

Submission
No 42

INQUIRY INTO ARTIFICIAL INTELLIGENCE (AI) IN NEW SOUTH WALES

Organisation: NSW Productivity Commission

Date Received: 27 October 2023

27 October 2023

Re: NSW Parliamentary Inquiry into Artificial Intelligence

Chair of the Portfolio Committee No. 1 - Premier and Finance,

Thank you for the invitation to make a submission to the *Inquiry into Artificial Intelligence (AI) in New South Wales*. I am writing to provide a submission (Attachment A) on behalf of the NSW Productivity Commission ('the Commission').

Adaptive NSW provides a framework of guiding principles for policymakers thinking about emerging technology. These include aiming to be a fast technology adopter; attracting and fostering the core technology workforce; building all workers' adaptive capacity; and ensuring technology adoption and adaptation is inclusive.

The Commission's submission highlights insights from *Adaptive NSW* and other related work to respond to several items from the Inquiry's terms of reference, particularly around the current and future extent, nature, and impact of AI in New South Wales; and the social, economic, and technical opportunities, risks, and challenges it presents.

To better understand the research and modelling behind the NSW Productivity Commission's principles, *Adaptive NSW* can be downloaded from: <https://www.productivity.nsw.gov.au/adaptive-nsw-embracing-tech>

The NSW Productivity Commission's purpose is to provide evidence on opportunities to improve productivity. I note that neither *Adaptive NSW* nor my submission represent NSW Government policy.

Sincerely,

Peter Achterstraat AM
NSW Productivity Commissioner

NSW Parliamentary Inquiry into Artificial Intelligence

NSW Productivity Commission Submission

Friday, 27 October 2023

Executive Summary

Emerging technologies, like artificial intelligence (AI), have a large potential to make our future a better one. Modelling by the NSW Productivity Commission (NSW PC) and NSW Innovation and Productivity Council (NSW IPC) suggests that the wide adoption of emerging technologies could increase NSW's productivity growth rate to 2.0 per cent a year, and lift the growth rate of real Gross State Product to 3.0 per cent a year, to 2035.

The NSW PC and NSW IPC 2022 report *Adaptive NSW*, published in November 2022, provides a framework of guiding principles for policymakers who are thinking about emerging technology. These include aiming for NSW to be a fast technology adopter; attracting and fostering the core technology workforce; building all workers' adaptive capacity; and ensuring technology adoption and adaptation is inclusive.

The NSW PC's submission highlights insights and principles from *Adaptive NSW* and related work that are relevant to the Inquiry's terms of reference, including:

- (a) the current and future extent, nature and impact of AI in New South Wales
- (b) the social, economic and technical opportunities, risks and challenges presented by AI to the New South Wales community, government, economy and environment
- (d) the current and future extent, nature and impact of AI on the New South Wales labour market
- (e) the current and future extent, nature and impact of AI on social inclusion, equity, accessibility, cohesion and the disadvantaged
- (g) the current and future extent, nature and impact of AI on human rights and democratic institutions and processes in New South Wales
- (l) the successes and positive precedents experienced by other jurisdictions, both international and domestic, to better understand best practice
- (m) recommendations to manage the risks, seize the opportunities, and guide the potential use of AI by government.

The submission sets out the NSW PC's views in response to each of these topics.

Response to Terms of Reference, by term of reference

(a) The current and future extent, nature and impact of AI in New South Wales

Adaptive NSW contains whole-of-NSW-economy modelling on the potential impacts of emerging technologies on NSW economic growth, industry composition, skills, occupations, and workforce profile. It also contains case studies and high-level policy principles for managing risks/challenges and seizing the opportunities of emerging technologies.

Adaptive NSW models emerging technology diffusion scenarios using Faethm AI's Economic Scenario Model (FESM). The FESM:

- uses the O*NET taxonomy¹ to decompose jobs into tasks
- identifies which tasks have the potential to be augmented or automated by the four groups of emerging technologies – Broad AI, Narrow AI, Reinforced AI, and Programmed AI (see Table 1)
- allows the modelling of different technology adoption rate scenarios and assumes the speed of technology diffusion is relatively slow initially before accelerating to a maximum rate and then tapering off
- derives projected future demand for jobs, skills, and tasks by industry, and economic growth.

Table 1: Four types of emerging technologies that can enhance productivity

Technology Category	Description	Technologies	Examples
Broad AI	AI that can operate with no human input. These technologies perform unstructured tasks and engage with their environment using perception and sensory processing of external input data.	<ul style="list-style-type: none"> • Conversation exchange • Decision generation • Dextrous robotics • Sensory perception 	<ul style="list-style-type: none"> • Motion tracking • Safety monitoring • Automated medical diagnosis • Chatbots • Advanced manufacturing robots
Narrow AI	Semi-autonomous AI able to perform structured familiar tasks of a certain type when prompted.	<ul style="list-style-type: none"> • Predictive analysis • Recognition vision • Suggestion provision • Voice response 	<ul style="list-style-type: none"> • Database manipulation and visualisation • Facial recognition • Medical image recognition • Search engines
Reinforced AI	AI that can learn from trial and error to perceive and complete new tasks. They can operate in unfamiliar environments by using reinforced learning.	<ul style="list-style-type: none"> • Assistive robotics • Collaborative robotics • Creative origination 	<ul style="list-style-type: none"> • Production robots • Art generation software • Design simulation

¹ O*NET is a US-based occupational classification database. It decomposes more than one thousand occupations into knowledge, skills, abilities, activities, and tasks.

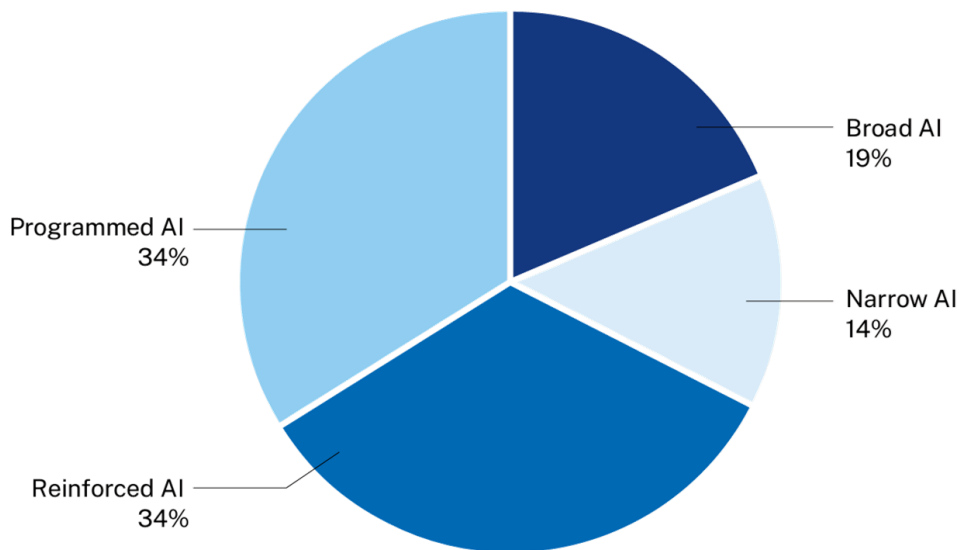
Technology Category	Description	Technologies	Examples
		<ul style="list-style-type: none"> Generative design Navigation robotics Solution discovery 	<ul style="list-style-type: none"> Aged care robots
Programmed AI	Pre-programmed intelligence relying on human input. They perform repetitive tasks by employing rules-based logic, processes, instructions, and simple robotics.	<ul style="list-style-type: none"> Fixed robotics Mobile robotics Process automation 	<ul style="list-style-type: none"> Robots assembling vehicle parts Autonomous warehouse picking robots Automatic HR and payroll processing

Source: Adaptive NSW, p. 33

While each of these emerging technologies could have broad applications across many industries if widely diffused, *Adaptive NSW* modelling suggests that Reinforced AI and Programmed AI have the largest potential to automate and augment work tasks in NSW by 2035 (see Figure 1).

Figure 1: Reinforced and Programmed AI will have the largest impact

Proportional impact of emerging technology types on 2021 work tasks by 2035, %



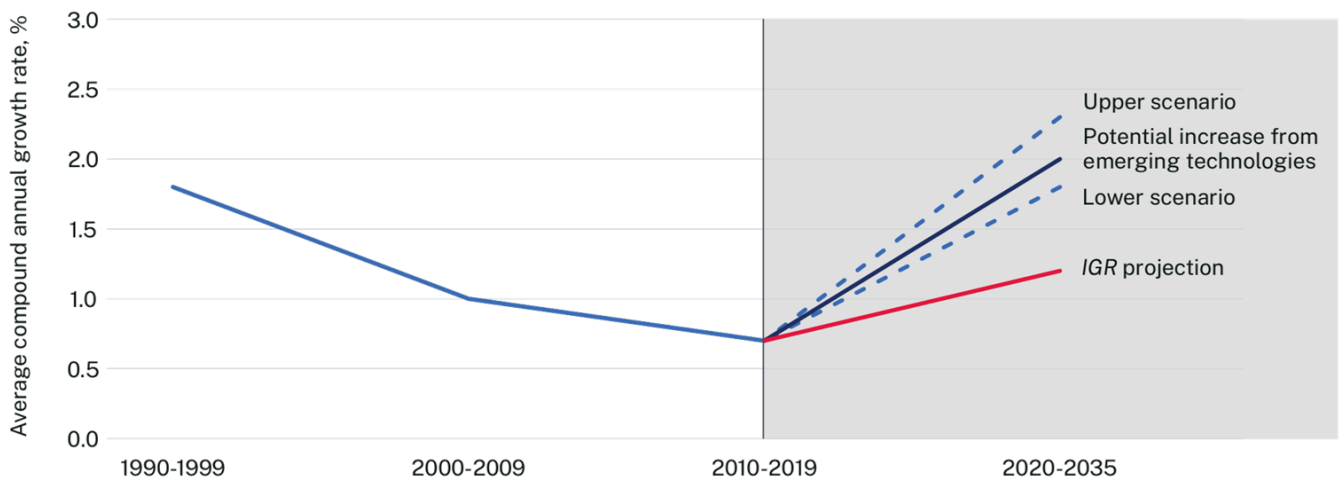
Source: Adaptive NSW, p. 34; NSW PC/ NSW IPC modelling (powered by Faethm AI)

The NSW PC's & NSW IPC's modelling suggests that if emerging technologies are widely adopted, by 2034-35 they could potentially:

- increase the productivity growth rate in New South Wales to 2.0 per cent a year and lift the growth rate of real Gross State Product to 3.0 per cent a year (see Figure 2)
- increase Gross State Product by 11.8 per cent, which is equivalent to an extra \$11,600 per person or \$27,400 per household (in real 2021-22 dollars)
- increase NSW government's own-source revenues by as much as \$4.5 billion relative to baseline projections presented in the 2021-22 NSW Intergenerational Report (IGR).

Figure 2: Emerging tech could recharge NSW's productivity and growth

Labour productivity average compound annual growth rate, 1990–2035



Note: The shaded area indicates the range of possible productivity growth rate scenarios from emerging technology diffusion.

Source: Adaptive NSW, p. 32; NSW PC/ NSW IPC modelling (powered by Faethm AI). 2021- 22 NSW Intergenerational Report

(b) The social, economic and technical opportunities, risks and challenges presented by AI to the New South Wales community, government, economy and environment

AI offers an enormous potential opportunity to recharge NSW's slowing productivity growth and drive a sustained improvement in our standards of living over the coming decades.

Productivity growth is key to driving economic growth and lifting living standards in the long run. As NSW Productivity Commissioner, Peter Achterstraat AM, commented in the *NSW Productivity Commission White Paper 2021, Rebooting the economy*:

Productivity growth offers the people of New South Wales important benefits: higher wages and output, greater business investment and employment, and a better quality of life. It makes our State a more attractive place to live, work, do business, and raise a family (NSW PC 2021, p. 5)

Over the last 20 years, however, there has been a slowdown in total factor productivity (TFP) growth across advanced economies. According to the *2021-22 NSW Intergenerational Report*, NSW's productivity growth was 0.9 per cent a year on average between 1999-2000 and 2018-19 (NSW Government 2021). The causes of the long-term decline are debated. Common explanations for the slowdown include mismeasurement issues, increased market power, reduced allocative efficiency, crisis-related scarring, and decreased spillovers from intangible capital (Jenner and Wheeler 2023).

More recently, labour productivity has decreased by 4.6 per cent in the 12 months to March 2023 (Commonwealth Productivity Commission 2023). The Commonwealth Productivity Commission (2023) attributes this decline to shorter-term factors like the unwinding of COVID-19 restrictions, as well as structural factors.

A recent NSW Treasury Technical Research Paper, *Trends in Productivity: What should we expect?* explores potential explanations for the productivity slowdown, and focuses on the possibility that standard productivity forecasting methods incorporate 'overly optimistic expectations' (Jenner and

Wheeler 2023, p. 1). Standard forecasting approaches assume that productivity grows exponentially, resulting in exponential economic growth. This exponential growth is at odds with the productivity slowdown seen in recent decades. Jenner and Wheeler (2023) apply an alternative model of productivity growth developed by Thomas Philippon, called the 'additive growth' model. Additive growth models predict that productivity growth tends to decrease over time, unless it is spurred by the diffusion of new general-purpose technologies, like electrification, information technology, or indeed AI. Jenner and Wheeler (2023) show that the additive growth model fits historical patterns of productivity growth seen in Australia better than standard models, and their work provides one plausible explanation for why productivity may have slowed down over time.

One implication of Jenner and Wheeler's work is that our future prosperity may be more dependent on adopting emerging general-purpose technologies like AI, than has previously been understood. They highlight how historical changes in the rate of productivity growth correspond with known waves of technological progress:

Philippon (2022) finds that TFP grows linearly within broad historical periods. At least for the United Kingdom, these periods correspond to 1650-1700 to 1830, 1830 to 1930, and 1930 until today.

Convincingly, these breaks correspond with known shifts in technological progress, such as the industrial revolution and the electrification of advanced economies. (Jenner and Wheeler 2023, p. 4)

Indeed, regardless of how productivity growth is modelled, historical experience has clearly shown that new waves of general-purpose technologies do have the potential to accelerate productivity growth for years or even decades into the future. It is hence plausible that emerging technologies like AI could be key to reversing the productivity slowdown we have recently seen. As Adaptive NSW states:

It is a mistake to assume recent slow productivity growth must continue forever. Historically, productivity growth has come in waves. We cannot predict when the next wave will come.

Productivity growth could continue to decline. But it is also possible that the world is now on the threshold of an enormous technology opportunity. There is a suite of emerging technologies that, if widely adopted, could recharge productivity growth for years to come. Among these technologies are artificial intelligence (AI), quantum computing, 3D printing, and autonomous vehicles. This wave of emerging technologies has been dubbed the Fourth Industrial Revolution or 'Industry 4.0'. (p.14)

Adaptive NSW notes that diffusion of these four groups of emerging technologies could represent a productivity boost comparable to the 1990s Information and Communication Technology (ICT) boom:

In our central modelling scenario, productivity growth would rise to levels not seen since the 1990s. And like the 1990's ICT boom, high productivity and economic growth rates would be sustained for several years, before things reverted to their previous trend.

Adaptive NSW outlines key principles for grasping the opportunities of AI and other emerging technologies. It finds that policy should be guided by an overarching aim **to be a fast tech adopter**. This involves focusing on facilitating the wider diffusion of labour-saving technologies that already exist and being a fast adopter of proven emerging technologies wherever in the world they are developed. NSW can achieve huge improvements in productivity just by adopting technologies and practices already used in other advanced economies. As the Commonwealth Productivity Commission has pointed out, 'on average it takes five days for an Australian worker to produce what a US worker can produce in four' (Commonwealth Productivity Commission 2020, p.8). Lifting NSW's productivity to that of the US would lift NSW residents' incomes by around 20 per cent (NSW PC2021, p. 29).

The Commonwealth Productivity Commission (2023) has again stressed the importance of fast technology adoption in its 5-year *Productivity Inquiry: Innovation for the 98%*. It stated:

'While novel, 'new-to-the-world', innovation is an important source of economic performance, it relates to only 1 to 2% of Australian firms. The slow accumulation of existing knowledge across the economy — diffusion — is often overlooked as a source of productivity. It has the scope to lift the performance of millions of businesses.' (p.1)

There are several recent examples of adopting emerging technologies in NSW on which to build. For example, the NSW PC and NSW IPC 's report, *NSW Remote Working Insights 2*, noted that Local Health Districts in New South Wales have recently moved towards greater use of virtual care — such as telehealth, videoconferencing, and remote monitoring.

Adaptive NSW also puts forward the following guiding principles for seizing the opportunities of AI and emerging technologies:

- **Favour policies to support tech adoption and adaptation.** This includes building trust with strong public sector governance, embracing tech to improve public services, and supporting private sector tech uptake through outcomes-focused, technology-neutral regulation that is regularly reviewed. For example, following the NSW Productivity Commission's report, *Lessons from COVID-19 Regulatory Relaxations*, the NSW Government decided to permanently retain temporary regulatory relaxations which allowed strata schemes to meet and vote electronically in response to COVID-19. This is an important illustration of how regulation can evolve to take advantage of new technology.
- **Attract and foster the tech-adoption workforce.** This includes nurturing entrepreneurship by creating a pro-entrepreneurship environment; fostering tech professionals by working with schools, higher education, and industry groups; and enticing the best and brightest from across the world by using strategic migration policies.
- **Intervene to support emerging industries only when there is a strong business case.** Government support for emerging technologies or industries can be part of the policy mix, but governments should always carefully consider the benefits and risks of providing such support. This includes assessing market failure arguments carefully before intervening and treating emerging industry arguments sceptically. Governments face a substantial risk of backing the wrong businesses or industries, and can manage these risks through strategies such as 'limiting investments to industries where there is a clear market failure, by limiting the size of investments in particular industries, using risk-sharing strategies, and by adopting a diversified portfolio approach.' (*Adaptive NSW*, p. 61). The NSW PC and NSW IPC provide further relevant guidance on these matters in *Adaptive NSW* (pp. 58-61).

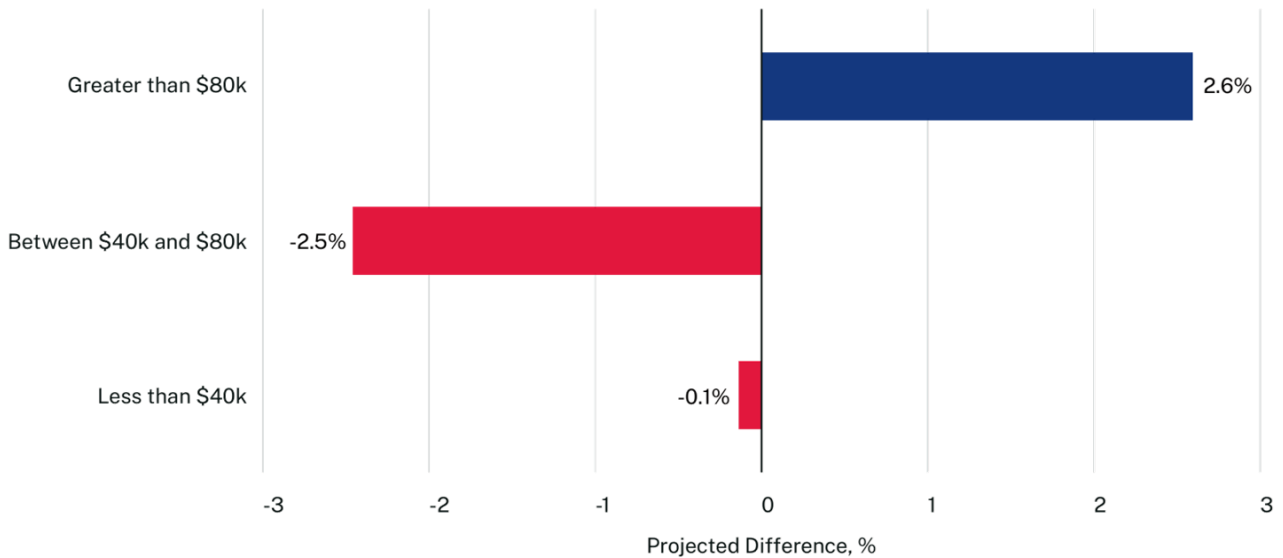
(d) The current and future extent, nature and impact of AI on the New South Wales labour market including potential changes in: (i) earnings, (ii) job security, (iii) employment type, (iv) employment status, (v) working patterns, (vi) skills and capabilities for the current and future workforce

(i) Earnings

Careful investment in emerging technologies and high-growth industries could increase employment in existing tech roles and create new high-skill, high-pay technology jobs in engineering, programming, data analytics and technical jobs to develop, maintain and administer technology (see Figure 3).

Figure 3: Emerging tech diffusion will increase the proportion of high-pay jobs

Projected difference in job demand by annual wages due to emerging technology diffusion, NSW, 2035



Source: Adaptive NSW, p. 40; NSW PC / NSW IPC modelling (powered by Faethm AI)

(ii) Job security

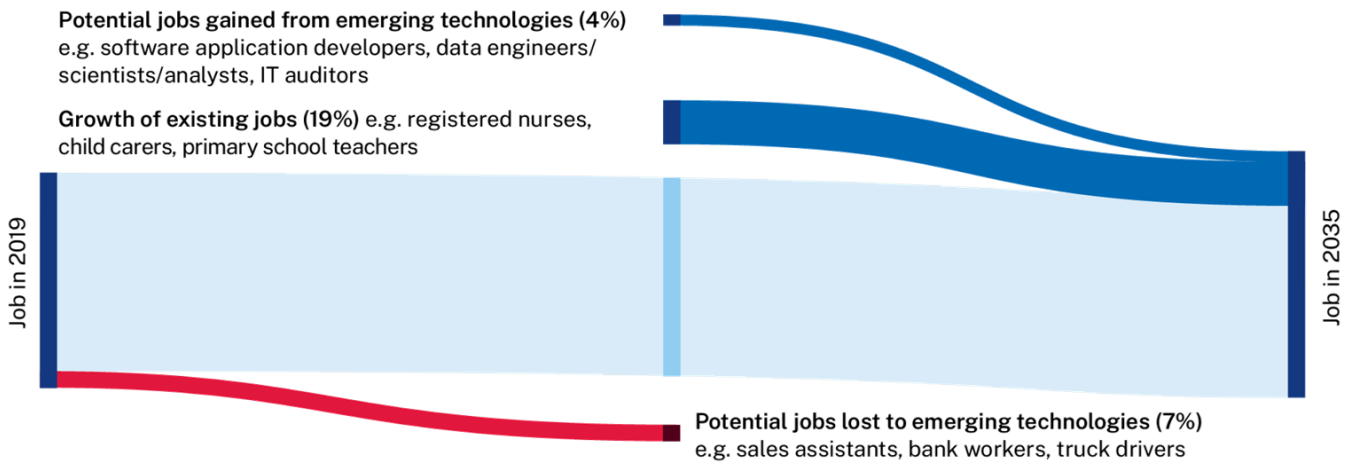
While public concerns around automation and job security are frequent, economists have found little evidence that technology causes long-term structural unemployment. This is because emerging technologies and automation tends to gradually change the work tasks within occupations rather than erase occupations entirely. The NSW PC and NSW IPC note that:

while some jobs will be entirely vulnerable to automation – estimates vary substantially from five per cent to 47 per cent of all jobs – it will not lead to widespread joblessness. This is because automation raises productivity, which increases the demand for workers performing non-automated tasks. (Adaptive NSW, p.35)

As shown in Figure 4, emerging technologies are expected to reduce demand for certain occupations – like sales assistants, bank workers, and truck drivers. However, this decrease is more than offset by the increasing demand associated with a growing economy and new jobs created to support emerging technologies – like software application developers and data engineers.

Figure 4: Emerging technology diffusion will result in more jobs overall

Predicted sources of job growth and job loss in NSW from emerging technology diffusion, 2019–2035



Source: Adaptive NSW, p. 35; NSW PC / NSW IPC modelling (powered by Faethm AI)

(iii) Employment type

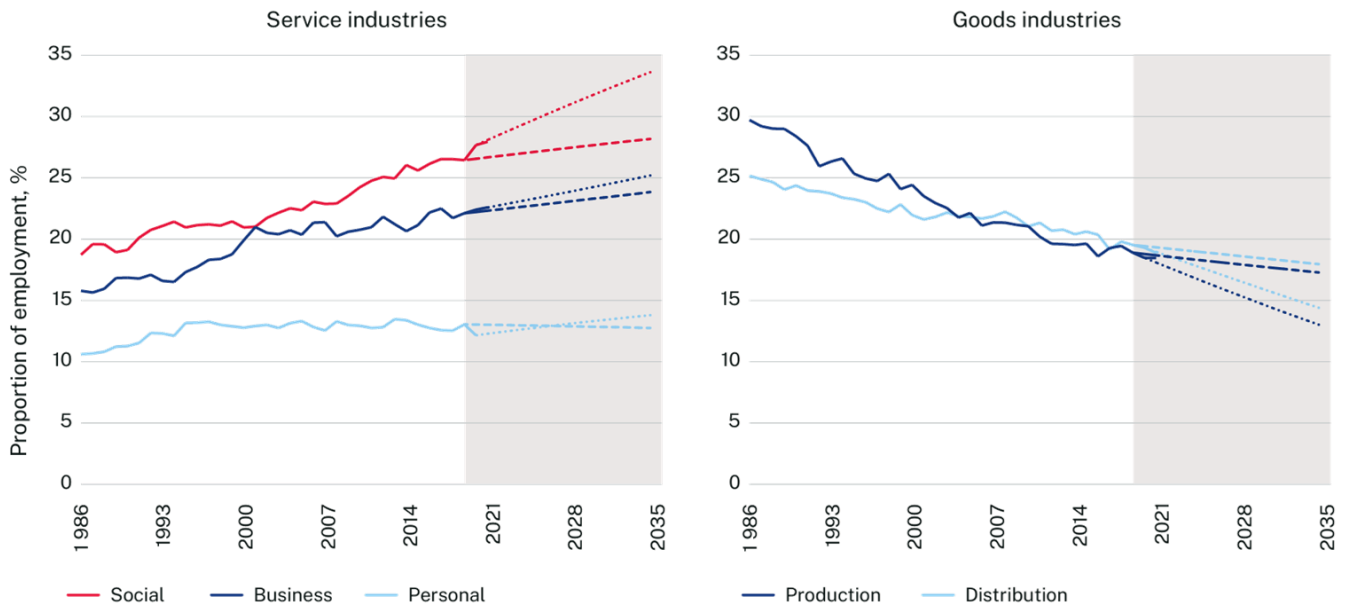
The creation of new, high skilled jobs associated with emerging technologies is expected to create multiplier effects throughout the economy, creating more jobs elsewhere. Research has shown that a large proportion of those jobs will be in services, with every high-skilled tech job creating up to five new local services.

Adaptive NSW notes that:

Services have been the main source of employment growth in NSW over recent decades. According to the IGR, the services sector is projected to make up 52 per cent of all jobs by 2035, up from 36 per cent in 1989–90 (NSW PC 2021). Emerging technology diffusion would lift the share of service employment even further (p.38) (see Figure 5).

While some of these service jobs already exist, others may be entirely new occupations created in healthcare and social assistance, education, arts, and recreation.

Figure 5: Emerging tech could further accelerate the growth of services jobs



Projected share of NSW employment by sector, 1986-2035

..... Dotted lines represent impact of emerging technology diffusion - - - - Dashed lines represent IGR projection

Note: IGR projection begins in 2018-19. The impact of emerging technology diffusion was projected from 2019-20.

Source: Adaptive NSW, p. 38; 2021-22 NSW Intergenerational Report, NSW PC / NSW IPC modelling (powered by Faethm AI)

(iv) Employment Status and (v) Working patterns

Emerging technologies will likely make work more flexible and hybrid.² Workers are increasingly pursuing ‘portfolio careers’, where they hold multiple roles at once, and participating in the workforce through different employment models such as casual and freelance ‘gig’ work.

Adaptive NSW notes that:

‘The gig economy is growing rapidly in size. In Australia, it grew ninefold between 2015 and 2019, to \$6.3 billion. It employs up to 250,000 workers. From 2018 to 2019, together with the Australian Capital Territory, the NSW gig economy grew by 31 per cent with 44 per cent of the population transacting through digital platforms.’ (p.42).

While the gig economy offers many positive and beneficial opportunities, it also creates competition and regulatory challenges. It raises new policy challenges around worker health and safety and industrial relations. These challenges are further discussed in section (e).

Additionally, the COVID-19 pandemic has meant that remote and hybrid working have become a major part of the post-COVID-19 economy. Remote and hybrid working offers opportunities to diversify NSW’s regional economies and break down barriers to workforce participation, for example, for carers and people with a disability.

(vi) Skills and capabilities for the current and future workforce

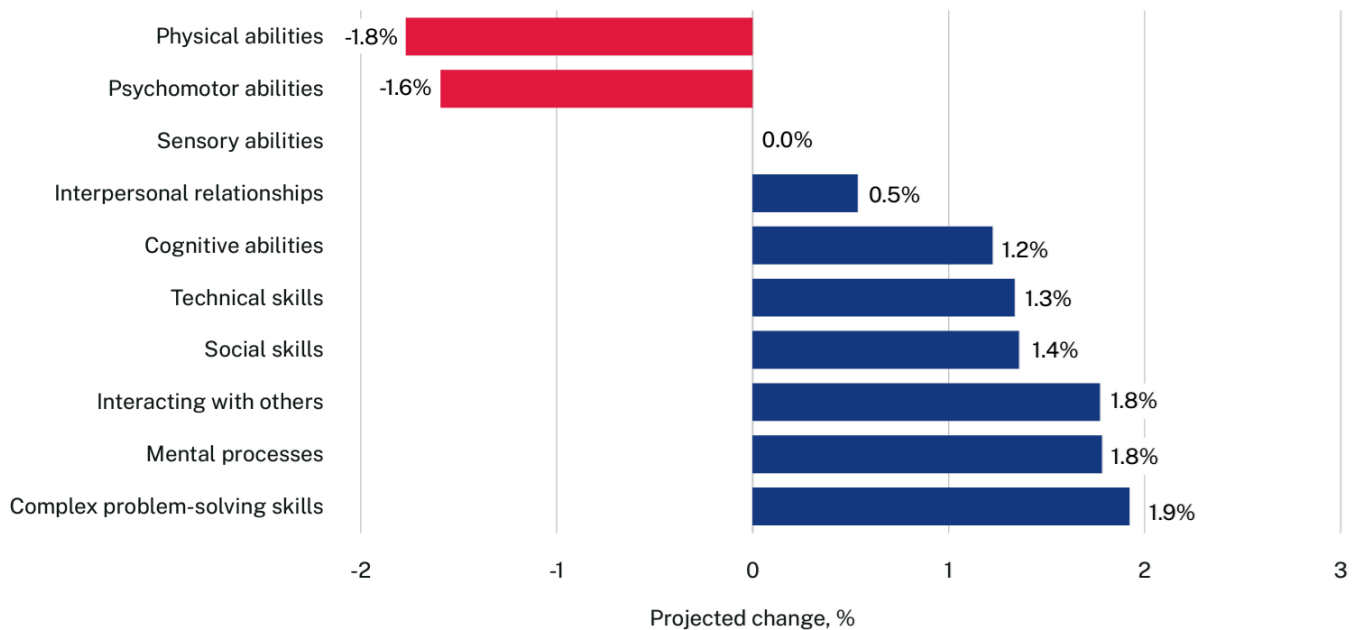
The adoption of emerging technologies is likely to accelerate the general trend away from repetitive, physically-demanding work. As technology has advanced over the decades, tools and

² The NSW Productivity Commission and NSW Innovation and Productivity Council (2021) define hybrid work as ‘a combination of on-site and remote work’ (p.6)

machinery have completely replaced certain tasks and reduced the time needed for others. As physically-demanding tasks are more likely to be repetitive, they are likely to be easier to automate. NSW PC and NSW IPC modelling shows that the diffusion of AI will reduce demand for physical skills and increase demand for complex problem-solving skills, cognitive abilities, and social skills (see Figure 6).

Figure 6: Emerging tech will accelerate the shift from physical to cognitive skills

Projected change in relative demand for skills and abilities due to emerging technology diffusion, NSW, 2035



Source: Adaptive NSW, p. 41; NSW PC / NSW IPC modelling (powered by Faethm AI)

The skills and capabilities needed to embrace new productivity-enhancing technologies will require permanent and long-term change. *Adaptive NSW* outlines some key strategies to promote workforce adaptation. These include:

- **Ensure workers are equipped with the skills of the future.** The skills that the general population will need to adapt well to technological change include foundational literacy, maths, and science skills; general digital literacy skills; and soft skills.
- **Use data and industry insights to keep training relevant and responsive.** As noted in *Adaptive NSW*, ‘governments need to stay across short-term shifts and fluctuations in demand for different skills to ensure the training system is responsive and delivers what the economy needs. This can be achieved using data and industry insights,’ (p.68).
- **Lower barriers to entry by combatting credentialism.** Credentialing plays a crucial role in the economy, ensuring that consumers, employers and workers can be confident that people have skills to perform their work safely and competently. However, as *Adaptive NSW* notes, ‘when training and qualifications requirements become unnecessarily onerous, expensive or lengthy – their costs outweigh their benefits – credentialing shades into credentialism. Credentialism prevents people from performing tasks they are capable of doing safely and competently. This can generate artificial skills shortages and drive up business costs, consumer prices, and the cost of delivering government services and infrastructure,’ (p.70). Addressing credentialism requires the ongoing review of qualification and occupational licensing requirements, as well as the structure and content of qualifications and mandatory training. Roles, scopes of practice, training requirements, and licencing requirements can be adjusted to ensure workers are able to

work to their full potential while maintaining standards of safety and competence. Addressing these issues often requires collaboration across state, territory, and Commonwealth regulators.

- **Create a system for continuous upskilling.** NSW needs to enable workers to upgrade skills and develop new capabilities to adapt to emerging technologies flexibly, rapidly, and successfully. The NSW vocational education and training (VET) system has a key role to play, with TAFE NSW at the heart of the system. The NSW Government has established a comprehensive NSW VET Review to provide insights and recommendations. Areas of focus for the review will include addressing the current and future skills needed for NSW, and meeting the needs of a changing landscape of jobs, skills needs, education, intersections and different models of delivery.
- **Create smooth and flexible pathways for multiple career transitions.** Research shows that young people will have significantly more careers over their lifetime than previous generations. Therefore, traditional education and training delivery models, that are designed for single-track careers, may not be as fit for purpose as they once were. *Adaptive NSW* notes, 'To prepare workers for multiple careers, governments can work together with employers to create smooth, flexible transitions between jobs and across a worker's life course,' (p.74). The insights and recommendations of the NSW VET Review may likewise be relevant here.
- **Give individuals the right incentives and information.** *Adaptive NSW* notes that 'while individuals need to be in the driver's seat of adaptation, the NSW Government can play a role in changing attitudes to upskilling and foster a growth mindset through targeted subsidies, training quality, and the provision of relevant information and support,' (p.75).
- **Make sure employers have incentives to train workers.** As noted in *Adaptive NSW*, employers have an important role in skilling workers, but their incentives to invest in employees' skills are limited by the risk of those employees' changing firms. And when employers do invest in workers' skills, they often aim to meet organisational needs in a relatively 'narrow, firm-specific, or reactive context', rather than having an incentive to build 'general, transferable skills' (p.77). Policy should consider how to give employers the right incentives to develop workers' skills.
- **Develop workforce strategies for growth sectors facing skills shortages.** Structural challenges in the workforce and labour market need to be tackled proactively. *Adaptive NSW* notes that workforce challenges 'can be created by technology – for example, technology use drives demand for ICT workers. Or they can arise from demographics – such as when an ageing population drives demand for aged-care workers,' (p.78). Government can be watchful to spot these challenges early and meet them with targeted workforce strategies.

(e) The current and future extent, nature and impact of AI on social inclusion, equity, accessibility, cohesion and the disadvantaged

It is important that the process of tech adoption and workforce adaptation is fair, inclusive, and effective. *Adaptive NSW* notes that:

Inclusive adaptation means that the benefits of technology are shared widely across the community. Inclusive adaptation is not about compensating those left behind in technological transitions. Nor will inclusive adaptation happen by itself. It requires active and judicious policymaking and management so that the many opportunities technology presents can be enjoyed by everyone. (p.84)

Adaptive NSW outlines relevant principles for inclusive technology adoption and adaptation. These include:

- **Ensure active and orderly industry transitions.** While technology adoption, in the long run, will create many more jobs than it destroys, certain industries will see a reduced demand for workers, and in certain cases, these can be spotted early and managed proactively where

necessary. *Adaptive NSW* notes, for example, that ‘employment will fall in industries associated with the production and distribution of goods, such as agriculture and mining. Meanwhile, demand for social and business services will increase.’ (p.85). By managing industry transitions more actively, the risk of harm to specific people and communities can be reduced.

- **Diversify our regions.** Regional areas that rely heavily on one or a few industries for employment are at greater risk of technological disruption than more diversified economies. As *Adaptive NSW* flags, regions vulnerable to industrial change may require ‘targeted policies to encourage diversification, technology uptake, and workforce flexibility’ (p.87). *NSW Remote Working Insights 2* finds that remote working can diversify employment in regional NSW by letting people live in regional areas while working for CBD-based businesses and giving regional employers access to larger talent pools. Additionally, ‘ensuring that basic infrastructure, such as stable and accessible internet, is widely available in regional areas, must be a priority that underpins any tailored policy approaches.’ (p.87). This is an area where the Commonwealth government also has an important role to play.
- **Use tech to broaden workforce participation.** Emerging technologies can reduce barriers to workforce participation by making work tasks less physically demanding, creating virtual mobility, increasing flexibility, and breaking down barriers to entry. For example, emerging technologies may mean people with limited mobility – due to age, disability, caring commitments, or geographical locations – can participate in the workforce.
- **Expand access and close the digital divide.** While emerging technologies have vast potential benefits, they need to be implemented in a way that is sensitive to the digital divide – that is, ‘the gap between those who do and do not have the essential digital skills and affordable access to devices and data they need.’ (p. 90). Policy should consider how to promote digital inclusion for at-risk groups, including people with low level of income, education, or employment, culturally and linguistically diverse people, First Nations people, and those living in particularly rural or remote areas.
- **Distribute the benefits of tech widely.** Emerging technologies have the potential to increase the size of the economic pie, but this may also affect how that pie is distributed. *Adaptive NSW* notes that ‘to garner community support for emerging technology diffusion, governments should proactively consider the distributional impacts of technological advancement and, where appropriate, intervene to ensure that the benefits are shared widely.’ (p. 91).
- **Ensure appropriate protections exist for workers.** New technological platforms have brought an increase in the number of workers participating in the gig economy. This presents new policy challenges in areas such as industrial relations, competition and work health and safety. These challenges can require action or collaboration at more than one level of government. But as noted in *Adaptive NSW*, ‘[w]ithout appropriate regulation, there is a real risk that, particularly for vulnerable workers, the gig economy could erode conditions that workers in NSW currently enjoy. This also risks undermining community support for the gig economy and the technologies that support it.’ (p. 94). Therefore, it is essential to ‘strike a careful balance between ensuring adequate worker protections and allowing workers, entrepreneurs, and consumers to benefit from the growth of the sector.’ (p. 94).

(g) The current and future extent, nature and impact of AI on human rights and democratic institutions and processes in New South Wales

While AI has a huge potential to provide better, cheaper public services, *Adaptive NSW* notes that rushed adoption has a real potential to do harm, damaging public trust in government and preventing uptake in the long term. It is important to implement AI and other emerging technologies

in ways that build community trust and acceptance, and especially to ensure that automated processes are fair and unbiased (*Adaptive NSW*, p.48).

Adaptive NSW notes that even unintentional mistakes can erode public confidence in the government's use of technology — as demonstrated by the use of predictive policing in the United States:

In 2013, the US states of California, Florida, and Maryland implemented PredPol, a predictive policing software. PredPol used data and machine learning to inform how and to which locations law enforcement officers would be deployed. PredPol was intended to help prevent urban crime and ensure impartial, evidence-based policing decisions.

In practice, however, PredPol's algorithms inaccurately predicted true crime rates. It sent law enforcement officers to neighbourhoods which typically had low-level crime but higher proportions of racial minorities.

It did this because it relied on historical data about previous arrests, which were greater in areas where more police had been deployed in the past.

*Instead of solving the issue of human and racial bias in policing, as was intended, PredPol reinforced biases that had been made in the past. This example shows how poorly-designed and poorly-managed automation can erode public trust in new, productivity-enhancing technologies — and in the governments and agencies that invest in and implement them. Mistrust in governance can then act as barrier to the development and adoption of further innovations. (*Adaptive NSW*, p.49)*

Alongside the challenges of successfully implementing AI to improve public services, governments also have the task of providing appropriate regulatory frameworks for private uses of AI and other emerging technologies. This requires developing regulatory frameworks that manage the risks involved without stifling the potential benefits. *Adaptive NSW* supports the appropriate use of regulatory experimentation to proactively accommodate AI and test AI applications in a controlled environment via regulatory sandboxing.

Spain launched an AI regulatory sandbox in 2022 as the first test of the future European Union Artificial Intelligence Act (OECD 2023), funded by the Spanish government's recovery and resilience funds as part of the Spanish National AI strategy (Holistic AI 2023). The United Kingdom (UK) Financial Conduct Authority (FCA) Regulatory Sandbox allows the testing of AI applications in financial services in a controlled environment and supports firms to identify appropriate consumer protection safeguards that can be built into new products and services (UK FCA 2022).

(l) The successes and positive precedents experienced by other jurisdictions, both international and domestic, to better understand best practice

Adaptive NSW notes an example of AI being successfully implemented in another jurisdiction — the use of autonomous robots to deliver social and physical care to residents in aged-care facilities in Japan:

robotic companion and conversation partners — provide communication stimuli and emotional responses to participants. These can take the form of animals or even humans for residents to hug and interact with

smart walkers — rehabilitate and assist those who have difficulty walking

mechanical lifting devices — assist staff in lifting, positioning, and turning residents, the source of most injuries in the sector. (p.81)

(m) Recommendations to manage the risks, seize the opportunities, and guide the potential use of AI by government

Discussed in Sections (b), (d) and (e).

Reference list

- Commonwealth Productivity Commission. 2020. 'Can Australia be a productivity leader?'. PC Productivity Insights March (2). <https://www.pc.gov.au/ongoing/productivity-insights/australia-leader/productivity-insights-2020-australia-leader.pdf>
- Commonwealth Productivity Commission. 2023. '5-year Productivity Inquiry: Innovation for the 98%'. <https://www.pc.gov.au/inquiries/completed/productivity/report>
- Commonwealth Productivity Commission. 2023. 'Bulletin 2023: PC Productivity Insights'. <https://www.pc.gov.au/ongoing/productivity-insights/bulletins/bulletin-2023>
- Holistic AI. 2023. 'AI Regulation Around the World: Spain'. <https://www.holisticai.com/blog/spain-ai-regulation#:~:text=Spain's%20regulatory%20sandbox%20for%20the,the%20supervision%20of%20relevant%20authorities>
- Jenner, Keaton, Angus Wheeler. 2023. 'Trends in productivity: What should we expect?'. Treasury Technical Research Paper. <https://www.treasury.nsw.gov.au/documents/trp23-07-trends-productivity-what-should-we-expect>
- NSW Government. 2021. '2021-22 NSW Intergenerational Report'. <https://www.treasury.nsw.gov.au/nsw-economy/2021-22-nsw-intergenerational-report>
- NSW Productivity Commission (NSW PC). 2021. 'White Paper 2021: Rebooting the economy'. <https://www.productivity.nsw.gov.au/white-paper>
- NSW Productivity Commission (NSW PC). 2022. 'Lessons from COVID-19 Regulatory Relaxations'. <https://www.productivity.nsw.gov.au/lessons-from-covid19-regulatory-relaxations>
- NSW Productivity Commission and NSW Innovation and Productivity Council. 2021. 'NSW Remote Working Insights 2: Why hybrid is here to stay and how to seize the opportunities'. <https://www.productivity.nsw.gov.au/nsw-remote-working-insights>
- NSW Productivity Commission and NSW Innovation and Productivity Council. 2022. 'Adaptive NSW: how embracing tech could recharge our prosperity'. <https://www.productivity.nsw.gov.au/adaptive-nsw-embracing-tech>
- The Organisation for Economic Cooperation and Development (OECD). 2023. 'Regulatory Sandboxes in Artificial Intelligence'. https://www.oecd-ilibrary.org/science-and-technology/regulatory-sandboxes-in-artificial-intelligence_8f80a0e6-en;jsessionid=J322_Q_E0y5zyTfDk3owkINurO4tOuBP7joFv7K7.ip-10-240-5-165
- United Kingdom (UK) Financial Conduct Authority (FCA). 2022. 'Regulatory Sandbox'. <https://www.fca.org.uk/firms/innovation/regulatory-sandbox>