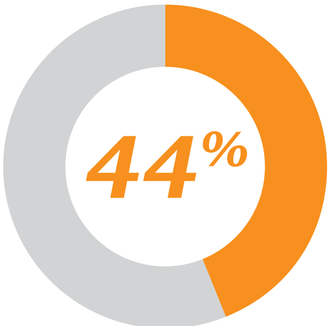
Future-proofing Australia's workforce by growing skills in science, technology, engineering and maths (STEM) /April 2015

A smart move



44%

or 5.1m

Jobs at risk from digital disruption

Innovation and STEM education are key to future growth

$57.4bn

Increase in GDP if we shift just 1% of our workforce into STEM roles.

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Overview

After a sustained period of economic prosperity, Australia is facing some tough challenges. Slowing growth, declining real wages, falling productivity, and the end of the mining boom, to name a few.

At the same time, businesses are coming to terms with the massive disruptive impact that digital technologies are having on business models, supply chains and customer behaviour.

These changes are putting major pressure on the Australian workforce, and the companies that rely on it.

Building on cutting edge work undertaken at Oxford University, new analysis by PwC shows that 44 per cent (5.1 million) of current Australian jobs are at high risk of being affected by computerisation and technology over the next 20 years.

In order to realise our potential for innovation, Australia needs an appropriately skilled workforce; a workforce fit for the future.

Businesses competing in a global economy driven by data, digital technologies and innovation will need more employees trained in science, technology, engineering and mathematics (STEM). Research indicates that 75 per cent of the fastest growing occupations now require these skills.[1]

Unfortunately, Australia is lagging on a number of key STEM indicators. STEM university completions are flat, the number of Year 12 students studying STEM subjects is declining and businesses are struggling to find STEM employees.

The benefits of a stronger commitment to STEM are many. It would help meet workforce needs, better equip workers with vital skills for the future and drive innovation and productivity. It would also deliver economic growth.

Modelling by PwC finds that shifting just 1 per cent of the workforce into STEM roles would add $57.4 billion to GDP (net present value over 20 years).

This report argues the case for growing the STEM workforce and outlines some of the benefits and impacts for businesses specifically and the Australian economy broadly.

And it calls on business, including PwC, to take a leading role alongside government and the education sector in order to deliver the STEM outcome Australia needs to remain a competitive, innovative and prosperous nation.

The need to act

Australia is waking up to the fact that the good times can't go on forever. In the face of economic challenges and a digital revolution that's reshaping business and the workforce, we need to act.

The economic challenges are significant.

Australia's recent economic history is truly impressive. The twenty four-year period from 1991 to 2015 is one of the longest continuous economic expansions of any developed country.[2]

Our prosperity during this period was underpinned by two key factors. One was the economic reforms of the 1990s, which drove productivity growth and created the foundation for long-term economic success. The other was the China-led surge in demand for commodities during the 2000s, which saw Gross Domestic Product (GDP) grow by 44 per cent.[3]

But in the wake of the GFC and the end of the commodity boom, Australia has become something of a victim of its own success. While the first ten years of growth were fuelled by genuine innovation and hard-won reforms such as trade liberalisation and a national competition policy, growth in the second decade was largely good luck.

We now face significant economic challenges that are both circumstantial and structural: slower GDP growth, declining real incomes, low productivity growth, declining employment, sluggish global growth and rising shortfalls in tax revenue.

Governments are finding it difficult to fund the services we expect – good schools, a strong health system, effective public infrastructure and a safety net for those that need it the most. Unless there's substantial action towards addressing these fiscal pressures, Australians can expect to see their standard of living deteriorate over the coming decades.

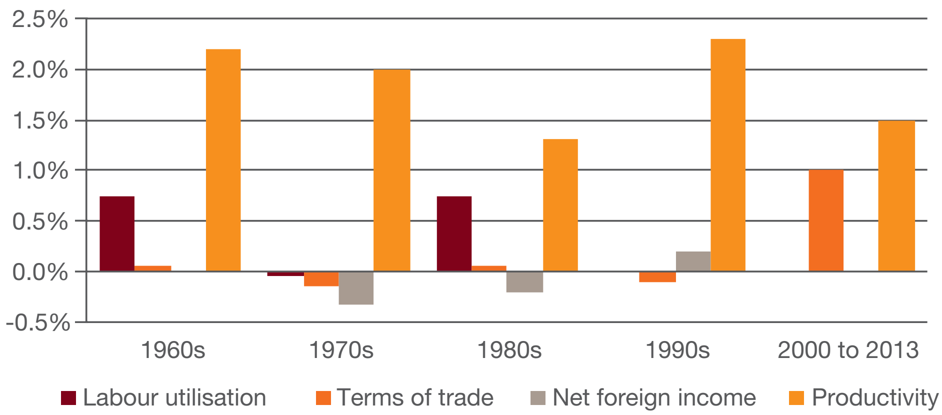
We're at an inflexion point.

The opportunity to move towards a more innovative, productive and sustainable economy is in front of us and we need to respond.

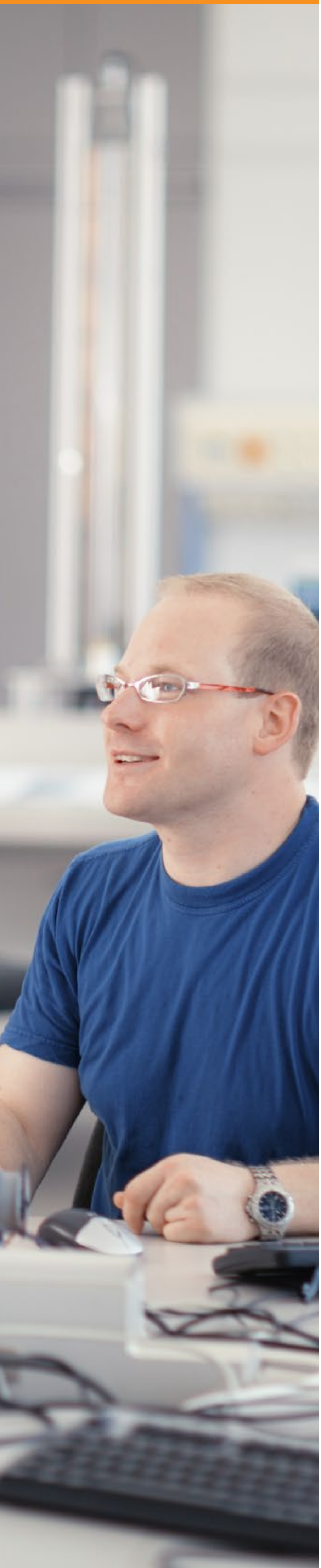
"Growth from productivity almost halved in the 2000s as we rode the commodity boom. But where will the next wave of growth come from?"

Jeremy Thorpe, PwC

Sources of growth in Australian income



Source: Dr Martin Parkinson (2014) 'Enhancing Our Living Standards Through Tax Reform', speech to the Business Council of Australia/PwC Tax Reform Forum, Sydney, 11 September



Digital is disrupting everything

Inextricably woven into the fabric of our economic future is the impact of digital disruption, arguably the most significant mega-trend of the 21st century. Digital technologies are radically changing the way we live, consume and work.

For example:

- Machine learning, which allows computers to make intelligent decisions by processing massive amounts of data, will be a source of major productivity gains. This will have significant implications for traditional workforces.[4]
- 3D printing stands to potentially disrupt traditional supply chains by lowering the cost of 'where' and 'how' manufacturing is done. An estimated 41 per cent of air cargo and 37 per cent of ocean cargo are threatened by 3D printing.[5]
- Crowdsourcing, enabled by online social networks, is creating a new human resource model by allowing companies to engage with a globally distributed workforce to complete tasks on demand and at scale.[6]

Businesses and institutions alike are working hard to adapt. How we respond to these changes will go a long way to determining the effectiveness of Australia's businesses and the prosperity and well-being of our society.

Top threats to growth according to Australian CEOs

79% *concerned about the impact of changes in core technology*

74% *worried about cyber risks*

74% *say availability of key skills – including technology skills – is a threat*

67% *concerned about the speed of technological change*

Jobs are at risk

One of the major implications of digital disruption for Australia is the impact it will have on our workforce. Many of the jobs people work in today simply won't exist in the next decade, either entirely, or at the same number.

Building on cutting edge work undertaken at Oxford University,[7] new analysis by PwC shows that 44 per cent (5.1 million) of current Australian jobs are at high risk of being affected by computerisation and technology over the next 20 years.

By 'high risk' we mean there's a greater than 70 per cent chance the job could be automated by technology.[8]

Jobs most likely to be affected are those where computer learning systems or robotics are able to perform simple and routine tasks faster and more accurately than humans. These typically include unskilled or low-skilled activities in offices, factories and shops. For example: data entry, operating a checkout, bookkeeping, doing simple office administration and operating machinery.[9]

The impact on the Australian workforce will be significant not only for employees but also for businesses, which are already struggling to find appropriately skilled talent.

Australian jobs most at risk from computerisation and technology in next 20 years

Occupation	Probability of being automated	Number of workers affected
Accounting clerks/bookkeepers	97.5%	263,348
Checkout operators/cashiers	96.9%	128,745
General office administration workers	96.1%	284,171
Wood machinists	93.4%	31,081
Financial and insurance administration workers	93.1%	128,425
Farm, forestry and garden workers	92.5%	106,017
Personal assistants and secretaries	92.4%	137,917
Sales administration workers	91.1%	56,964
Keyboard operators	87.1%	59,852
Hospitality administration and support workers	85.5%	248,862
Sales assistants and salespersons	85.2%	698,780
Real estate sales agents	85.2%	70,673
Factory process workers	84.6%	52,631
Fabrication trades workers	84.3%	90,039
Receptionists	83.9%	169,371
Clerical and office Support workers	83.8%	114,710
Printing trades workers	82.9%	23,930
Mobile plant operators	82.8%	127,298
Food preparation assistants	82.5%	154,438
Food process workers	82.2%	63,072
Glaziers, plasterers and tilers	81.4%	60,977
Food trades workers	80.7%	173,639
Automobile, bus and rail drivers	80.5%	94,946
Machine operators	80.1%	83,757

Derived from Oxford University study, PwC analysis

Jobs that will likely be automated in the next 20 years

97.5%

Accounting clerks and bookkeepers

96.9%

Checkout operators

96.1%

General office support eg data entry, mail

92.4%

Personal assistants and secretaries

92.5%

Farm and forestry workers

A workforce for the future

As Australia looks towards new sources of growth in a rapidly changing global economy, we need to start building a workforce fit for the future.

But what does the workforce of the future look like? And where should we be focusing our attention? Identifying jobs that have a low risk of being automated is a good place to start.

Modelling shows that the jobs most likely to endure over the next couple of decades are ones that require high levels of social intelligence, technical ability and creative intelligence. This includes doctors and nurses, teachers, engineers, and information communication and technology (ICT) professionals, and managers.

Australian jobs least at risk from computerisation and technology in next 20 years

Occupation	Probability of being automated	Number of workers affected
Medical practitioners	0.4%	89,754
Education, health and welfare managers	0.7%	75,082
Midwives and nurses	0.9%	301,762
Advertising, Public Relations and sales managers	1.5%	126,616
Database and systems administrators, and ICT Security Specialists	3.0%	34,764
Education professionals	3.3%	56,264
ICT managers	3.5%	57,184
Tertiary-level teachers	3.6%	116,001
School teachers	4.0%	407,693
Engineering professionals	4.2%	132,736
Legal professionals	6.5%	82,552
Social and welfare workers	6.8%	123,933
Accommodation and hospitality managers	7.2%	100,765
Construction, distribution and production managers	8.2%	258,794
Child carers	8.4%	130,510
ICT network and support professionals	9.7%	49,688

Derived from Oxford University study, PwC analysis

Jobs unlikely to be automated in the next 20 years

<1%
Doctors, nurses and midwives

<1%
Education, health and welfare managers

3.5%
ICT managers

4.0%
School teachers

4.0%
Engineers

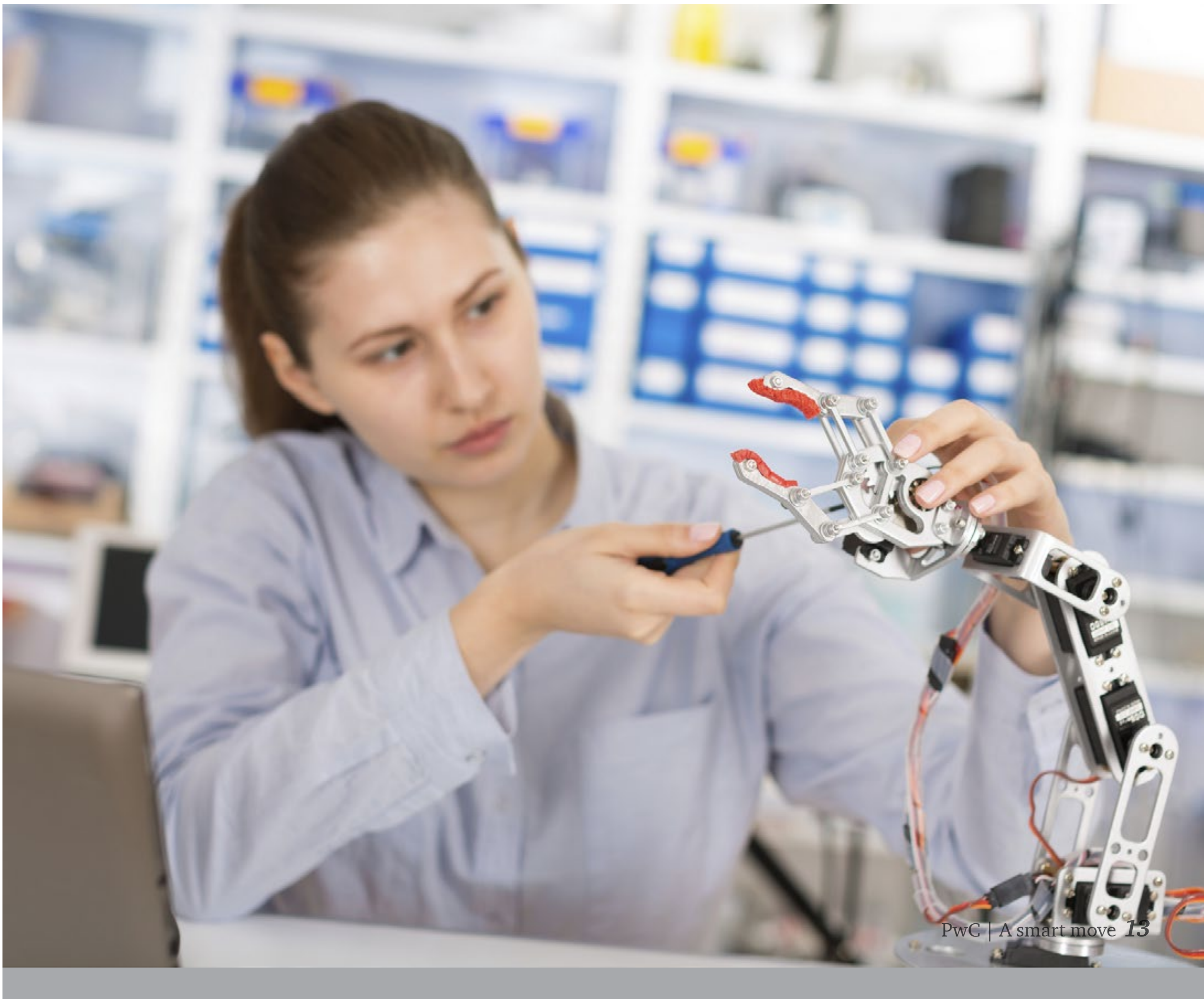
But what about the jobs we don't yet know we need, the jobs of the future? The rapidly changing nature of technology and global competition makes it difficult to predict precisely what these will be.

What we do know, however, is that technology and innovation, which are transforming our economy whether we like it or not, are key to solving both our workforce and our growth challenge.

For example, in 2013 data-driven innovation added $67 billion to the Australian economy, or 4.4 per cent of GDP.[10] And innovation and digital technologies have the potential to increase Australia's productivity and raise GDP by $136 billion in 2034, and create close to 540,000 jobs.[11]

Australian business leaders intuitively understand this. More than 80 per cent believe innovation is the main driver to creating a competitive economy and the best way to improve productivity.[12] But we need to lift our game; the OECD recently rated Australia as only 'average' in its competency and capacity to innovate.[13]

In order to realise our potential, Australia needs a workforce that is technologically savvy and able to innovate. And one of the best ways to do this is by improving capabilities in STEM.



The critical role of STEM

A STEM education underpins innovation and plays a critical role in economic and business growth. But Australia is lagging on key indicators of STEM.

In order to realise our potential for innovation, Australia needs an appropriately skilled workforce. Businesses competing in a global economy driven by data, digital technologies and innovation will need more STEM-trained employees. Research indicates that 75 per cent of the fastest growing occupations now require STEM skills,[14] and over 70 per cent of Australian employers identify STEM employees as being among the most innovative.[15]

There will also be a growing need for the broad skills that STEM fosters. Critical thinking and problem solving, analytic capabilities, curiosity and imagination have all been identified as critical 'survival skills' in the workplace of the future.[16]

What counts as STEM?

There is no universally agreed definition of what counts as a STEM education or field of occupation.

In Australia it's generally considered to include an education at the Bachelor level or higher in the fields of:

- natural and physical sciences
- information technology
- engineering and related technologies
- mathematics.

From an economic view however, qualifications at the Diploma level and in related fields can also be important to consider, including:

- architecture and building
- agriculture, environmental and related studies
- health.

STEM underpins innovation

Countries that lead in STEM education also rank high on innovation. Germany, for example, ranks third in the OECD in terms of graduates in STEM fields, compared to the US which ranks 33rd.[17] In 2011 Germany produced 53 patents per 1000 researchers, while the US produced 39.[18]

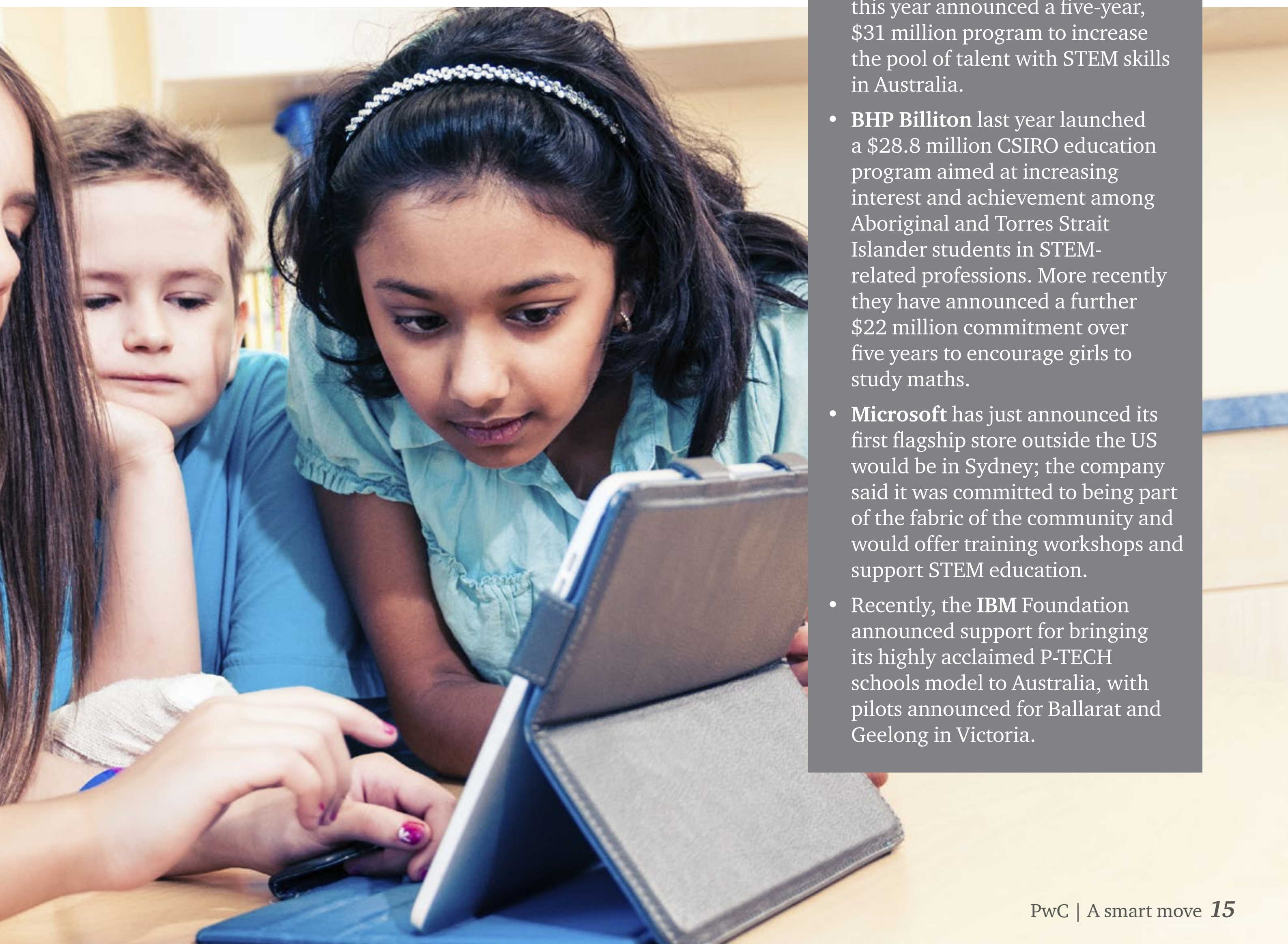
Sweden, which has a reputation for successfully commercializing innovative research, including seat belts, pacemakers and Skype, has a STEM-focused education system. 90 per cent of Swedish students attend highly digitally equipped schools and each year several thousand teachers attend national STEM-focused training centres.

In the US the Obama administration recently announced over $240 million in new private-sector commitments to inspire and prepare more students – especially those from underrepresented groups – to excel in STEM fields. The 'Educate to Innovate' campaign has to date resulted in over $1 billion in financial and in-kind support for STEM programs.

By developing the right infrastructure and teaching capabilities, these countries are growing a workforce of the future that has the core skills and competencies for driving innovation.

Leading businesses get it too

- Computer networking giant **Cisco** this year announced a five-year, $31 million program to increase the pool of talent with STEM skills in Australia.
- **BHP Billiton** last year launched a $28.8 million CSIRO education program aimed at increasing interest and achievement among Aboriginal and Torres Strait Islander students in STEM-related professions. More recently they have announced a further $22 million commitment over five years to encourage girls to study maths.
- **Microsoft** has just announced its first flagship store outside the US would be in Sydney; the company said it was committed to being part of the fabric of the community and would offer training workshops and support STEM education.
- Recently, the **IBM** Foundation announced support for bringing its highly acclaimed P-TECH schools model to Australia, with pilots announced for Ballarat and Geelong in Victoria.



We could be doing much better

Despite these and other positive initiatives, Australia overall is lagging behind many of its OECD peers on a number of key indicators for STEM.

Year 12 participation in STEM subjects is declining. Over the twenty-year period from 1992 to 2012 there was a fall in participation of 11 per cent for intermediate mathematics,[19] 10 per cent for biology, 5 per cent for chemistry and 7 per cent for physics.[20]

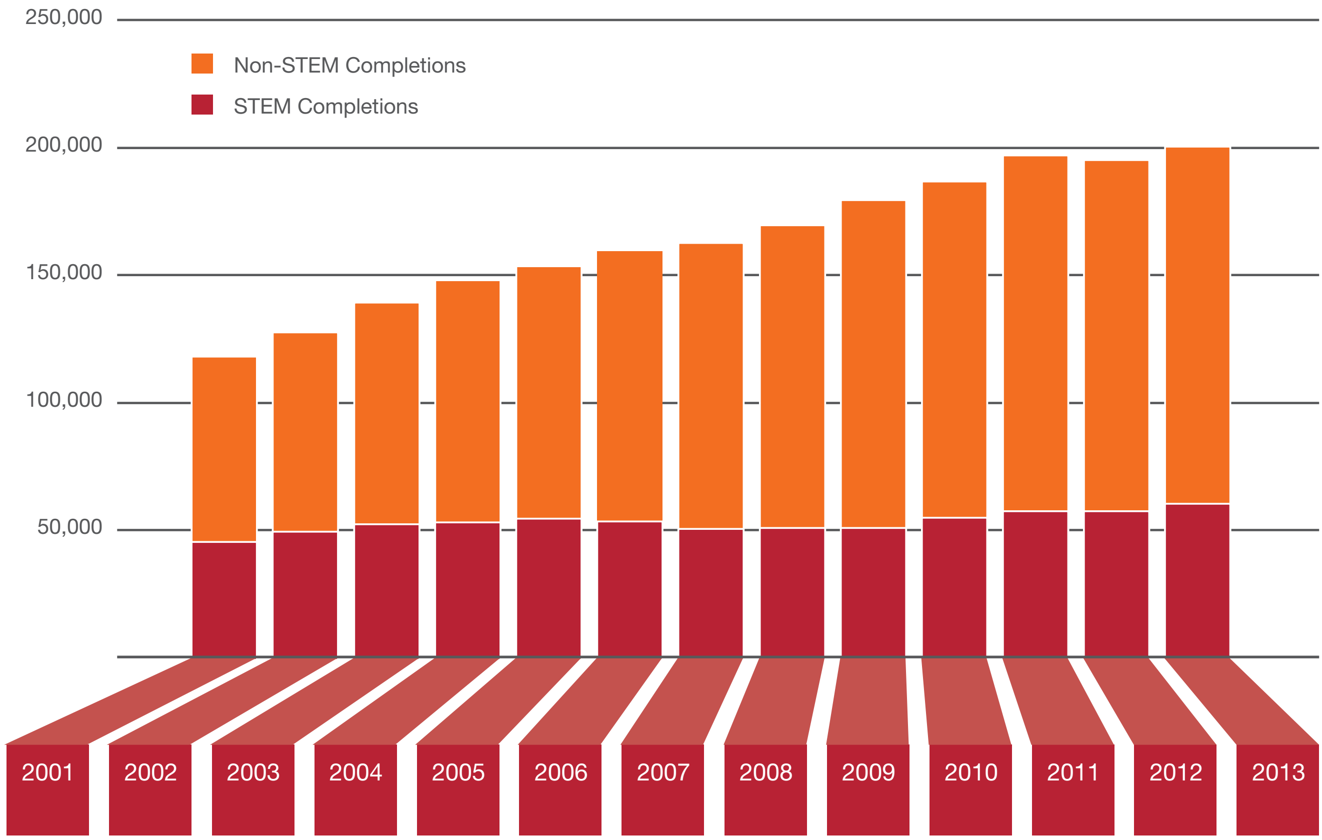
Enrolments and completions in university STEM courses have remained flat over the period 2001 to 2013. Non-STEM, on the other hand, has grown steadily.

In 2012 in the highly innovative manufacturing nation of Singapore, 52 per cent of university graduates were from a STEM-related course. In Australia the proportion was just 16 per cent.

While these results are a concern, it's important to recognise that education is one of a number of ways to boost STEM skills. Alternatively, Australian businesses could reskill current employees or bring talent in from overseas. In fact, it has been argued that at the global level, there's no shortage of STEM skills. Rather, there's just a location mismatch. For example, there may be a shortage of electrical engineers in the UK but a large and growing supply in India.

What is clear, however, is that the countries with a strong track record in innovation also tend to have a strong commitment to STEM education and as a result a strong pipeline of STEM workers.

Number of students completing degrees in STEM*



Source: Department of Education (C'th), PwC analysis.

*STEM qualifications includes degree completions in natural and physical sciences (including mathematics), information technology, engineers and related technologies, architecture and building, and agriculture, environmental and related studies.

The benefits of growing STEM

Growing STEM would help businesses meet workforce needs, better equip workers with vital skills for the future and drive innovation and productivity. It would also deliver economic growth and higher wages for STEM workers.

We know Australia needs to grow its STEM workforce. The shift away from mining-led growth to knowledge, services and construction is well underway. For example, the services industries account for the majority of the Australian economy.[21]

Additionally, Australia expects to spend over $100 billion in new infrastructure projects over the next five years. The demand for engineers and construction managers alone will be significant.

But what is an appropriate STEM target across the whole economy? We looked to countries considered to be leaders in STEM, to see what they consider reasonable targets for accelerated workforce growth.

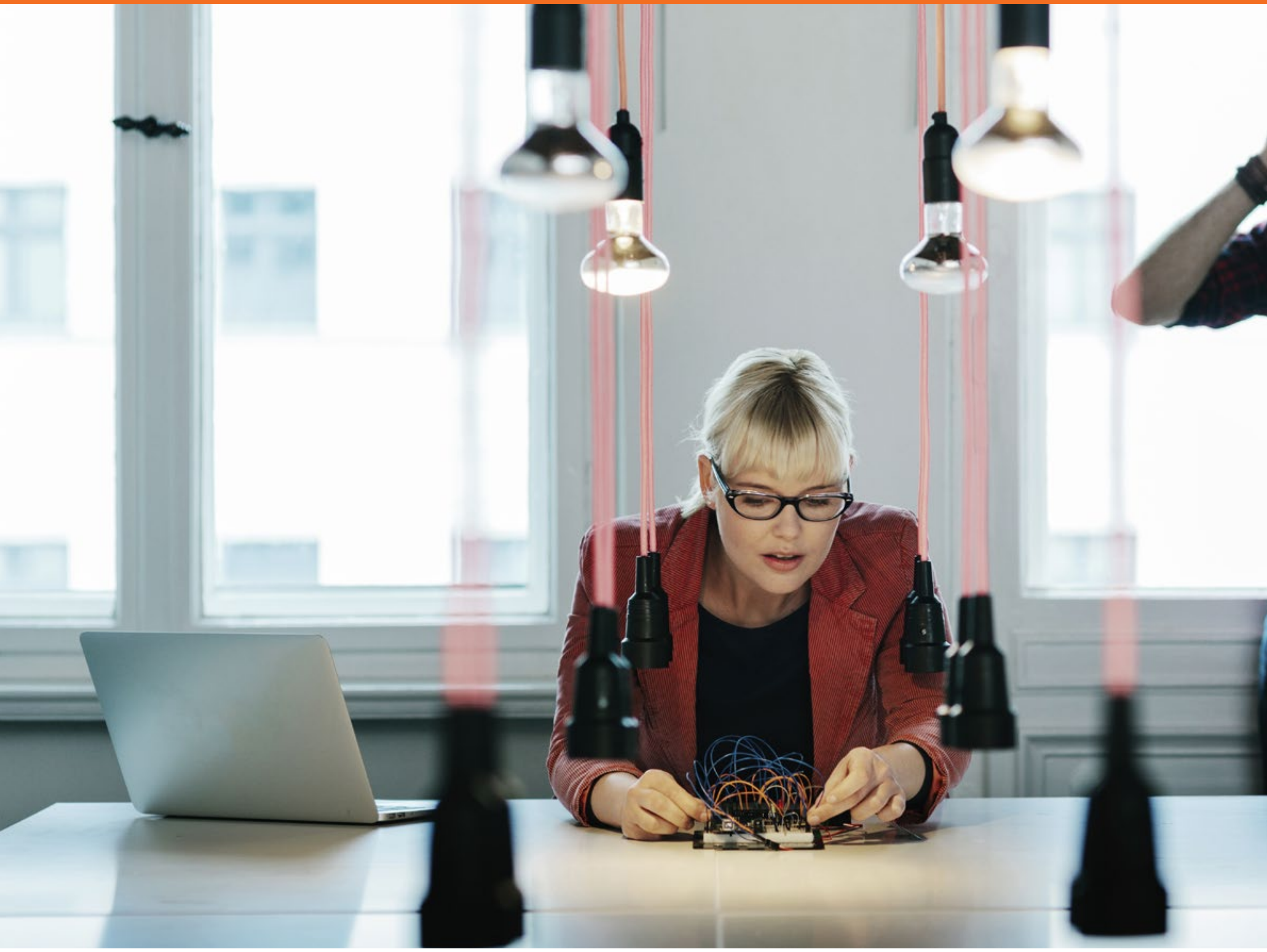
According to the European Centre for the Development of Vocational Training, demand for STEM skills in Germany could potentially be as high as 7.6 per cent more than forecast.[22]

Modelling by PwC shows that if Australia were to target a similar growth trajectory to compete with STEM leaders like Germany, 126,327 Australian workers – or 1 per cent of the current workforce – would need to move into more STEM occupations by 2035.[23]

This means that over and above the current expected number of graduates, we would need to train: an additional 20,500 new engineers, 17,500 business and system analysts and programmers, 13,500 construction, distribution and production managers, 12,000 natural and physical scientists, 9,500 architects, designers, planners and surveyors, and 53,000 workers in other STEM fields.

To put these numbers in perspective, in 2014 the University of Melbourne's Faculty of Science had 6,500 graduate and undergraduate students enrolled.[24] Australia would need at least another dedicated science faculty of comparable size to reach the STEM target.

The table on the following page shows the 10 STEM jobs that would grow the most if Australia met the accelerated STEM target.[25]



Top 10 jobs that need to grow to achieve STEM target by 2035

Job	Estimated baseline workers in 2035	Number of additional workers in 2035	Percentage growth
Engineering professionals	175,484	20,596	11.7%
Business and systems analysts, and programmers	186,631	17,672	9.5%
ICT network and support professionals	66,833	6,043	9.0%
Database and systems administrators, and ICT security specialists	46,805	3,861	8.2%
Natural and physical science professionals	149,009	11,856	8.0%
ICT and telecommunications technicians	82,102	5,803	7.1%
ICT managers	77,146	5,247	6.8%
Architects, designers, planners and surveyors	155,550	9,700	6.2%
Building and engineering technicians	164,930	8,348	5.1%
Construction, distribution and production managers	329,242	13,563	4.1%

Source: PwC

More STEM workers would deliver an economic boost

Growing Australia's STEM workforce would also deliver a sustained boost to the economy. This is because higher skill workers create more valuable goods and provide more valuable services than lower skilled workers. They can then sell these at higher real prices and command higher wages for doing so.

Modelling by PwC shows that if Australia were to develop a STEM workforce in line with other leading STEM countries, it would generate, in present value terms, an additional $57.4 billion in GDP over the next 20 years.

That's roughly equivalent to our motor vehicles and parts industry, and almost twice as big as our aircraft manufacturing industry.

While the benefit of this boost would be felt right across the economy, some industries stand to gain more than others. The professional, scientific and technical services industry would see the biggest gain with an additional $21 billion (net present value) of output. The benefit for the mining industry would be marginal given that the mining construction boom is now over and operations are not as heavily reliant on STEM occupations.

Benefit to key industries as a result of increasing the STEM workforce

Industry	Additional output (NPV, $AUD million) over and above baseline by 2035	Cumulative growth over and above baseline percentage
Professional, scientific and technical services	21,070	1.1%
Information media and telecommunications	4,821	0.6%
Financial and insurance services	12,013	0.5%
Construction	6,123	0.4%
Electricity, gas, water and waste services	1,539	0.3%
Manufacturing	4,107	0.2%
Wholesale trade	2,233	0.2%
Rental, hiring and real estate services	1,664	0.2%
Retail trade	1,321	0.2%
Administrative and support services	1,072	0.2%
Transport, postal and warehousing	1,018	0.1%
Public administration and safety	803	0.1%
Arts and recreation services	183	0.1%
Mining	378	0.0%

Source: PwC

Real wages growth for key STEM jobs

A stronger STEM workforce will also have a positive impact on wages growth. STEM occupations tend to be relatively higher paying, reflecting higher productivity; expanding the STEM workforce will result in a growth in higher paying jobs.

Engineers could expect to see an almost 2 per cent increase over and above baseline growth each year, with business and systems analysts and programmers enjoying 1.4 per cent annualised growth in wages above baseline.

For example, if Australia increased its STEM workforce in line with global peers, business and systems analysts and programmers on an average income of $100,000 in 2015 could expect to be earning $149,000 by 2035 - this would means be an additional $8000 per year, over and above projected wage growth.

Additional wages growth over 20 years if we increase the STEM workforce

Occupation	Cumulative growth over and above baseline percentage
Engineering professionals	1.8%
Business and systems analysts, and programmers	1.4%
ICT network and support professionals	1.3%
Database and systems administrators, and ICT security specialists	1.1%
Natural and physical science professionals	1.1%
ICT and telecommunications technicians	1.0%
Air and marine transport professionals	1.0%
ICT managers	1.0%
Architects, designers, planners and surveyors	0.8%
Building and engineering technicians	0.6%

Source: PwC

Australia stands to gain significant benefits by building the STEM workforce. But this will be no mean feat. Industries and institutions will need to create new STEM roles; workers will need to be re-skilled and redeployed.

So, how do we do it?

A framework for action

There are many voices in the STEM debate. What's clear is that no single group can solve the problem on its own. Business, government and educators need to plan and work together to create the STEM workforce Australia needs.

Business must play a leading role

Australian businesses already have an important role in building an innovation ecosystem through providing venture capital and R&D. But they also have a role to play when it comes to STEM education. After all, they will be the ones fighting for STEM talent if we continue down the path of flat growth. Here's how they can help.

Engage, influence and connect

Driving change through the education system is challenging. And in the case of STEM it needs to begin with a clear, shared understanding and belief in the importance of the challenge and the innovation outcomes we're striving for. This starts with more open discussions between business and education leaders.

Business also has the opportunity to better connect with students. This can be done by profiling emerging STEM careers, talking about workforce needs, offering workforce and internship experiences and breaking down the stereotypes and barriers that still remain today. It's not new, but scope exists for a much more coordinated approach to engaging with the potential STEM workforce.

In terms of policy reform, business is well placed to help move the agenda forward through thought leadership and advocacy. In particular, they can provide data and insights to help governments make evidence based policy decisions.

Innovate

Advances in technology have the potential to disrupt education in the same ways they are disrupting entire industries. Business is at the forefront of this change. How can they bring those skills to the table and combine it with the deep knowledge of our educators, to unearth new solutions in the challenge of educating to innovate?

Scale

While the importance of STEM has gained increasing prominence of late, the issue is not new. Many long-standing initiatives are in play and new ones are emerging. The challenge is not a lack of solutions but of identifying and scaling the solutions that can achieve rapid and national-level change.

Perhaps the most important role for business is to apply its expertise in growth and expansion, and in particular in adapting solutions to new markets.

The skills that business brings to the table include: evaluating initiatives likely to succeed, developing rapid scale solutions and mobilising resources to make change happen.

This is not just about identifying philanthropic programs for businesses to support. It's about creating an ecosystem of high potential commercial, semi-commercial and philanthropic solutions – both within and external to the education system.

The benefit of leadership on STEM

As digital technologies continue to disrupt, and as Australia looks for new avenues of growth, a growing number of businesses will be facing a STEM skills deficit. Business therefore needs to be part of a collective effort to create the scale of change required.

Those that engage now will be those that reap the rewards.

Methodology

PwC undertook computable general equilibrium (CGE) modelling to arrive at the conclusions contained in this report. CGE models recognise that complex macroeconomic mechanisms and inter-industry interactions exist in the economy. It can be used to estimate the direct, indirect and induced impacts of different STEM scenarios on the national economy, including on specific industries and occupations.

Endnotes

1 'Effects of integrative approaches among STEM subjects on students' learning', Becker, K. and Park, K., Journal of STEM Education Volume 12 – Issue 5 & 6, July-September 2011

2 Garnaut, R. (2013). 'Dog Days: Australia After the Boom', Redback Publishing, Collingwood, Victoria.

3 Minifie, J. (2013). 'The Mining Boom: Impacts and Prospects'.

4 McKinsey & Company, (2014), The Great Decoupling: The rapid advance of machine learning presents an economic paradox: productivity is rising, but employment may not, available at: http://www.mckinsey.com/insights/public_sector/the_great_decoupling.

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6 PwC (2014), Expanding Australia's Economy: How digital can drive the change, available at: http://www.pwc.com.au/consulting/assets/publications/Expanding-Australias-Economy-Apr14.pdf.

7 Carl Frey and Michael Osborne (2013), The Future of employment: How susceptible are jobs to computerisation? Oxford University,, available at http://www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment.pdf.

8 Frey and Osborne do not specify a specific timeline rather that "occupations are potentially automatable over some unspecified number of years, perhaps a decade or two".

9 This is not to say that jobs will no longer exist or that industries would disappears, rather it is indicative of where major impacts are likely to occur give the pace of technological development. Rather it is a continuation of a trend we are currently seeing in examples such as automated check-out systems replacing routine transactions; however, customer service still being performed by people.

10 PwC (2014), *Deciding with data How data-driven innovation is fuelling Australia's economic growth,* page 13, available at: http://www.digitalinnovation.pwc.com.au/digital-innovation-publications/

11 PwC (2014), *Expanding Australia's Economy: How digital can drive the change,* page 2, available at: http://www.digitalinnovation.pwc.com.au/digital-innovation-publications/

12 General Electric. (2013). 'GE Global Innovation Barometer: 2013 – Focus Australia'.

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14 'Effects of integrative approaches among STEM subjects on students' learning', Becker, K. and Park, K., Journal of STEM Education Volume 12 – Issue 5 & 6, July-September 2011

15 Prinsley, R. & Baranyai, K. (2015). *'STEM Skills in the Workforce: what do employers want'*

16 Ellen Kumata, consultant to Fortune 200 companies, as quoted by Tony Wagner, *Tony Wager's Seven Survival Skills – as defined by business leaders in their own words,* available at: http://www.tonywagner.com/7-survival-skills.

17 The Brookings Institute (2015), *Skills and Innovation Strategies to Strengthen U.S. Manufacturing Lessons from Germany,* page 7.

18 The Brookings Institute (2015), *Skills and Innovation Strategies to Strengthen U.S. Manufacturing Lessons from Germany,* page 7.

19 John Kennedy, Terry Lyons and Frances Quinn (2012), *The Continuing Decline of Science and Mathematics Enrolments in Australian High Schools, 60(2) Teaching Science,* pages 34-46. Research suggests that the divergence is explained largely due to a preference among year 12 students for selecting non-calculus based course work.

20 John Kennedy, Terry Lyons and Frances Quinn (2012), *The Continuing Decline of Science and Mathematics Enrolments in Australian High Schools, 60(2) Teaching Science,* pages 34-46.

21 Commonwealth Department of Industry (2014), *Australian Industry Report 2014: Highlights,* page 2.

22 European Centre for the Development of Vocational Training (2014), *Forecasting skill demand and supply,* available at: http://www.cedefop.europa.eu/en/events-and-projects/projects/forecasting-skill-demand-and-supply/skills-forecasts-detailed-data, last accessed 23 April 2015.

23 According to PwC baseline modelling, by 2035 Australia's workforce is expected to grow from 11 million workers to over 15 million. During that time the 'baseline' STEM workforce will continue to grow from 760,000 workers to over 1 million workers. To meet our accelerated target we will need an additional 126,327 people working in STEM occupations in addition to the baseline. This equates to approximately 1.1% of the current Australian workforce.

24 University of Melbourne (2015), Faculty of Science, About us, https://science.unimelb.edu.au/about-us.

25 Assuming a throughout of +6,300 students per year over the next 20 years (eg 6,300 x 20 = 126,000).

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