effective.

It is important to focus on the positive impact that AI will have in the workplace, says Dayle Stevens. PHOTO: WAYNE TAYLOR

Dayle Stevens, divisional chief information officer, PT3 and Growth, AGL Energy, says it is important to focus on the positive impact that AI will have in the workplace rather than become stressed about its ability to replace humans. She points to Australian technology start-up MedCorp Technologies which is working on devices that can monitor a patient's core temperature and relay that data to a doctor. In this way, serious infections can be detected earlier allowing treatment to be undertaken.

"This is a really good use case for where [AI] makes a big difference in people's lives," she says. "It's about finding the right places to use that technology, where to apply it, and where it can be enforced for good."

It's about having constructive dialogue about automation.
Greg Miller, director and co-founder of analytic company Faethm.

ACS president Yohan Ramasundara says the potential of AI should be seen in a positive context, but also cautioned that it should be viewed in a similar way to fire.

"You can use fire to light a room and make it bright, or you can use the fire to burn the house down," he says. "Overall, I think the more 'human' skills of humans will be the ones that are going to be in more demand. That's because everything that's machine learnable is going to be done by the machines."

Sandy Abrahams, executive head of managed services at Avanade Australia, says the group of workers who are most likely to feel disruption as a result of AI are those in lower-skilled roles undertaking repetitious processes.

"Some people just want to do these jobs," she says. "They want to do a mundane process that they don't have to think about, and go home and spend their time with their family. I'm worried about those people, and the ramifications of them and the social impact on that demographic.

"I'm worried there's going to be a whole lot of people left by the wayside who don't have a job as a result of this."

Global change demands unique local responses

Workforce **Action urged now to get ahead of the potential issues.**

James Sherbon

Australia must confront its own unique set of challenges and devise its own solutions when it comes to developing the future of work.

That is the consensus among participants at the recent Jobs of the Future roundtable co-hosted by *The Australian Financial Review* and the Australian Computer Society (ACS).

Importantly, the director and co-founder of analytics firm Faethm, Greg Miller, said we need to move away from the "future of work as a tagline and maybe refer to it as the now of work".

"A lot of these technologies are in place today and are impacting jobs today so maybe this notion ofit being the future is doing it a disservice because we need people to act now and get ahead of the potential skills downside so they're ready for the impact of change."

ACS president Yohan Ramasundara agreed we have to start acting now and while we need to take a global view it certainly has to be localised. "It's a global issue but we need to have local, state and federal governments working together to create customised local solutions when it comes to the future of work," Ramasundara said.

One particular issue that needs to be addressed is the idea of the gig economy and how Australia creates a stronger safety net for those people increasingly working in the gig economy.

According to Australian Bureau of Statistics figures on local business released earlier this year, the size of the gig economy is rising rapidly especially in service industries such as urban transport and food delivery but at the same time it is also an area of the economy experiencing the most exits as well.

So while businesses might like the idea of having a permanently itinerant workforce that can be switched on and off, people in general want a full-time job. What's required is a rethinking of what a full-time job might look like because as Avanade Australia's executive head of managed services, Sandy Abrahams, said, there are a lot of societal factors linked to full-time employment such as a mortgage with a bank.

How we change the way we structure work within the concept of a full-time job creates some opportunities.
Dayle Stevens, AGL Energy

Divisional chiefinformation officer, PT3 and Growth, at AGL Energy Dayle Stevens suggested one solution for the future could be one employer giving people lots of opportunities and not just the one career path to get to master the whole time. "How we change the way we structure work within the concept of a full-time job creates some opportunities," she said.

Yohan Ramasundara: Local, state and federal governments must work together. PHOTO: WAYNE TAYLOR

Deloitte's managing partner consulting, Robert Hillard, agreed we are going to see this more portfolio approach, "and the really smart business is going to actually offer that full-life experience".

For Hillard the key is companies can provide the one thing most people crave and that's the working capital which ensures people get paid every month. What the gig economy does is free up working capital because business does not have the on-costs of employees but what it also does is make people feel insecure. They might be earning the same amount of money as a full-time job but they are worried about next month's mortgage and feel insecure. What forward-thinking companies need to do is to provide people with a bit of both.

"The best of both worlds, they are going to apply the working capital behind you so you have job security and they're also going to provide the full range of experience, and perhaps some shared risk. So shared upside on invention and innovation and that's going to require whole new ways of thinking about labour."

Retrofitting regulation of the internet


Deloitte's Robert Hillard says it is only now that we have an opportunity to get the regulatory step right. PHOTO: WAYNE TAYLOR

Government Rapid technological change demands attention.

Mark Eggleton

Back in the 1990s when the web was at the beginning of its journey to omniscience, we tended to be more focused on its infinite possibilities.

Rather than formulate regulatory ground rules like we do with every other industry, ranging from our food quality to aviation, we embraced its unfettered growth.

It is only now after almost weekly privacy scandals mixed with occasionally alarmist predictions about what automation and artificial intelligence might be capable of in the future that we are finally asking for a little regulation.

For recent participants at the Jobs of the Future roundtable co-hosted by *The Australian Financial Review* and the Australian Computer Society (ACS), the big question was how we now retrofit regulation to an industry and technology that touches every facet of our lives.

Deloitte Australia managing partner consulting Robert Hillard suggested we missed the regulatory step back in the 1990s and it is only now that we have an opportunity to get that step right.

Shadow minister for the digital economy and the future of work, Ed Husic, suggested if we are going to better regulate what's happening we need to boost the knowledge of regulators so they know what they are dealing with and can capably deal with the pace of technological change.

He suggested business self-regulating has not really worked in the past as players beyond government tend to act in their own interests.

What participants generally agreed upon was governments need to better support those affected by technology whether that be by more training or even funding to allow people to train.

For Husic, rather than always asking what government or the individual should do, more should also be asked of business. He asked whether business would take its traditional approach, which has been to question the benefits of employee education because they ask "why should I train someone up, and then have them taken by someone else?" "There is an actual benefit in having government work with business in terms of skills development, not just to meet skill shortages we know exist now, but to actually put people on a pathway of skills acquisition that will get them into sustainable employment," Husic said.

Furthermore, he said it is important governments acknowledge change is coming and let people know "we are going to work through this and this is what we're going to do".

"I think government leading this investment in human capital will be key to being able to send the signal or to be able to build assurance in the broader community, that there is something there in place.

"There's a game plan and people have been brought together to work on it in a very collaborative way."

Fellow participant and divisional chief information officer, PT3 & Growth at AGL Energy Dayle Stevens said business and government need to work more closely to create the right attitude among people at risk of losing their jobs when it comes to continuous learning.

For Greg Miller, the director and co-founder of Faethm, governments should start by building a program that identifies "those folks jobs that are at risk and get them on a path to future skills and rediscovery".