

National Industry Insights Report

2021/22 National Overview

This document is a print friendly version of the National Overview section of the National Industry Insights Report website. The National Overview can be viewed online at <<u>https://nationalindustryinsights.aisc.net.au/national</u>>.

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The National Skills Overview provides high-level analysis of industry skills needs, and the factors and trends affecting the demand for skills at a national and cross-industry level.

The overview draws on Industry Reference Committee (IRC) Skills Forecasts, Industry Outlooks and Proposed Schedules of Work, alongside other relevant industry literature. It supports the design and development of training packages that meet the current and future skills needs of industry.

The overview links cross-industry analysis on skills needs with the activities and initiatives of the Australian Industry and Skills Committee and its network of Industry Reference Committees. It comprises four key sections which are detailed below:

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Insights and highlights

Overview

This section provides a summary of five skills that were highly prioritised by industry, the factors and trends which affect the demand for these skills, and key initiatives underway which aim to address skills needs.

Drawing on information from the Industry Reference Committee (IRC) Skills Forecasts and Industry Outlooks from 2021, alongside other relevant industry literature, this section identifies which skill areas were prioritised by industries. The skills set out in the **Future skills and training: A practical resource to help identify future skills and training** report have been used as a framework for organising these skill areas.

It is evident from the analysis that there is a huge industry demand for cross-sector skills such as adaptability, analytical, digital, and collaboration skills.

Given the ever-evolving challenges that industry face due to factors such as structural change, economic cycles, changing markets, emerging technologies, and the impacts of a global pandemic, these transferable cross-sector skills are critical for ensuring Australia's workforce can adapt to the ever-changing environment.

In addition, industry and occupational-specific skills remain a priority for all industries, with many industries identifying key technical skills in demand. These specific skills for specific jobs remain an integral part of Australia's vocational education and training system.

For more detailed analysis on each of the eleven priority skill areas and industry demand please visit the **Priority skills** page. For more information on the factors driving demand for skills, please visit the **Factors and trends** page, and to find out about cross-sector projects and training package development work underway, please visit the **Key initiatives** page.

Five skills that were highly prioritised by industry are summarised on the following pages.

Adaptability skills

As emerging technologies and changing job requirements constantly create demand for skills, workers must enhance their ability to adapt to new situations and acquire new skills. In addition, as the world of work becomes more flexible, individuals are expected to take more responsibility for their own skill development.

PRIORITY SKILLS

Skills identified by industry

- Being adaptable to changes
- Changing skill needs arising from new technologies
- Emotional intelligence
- Resilience, stress tolerance and flexibility
- Self-management.

FACTORS AND TRENDS

Driving demand for skills

- Artificial intelligence and machine learning
- Augmented Reality and Virtual Reality
- Automation and robotics
- Big data and data analytics
- Demand for care-related services and products
- Demographic changes
- Digitalisation and the 'internet of things'
- Emerging markets
- Emerging technologies
- Empowered customers, and changing work and career values
- Globalisation and its impact on mobility, migration and international markets
- Complex regulatory environment
- Increasing participation by equity groups
- International and domestic sustainability action
- Policy environment
- Political appetite for reform
- Skills mismatch, shortages or gaps
- Technologically advanced materials and products.

COVID-19 impact

Adaptability was a key skill utilised in response to the pandemic, shown by:

- Education providers rapidly deploying online instruction and students transitioning to online learning
- Industry responses to border closures that restricted fly-in-fly-out work arrangements, skilled migration and business travel.
- High compliance rates from businesses and citizens to COVID-19 government directions.
- The volume of businesses that reported successful transitions to remote working.

Adaptability skills (including self-management and flexibility) will remain highly regarded due to the unpredictable nature of COVID-19. These skills will be vital as industry implements further changes in response to the pandemic and attempts to take advantage of any opportunities that may be presented.



Those able to collaborate and share information are best able to adapt to changing markets and technologies, interact in diverse workplaces, and effectively respond to customer needs. Skills that enhance collaboration include communication and teamwork skills, relationship management, emotional intelligence, and social and cultural awareness.

PRIORITY SKILLS

Skills identified by industry

- Communication skills
- Conflict resolution
- Cultural and global awareness
- Customer service
- Emotional intelligence
- Relationship management
- Social perceptiveness and competence
- Teamwork.

FACTORS AND TRENDS

Driving demand for skills

- Access to quality internet
- Changing work and career values
- Changing workplace dynamics
- Demographic change
- Digitalisation of the workplace
- Emerging markets
- Global mobility
- Growing demand for care-related services and products
- Increased participation by equity groups
- Innovation ahead of regulation
- Sustainability action, driving the demand for more sustainable products and services
- Technological change.

COVID-19 impact

- Virtual collaboration became the 'new normal', involving a massive increase in the uptake of digital collaboration tools and rapid upskilling for workers.
- Strong teamwork skills and emotional intelligence were vital as people transitioned to new ways of working and studying.
- Communication skills were key to successful relationship building and management with customers, and messaging from leaders and between colleagues.



Data is becoming increasingly available, with 'big data' derived from online activity, sensors, the 'internet of things', new analytical tools, and artificial intelligence. With this, comes an expectation that workers in almost all industries, and across most roles, will be able to use available data to derive value, and improve products and services.

This may require the ability to analyse and present raw data or to interpret data analysis and apply findings. It may also involve other skills, such as data management, information literacy, problem-solving, critical thinking, and creative thinking.

PRIORITY SKILLS

Skills identified by industry

- Analytical thinking
- Complex problem solving
- Creativity, and creative problem solving
- Critical thinking
- Data analysis
- Diagnosis, analysis and evaluation skills
- General analytical skills
- Identifying, locating, interpreting and evaluating information
- Innovation.

FACTORS AND TRENDS

Driving demand for skills

- Artificial intelligence and machine learning
- Augmented Reality and Virtual Reality
- Big data and data analytics
- Cross-disciplinary science
- Digitalisation and the 'internet of things'
- Emerging technologies
- Start-up thinking.

COVID-19 impact

- A key impact generated by the COVID-19 pandemic has been the rapid digitalisation in the way businesses deliver their products and services this trend has driven demand for data analysis skills
- The pandemic has also created demand for problem-solving skills as industries have grappled with challenges such as supply chain issues and disruption in normal services.



Digital skills

In a world of rapid technological expansion affecting all industries, it is vital to have an agile workforce, with the skills to drive and adapt to modern technologies. Digital skills include coding and programming, development and use of robotic and automation technologies, leveraging ICT skills in business, and exploring the world of cloud computing and the 'internet of things'.

PRIORITY SKILLS

Skills identified by industry

- Automated design
- Coding and programming
- Cyber security skills
- Data analysis
- Digital literacy
- Digital skills relating to industry specific software and technology
- Information and communication technology skills
- Understanding and working with automation.

FACTORS AND TRENDS

Driving demand for skills

- Access to quality internet
- Artificial Intelligence and machine learning
- Automation and robotics
- Big data and data analytics
- Changing workplace dynamics
- Digitisation and 'Internet of Things'
- Emerging or changing markets
- Emerging technology
- Empowered customers
- Increase in jobs requiring computer skills
- Mobility and connectivity
- More technologically advanced materials and products.

COVID-19 impact

Digital skills have been vital as Australian businesses adapted to new ways of working considering the COVID-19 pandemic:

- A decade of digital transformation was achieved within a few months.
- Changes in the way businesses operate have driven advances in technology
- With increased government assistance for upskilling and reskilling in digital skill areas.
- Increase in remote working arrangements
- Endorsement of new skill sets for the ICT sector and small business.



Industry and occupation skills refer to specific skills that various IRCs have identified as being a priority for their industry. These skills vary from industry to industry, and they are unpacked further on the Priority skills page.

PRIORITY SKILLS

Skills identified by industry

- Cross-industry skills and trades
- Industry or occupation-specific skills
- Industry or occupation-specific knowledge, including technical, product and market-related knowledge
- Understanding and use of equipment or technology.

FACTORS AND TRENDS

Driving demand for skills

- Attracting and retaining a workforce
- Automation and robotics
- Big data and data analytics
- Demographic changes, and their impact on workforce and markets (adaptability)
- Digitisation and the Internet of Things
- Emerging or changing markets
- Emerging technologies
- Policy environment
- Complex regulatory environment
- Skills mismatch, shortages or gaps
- Sustainability action, driving the demand for more sustainable products and services.

COVID-19 impact

The COVID-19 pandemic amplified industry specific and cross-industry skills demand in particular areas including:

- artificial intelligence, data science, cloud computing, Internet of Things, robotics, and cybersecurity
- web development, customer experience and social media skills
- supply chain management
- health and safety, particularly infection control
- risk management and strategic planning.

Factors and trends

Overview

This section examines some of the high-level factors and trends which influence and drive the demand for skills.

This information includes economic conditions and trends in the labour market, as well as other factors such as changes in society and culture, business and market, advancements in technology, implications arising from climate change, increasing emphasis on sustainable environmental practices, and policy and regulatory requirements.

All data on this page should be considered in the context of the ongoing COVID-19 pandemic, which may impact key measures.

Drawing on information from the Industry Reference Committee (IRC) Skills Forecasts and Industry Outlooks from 2021, alongside other relevant industry literature, this section identifies which factors are having a greater impact across industries.

The report **Future skills and training: A practical resource to help identify future skills and training** provides more detail on some of the factors listed above and is available on the Australian Industry and Skills Committee (AISC) website.

Factors identified as having the greatest impact on industry are:



Economic conditions

Despite the ongoing challenges of the COVID-19 pandemic Australia continues to experience growth and low unemployment. In 2021, the top three industries contributing to this growth were:

- Mining
- Health care and social assistance
- Financial and insurance services.



Aug 2021

Unemployment	Underemployment
• 4.6% overall	• 9.1% overall
• 10.2% for 15-24 year olds	• 16.6% for 15-24 year olds



Industry employment level



Employment grew in absolute numbers for most industries between 2001 and 2021. The exceptions are Agriculture, Forestry and Fishing; Manufacturing; and Information Media and Telecommunications industries, which saw a decline in their workforce over this period.

The COVID-19 pandemic which began in 2019 initially had a significant negative impact on the Australian labour market due to social and economic restrictions imposed by governments to control the spread of the virus. Since then, as restrictions have eased, the labour market has bounced back strongly although the recovery has varied widely by industry. Industries that have seen the largest percentage decline in employment numbers between 2019 and 2021 are:

- Arts and Recreation Services (-16.6%),
- Wholesale trade (-14.2%),
- Administrative and Support Services (-12.9%).

Industries with the largest percentage increase in employment numbers between 2019 and 2021 are:

- Financial and Insurance Services (17.4%),
- Mining (12.7%),
- Manufacturing (11.2%).



Employment projections

Projected employment growth five years to November 2025 by industry (%)

Employment levels are projected to increase in most industries over the next few years to 2025. The exceptions being Information Media and Telecommunications, and Manufacturing. Industries with the largest projected percentage employment growth from November 2020 to November 2025 are:

- Accommodation and Food Services (16.8%)
- Health Care and Social Assistance (14.2%)
- Professional, Scientific and Technical Services (11.0%).
- The projections for the three industries above equate to approximately 520 500 additional workers.

Industry and occupational structural change

Agriculture, Forestry and Fishing Mining Manufacturing Electricity, Gas, Water and Waste Services Construction Wholesale Trade Retail Trade Accommodation and Food Services Transport, Postal and Warehousing Information Media and Telecommunications Financial and Insurance Services Rental, Hiring and Real Estate Services Professional, Scientific and Technical Services Administrative and Support Services Public Administration and Safety Education and Training Health Care and Social Assistance Arts and Recreation Services Other Services 0 % point change between 2001 and 2021

Industry structure

Change in total employment share 2001-2021 by industry, August quarter (% points)

Occupation structure

Change in total employment share 2001-2021 by occupation major group, August quarter (% points)



Employment status

Change in part-time share of total employment 2001-2021 by industry (% points)



There is an evident shift in industry structure. The industries with the largest decline between 2001 and 2021 (in terms of share of total employment) are:

- Manufacturing (4.1 percentage points)
- Agriculture, Forestry and Fishing (2.5 percentage points)
- Retail Trade (1.9 percentage points).

The industries with the largest increases in share of total employment have been:

- Health Care and Social Assistance (4.8 percentage points)
- Professional, Scientific and Technical Services (2.6 percentage points)
- Education and Training (1.2 percentage points).

Within these three industries, and noting that over this time the number of people employed across all industries has grown by 41%, some of the industry sectors with the largest growth are:



The occupational structure of the labour market has also changed over the same period, with higher-level skills increasingly more in demand. The occupation grouping with the largest growth is Professionals (increasing their share by 6.7 percentage points). The second-largest increase is Community and Personal Service Workers (increasing its share by 2.2 percentage points).

The occupational groupings with the largest decline in labour market share between 2001 and 2021 were Clerical and Administrative Workers (-3.2 percentage points), and Labourers (-2.5 percentage points). This reflects the global trend of increasing automation and efficiency for entry-level administrative or manual labouring positions that are characterised by repetitive tasks.

Within the Community and Personal Service Workers category, for occupations where there were at least 20,000 people employed in 2021, the largest percentage increases between 2001 and 2021 are:



In terms of numbers employed, however, the largest increases were:



In most industries, part-time employment is also growing. The industries with the largest increases in part-time employment (as a proportion of total employment between 2001 and 2021) were Accommodation and Food Services (12.8 percentage point increase), and Manufacturing (6.2 percentage point increase). The industry with the largest decrease in the proportion of part-time workers was Financial and Insurance Services (-3.0 percentage points).

Demographic trends

Australia's ageing population has led to an increasing share of older workers, however this trend varies widely across industries. For example, in 2021, more than half of Agriculture, Forestry and Fishing workers were 50 years or older (53.7%), in contrast, only 14.7% of Accommodation and Food Services workers were aged 50 or over. In total there were ten industries in 2021 with 30% or more of their workforce aged 50 and over.

Since 2001 all industries have seen an increase in the proportion of their workforce aged 50 years and over. Industries which have seen the largest increases are:

- Agriculture, Forestry and Fishing (18.0 percentage points)
- Transport Postal and Warehousing (13.6 percentage points)
- Wholesale Trade (12.9 percentage points)
- Rental, Hiring and Real Estate Services (12.8 percentage points)
- Electricity, Gas, Water and Waste Services (12.2 percentage points).



Workforce age

Workforce aged 49 and under and 50 and over by industry, 2021, August quarter (%)

Ageing workforce

Change in share of workforce aged 50 and over from 2001-2021 by industry, August quarter (% points)



Shifts in gender participation have also varied across industry and occupation groups. For some industries, there was little change in the proportion of the female workforce between 2001 to 2021, other industries have seen an increase over this period. Industries that have seen the largest growth in the female workforce are Information Media and Telecommunications (8.6 percentage points), Mining (6.7 percentage points), and Other Services (6.5 percentage points).

Among occupation major groups, Professional and Managers have seen the largest increase in the female proportion of the workforce between 2001 and 2021, with 7.5 percentage point and 6.7 percentage point increases respectively.



Female participation in industry

Female participation in occupations

Changes in female workforce 2001 to 2021, by major occupation group (% points)



Factors influencing the demand for skills

The Miles Morgan report, **Future skills and training**, identifies several factors and trends currently driving and influencing the demand for skills in Australia and internationally. The factors are grouped into five overarching clusters: society and culture, business and economics, technology, resources and environment, and policy and regulatory. Below is a brief overview of these factors, with more detailed information available in the Future skills and training report.



This group of factors relate to changes in society and culture which have implications on the labour market and skills.

Society and culture-related factors which affect the labour market include:

- Demographic changes, such as population growth and an ageing population and their impact on the workforce and markets, including industry adaptation to the diversity of workforce aspirations and experience
- Globalisation and its impact on mobility, migration and international markets
- Changing work and career values with a greater emphasis on flexible working arrangements, work/life balance and increase in part-time work
- Attracting and retaining a workforce
- Urbanisation and implications for regional, rural and remote areas
- Increased participation by women and gender-related disparity
- Increasing participation by equity groups
- Workforce vulnerability due to automation and cost reduction strategies.

An aging workforce

The most prominent society and culture factor identified by industries is *demographic change*, particularly Australia's ageing population. Many industries cite an ageing workforce as being a potential challenge. The following quotes highlight just a few of the many industries experiencing challenges associated with an ageing workforce and population:

Attracting and retaining young workers remains a challenge for the industry. The current employment rate for those aged under 30 is approximately 11 per cent, which has the potential to negatively impact the industry. The Rail industry needs to work with parents and secondary education providers to create greater awareness of training and career pathways and apprenticeship and traineeship opportunities. (Rail IRC's Industry Outlook 2021)

The industry has a large proportion (36 per cent) of older workers aged 50 or over, many of whom are projected to retire in the next 10-15 years. The pace of technological change and the capacity for the existing older workforce to adapt to the new technologies are a challenge for the industry. Water utilities need to continue to look at how they promote careers in the industry, particularly entry-level roles. (Water IRC's Industry Outlook 2021)

However, the ageing population is also creating new markets and opportunities for some industries:

The ageing population will drive strong demand for health insurance, superannuation and financial advice over the medium to long term. (Financial Services IRC's 2019 Skills Forecast)

Demand for Access Consultants is being driven by a heightened focus on community-based care and aging in place, supported by community care packages and the NDIS. These schemes are driving increased residential modifications requiring competent consultants to provide advice and compliance reporting. (**Property Services IRC's 2020 Skills Forecast**)

Skilled migration

As the Miles Morgan report, **Future skills and training** identifies, skilled migration provides an opportunity for Australia to access a much larger pool of talent and increase diversity within the labour force. It also contributes to the Australian economy through population growth, the introduction of new technology, and the transfer of skills to the resident Australian workforce. However, the influx of skilled migrants has slowed over the last 5 years exacerbated by the closure of Australia's international borders in response to the COVID-19 pandemic. During 2016–17 around 123 500 people entered Australia through the Skill Stream of the Permanent

Migration Program. This number fell to just under 80 000 in 2020–21, representing a decline of approximately 36% (**2020-21 Migration Program Report**, Department of Home Affairs).

In addition to permanent skilled migration, employers can meet short-term skills needs through temporary visas. On 30 June 2021, there were approximately 55 030 Temporary Work (skilled) visa holders in Australia. This was down from around 90 590 Temporary Work (skilled) visa holders at 30 June 2017, representing a decline of 39% (**Temporary work (skilled) visa program**, Department of Home Affairs).





Permanent migration skill stream places delivered in program years 2017-2021



Temporary resident (skilled) visa holders in Australia as at 30th June 2017-2021



The following quotes provide examples of industries experiencing challenges associated with decreased access to skilled migrants:

COVID-19 saw many industry visa holders sought for their speciality skills return to their homes as the government closed borders and stopped international travel in the immediate response to the pandemic. As an example, arboriculture relies heavily on European and UK climbers to come and work in Australia. Their return home has created a massive shortage of climbers and hindered the completion of works. (Australian Agriculture, Horticulture, Conservation and Land Management IRC's 2021 Skills Forecast)

Australia has historically relied on skilled migrants to fill workforce shortages across public and private infrastructure projects. However, border closures because of COVID-19 have placed a strain on businesses' ability to meet the current increase in demand for services. As borders begin to open there will be a greater focus from the public infrastructure sector on obtaining skilled migrants. (Infrastructure workforce and skills supply report, Infrastructure Australia 2021)

Lack of access to the global labour market over the last two years has meant that businesses skilling requirements have largely needed to have been met by Australia's existing labour force. As Australian borders reopen it remains to be seen if the temporary interruption to the supply of skilled migrants will have longer-term impacts on the Australian workforce and economy.

Remote working

As the Productivity Commissions' **Working from home research paper** highlights, one of the most significant impacts of the COVID-19 pandemic on businesses and employees is the forced experiment of working remotely from home.

Industries with a high percentage of office-based or 'knowledge' workers such as professional, scientific and technical services and information media and telecommunications had the largest percentage point increases in the proportion of employing businesses with some staff working from home. Conversely, industries requiring a great deal of on-site work, such as electricity, gas, water and waste services, or physical interactions with people, such as health care and social assistance, experienced a decrease in the proportion of businesses with staff working remotely since COVID-19.

Remote working

Administrative and Support Services Wholesale Trade Professional, Scientific and Technical Services Financial and Insurance Services Mining Information Media and Telecommunications Education and Training Rental, Hiring and Real Estate Services Manufacturing Transport, Postal and Warehousing All employing businesses Arts and Recreation Services Health Care and Social Assistance Construction Electricity, Gas, Water and Waste Services Retail Trade⁴ Other Services Accommodation and Food Services 0 10 20 30 40 50 60 70 Pre COVID-19 Post COVID-19 (April 2021)

Employing businesses with staff working from home before and after COVID-19, by industry (%)

The Productivity Commissions' Working from home research paper notes that before the pandemic, working from home may have been discouraged by management policies, and cultural norms in workplaces. The report argues it is unlikely that Australia will return to pre-pandemic levels of working from home, given both employer and employee shifts in perspectives on this approach. Reasons posited include the benefits for employees of avoiding the daily commute to the office, along with flexible working arrangements, which suit other lifestyle factors such as childcare and out-of-work pursuits. Employers also came to recognise that remote working was potentially both feasible and beneficial to the business. The report concludes the process of trial and adaptation is likely to continue for some time as businesses adopt differing remote-working models, based on judgments on what will work best for them.

Other society and culture factors that industries have identified as important include:

- Attracting and retaining a workforce, including attracting younger workers, reducing high staff turnover, and changes to visa arrangements reducing access to overseas workers
- Increasing participation by equity groups, including promoting employment opportunities for people with disabilities and mature age workers, as well as responding to the growing needs of an ageing population who have a diversity of chronic conditions and disabilities,
- Changing work and career values / flexible working arrangements, work/life balance and part-time work
- Increased participation by women/gender disparity
- Workforce vulnerability due to automation and cost reduction strategies.



These factors relate to trends in business and economics which influence how companies operate. Factors include:

- High-speed competition and workplace dynamics involving reorganisation of human resources to sustain competition
- Start-up thinking (including entrepreneurialism, freelancing and contracting)
- Emerging or changing markets
- Skills mismatch, shortages or gaps
- Network working and producing and supply chain management
- Knowledge-based economy
- Empowered customers, and changing work and career values
- A growing demand for care-related services and products.

Skills in the workforce

One of the most important business and economic factors identified by many industries related to *skills mismatch, shortages or gaps*. This included challenges associated with finding an appropriately skilled workforce, and job market demand exceeding the supply of appropriately skilled graduates. According to the **ABS Business Conditions and Sentiments Survey** in June 2021, over a quarter of all employing businesses in Australia were having difficulty finding suitable staff - this rose to over a third of employing businesses in the following industries:

- Accommodation and Food Services (38%)
- Electricity, Gas, Water and Waste Services (37%)
- Other Services (36%)
- Manufacturing (35%).

Staffing difficulties

Employing businesses having difficulty finding suitable staff, June 2021, by industry (%)



The top three reasons given by employing businesses with difficulties finding staff to fill jobs were:

- Lack of applicants for jobs
- Applicants don't have the skills or qualifications required for jobs
- International border closures limiting the recruitment pool.

A few examples of these skills mismatch, shortages or gaps-related factors in some industries include:

A significant number of apprenticeships were unfortunately suspended or terminated due to COVID-19, and skilled migration has been extensively disrupted, which will result in a shortage of qualified electrotechnology tradespeople in the near future (**Electrotechnology IRC's Industry Outlook 2021**)

The industry has the opportunity to automate low-skill tasks. Retraining and up-skilling will be needed to ensure the workforce is well-informed of emerging technologies to maintain assets, and improve water utility efficiency. The workforce will require new skills in the use of visual technology and equipment deployed to monitor, inspect, maintain, and repair water network assets. (Water IRC's Industry Outlook 2021)

More than 40 per cent of farmers report labour shortages during peak times (such as harvest) in a 'normal' year and there are concerns that, if strategies are not implemented to respond to increasingly acute labour shortages now, production costs are likely to grow or worse, producers' difficulties may lead to limited harvest outputs. (Australian Agriculture, Horticulture, Conservation and Land Management IRC Skills Forecast Update 2021)

Supply chain disruption

Another prominent business and economics factor identified by many industries are the challenges brought about by disruption to supply chains both globally and within Australia due to the COVID-19 pandemic. Data collected by the ABS Business Conditions and Sentiments Survey, indicate that supply chain disruption has worsened between April 2021 and January 2022 for many industries in Australia, with the three most impacted industries being:

- Wholesale Trade
- Retail Trade
- Manufacturing.

Supply chain disruption



Businesses experiencing supply chain disruptions, by industry (%)

The following quotes from the **Transport and Logistics Industry Outlook 2021** illustrate the supply chain challenges faced by the industry, and the innovations implemented in response to these pressures.

The global supply chain has been significantly affected by the pandemic and strict lockdown measures in many countries. There are unprecedented demands for critical products......

The COVID-19 pandemic has caused serious disruptions to Australian supply chains. Whilst there has been an unprecedented demand for certain products and services, delivery was impacted by strict lockdowns and border closures in several states......

Workers have had to work longer and harder to keep the supply chain flowing. COVID-19 expedited the digitalisation of businesses and increased the demand for e-commerce which exerted enormous pressure on the sector. The Australian Transport and Logistics sector has had to adapt and respond to the unanticipated impacts by increasing the implementation of digital innovations such as blockchain, the Internet of Things, and data analytics to improve operations and save costs.

Other business and economics-related factors mentioned by industries include:

- Emerging or changing markets, including the growth in products and services for an ageing population
- Growing demand for care-related services and products, such as an increasing demand for health services, particularly within the area of complex and long-term care
- Empowered customers, and changing work and career values, including consumer demands for more sustainable products.



This group of factors cover the ever-evolving nature of technology and the implications it has for the workforce and skills needs. Factors include:

- Emerging technologies
- Digitalisation and the Internet of Things, mobility and connectivity
- Big data and data analytics
- Artificial Intelligence (AI) and machine learning
- Automation and robotics (including drones)
- More technologically advanced materials and products
- Augmented Reality and virtual reality
- Optimising brain and cross-disciplinary science.

Although the pressures on employers to reskill and upskill their workforce due to technological changes existed before COVID-19, the pandemic has exacerbated and accelerated this requirement. As the **Skills urgency report** by Australian Industry Group posits, the implementation of new technologies and increased digitalisation of businesses have meant that the intrinsic nature of work in some industries has been forced to evolve rapidly. Advances in technology have largely resulted from changes in how businesses operate, and the way services are delivered. Factors driving these technological changes include:

- increased use of digital technologies and IT services due to COVID-19 restrictions in movements
- increased use of online shopping for products and services
- businesses increasing their online footprint
- increased proportion of the workforce working from home or remotely.

The most prominent technology factors highlighted by industries in Australia are *automation and robotics* (*including drones*), and *digitisation and the Internet of Things, mobility and connectivity*. Several industries cite automation as providing a range of benefits, including improved workforce efficiency, enabling remote operations, and cost reduction in many areas. *Mobility and connectivity* have been identified by some industries as enabling market expansion, while *digitisation* and the *Internet of Things* has for certain industries improved project management processes, as well as streamlining warehousing and dispatching processes. These technology factors have implications for the way work is conducted and therefore the skills mix required.

The following quotes provide an example of how technology is impacting some industries:

The pandemic has expedited the utilisation of electronic and communication systems which form the backbone of automated systems and smart devices. Many appliances and equipment at work/home are embedded with electronics which allow them to be controlled automatically and remotely with the help of radiofrequency (RF) communication systems and wireless technology. The Internet of Things relies on computer technology and RF communication systems. The increasing use of these systems requires workforce skills to be updated in accordance with the latest changes. (Electrotechnology IRC's 2021 Industry Outlook)

The use of technology in managing public safety matters, including drones, predictive tools, and remote learning, will continue to grow. Developments in technology will have ongoing impacts on police training, particularly in specialist areas such as remotely piloted aircraft (drones), cybercrime and investigations. (Public Safety IRC's 2021 Industry Outlook)

The implementation of digitalisation and automation are gaining more pace in the Maritime industry. Underwater or surface autonomous vessels equipped with a range of data collection technologies are currently in operation. Autonomous technology will reshape the industry's technology-based operational systems and necessitate new skills and training (Marine IRC's 2021 Industry Outlook)

While increasing advancements in technology and a growing digital economy offer significant opportunities

for Australian industries - increased connectivity also brings increased risks of cyber-attacks by malevolent agents. Recognising this, in October 2020, the **Cyber Security Industry Advisory Committee** was established by the Government to provide independent strategic advice on Australia's cyber security challenges and opportunities. The committees report **Back to Business Recognising and reducing cyber security risks in the hybrid workforce** highlights the importance of collaboration between governments, businesses, and individuals to bolster cyber security awareness. The rapid rise in remote working due to the pandemic has driven demand for increased cyber security awareness and educational programs across the workforce, as well as the need for specialised skills in implementing cyber security policies and procedures.

Other technology factors which are mentioned by industries include:

- Emerging technologies
- Big data and data analytics
- Artificial Intelligence (AI) and machine learning
- More technologically advanced materials and products
- Augmented reality and virtual reality.



Resources and Environment

These factors cover issues such as climate change, international action on sustainability, as well as access to reliable internet, and implications for business, the workforce and education and training. Factors include:

- Sustainability action, driving the demand for more sustainable products and services
- Climatic weather shifts and the impact of climate change
- Improving energy efficiency
- Access to quality internet
- Financial viability.

The most prominent resources and environment factor is *sustainability action*, which is driving the demand for more sustainable products and services. Some industries cite *sustainability action* as being a potential challenge. This is due to changing customer expectations and changes in approaches to business operations, and challenges in meeting skill requirements. However, most industries identify *sustainability action* as leading to new opportunities and markets.

A key sustainability action currently underway is the transition to cleaner energy. **Australia's whole-of**economy Long-Term Emissions Reduction Plan sets out how Australia will achieve net zero emissions by 2050. The Plan is based on five key principles, with an enabling role for government. These principles are:

- Technology, not taxes no new costs for households or businesses
- Expand choices, not mandates we will work to expand consumer choice, both domestically and with our trading partners
- Drive down the cost of a range of new energy technologies bringing a portfolio of technologies to parity is the objective of Australia's Technology Investment Roadmap
- Keep energy prices down with affordable and reliable power our Plan will consolidate our advantage in affordable and reliable energy, protecting the competitiveness of our industries and the jobs they support
- Be accountable for progress transparency is essential to converting ambition into achievement. Australia will continue to set ambitious yet achievable whole of-economy goals, then beat them, consistent with our approach to our Kyotoera and Paris Agreement targets.

The plan acknowledges that significant investment will be required to develop a workforce with the right skills and expertise to deploy opportunities in low emission technologies. Specifically, Australia will need a workforce with general capabilities (like communication, problem-solving and digital literacy), as well as discipline-specific skills in fields like construction, physical sciences, engineering, project management and data analytics.

Below are some examples that relate to sustainability action identified by industries:

Solar installation has been steadily growing with currently over two and a half million installations in Australia, which is anticipated to double by the mid-2020s. The renewable sector has the potential to employ over 44,000 by 2025. With the right policy settings, regional areas are poised to benefit as about 70% of these jobs could be in regional Australia by 2025. As many as 50% of clean energy jobs are projected to be in operation and maintenance by 2035. The industry has emphasised the role of training and upskilling workers to leverage from these opportunities (**Electrotechnology IRC's 2021 Industry Outlook**).

Hydrogen is a very versatile, low cost, and low emission fuel which can create enormous environmental and economic benefits to take Australia into the future. The workforce will need to be qualified to work with hydrogen safely and competently. Workers require skills and knowledge about hydrogen storage optimisation, repair and maintenance of hydrogen storage equipment, requirements for blending hydrogen with gas, and use of control systems to monitor hydrogen in gas distribution networks. (Gas IRC's 2021 Industry Outlook)

The effects of climate weather shifts and the impact of climate change were also identified by some industries. This leads to both challenges and opportunities in the need to adapt to changing expectations by both customers and governments. This also presents the need for a workforce that has the skills and knowledge required to respond and manage the various unique industry impacts of climate change and climate weather shifts. The **Royal Commission into Natural Disaster Arrangements Report** recommended '*national consistency in training and competency standards*' to encourage resource and information sharing, and to enable '*someone trained in one state or territory to work effectively in another*'

Below are some examples from industry that relate to the impacts of climate change and climate weather shifts

The 2019-2020 bushfires highlighted the important role of animal facility workers, emergency service workers, and evacuation centres in supporting injured and displaced animals. With many evacuation centres overwhelmed, the need for revised evacuation protocols, procedures for accommodating companion animals and staff training were recommended by several reports, including the Royal Commission. (Animal Care and Management IRC's 2021 Skills Forecast)

All states and territories have implemented several significant changes since the release of the 2020 Bushfire Royal Commission recommendations. Interoperability of personnel and resources has improved through the use of a common incident management system, supporting protocols and procedures, rolebased competencies and national industry doctrine. All state and territory fire agencies continue to work collaboratively to further develop workforce capabilities to ensure that interoperability is successfully implemented. (**Public Safety IRC's 2021 Industry Outlook**)



This group of factors covers the policy and regulatory landscape which influences the demand for skills. This includes understanding and adhering to the regulatory environment, the policy environment and its implications for businesses and the workforce, and reform in the education and training sector. Factors include:

- Innovation ahead of regulation
- Policy environment
- Appetite for reform
- High and complex regulatory environment
- Safety requirements.

The most prominent policy and regulatory factors mentioned across industry sectors are policy environment and high and complex regulatory environment. For most industries a *policy environment* and a *high and complex regulatory environment* are part of the operational environment, either specific to the industry or applied more broadly, and can include:

- Licensed occupations
- Industry standards
- Legislation to manage and protect resources
- Workplace health and safety legislation
- Legislation to protect consumers (noting that these can vary by state or territory)
- Changes to government policy which at times can impact workforce operations, as well as require businesses to update core procedures and processes.

Many industry sectors report the need for business and compliance skills to enable the workforce to negotiate the regulatory environment. Regulation has also led to new technologies in some areas that require new skills. This can also have implications for training package development.

A few policy and regulatory factors identified by some industries include:

The sector is highly regulated across every level, meaning that businesses must adhere to overlapping international, national, state and local compliance legislation...Supporting sustainable fisheries and marine environments has also led to complex regulatory arrangements, licensing issues and quotas that have hampered productivity (Aquaculture and Wild Catch IRC's Skills Forecast Update 2021)

Operators and workers are faced with challenges in dealing with the consequences of international standards (including ISO), as well as policies and regulation that are driven at federal, state and territory levels, and by local governments and government agencies...... Knowledge about common food groups that cause reactions, identifying and mitigating risks and accurate labelling and regulatory compliance have become critical skills for people producing food, beverages, ingredients, supplements and additives for consumption by humans and animals (Food, Beverage and Pharmaceutical IRC's Skills Forecast Update 2021)

Some industries also mention a lack of legislation and regulation around new technologies. An example of this is the Information and Communications Technology industry which conveyed concerns over regulation and standards being unable to keep up with the pace of new technology, therefore creating industry-wide challenges relating to product quality. Lagging regulation was also identified by the ESI Transmission, Distribution and Rail Sector, see example below:

Distributed energy resources and other technologies are gaining more traction in Australia. However, energy regulations and policies have been lagging behind. The energy sector has identified policy uncertainty and regulations as a key challenge to address. A coherent energy policy can encourage more investment in distributed energy resources and improvement of integration with the grid. (ESI Transmission, Distribution and Rail IRC's Industry Outlook 2021)



Methodology

The factors and trends framework has largely been based on the factors outlined in the Miles Morgan report **Future skills and training: A practical resource to help identify future skills and training**. The report outlines several factors which are influencing the demand for skills in the following broad categories: society and culture, business and economics, technology, resources and the environment, policy and regulatory.

A review of the Skills Forecasts and Industry Outlooks from 2021 alongside other relevant industry literature and data sources has been undertaken to identify which factors are most prevalent for the IRCs.

Employment data has also been provided to show how labour market trends have been shaping the workforce between 2001 and 2021.

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- Employed total, percentage change by ANZSIC 1 digit Industry, between 2001 and 2021, August Quarter
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- April 2021, Table 11: Percentage of business's workforce that are currently teleworking, by employment size, by industry
- April 2021, Table 14: Businesses currently experiencing supply chain disruptions, by employment size, by industry
- June 2021, Table 10: Whether businesses were having difficulty finding suitable staff, by employment size, by industry
- June 2021, Table 11: Factors impacting ability to find suitable staff, by employment size
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• Permanent migration skill stream places delivered in program years 2016-17 - 2020-21

Priority skills

Overview

This section provides a summary of key skills identified by Industry Reference Committees (IRCs) in their Skills Forecasts.

IRCs have pinpointed a variety of skills as priorities for their industry. Drawing on the skills framework set out in the report Future skills and training: A practical resource to help identify future skills and training, these have been grouped within eleven high-level skill areas for the purposes of this analysis.

For more information on the factors driving demand for skills, please visit the Factors and trends page. For information on the cross-sector projects and training package development work underway, please visit the Key initiatives page.

Each page below contains a summary of the skill need, industry demand for that skill, and case studies of industry clusters and sectors with a specific need for these skills:





Overview

Industry and occupation skills refer to specific skills that different IRCs have identified as being a priority for their industry.

While all industries and occupations require skills specific to their industry or occupation, many Industry Reference Committee (IRC) Skills Forecasts, Industry Outlooks and Proposed Schedules of Work, alongside other relevant industry literature identified specific technical skills which are deemed to be a *high priority*. These skills vary from industry to industry — some are specific to the context of a particular industry or occupation, while others apply to multiple industries and occupations. The following groups of industry occupation skills and knowledge will be discussed further below:

- Occupation and industry-specific skills
- Cross-industry skills and trades
- Industry knowledge
- Understanding and use of technology and equipment.



This refers to the specific skills IRCs identified as being unique to their industry and

occupations. Many IRCs identified industry or occupation-specific priority skills, including (but not limited to) skills like:

- Animal welfare, and integrity and ethical conduct in the Racing industry
- Application of traceability processes in Food, Beverage and Pharmaceutical Product Manufacturing industry
- Ethical animal use in the Animal Care and Management industry
- Facilitating online and face to face learning, and the ability to identify individual learner needs in the Education industry
- Fault diagnosis and mechanical and electrical repair of modern vehicle systems in the Automotive industry
- Financial literacy, capacity and industry knowledge in the Financial Services industry
- Genetics and molecular testing diagnostics in the Laboratory Operations industry
- High pressure water jetting and vacuuming in the Recreational Vehicles industry
- Industrial sewing in the Textiles, Clothing and Footwear industry
- Maintenance of ageing aircraft in the Aerospace industry
- Mechatronics in the Metals, Engineering and Boating industry
- Piloting in the Aviation industry
- Pulp de-inking and bleaching for high and medium grade paper products in the Pulp and Paper Manufacturing industry
- Search and rescue in the Public Safety industry
- Track vehicle operations and signalling in the Rail industry
- Transmission, cabling and electrical in the ESI Transmission, Distribution and Rail industry
- Treatment and processing in the Water industry.

Please visit **industry sector pages** for more information on the specific skills for each industry and Industry Reference Committee.







Cross-industry skills and trades

This refers to specific technical skills that are important across different industries. Several IRCs identified cross-industry priority skills and trades. This includes skills like:

- Digital skills
- Electrical skills
- Health and safety
- Maintenance and servicing
- Project Management
- Testing and diagnostics

Industry-specific knowledge

This refers to the specific knowledge identified as a priority for each industry. It includes knowledge of materials and products as well as knowledge of the industry sector. Some of the IRCs and industry sectors that identified industry knowledge as being a priority include:

- Aerospace
- Arts, Culture, Entertainment and Design
- Automotive
- Aviation
- Business Services
- Education
- Financial Services
- Information and Communications Technology
- Laboratory Operations
- Manufacturing
- Printing and Graphic Arts
- Rail.

Understanding and use of equipment or technology

This refers to examples where skills are required in using specific equipment or technology, such as:

• Technology skills for paper bag, paper stationary and sanitary paper production manufacturing in the Pulp and Paper Manufacturing industry.

Whether skills are referred to specifically or more generally, it is clear there is a need for technical and occupation-specific skills across all industries.





Most industries have been impacted to some degree by the COVID-19 pandemic. In many instances, businesses have been able to respond to the challenges faced through the use of existing industry and occupation skills.

Industry and occupation-specific skills

When faced with the challenges posed by the pandemic, existing industry and occupation-specific skills are proving invaluable for some sectors, for example:

Within the Maritime sector **Pilotage** is a highly skilled profession as it is essential for the safe carriage of vessels. Pilots are rarely readily transferable across ports, due to the requirement of specific knowledge of a stationed locality. During COVID-19 ports were acutely aware of this, as pilots are also the first individuals to interact with crew and board a vessel. Accordingly, ports around Australia promptly implemented significant additional safety procedures to protect their pilots and to allow for the continued functioning of trade in the event pilotage is compromised.

The **Racing Industry** was able to continue operations during the pandemic because workers already maintained the skills required to handle complex biosecurity risks. Infection control, which may usually be considered in terms of occupations that routinely deal with biosecurity risks, such as in health and animal care, laboratory operations and security, became mandatory for all industry sectors. Cross-sector infection control skill sets with contextual advice for 10 industry sectors were **endorsed in July 2020** to enable current and future employees to gain the skills needed for their specific industries.

Increased demand for 'point of care' testing skills was anticipated for the Laboratory Operations industry at the onset of the pandemic. Frontline workers with diagnosis and testing skills were provided with additional training opportunities, through the **COVID-19 Critical Skills Point of Care Testing Skill Set**, which was endorsed in April 2020, to support the testing and post-diagnosis care of COVID-19 patients.

In addition, the University of Adelaide with participation from the Department of Agriculture, Water and the Environment (Biosecurity), Australian Border Force and the South Australian Metropolitan Fire Service have been **trialling the training of COVID-19 detector dogs** following preliminary results that show specialised working dogs can detect COVID-19 Volatile Organic Compounds (VOCs) in patients, even when people are asymptomatic or in the incubation phase. Research trials were conducted at Sydney International Terminal and Adelaide Airport in 2021, and if successful, SA Health have indicated support to the commencement of operational trials on 'live' samples from passengers arriving on repatriation flights. The potential use of COVID-19 detector dogs, as a safety measure for Australia's Tourism Industry, may lead to an increase in demand for quarantine officers who already have dog handling skills.

Cross-industry skills and trades

Given many industries were hit hard by restrictions imposed because of the pandemic, there has been a strong focus on **transferable skills** to assist displaced workers into occupations where demand is high.

Businesses have had to shift their focus, in order to continue operating (in some instances thriving) in the face of new product demand. For example:

The Department of Industry, Science, Energy and Resources released a **series of case study videos** on YouTube which highlight the ingenuity which has been applied by Australian businesses in response to heightened PPE product demand as a result of COVID-19. This includes businesses that reverse engineered their production lines to manufacture surgical masks, sneeze barriers for reception areas, and mask filtration
materials. An example of this was evident in the performing arts industry, which was largely was closed down as a result of the virus. Rather than becoming disused, **costume designers and theatrical wardrobe stitchers** utilised their industry skills to make fabric masks to sell to the public.

Due to surges in product demand; the temporary closure of manufacturing in parts of Asia; and border restrictions as a result of COVID-19, supply chain management became a critical skill for many industries.

The previously mentioned **case study videos** promote the agility and resilience displayed by food manufacturers when managing surges in product demand, and identified lessons to be learned about the complexity of their supply chain. The pandemic also caused noticeable shifts in demand for **Food and Pharmaceutical Production**, and **Mining**, **Drilling and Civil Infrastructure**; there was the loss of markets into Asia for **Aquaculture and Wild Catch**, and border closures affected the **Transport** Industry. In each of these instances, skills in supply chain management proved vital.

Understanding and use of equipment or technology

Skills in the use of digital technology has become an integral part of many industries as a result of the COVID-19 pandemic.

The CSIRO report **Global trade and investment megatrends** states the necessity of remote working and learning, online shopping, healthcare (telehealth), communication and entertainment has compelled a decade's worth of digital transformation to occur within a matter of months. Industry-specific examples include:

- Medicare-funded access was made available for general practice, nursing, midwifery, allied health and allied mental health services, bringing forward a 10 year plan on telehealth, to occur within 10 days. Rapid growth was reported by platform providers, and the National Nursing and Midwifery Digital Health Capability Framework was released in October 2020. ACS Australia's Digital Pulse 2021 found that 48% of survey respondents who visited their general practitioner between April and May 2020 did so virtually. New technology platforms have also been adopted to support the provision of an integrated vaccination record system across Australia.
- The Australian Information Industry Association (AIIA) has aggregated solution services, information and advice to support business continuity through the use of technology and, Atlassian made its remote-friendly software products available for free, for small teams. ACS Australia's digital pulse 2021 noted people were 1.7 times more likely to work from home at least once a week in February 2021 (compared to March 2020), with 41% of Australian workers were still working from home in some capacity in early 2021. Additionally, more than half (56%) of all employed Australians wanted the amount of working from home to remain the same or increase in the future.
- Mining companies have been early adopters of automation technologies and the automation micro-credential course developed by the Resource Industry Collaboration in Western Australia was offered to apprentices displaced by COVID-19.
- The closure of gyms and personal training studios has increased the number of operators in the Fitness Industry providing services over digital platforms, changing the look of fitness in the future.

As a consequence of this, cross-industry information and communication technology (ICT) skills related to artificial intelligence (AI), data science, machine learning, robotics, and cybersecurity have become a priority. Nine new skill sets were **endorsed in July 2020** to assist the ICT sector meet its priority workforce needs in a number of specialty areas, followed by the **Digital Skills for Small Business Skill Set** and **Entry into Technology Skill Set** in September 2020.



Laboratory Operations, and Food, Beverage and Pharmaceutical Product Manufacturing Industries

Included in this case study are two distinct industry clusters, both of which identified specific industry and occupation-related skills as priorities for their workforce.

- **Laboratory Operations,** which covers a diverse range of technical and scientific operations across a variety of industry sectors, such as:
 - Biomedical laboratories
 - Biotechnology
 - Construction materials testing
 - Defence laboratories
 - Environmental testing/monitoring
 - Food and beverage testing
 - Manufacturing testing
 - Mineral assay
 - Pathology testing
 - Process manufacturing
 - Wine making.
- Food, Beverage and Pharmaceutical Product Manufacturing, which comprises three sectors:
 - Food Product Manufacturing
 - Beverage Manufacturing
 - Pharmaceutical and Medicinal Product Manufacturing.

The industry and occupation-related skills identified by these industries were:

- Laboratory Operations:
 - Point of Care Testing (PoCT)
 - Surgical cut-up
 - Genetics and molecular testing diagnostics
- Food, Beverage and Pharmaceutical Product Manufacturing:
 - Product and equipment handling including transporting, processing packaging and stock control
 - Application of traceability processes
 - Operating new technologies including provenance processes and systems.

The following quotes highlight the need for industry and occupation-specific skills:

With 80% of minerals laboratories expected to have automation capability by 2030, the need to upskill laboratory workers to operate autonomous machinery and work safely in an autonomous environment remains apparent. Laboratory technicians specializing in sample preparation, sample analyst, and quality control roles are likely to spend less time on repetitive, manual tasks and more time on monitoring multiple systems, troubleshooting equipment and processes, interpreting results, and ensuring the integrity of large batches of samples are maintained. (**Resources Industry Training Council Laboratory Operations Snapshot**)









The Process Manufacturing, Recreational Vehicle and Laboratory Industry Reference Committee identified an opportunity for extractive metallurgical technicians to have specialist skills in process flow operations to support the battery minerals industry, and the RITC are furthering recommendations for a fire-assay qualification or skill set to support other metallurgical skill demand. (Resources Industry Training Council Laboratory Operations Snapshot)

Indigenous food is a rapidly expanding sector in both local and global markets. There is growing demand from domestic and international consumers for products made with native ingredients due to their nutritional value and 'storied' provenance.

New job roles in the native foods industry require specific skills for working with and in Aboriginal and remote communities, wild food harvesting and processing, and exporting 'exotic' products with strict food safety regulations. A new Case for Change proposes the creation of a qualification specialisation or skill set to describe the skills necessary for working in the burgeoning Australian indigenous bush foods industry. (Food, Beverage and Pharmaceutical IRC's 2021 Skills Forecast and Proposed Schedule of Work)

The society and cultural influences on the laboratory operations industry include an ageing population, with an expected increase in demand for healthcare services. In turn, this is expected to drive higher demand for laboratory services. For example, NSW Health Pathology has trained over 35,000 operators in PoCT. It is the world's largest accredited managed PoCT service and currently has over 500 devices in more than 180 metropolitan, regional and rural hospital locations. (Process Manufacturing, Recreational Vehicle and Laboratory Operations IRC's 2019 Skills Forecast)

The food, beverage and pharmaceutical manufacturing industries operate in constantly changing environments driven by consumer demands and industry practices and innovations, with risk management a key focus in all operations. Operators and workers are faced with challenges in dealing with the consequences of international standards (including ISO), as well as policies and regulation that are driven at federal, state and territory levels, and by local governments and government agencies. (Food, Beverage and Pharmaceutical Product Manufacturing IRC's 2019-2022 Skills Forecast)



Overview

As demand for skills is constantly adapting to new technologies and job requirements, people will also need to enhance their ability to adapt to new situations and acquire new skills. As the world of work becomes more flexible, workers are expected to take more responsibility for their skills development.

Some of the ways in which industry need workers to be adaptable include:

- showing awareness of changes in the industry
- showing resilience and embracing change
- being adaptable in a changing industry, changing environments and changing markets
- adapting to new technologies and new ways of doing business
- showing a proficiency and willingness to learn
- being engaged in career development and planning
- maintaining skill relevancy, upskilling and multi-skilling
- responding to situations with flexibility and open-mindedness
- showing innovation and creativity
- being entrepreneurial.



The reviewed literature emphasises the adaptability, flexibility and learning skills demonstrated by workforce due to the rapid digital transformation that has occurred within industries in response to the COVID-19 pandemic. Examples include:

- The power of TAFE: the COVID story explores the approaches TAFE staff took to adapt at the onset of the pandemic. Virtually overnight TAFE staff transformed their teaching and training to be delivered into the home of students for over seventy per cent of activity.
- The research conducted for Service Innovation Deep Dive: Capturing and Leveraging Learnings from Service Innovation during COVID-19 found that organisations in the aged care, disability services, and emergency relief sectors adapted rapidly in order to continue meeting their clients' needs during the COVID-19 crisis, leveraged technology, such conducting cooking, art and exercise classes and social groups online.
- In **People Matters: Unleashing The Future**, all respondents acknowledged the incredible resilience and capacity of their people to manage often overwhelming change.

There have been a number of businesses that have adapted their operations and products to assist with the COVID-19 health response. The Australian Government Department of Industry, Science, Energy and Resources has **showcased** some of these, primarily manufacturing, businesses.

Industries and their workforces providing essential services have been required to be innovative and adaptive to change due to government health measures, sometimes at short notice. There have been **rostering changes, capacity limits, and additional hygiene requirements** for the majority of industries as they have needed to retain provision of onsite labour or in-person services. Critical industries and occupations have varied between the states and territories, **but have generally included** the Health, Public Safety, Utilities, Retail (essential), Transport, Agriculture, Aquaculture, Education, Mining, Manufacturing (major), particularly Food and Pharmaceuticals, and Information and Communications Technology sectors that relate to telecommunications, data, broadcasting and media services.

Skills Urgency: Transforming Australia's Workplaces reports that respondents to the survey, which focussed specifically on the skill needs and workforce development plans of businesses as they ramped up their activity, indicated they have a growing need for soft skills, such as problem solving, adaptability, creativity, and initiative. The employers surveyed representing a mix of industry sectors including Manufacturing, Construction, Services and Mining, and the demand for soft skills had increased substantially for occupational categories including Managers, Professionals, Sales Workers, Technicians and Trade Workers, and Clerical and Administrative workers.



Industry skills needs

Australian respondents to the LinkedIn Learning Workplace Learning Report 2021 ranked resilience and adaptability at number one in the top ten most important skills. The report found that across the countries surveyed, resilience and digital fluency skills were ranked in either the first or second places.

The 2020 Future of Jobs Report based on the results of the 2020 edition of the Future of Jobs survey by the World Economic Forum (WEF) asked employers to identify emerging skills within their organisation. For Australia's country profile, there were three adaptability and learning skills that were identified as in high demand.

- Active learning and learning strategies (ranked 2)
- Emotional intelligence (ranked 6)
- Resilience, stress tolerance and flexibility (ranked 8).

Some specific examples of adaptability skills that industries have identified as important include:

- Emotional intelligence, identified by the following industries:
 - Corrections and Public Safety
 - Children's Education and Care
 - Dental
 - Government
 - Rail
 - Technicians Support Services.
- Resilience, stress tolerance and flexibility, identified by the following industries:
 - Animal Care and Management
 - Children's Education and Care
 - Corrections and Public Safety
 - Government
 - Printing and Graphic Arts
 - Technicians Support Services
 - Water.
- Self management, identified by the following industries:
 - Corrections
 - Aboriginal and Torres Strait Islander Health Workers
 - Children's Education and Care
 - Corrections.





Internet job vacancy postings that contained requests for adaptability skills were examined for occupational trends. This includes process improvement, change management, problem solving and creativity. The chart below compares the percentage of internet job postings in each occupation (ANZSCO Major Group) that requested adaptability skills.



Internet job postings that requested adaptability skills, by occupation (2018-21)

Source: Burning Glass Technologies' Labor Insight™ Real-time Labor Market Information tool.

Adaptability skills were most often requested for managerial and professional positions, and least often for labourers, machinery operators and drivers.

The following graphic shows examples of occupations where adaptability skills are highly requested, and some examples of the types of requests employers are making for those in these occupations.



When asking for adaptability skills from potential employees, postings often ask for the ability to cope with or lead change, as well as learning quickly on the job. The rate of change in many industries is likely one reason for these requests.



Corrections and Public Safety

The work environment in the Correctional Services sector is very diverse, and those working within the sector occupy a range of roles in prisons, juvenile and immigrant detention, parole services, correctional administration, and management.



The **Corrections IRC's 2021 Industry Outlook** identifies the three main adaptability related skills 'emotional intelligence', 'resilience, stress tolerance and flexibility' and 'self-management' as essential skills for the Correctional Services workforce. This is highlighted in the following quotes taken from the industry outlook:

The Corrections workforce need to manage increasingly large populations of offenders and provide individualised support. This requires them to have higher-order skills in communication, critical thinking, problem solving, empathy, victim awareness, relationship management, and self-management planning.

Although trained to deal with stressful situations, staff rarely receive formal/ accredited training relating to looking after their own mental health and building resilience to handle stressful situations over prolonged periods.

The Corrections workforce needs to have the appropriate skills and understanding of offenders with a cognitive impairment to be able to support them in the prison environment. The workforce needs to understand prisoner patterns of thoughts and behaviour to de-escalate stressful situations and engage effectively with them.

Additionally, the challenges and opportunities listed in the **Correctional Services Workforce Insights** highlights the three main adaptability skills in the following quotes:

- professionalisation and changing skills needs, including in communication, critical thinking, problem solving, empathy, victim awareness, relationship management and self- management planning.
- more requirements for staff to have 'soft' skills, with staff needing cognitive skills and emotional intelligence to build rapport and sympathy with offenders to communicate effectively and resolve or de-escalate conflicts.

Public Safety industry comprises police, fire and rescue services, maritime rescue, emergency services and emergency management agencies, Defence, and intelligence organisations, including associated administrative and support functions. The Police sector workforce is engaged in a range of activities including crime prevention, emergency and non-emergency assistance and response, regulatory and licencing enforcement. Police also often engage in community programs and engagement activities.

The **Public Safety IRC's 2021 Industry Outlook** identifies 'resilience, stress tolerance and flexibility' as essential skills for the Police sector workforce, highlighted in the following quote:

The ability to move flexibly from one role to another and similarly from a specific set of duties to others is becoming more important. A focus on a resilient and adaptive workforce that can respond to any context remains a key priority. The welfare of police is also of paramount importance; therefore a focus on resilience and wellbeing will continue to be maintained.

The **Government Response** to the inquiry report '**The People Behind 000: Mental Health of Our First Responders**' acknowledges the importance of resilience and stress tolerance, supporting in principle the committee recommendation committee recommends that compulsory first responder mental health awareness training, including safety plans, be implemented in every first responder organisation across Australia. The Response includes examples of initiatives funded by the Australian Government, such as:

> Development of the National Police Memorial Co portal, which will educate and build resilience in police officers in the area of social, emotional and psychological health.

An evidence-based program designed by the Canadian Mental Health Commission aimed at improving individual and organisational resilience and reducing stigma associated with mental health.

The Response also states:

First responder organisations are familiar with the high-risk nature of first responder work and must consider and implement strategies to minimise risks to psychological health, including building a positive workplace culture and providing appropriate mental health training to staff and managers.



Overview

Data is becoming increasingly available, with 'big data' being derived from online activity, sensors, the 'internet of things', new analytical tools, and artificial intelligence. Workers in almost all industries, and across most roles, will be expected to use available data to derive value, and improve products and services. This may require the ability to analyse and present raw data or to interpret data analysis and apply findings.

While data analysis skills are increasingly important, other analytical skills such as data management, information literacy, problem solving, critical thinking and creative thinking skills are also required by industries.

The cross-sector project, **Big Data**, reviewed current and emerging developments in big data skills, particularly in relation to data management, data analytics and data-driven decision-making to identify the related skills needs shared by multiple industry sectors. The project is now complete and led to the AISC approving the development of nine new big data cross sector units and two new skill sets which are housed in the Business Services Training Package.





The National Skills Commission's report **State of Australia's Skills 2021: Now and into the Future** reveals that during the COVID-19 pandemic there has been an increase in demand for core competencies or 'employability skills' such as teamwork, planning and organising, and problem-solving skills.

The Australian Industry Standards report Industry Outlook 2021: Water Industry Reference Committee divulges the pandemic created a surge in the uptake of digital and remote connection technologies. With data analytics enabling digital simulation and modelling of water networks to collect real-time data from control systems and sensors, the report advised the workforce will require skills for the new technologies and the data analysis and management of them. The report also noted industry requires a flexible workforce with skills such as creativity, problem-solving, and critical thinking.



The 2020 Future of Jobs Report by the World Economic Forum (WEF) finds the top skills employers consider to be increasing in importance include critical thinking and analysis skills as well as problem-solving. For Australia's country profile, the skills identified as being in high demand by the organisations surveyed were:

- Analytical thinking and innovation ranked number 1
- Critical thinking and analysis ranked number 3
- Complex problem-solving ranked number 7
- Reasoning, problem-solving and ideation number 13.

Following a referral from the Australian Government Minister for Education and Youth, the House Standing Committee on Employment, Education and Training will inquire into and report on **adult literacy, numeracy and problem-solving skills in Australia** in 2021-22.

The report **Skills urgency: transforming Australia's workplaces** by the AiGroup shows Human skills such as analytical thinking and complex problem solving are seen as vital to future workforce capability. In addition, **LinkedIn's 2021 Grad's Guide to Getting Hired** shows analytical skills as the top skill employers are looking for. The **National Skills Commission** has also identified data analysis as one of the skills spreading most quickly across the labour market, stating in the report data analysis is trending in 61 occupations and emerging in 11 others.

Some specific examples of analytical skills that industries have identified as important include:

- Data analysis, identified by the following industries and sectors:
 - Business Services
 - Electrotechnology
 - ESI Generation
 - Gas
 - Mining, Drilling and Civil Infrastructure
 - Rail
 - Tourism, Travel and Hospitality
 - Transport and Logistics
 - Visual Arts
 - Water
- Critical thinking, identified by the following industries and sectors:
 - Architectural, Surveying and Related Services
 - Corrections
 - Digital Media
 - Financial Services (Accounting and Bookkeeping)
 - Government Services and Local Government
 - Health (Dental, First Aid)
 - Mining, Drilling and Civil Infrastructure
 - Water
- **Problem solving**, identified by the following industries and sectors:
 - Corrections industry
 - Government Services
 - Health (Dental, First Aid)
 - Manufacturing
 - Maritime
 - Property Services
 - Tourism, Travel and Hospitality
 - Transport and Logistics.







Internet job vacancy postings that contained requests for analytical skills were examined for occupational trends. This includes problem solving, critical thinking, troubleshooting, research and data analysis expertise. The chart below compares the percentage of internet job postings in each occupation (ANZSCO Major Group) that requested analytical skills.



Internet job postings that requested analytical skills, by occupation (2018-21)

Source: <u>Burning Glass Technologies</u>' Labor Insight[™] Real-time Labor Market Information tool.

Analytical skills were most often requested for professional, clerical and administrative or managerial positions. They were rarely requested for machinery operations or driving, labouring or community and personal service positions. This suggests that employers may consider these roles to be more restricted and technical in focus, rather than positions requiring higher-level analytical thinking.

The following graphic shows examples of occupations where analytical skills are highly requested, and some examples of the types of requests employers are making for those in these occupations.



There are a range of technical occupations for which analytical skills are commonly requested, from data and business analysts to medical and marketing related occupations. Businesses are eager to take advantage of analytical and data-based insights in order to drive productivity, add value in highly competitive environments, create greater insights to increase asset utilisation, and to tailor customer-focused solutions accordingly.



Transport

The Transport industry in Australia comprises of the following four main sectors:

- Aviation
- Maritime
- Rail
- Transport and Logistics.



The need for analytical and related skills is driven by new technology and the need to work with and interpret data. These needs were identified in the **2021 Industry Outlook** for the Rail industry sector, and is highlighted by the following quotes:

The advent of autonomous systems and trains increases the volume and complexity of information (i.e. data, train telematics, diagnostics of vehicle health), changing the role of remote operators significantly. Remote operators require higher-order skills in data analytics, problem-solving, and an understanding of autonomous systems.

The workforce will require basic digital literacy, data manipulation and data analysis skills, through to quality decision systems thinking and judgement making. Additionally, they will need to understand the impact of wearable technologies and how to interface with this type of technology.

The workforce requires customer service skills in interfacing between digital systems and customers. Having the right skills to determine and meet these expectations is key to improved and efficient operations. The ability to traverse data, find and interpret information effectively to meet customer needs is essential to enhance the customer experience.

Utilities

The Utilities industry in Australia comprises of the following four main sectors:

- ESI Generation
- ESI Transmission, Distribution and Rail
- Gas
- Water.



The need for analytical and related skills in the Gas industry are highlighted by the following quote from **Industry Outlook 2021: ESI Generation Industry Reference Committee**:

The ESI Generation industry is increasing its use of automation and digitalisation. Sensors and digital devices are being deployed to diagnose issues and optimise operations. Installation of such equipment highlights the role of data analytics and digital literacy. The need for these skills is also noted in the Water industry, highlighted by the following quote from **Industry Outlook 2021: Water Industry Reference Committee**:

Smart technologies have enabled the industry to predict issues before they affect customers. The water industry needs to be agile in managing the relationship with customers. There is also a growing social expectation that organisations should provide increased customer service. The industry requires a flexible workforce with skills such as creativity, problem-solving, critical thinking and specialists who may create human-centred techniques such as design thinking.

Corrections and Public Safety

The Corrections and Public Safety industry in Australia comprises of the following four main sectors:

- Correctional Services
- Defence
- Fire and Other Public Safety
- Police.



The need for analytical and related skills in the Corrections and Public Safety industry are highlighted by the following quote from the Industry Outlook 2021: Corrections Industry Reference Committee:

The Corrections workforce need to manage increasingly large populations of offenders and provide individualised support. This requires them to have higher-order skills in communication, critical thinking, problem solving, empathy, victim awareness, relationship management, and self-management planning.



Overview

Business and compliance skills encompass the broad range of capabilities required to run a successful business, to understand relevant regulatory requirements and to maintain compliance.

Though there are many business skills required to be a successful business leader, key skills may include sound financial and project management skills, the ability to plan, and effectively manage resources. Understanding the regulatory environment in which the industry is operating is also necessary, to ensure that the company adheres to industry standards and rules, follows internal compliance guidelines, and maintains dialogue with regulatory bodies for the industry.

In 2019/2020 a **Supply Chain Skills** cross sector project was commissioned by the AISC. Its goal was to examine the implications of major changes underway across, and within, supply chains due to the impact of automation, robotics, big data and other new technologies. The project resulted in ten new skill sets and sixteen units of competency being developed and approved for supply chain skills which are common to a range of industry sectors.





Lockdowns and border closures imposed in efforts to contain the spread of COVID-19, compounded by panic buying of some goods, presented numerous challenges in supply chain management, requiring skills in **identifying risks**. It was also **reported** by the National Australia Bank (NAB) that some businesses are rethinking 'just-in-time' inventory management and are paying suppliers sooner to ensure supply.

Skills in workplace health and safety have also become a priority, with both workers and customers becoming responsible for mitigating the risks of exposure to the virus. Cross-sector infection control skill sets with contextual advice for 10 industry sectors were **endorsed in July 2020** to enable current and future employees to upskill in managing these risks.

Health and Safety skills were also acknowledged in the **Offshore Oil and Gas Safety Review: Policy Framework**, which found the pandemic has emphasised the importance of managing physical and mental health impacts for workers, and notes the need for businesses to have proactive mental health strategies in place to ensure workers' overall wellbeing.

The Australian, State and Territory governments have recognised small business owners and their employees may need additional support to strengthen their business skills as a result of the pandemic, and have introduced a number of programs through their **COVID-19 recovery plans** and budgets. The Australian Government Department of Business has also **provided a website** to help businesses cope with the changed conditions and compliance regulations, including information on business planning, government funding reducing cyber security risks and updating policy, procedures and processes. The National Skills Commission's **Impacts of COVID-19 on Businesses** report found that proportion of businesses affected a great deal by COVID-19 has decreased significantly since April 2020, with the most common impact of COVID-19 on businesses in July 2021 being the need to change their business practices.

In response to the pandemic accelerating digitisation across the economy, the media release **Digital Training for Australian Directors** announced the Australian Government had launched a new training program designed to lift the digital literacy of company directors. The training comprises 10 online modules that cover topics such as modern competitive business practices, digital risk and compliance and digital investment strategy.



Industry skills needs

2020 **Future of Jobs Report** by the World Economic Forum (WEF) finds for Australia's country profile, the skills identified as being in high demand by the organisations surveyed were:

- Leadership and social influence ranked number 4
- Complex problem-solving ranked number 7
- Reasoning, problem-solving and ideation number 13
- Quality control and safety awareness number 14.

In addition, Leadership and social influence, and Quality control and safety awareness were also identified in the top 10 list of skills currently in focus of across reskilling/upskilling programmes. The report also lists Business Management as a specialised skill of the future, which is in demand across multiple emerging professions (People and Culture, Marketing, Product Development and Sales).

The National Skills Commission's report **State of Australia's Skills 2021: Now and Into the Future** found across the economy most employed people (80%) require skills in the business operations and financial skill cluster family to perform their job.

A 2021 **Infrastructure Australia** report reveals the shortage of project management professionals is anticipated to peak at 19,000 at some point in the next three years, with over 40 per cent of the current infrastructure workforce likely to retire over the next 15 years. This challenge is greatest for project management professionals and structures and civil trades and labour, both of which have more than 40 per cent of workers over the age of 45. While new entrants will join the sector, the loss of experience will be significant.

The Hays article **The Most In-Demand Skills in 2022** lists IT Project Managers as the top in-demand skill that companies need nationally, with successful candidates to work within agile frameworks, have exceptional communication skills and bridge the gap between stakeholders and non-technical experts. This is supported by the BetterUp blog **8 Hard and Soft Skills a Project Manager Should Have**, which lists the top three hard skills required as a project manager as Negotiation, Relevant technical skills, and Writing skills, and the top three soft skills listed as Communication skills, Leadership skills and Motivation skills.

According to the Australian Industry Standards report **Industry Outlook 2021: ESI Generation Industry Reference Committee**, workers are required to be aware of the latest regulatory and compliance issues regarding the implementation, operation, and maintenance of emerging renewables technologies such as Carbon Capture and Storage, battery storage, and demand management.

The podcast **Business View Podcast: 2020 in focus - leadership and resilience** discussed how businesses' leadership skills are critical to taking advantage of emerging opportunities.

These skills include sound financial skills, resilience, planning skills and decision-making skills. Communication skills and compassion to their workforce also rated highly.

Some specific examples of business and compliance skills that industries have identified as important include:

- Compliance skills, identified by the following industries and sectors:
 - Financial Services
 - Local Government
 - Specialised Business Services
 - Sport
- Health and Safety skills, identified by the following industries and sectors:
 - Business services (Business Administration and Governance)
 - Health
 - Maritime
 - Sport, Fitness and Recreation
 - Tourism, Travel and Hospitality
- Project/program management skills, identified by the following industries and sectors:
 - Utilities (Gas)
 - Civil Infrastructure
- Risk Management, identified by the following industries and sectors
 - Defence
 - Events
 - Insurance and Superannuation
 - Local Government
 - Specialised Business Services
 - Tourism and Travel



Internet job postings

Internet job vacancy postings that contained requests for business and compliance skills were examined for occupational trends. This includes experience in planning and prioritising tasks, preparing business presentations and organisational skills. The chart below compares the percentage of internet job postings in each occupation (ANZSCO Major Group) that requested business and compliance skills.

Internet job postings that requested business and compliance skills, by occupation (2018-21)





Source: <u>Burning Glass Technologies</u>' Labor Insight™ Real-time Labor Market Information tool.







Business and compliance skills were most often requested for managers, and clerical and administrative workers, and were least often requested for machinery operators and drivers, and labourers. Sales workers and Professionals also had higher rates of these skills requested.

The following graphic shows examples of occupations where business and compliance skills are highly requested, and some examples of the types of requests employers are making for those in these occupations.



Skills in this area are often more relevant to those working in management positions or who are otherwise asked to input on business project controls and budgets. Many job postings reference the need for experience working within a business environment.



Transport industry cluster

The Transport industry plays a key role in enabling Australia's economic activity. Without the capacities and capabilities provided by the Transport industry, no passengers or freight would move. The industry comprises four sectors:

- Transport and Logistics
- Maritime
- Rail
- Aviation.



The need for work health and safety, and compliance skills (or a combination of both) were identified in the Industry Outlooks for the Transport sector, and is highlighted by the following quotes:

The pandemic has highlighted the significance of health and safety issues. The workforce needs to be abreast of the latest health and safety regulations and updates to ensure operations are conducted seamlessly and safely. Trainers need to ensure the workforce has the competency and capacity to conduct their duty safely in compliance with regulations. (**Rail IRC's 2021 Industry Outlook**)

Safety and compliance are of utmost importance in the Aviation industry. To this end, regulations are updated to ensure ongoing safety. The workforce will need to maintain their current skills to ensure safety and compliance in Flight Operations, Flight Training and Ground Operations. (Aviation IRC's 2021 Industry Outlook)



Overview

Interpersonal skills are highly sought after in many industries. Those able to collaborate and share information are best able to adapt to changing markets and technologies, interact in diverse workplaces, and effectively respond to customer needs.

As organisations become increasingly dynamic and horizontally structured, collaboration skills are needed across all types of roles, to help businesses improve efficiency and achieve organisational goals.

Communication and collaboration tools will evolve, and Australian workers will need to be skilled in new media literacies, for example communication through social media. Skills that enhance collaboration include communication and teamwork skills, active listening, social perceptiveness, relationship management, and social and cultural awareness.



Border closures, social distancing directives, remote working and business continuity plans limiting face-to-face contact has compelled a shift in the way workers and students are able to collaborate during the pandemic. **ACS Australia's digital** pulse 2020 reported nearly half (46%) of Australia's workforce were working from home in April 2020, and there was a 1,125% increase in the number of people using Zoom, a 560% increase in Cisco's Webex and 108% increase in Microsoft Teams over Optus networks. **ACS Australia's digital pulse 2021** reported people with a job were 1.7 times more likely to work from home at least once a week in February 2021, compared to March 2020, with 41% of Australian workers still working from home in some capacity in early 2021.

In their article **Gartner Identifies Nine Trends for the Future of Work in a Post-COVID-19 World**, Gartner states:

- 48% of employees will likely continue to work remotely at least part of the time, compared to 30% pre-pandemic.
- 74% of CFOs intend to increase remote work at their organisation.
- Hiring managers should prioritise digital dexterity and digital collaboration skills to succeed in a predominantly remote working environment.

However, **a survey** conducted by Adecco Group found that while in Australia 83% of workers said they had benefitted from flexible work, the majority indicated the preference to spend only half the working week working remotely, so teams can collaborate face-to-face.

Collaboration tools found renewed importance during COVID-19 for their role in ensuring the productivity of suddenly remote teams. In their article **Gartner Survey Reveals a 44% Rise in Workers' Use of Collaboration Tools Since 2019**, Gartner reveals nearly 80% of workers are using collaboration tools for work in 2021, up from just over half of workers in 2019. As many organisations shift to a long-term hybrid workforce model, cloud-based, personal and team productivity technologies, along with collaboration tools, will form the core of a series of new work hubs that meet the requirements of various remote and hybrid workers.



ACS Australia's digital pulse 2021 reports employers are looking for technology workers who can bridge the gap between user needs and digital solutions and bring communication and collaboration skills as well as technical expertise to a role. The report shows more than half of the top 10 skills most demanded by technology employers were soft skills such as communication (requested in 42% of job postings), teamwork (23%) and problem solving (18%).

The report **Australian Graduates' Work Readiness: Deficiencies, Causes and Potential Solutions** found that stakeholders reported that the Australian vocational education and higher education sectors do not sufficiently prepare graduates in terms of their work readiness skills. Self-management skills, communication (written and expression), teamwork skills, cognitive skills, system thinking and innovation and creativity were the main work readiness competency deficits reported by the stakeholders interviewed.

The Centre for the New Workforce report **Peak Human Workplace: Innovation in the Unprecedented Era** reveals 53% of Australian workers report working collaboratively with others in their daily jobs, up from 46% reported in a comparable survey by **Deloitte in 2014**. The report also finds that due to its increased prevalence, online collaboration has a growing role to play in driving innovation across an organisation's ecosystem. However according to **research done for Atlassian**, online daily collaborative work is minimising the casual interactions that build trust and cooperation, strengthen community, and feed positively into organisation culture. Although 77% of Australians interviewed said they missed the energy of their workplace, they believed home could play host to both independent and collaborative working.

The National Skills Commission's report **State of Australia's Skills 2021: Now and Into the Future** revealed that when looking at the economy-wide skills portfolio, 74% of people required skills from the Communications and Collaboration skills cluster - which includes skills clusters such as collaborating with stakeholders and dispute resolution - for their occupation. This reflects the prevalence of these skills across a wide range of occupations.

According to DeakinCo, **research shows** that 70% of all future job profiles in the nontechnical area, will be made up of human-centred capabilities, with Collaboration noted as one of the core capabilities. As organisations move to a more floating workforce with an increase of freelancers and contractors, the ability to collaborate with new people from across a variety of areas will be of paramount importance.

Some specific examples of Collaboration skills that industries have identified as important include:

- **Teamwork and Communication,** identified by the following industries and sectors:
 - Financial Services
 - Government (Interpreting and Translating)
 - Information and Communications Technology
 - Property Services
 - Sport, Fitness and Communication
 - Tourism, Travel and Hospitality
- Customer Service, identified by the following industries and sectors:
 - Arts, Culture, Entertainment and Design
 - Banking and General Financial Services
 - Community Services
 - Corrections and Public Safety
 - Health
 - Insurance and Superannuation
 - Property Services
 - Tourism, Travel and Hospitality





Internet job vacancy postings that contained requests for communications skills were examined for occupational trends. This includes experience in building relationships, different types of communication and listening, team building and negotiation. The chart below compares the percentage of internet job postings in each occupation (ANZSCO Major Group) that requested collaboration skills, including communication.



Internet job postings that requested collaboration skills, by occupation (2018-21)



Collaboration skills were most often explicitly requested for clerical and administative or managers, and least often for machinery operation or labouring positions. This suggests the employers consider these skills more important in roles where teamwork and collaboration are central to daily duties.

The following graphic shows examples of occupations where collaboration skills are highly requested, and some examples of the types of requests employers are making for those in these occupations.



Employees are looking for individuals who can communicate both internally and externally in a range of formats. These skills are often mentioned for positions such as project manager or business manager, where there will be a need to manage teams, engage with internal stakeholders while also communicating with external clients.



Arts, Culture, Entertainment and Design

The Arts, Culture, Entertainment and Design industry includes a broad range of individuals and organisations, producing artistic and creative works for both commercial and social outcomes.



The quotes below demonstrate the importance of collaboration for this workforce, including the ability to communicate and work as a team:

Artists and art organisations have developed new skills and greater capacity to adapt to rapid change, draw in broader audiences, engage with them digitally, and work collaboratively with their peers to achieve outcomes despite adversity. (FutureNow Creative and Leisure Industries Training Council: Performing Arts, 2022)

There are countless studies that demonstrate that training in the arts helps students develop crucial skills, including creativity, innovation, agility, intellectual curiosity, resourcefulness, exploratory thinking, communication, teamwork, problem solving, emotional judgement, professional ethics, global citizenship, entrepreneurship and the courage to take risks. These qualities are essential for the 21st century working environment. (National Association for the Visual Arts (NAVA) Pre-budget Submission Process for 2021-22)

Employers were asked what the most important recruitment factors are when employing school leavers and graduates. Fifty-three per cent state that a positive attitude and soft skills (communication, problem solving, teamwork etc.) are the most important factors. (Australian Industry Group's Skills Urgency: Transforming Australia's Workplaces)

Corrections and Public Safety

The Corrections and Public Safety industry comprises of workers in the four main industry sectors of Correctional Services, Defence, Fire and Other Public Safety, and Police.



The quotes below demonstrate the importance of collaboration for this workforce, including the ability to communicate and work as a team:

All states and territories have implemented several significant changes since the release of the 2020 Bushfire Royal Commission recommendations. Interoperability of personnel and resources has improved through with the use of a common incident management system, supporting protocols and procedures, role based competencies and national industry doctrine. All state and territory fire agencies continue to work collaboratively to further develop workforce capabilities to ensure that interoperability is successfully implemented. (Public Safety IRC's Industry Outlook 2021)

The Corrections work environment is transitioning towards a more rehabilitative model rather than an institutional model, with greater emphasis placed on offenders' mental and physical health. Correctional staff require higher-order skills in communication, critical thinking, problem solving, and relationship management to effectively engage with offenders. (Corrections IRC's Industry Outlook 2021)



Overview

Approaches to customer service, marketing and communication are evolving, with social platforms increasing in prevalence. As such, the workforce will need to become skilled in new media literacies in order to engage with customers and achieve sales and marketing targets.

A cross-sector project is currently in progress, which is looking at developing **Consumer Engagement through Social and Online Media** to improve social platform & marketing skills. The Case for Change associated with this project has been finalised and submitted to the AISC for endorsement.





COVID-19 impact

As government health directives closed or limited non-essential retail outlets and **more people chose to shop online**, having an online presence to attract customers and offer alternate purchasing options became vital to survival for many businesses. **ACS Australia's Digital Pulse 2020** highlights that:

- Previously physically-delivered industries have transformed their products, offering new online services to consumers for example telehealth.
- Expenditure on food delivery services increased 230% compared to pre-COVID levels.
- Restaurants, clothing stores and other retail moved substantially or entirely online.

ACS Australia's Digital Pulse 2021 survey results of Australian businesses in August 2020 showed this shift to online activity increased average online revenue between \$105,000 and \$708,000 for small businesses. This shift to digital purchases is expected to persist, with home deliveries expected to remain 25% higher than before March 2020.

FutureNow's **Industry Snapshot: Sport** reveals national sports training packages have recently been updated to encompass COVID-19 operational changes and policy and framework content, as well as skills in communication, online and social media, marketing, initiative, and enterprise to aid in COVID-19 recovery.

According to the **Administrative Services Workforce Profile**, many Australian businesses lost capacity in their offshore centres in Indian and the Philippines when COVID lockdowns took effect. Telstra recruited at least 1000 new staff in Australia to cover the shortfall and is set to permanently change the way it provides customer service post-COVID with an aim to route all inbound voice calls through Australian call centres by 2022.

The PwC Australia report **Where Next for Skills?** states the digital skills needed to support consumers as they transition to online purchasing and to engage these customers through electronic business communication and marketing channels were already in short supply and the pandemic magnified that shortage. The article **Redefining Customer Experience: Connecting in the Time of COVID-19** shows that as

more customers are having to make purchases online, which has meant that human connections – and thereby customer service skills – have become essential. This is supported by further **article** in the series, which advocates blending digital and human experiences.

Frontline customer service representatives have been required to augment their skills, regarding health and safety, to try to minimise the risk of COVID-19 transmission by staff and patrons. The **Infection Control Skill Set (Retail)** was endorsed in May 2020, followed by **cross sectorial skill sets** with contextual advice for 10 industry sectors in July.

Media reports and viral social media posts of some consumers who struggled with changes in public health requirements and temporary supply difficulties also highlighted the importance of conflict resolution skills for customer service workers. The new skill set **Manage disrespectful, aggressive or abusive customers** was endorsed in October 2020.



Industry skills needs

The **Rail IRC's Industry Outlook 2021** has commenced a review of the Certificate II and III in Rail Customer Service to enable customer service operators to provide the service that meets passengers' expectations. Passenger safety, security, ticketing technology and communications skills will be addressed. The report acknowledges the workforce requires customer service skills in interfacing between digital systems and customers, and having the right skills to determine and meet these expectations is key to improved and efficient operations.

The shift to digital technologies and online platforms are reshaping customer behaviour. The **Water IRC's Industry Outlook 2021** notes the growing social expectation that organisations should provide increasing customer service and transparency of their services, with the IRC committing to conducting regular targeting stakeholder consultation/ engagement to identify and respond to priority customer service skill needs. The report also notes digital skills are equally important as customer service and engagement is mediated via digital platforms.

The Jobs Queensland report **Future Work for Small Business: Skills, Capabilities and Potential** states electronic invoicing and social media marketing are now essential for many small businesses, with small business workers commonly identifying skills gaps in relation to marketing. The report reveals skills and capability development areas for small businesses include contemporary marketing and advertising (digital strategies).

The **State of Australia's Skills 2021: Now and Into the Future** report reveals social media is a skill rising in importance, trending in 47 and emerging in 18 occupations, and providing an alternative avenue for digital marketing. Additionally, **ACS Australia's Digital Pulse 2021** lists Customer Service skills in the top 10 requested skills in ICT job postings in 2020.

Hay's list **The most in-demand skills in 2022** lists Customer Service Representatives in high demand in call centres, with Customer Service Representatives with financial services, manufacturing, fast-moving consumer goods (FMCG) or medical supplies/devices industry experience in greatest demand. Customer service skills such as confidence, a professional phone manner, an ability to work under pressure and a genuine passion for helping people are all necessary.

Some specific examples of customer service and marketing skills that industries have identified as important include:

- **Customer service skills**, identified by the following industries and sectors:
 - Business Services
 - Community Services
 - Corrections and Public Safety
 - Financial Services
 - Government
 - Health
 - Property Services
 - Tourism, Travel and Hospitality
 - Transport
- **Marketing skills,** including online and social media, identified by the following industries and sectors:
 - Arts, Culture, Entertainment and Design
 - Business Services
 - Community Services
 - Property Services
 - Retail and Wholesale
 - Sport, Fitness and Recreation
 - Tourism, Travel and Hospitality



Internet job vacancy postings that contained requests for customer service & marketing skills were examined for occupational trends. This includes skills related to sales, telephone marketing, social media and communication. The chart below compares the percentage of internet job postings in each occupation (ANZSCO Major Group) that requested customer service & marketing skills.

Internet job postings that requested customer service and marketing skills, by occupation (2018-21)



Source: <u>Burning Glass Technologies</u>' Labor Insight™ Real-time Labor Market Information tool

Unsurprisingly, customer service & marketing skills were most often requested for sales workers, with 76% of postings for these occupations containing at least one skill. Clerical and administrative workers and managers also had high rates of customer service and





marketing skills requested. Labourers, machinary operators and drivers and technicians and trade workers had lower rates of these skills requested, suggesting these occupations are less often customer facing.

The following graphic shows examples of occupations where customer service & marketing skills are highly requested, and some examples of the types of requests employers are making for those in these occupations.



As well as general communication and sales skills, employers are seeking those with the ability to work with social media technology such as Instagram and Facebook. For higher level positions there is interest in those who have used their skills in different contexts, such as in business-to-business and consumer sales, and when engaging with diverse clients and customers.



Corrections and Public Safety

The Corrections and Public Safety industry in Australia comprises four main industry sectors: Correctional Services, Defence, Fire and Other Public Safety, and Police.



The quote below demonstrates the importance of Customer Service and Marketing Skills for this workforce:

> The development of soft skills are critical to the manpower security industry. Security officers rely heavily on their interpersonal, communication, emotional intelligence and conflict resolution skills in order to assess and respond to situations in a professional manner. Excellence in customer service together with the ability to interact with people and build rapport are fundamental to the role and will become even more important in the coming years. These skills, although essential in many security roles, are often flagged as lacking by employers. (Public Order, Safety and Regulatory Services Workforce profile)

Financial Services

The Financial Services industry comprises of workers in the following six main industry sectors:



- Accounting and Bookkeeping
- Banking and General Financial Services
- Financial Markets and Planning
- Insurance and Superannuation
- Mortgage and Financial Broking
- Specialised Financial Services.

The quotes below demonstrate the importance of Customer Service and Marketing Skills for this workforce:

Given the very high skill level to perform the Financial Broker role, many employers now seek candidates who provide good customer service and who have strong interpersonal skills. (Insurance and Finance Broking Services Workforce Profile)

Technical skills aren't all that employers expect of their candidates. They look for strong interpersonal and creative skills, the ability to make data-based decisions, adapt well to change and a continuous learning mindset. Insurers are looking beyond their typical candidate profile to consider people with strong customer service skills and a willingness to learn.

A key focus has been the development of stronger partnerships with brokers and insurers to help deliver value for customers. They make sure the customer has the right insurance solutions for the right risks and are well protected. The specialisation for brokers is their ability to understand customer demands and needs which, in turn, builds trust, and strengthens brand and reputation. (Insurance and Superannuation Funds Workforce Profile)

Property Services

The Property Services industry is composed of a diverse range of sectors involved in the design, operation, servicing and sale of commercial and non-commercial buildings.



The quotes below demonstrate the importance of Marketing Skills for this workforce:

With many small companies vying for contracts, the competitive environment requires more than quality service delivery. Organisations need to stay connected with their clients in order to maintain communication and be responsive to their needs. Social networking and social media marketing are effective ways to promote and differentiate a business, inform clients and connect to new growth opportunities. Service providers need to foster interactive relationships with existing clients and utilise breadth of communication platforms to market themselves.

Self-managed websites, use of social media platforms for marketing purposes and the integration of smart devices into work processes rely on computer literacy capability and need to be developed. Communication and customer service skills continue to be important in settings where services are being delivered domestically or in populated areas, requiring client interaction. (Building Cleaning, Pest Control and Other Support Services Workforce Profile)



Overview

The current explosion in new technologies is reinventing much of the way businesses are run. This has significant implications for the workforce, which needs to evolve and be agile to keep up with this technological expansion.

Digital skills, which are becoming increasingly important and a priority for many industries, can include:

- coding and programming
- developing and using robotic and automation technologies
- leveraging information and communication technologies (ICT) skills in business
- exploring the world of cloud computing and the Internet of Things.

Several **cross-sector projects** have focused on the impact of technological advances on the workforce. These projects have sought to address common skills needs, minimise duplication and consolidate existing training units. Projects include:



- looking at developing **Digital skills** across industries
- looking at the workforce skilling implications in relation to the use of Automation and Digital Skills, namely robotics, drones and remote operation systems
- examining the implications of the major change underway across and within **Supply chains** due to the impact of automation, robotics, big data and other new technologies
- reviewing current and emerging developments in **Cyber security** skills, particularly in relation to data confidentiality, protection and privacy, and identifying related skills needs shared by multiple industry sectors
- providing an evidence-based case and industry support for developing vocational training in **Big data** and big data analytics skills that can be transferable across multiple industries.



COVID-19 impact

The CSIRO report **Global trade and investment megatrends** explains that the necessity of remote working and learning, online shopping, healthcare, communication and entertainment has compelled a decade's worth of digital transformation to occur within the space of a few months. The digital technology sector is expanding worldwide despite the global economic downturn and there is an urgent need to upgrade skills in artificial intelligence (AI), data science, machine learning, robotics, and cybersecurity.

ACS Australia's Digital Pulse 2021 reports that the importance of digital technology has increased, with workers almost twice as likely to work from home in February 2021 compared to March 2020, retailers adopting e-commerce, and education providers transitioned to periods of online learning. Healthcare and education had the largest growth in overall employment and in technology occupations as they experienced greater demand for their services, and needed to shift to online modes of delivery.to mitigate a higher risk of spreading COVID-19.

The FutureNow **Digital Technology Industry Snapshot** states demand for the products and services of the digital technology industries has expanded significantly as people seek to engage for work and other pursuits remotely. **Critical Role of Blue Tech and Digital Skills in Australia's Economic Recovery**, indicates that when Australia starts moving into the recovery phase, the digital and AI disruption already being experienced pre-COVID-19 will accelerate, and the workforce needs to be prepared now.

Nine new skill sets were endorsed in relation to digital skills in July to assist the ICT sector to meet priority workforce needs in a number of specialty areas, followed by the **Digital Skills for Small Business Skill Set** and the **Entry into Technology Skill Set** in September designed to support small businesses as they adapt to operating in an online environment, and assist displaced workers to secure employment in areas of labour market growth.

The Australian Government **Digital Economy Strategy 2030** states COVID-19 accelerated the take up of digital technology and highlighted the role it can play to support and enhance business operations across every sector of the economy, improve the delivery of government services and make life easier for Australians. The pandemic has driven a huge leap forward in Australia's digital capability and appetite for data, and this momentum must be maintained to secure its future prosperity and protect its national interests.



The **Technology impacts on the Australian workforce** report finds that 2.7 million Australian jobs are at risk from automation over the next fifteen years, but more than twice as many jobs can be created if Australia decides to invest in the skills development of its workforce.

State of Australia's Skills 2021: now and into the future identifies data and digital skills as the fastest growing skills required by employers. In the **LinkedIn Learning Workplace Learning Report 2021**, digital fluency skills were ranked second by Australian respondents to the survey.

The 2020 **Future of Jobs Report** based on the results of the 2020 edition of the Future of Jobs survey by the World Economic Forum (WEF) asked employers to identify emerging skills within their organisation. For Australia's country profile, there were two digital skills that were identified as in high demand.

- Technology use, monitoring and control (ranked 5)
- Technology design and programming (ranked 10).

The Learning Country: Digital Transformation Skills Strategy states the types of skills included in digital frameworks tend to be grouped into three areas:

- Digital literacy skills, comprising the essential skills needed by everyone to enable citizenship, social inclusion and economic participation in a digital society
- General digital skills, which are needed across the broad workforce to enable effective work in a digital economy
- Advanced digital skills, which are the specific skills needed by ICT professionals, technicians and managers working with information technology systems, hardware and software.

Australian Government Digital Economy Strategy 2030 **details the 2021-2022 budget initiatives**, categorised as digital skills, artificial intelligence, enhancing government service delivery, investment incentives, SME digitalisation, emerging aviation technology, data and the digital economy, and cybersecurity, safety and trust. Some specific examples of digital skills that industries have identified as important include:

- Digital skills relating to industry specific software or technology, identified by the following industries and industry sectors:
 - Agriculture
 - Aviation
 - Business Services
 - Financial Services
 - Electricity Supply Generation
 - Electricity Supply Transmission, Distribution and Rail
 - Maritime
 - Property Services
 - Rail
 - Timber Processing and Products
 - Process Manufacturing (PMA).
- **General digital skills and literacy**, identified by the following industries and industry sectors:
 - Corrections and Public Safety
 - Dental
 - Forestry and Wood Products
 - Gas
 - Government
 - Maritime
 - Mining, Drilling and Civil Infrastructure
 - Technicians Support Services
 - Transport and Logistics
 - Water.



Internet job postings

Internet job vacancy postings that contained requests for digital skills were examined for occupational trends. This includes requests for specific technical skills such as experience in Microsoft Office software or SQL, as well as general requests for computer literacy, software development or data entry experience. The following chart compares the percentage of internet job postings in each occupation (ANZSCO Major Group) that requested digital skills.

Internet job postings that requested digital skills, by occupation (2018-21)







Source: <u>Burning Glass Technologies</u>' Labor Insight™ Real-time Labor Market Information tool

Computer skills were requested most frequently for clerical, administrative and professional occupations, and least often for community or personal service workers and labourers. This suggests that most clerical and administrative jobs will involve frequent use of digital technologies. Job postings will often specify the type of digital technology that will be used, with Microsoft Office products such as Word, Excel and PowerPoint the most common.

The following graphic shows examples of occupations where digital skills are highly requested, and some examples of the types of requests employers are making for those in these occupations.



There are two broad occupation types where digital skills are often requested – non-IT focused occupations where digital skills are often for more basic or broad tasks, and IT professions where high levels of specific digital skills are needed.



Community Services

The Community Services industry is one of the largest industry areas in Australia. Much of it sits within the Health Care and Social Assistance industry. The industry can be broken down into a number of sectors:

- Children's Education and Care
- Client Services
- Community Sector and Development
- Direct Client Care and Support.



The workforce encompasses a diverse range of job roles and functions which are multi-levelled as well as requiring multiple skill areas, often overlapping with other sectors such as housing, health, education, aged services and disability. The COVID-19 pandemic accelerated the uptake of teleservices within the industry, and the importance of digital skills for the workforce and their clients is highlighted in the following guotes from the reviewed literature.

> [The] research found that organisations in the aged care, disability services, and emergency relief sectors adapted rapidly in order to continue meeting their clients' needs and continue pursuit of their respective missions during the

COVID-19 crisis. The process of innovation served to demonstrate the benefits of flexibility for clients, staff, and the broader organisation, and the importance of technological skills and infrastructure in the modern world. (Service Innovation Deep Dive: Capturing and Leveraging Learnings from Service Innovation during COVID-19)

Research on telepractice for the family and relationship service sector is emerging, especially in response to the COVID-19 pandemic in 2020...To support practitioners, services may need to invest in developing the technological skills of practitioners and their understanding of the benefits of its use. (**The Use of Telepractice in the Family and Relationship Services Sector**)

Both clients and staff noted the potential of telepractice to expand the reach of services as well as deliver support in a more flexible and accessible way. The benefits of this for vulnerable groups, such as those living rurally, are well documented. However, the rapid digitalisation catalysed by COVID-19 has also "highlighted the broad implications of the digital divide". Disparities in digital literacy, access to reliable internet, and ownership of devices or hardware exclude some people from accessing telehealth services. (Necessity as the Catalyst of Change: Exploring Client and Provider Perspectives of Accelerated Implementation of Telehealth by a Regional Australian Community Service Organisation during COVID-19 Restrictions)

COVID-19 focused attention on the need for organisations to apply plain English principles to their communication with employees and members of the community...We produced a permanent online course for teachers and school administrators to help them communicate clearly with parents and carers.

Once we realised the need for trainers to become instant experts in key learning platforms such as Zoom, 26TEN ran three training sessions for Tasmanian adult literacy practitioners. (26TEN: Tasmania's Strategy for Adult Literacy & Numeracy: Annual Progress Report 2020)

Utilities

The Utilities industry employs over 100,000 people, providing vital services in Fossil Fuel and Renewable Generation, supplying high-voltage electricity from generators to distribution networks and directly to domestic and industrial users, gaseous fuel storage and distribution, gas retail, transmission and distribution, and providing water and sewerage systems to households and businesses, and irrigation water in agriculture. The industry is comprised of four main industry sectors:

- ESI Generation
- ESI Transmission, Distribution and Rail
- Gas
- Water.



The increasing adoption of new technologies has reshaped the industry's operations, increasing the need for workers to possess digital skills. This is highlighted in the following quotes taken from the four 2021 industry outlooks:

The ESI Generation industry is increasing its use of automation and digitalisation. Sensors and digital devices are being deployed to diagnose issues and optimise operations. Installation of such equipment highlights the role of data analytics and digital literacy. Digital innovations provide real-time information about electricity consumption, potential power outages and fault identification. Insights provided by data analytics and AI can also improve decision making processes in the energy generation sector. (ESI Generation IRC's 2021 Industry Outlook)

Customers' interaction with the grid is radically changing due to the increasing adoption of [Distributed Energy Resources] DERs which enable consumers to store surplus energy, inject it back into the grid, or buy and sell energy from platforms such as peer-to-peer (p2p) trading platforms where energy is traded between consumers at an agreed price...These kinds of changes require the workforce to be more focused on their interactions with customers as they are becoming more digitally interconnected. Digital strategies and digital skills will play a significant part in enhancing customer experience and improving services. (ESI Transmission, Distribution and Rail IRC's 2021 Industry Outlook)

The increasing development of gas projects and the implementation of new automation and digital technologies will require the workforce to have the right skills and capabilities in automation technologies. Skills related to remote operations, robotics, wireless networks, data analytics, maintenance and operation of connected technologies will be fundamental to successful the implementation of automation in the gas industry. (Gas IRC's 2021 Industry Outlook)

Data analytics enables digital simulation and modelling of water networks to collect real-time data from control systems and sensors, optimise operations, forecast the behaviour of water networks, and predict issues. Big Data analytics can also predict supply and demand availability to ensure water security and identify the need for infrastructure upgrades. The [Internet of Things] IoT in the water sector is focused on Intelligent Water Metering...Intelligent Asset Management and Operations...and Data Acquisition and Insights. VR technology is being used as a training tool to assist with safety and site inductions and to enable training in the current pandemic environment. The workforce will require skills for new digital and remote technologies and data analysis/management. (Water IRC's 2021 Industry Outlook)

Agriculture

The Agricultural industry comprises the following industry sectors: Production Horticulture, Broadacre Farming, Livestock Farming, Mixed Crop and Livestock Farming, Agriculture Support Services and Agricultural Product Wholesaling.

The agricultural industry and the Australian Government have identified digital and technological trends could be harnessed to optimise the industry along its value chain. For example, the **National Farmers' Federation roadmap** sets a vision to exceed \$100 billion in farm gate output by 2030, supported by the **Accelerating Precision to Decision Agriculture (P2D)** project and **Growing a Digital Future**, led by the Cotton Research and Development Corporation (CRDC), and the Australian Government Department of Agriculture, Water and the Environment. An increased need for digital skills is highlighted in the following quotes from the related strategies and reports.

Quotes from the National Agricultural Workforce Strategy include:

Throughout the report, the Committee deliberately uses the term 'AgriFood' instead of simply 'agriculture'. This is to underline one of the report's main themes: that in the 21st century the sector needs to think of, and project, itself as encompassing primary, secondary and tertiary industries – farm production, value-adding in factories, and use of digital and automated production techniques, including robotics.

AgriTech adoption will lead the workforce to transition from manual lowpaying jobs to more technical high-paying jobs that are also more attractive to Australian workers in terms of reputational appeal and career development. This transition will require new education and training structures, because farmers and other AgriFood workers need support to familiarise themselves with emerging technologies and to obtain the specialist skills required to maximise their use.

Providing the skills for farmers to use new technology on farm is important, as is developing the broader rural workforce to work in support and service roles. Upskilling can be provided through accredited university and VET courses, microcredentialling, other professional development programs and informal training.

The accompanying Australian Government Response includes:

As part of the National Agricultural Innovation Priorities, the Government has developed a National Agricultural Innovation Policy Statement that includes four new National Agricultural Innovation Priorities. One of the priorities is to support Australia to be a mature adopter, developer and exporter of digital agriculture by 2030. In contribution to this digital priority, the Government is developing a Digital Foundations for Agriculture Strategy to help set the foundations for the widespread adoption of digital technologies across agriculture, forestry and fisheries as well as grow the Australian agtech industry.

To ensure career advice and agriculture data reflects modern agricultural occupations the Government has announced \$2.7 million from 2021-22 to support development of a comprehensive, up-to-date map of agricultural occupations which will be accessible through an interactive, user driven experience on the Your Career website (to be led by the National Careers Institute).

The National Agricultural Innovation Policy Statement includes:

Digital adoption in the Australia agriculture industry is estimated at just 10%. A 3-fold increase in active technology users is required for agriculture to reach its ambitious goal to move to a \$100 billion industry by 20301. Uptake of digital technology could create a \$20.3 billion per year increase to industry production.

We are supporting industry to improve the sharing of data across the agriculture and food supply chain, through the Australian AgriFood Data Exchange project led by Integrity Systems (a subsidiary of Meat and Livestock Australia). The Australian AgriFood Data Exchange will create an interconnected data highway for Australia's agrifood value chain. The data exchange will allow the timely and permissioned exchange of data between participants across the agriculture and food supply chain.

Quotes from the Agricultural Workforce Digital Capability Framework are:

Whilst the full range of digital and enabling capabilities will be required in the future of the agricultural industry, the greatest level of expectation is set on data collection and analysis as well as data management.

The industry is also likely to face an increasing need for other non-traditional agricultural skills in the workforce such as technological, scientific and management competencies, which are also identified to possess more mature digital capabilities.

Transport

The Transport industry plays a key role in enabling Australia's economic activity. Without the capacities and capabilities provided by the Transport industry, no passengers or freight would move. The industry comprises four sectors:

- Aviation
- Maritime
- Rail
- Transport and Logistics.



The need for digital skills were identified in the 2021 Industry Outlooks for the four sectors of the Transport industry, and is highlighted by the following quotes:

The use of drones and unmanned aerial taxi for delivering products such as food or medical supplies, and even commuting to work will be more prevalent in the future. A new development is Electric Vertical Take-off and Landing (eVTOL) Vehicles that will create even more opportunities. Drone technology is projected to create up to 5,500 new full-time jobs each year for the next two decades.

The industry is also working towards introducing Digital Aerodrome Services, also known as Digital Control Towers, to help air traffic controllers, enhance service delivery and improve safety outcomes. The technology involves capturing video imagery of an airport and surrounding airspace and displaying it on screens at a centrally based control room. Digital towers can also be integrated into the air traffic management data networks to improve flow management and collaborative decision-making. This technology can increase efficiency and save costs. (Aviation IRC's 2021 Industry Outlook)

Autonomous vessels are having a more prominent focus in the industry. The Australian Maritime Safety Authority (AMSA) has recently approved the operation of an unmanned surveillance vessel equipped with radar, cameras, and sensors for various applications. The development and trials of electric and autonomous ships are well underway across the world and autonomous underwater vessels are currently in operation. These vessels still operate in conjunction with human supervision.

E-navigation and digital developments in information and communication systems is impacting the industry. New systems enable the harmonised collection, integration, exchange, presentation, and analysis of marine information on board and ashore by electronic means to enhance navigation and improve safety and security. Examples of changes in technology include dynamic positioning, electronic charts and Dynamic Positioning Maintainer. An increasing number of new vessels are also equipped with Dynamic Positioning (DP) systems which help to keep vessels at a fixed position and heading by integrating a variety of systems and functions through a computer control system. (Maritime IRC's 2021 Industry Outlook)

The industry has identified that tasks related to autonomous rail traffic, automatic signalling and rollingstock fault identification require the workforce to have a mix of basic, intermediate, and advanced digital literacy skills and knowledge. [Advanced Train Management System] ATMS requires drivers, infrastructure maintainers and Network Controllers understand systems, digital displays, how data is being transferred and the impact of action/ inaction in relation to data and error messages. Automation requires consideration of the impact on rail safety and the need to strengthen risk intelligence, problem solving and decision making within competency standards. (**Rail IRC's 2021 Industry Outlook**) The introduction of new technologies will require the development of digital skills for procurement and scheduling professionals. It is anticipated Australian transport and logistic enterprises will use blockchain for financial reconciliation, tracking goods and services and supply chain reporting.

Automation will require the development of workplace skills for the operation of semi-autonomous and autonomous machines, as well as working in robotic warehouses. The key challenge during the transition period will be to upskill existing operators within the supply chain to minimise workplace displacement thereby creating greater opportunity to realise significant productivity benefits for industry. (Transport and Logistics IRC's 2021 Industry Outlook)



Overview

Strong foundational skills, namely literacy and numeracy skills, but also digital and financial literacy, are extremely important for most jobs in the knowledge economy. Foundation skills underpin the productivity of Australia's workforce and are instrumental in ensuring workers have the ability to upskill.

Training for foundation skills is undertaken through the Foundation Skills Training Package which is developed by the Education Industry Reference Committee.

Recent feedback from industry and providers indicate that the Foundation Skills Training Package is currently failing to provide foundation skills to learners, and a review of the training package is required in an attempt to address this.



In their submission to the Australian Government titled **Critical Role of Blue Tech and Digital Skills in Australia's Economic Recovery**, TAFE Directors Australia, CISCO Systems and Optus highlight the rapid shift to digital technologies which was prompted by the COVID-19 pandemic, and stated that for all Australians to be able to participate and contribute to economic and social development, they will require some degree of digital literacy.

The **submission report** from TAFE Queensland to the Standing Committee on Employment, Education and Training revealed the period of remote working introduced across business sectors during the COVID-19 lockdown exposed the extreme shortage of digital skills and knowledge amongst a broad spectrum of the population. Digital technologies are increasingly embedded in all aspects of working practices, and the widespread automation of routine tasks in many workplaces is also leading to the disappearance of roles traditionally available to those with lower levels of literacy and numeracy. The submission states that to provide ongoing, realistic employment prospects to all Australians, it is vital that a revised approach to adult literacy aims to improve literacy and numeracy levels across the board.

Foundation skills are one of the Australian Government's priorities for skills development:

- Announced as part of the Delivering Skills for Today and Tomorrow package in May 2019, the Foundation Skills for Your Future Program commenced in April 2020 and has the aim of assisting people who are employed but need their language, literacy, numeracy and digital literacy (LLND) skills enhanced to enable them to engage in higher skilled work or training.
- The **Skills for Education and Employment (SEE) program**, which replaced the Language, Literacy and Numeracy Program in 2013, is the Government's primary program for helping eligible job seekers to improve their LLN skills.

As part of the government's COVID-19 response, the Foundation Skills for Your Future Program has been enhanced to allow the development and delivery of online resources and the SEE program will be funded for an estimated additional 14,485 places. The Australian and State and Territory Governments have all included additional assistance for business owners, their employees and those who need to upskill or reskill to access training in digital skills in their **COVID-19 recovery plans** and/or budgets.


The **Skills and Training 2021-22 Budget Presentation** included a Government pledge of \$23.6 million to expand access to basic language, reading, writing, maths and computer skills training for Australians with low levels of language, literacy, numeracy and digital literacy. This included \$1 million for research activities to support foundation skills policy.

Across all occupations and industries, baseline digital skills are foundational to workers in across many roles. The **Digital Economy Strategy 2030** reveals the Government is expanding and uncapping the Skills for Education and Employment (SEE) program. This will provide an additional \$4 million to support projects that better incorporate digital skills training for job seekers as part of the Commonwealth's commitment to providing stronger support for foundation skills under the Heads of Agreement for Skills Reform.

The submission report **Public Enquiry: Adult Literacy and its Importance** acknowledges that the skills and knowledge adults now need to succeed in work and life have dramatically changed, and is often driven by technological advances. A significant number of people aged from 15 to 74 years old in Australia do not have access to sufficient foundation skills in reading and numeracy to be able to cope equally with life and work, with low levels of language, literacy and numeracy skills having a negative impact on an individual's social and economic future. The report states improving foundation skills in both parents and children can reverse intergenerational patterns of low achievement, with evidence showing that investing in improving the language, literacy and numeracy skills of the population also has economic benefits for the nation - including by Gross Domestic Product (GDP) and productivity.

Following a referral from the Australian Government Minister for Education and Youth, the House Standing Committee on Employment, Education and Training will inquire into and report on **adult literacy, numeracy and problem-solving skills in Australia**.

The presentation **Financial Literacy in Australia: Insights from HILDA Data** notes that although Australia has a relatively high level of financial literacy when ranked globally, there is widespread financial illiteracy within Australia, particularly amongst young people. There are also large and significant gender gaps, with women less financially literate than men on average. Widespread financial illiteracy is of increasing concern within the context of highly complex financial markets, high levels of personal and household debt and easy access to numerous credit opportunities.

In many industries, baseline foundation skills may be treated as assumed knowledge. Some specific examples of foundational skills that some industries have identified as important include:

- Language, Literacy and Numeracy, identified by the following industries and sectors:
 - Arts, Culture, Entertainment and Design
 - Building and Construction
 - Business Services
 - Corrections and Public Safety
 - Retail and Wholesale.
- Digital Literacy, identified by the following industries and sectors:
 - Corrections and Public Safety
 - ESI Generation
 - Financial Services
 - Government
 - Manufacturing
 - Nursing
 - Retail and Wholesale
 - Transport.





- Financial literacy, identified by the following industries and sectors:
 - Financial Services
 - Government
 - Retail and Wholesale.



Internet job vacancy postings that contained requests for foundation skills were examined for occupational trends. This includes writing, communication, typing and basic digital skills. The chart below compares the percentage of internet job postings in each occupation (ANZSCO Major Group) that requested foundation skills.

Internet job postings that requested foundation skills, by occupation (2018-21)



Source: <u>Burning Glass Technologies</u>' Labor Insight™ Real-time Labor Market Information tool

Foundation skills were most often explicitly requested for clerical and administrative positions, and least often for labourers and machinery operation and drivers positions. Overall these skills are often requested, with postings across all occupational types requesting foundation skills more than 20% of the time. Often these skills will be implicit in a job (such as expecting good digital literacy skills for IT workers), which may explain why these rates are not higher.



Employers are requesting a range of basic communication and administrative skills when recruiting for entry-level postions. It is difficult to understand the full extent to which these skills are required as for many occupations these skills are implicitly required and won't be specifically asked for. For example, employers will not ask for basic communication or literacy skills when recruiting for managerial or highly technical positions.



Transport

The Transport industry in Australia comprises of the following four main sectors:

- Aviation
- Maritime
- Rail
- Transport and Logistics.



The need for strong foundational skills within the transport sector is highlighted by the following quotes:

The growing need for digital literacy that goes beyond basic computer skills is fast becoming the new standard. Incorporating these skills is vital to being able to adapt, adopt, analyse and interact with several platforms that are not limited to the internet of things, cloud computing and artificial intelligence.

Additional skills required within the industry will include communication skills; virtual collaboration and social intelligence; managerial/leadership skills; design mindsets, critical thinking/problem solving and system thinking skills; learning agility/information literacy skills; intellectual autonomy and self-management skills; Language, Literacy and Numeracy (LLN) skills; technology and data analysis skills. (Logistics and Defence Skills Council's Rail Industry Profile (Rail - Passenger))

As companies move into more technology-based operations, assistance with training will be required for current staff and an older workforce to transition into new work modalities particularly for small to medium sized operators. Those groups with low technical expertise/literacy, and low Language, Literacy, Numeracy (LLN) skills may be at further risk of experiencing delays in training.

Some organisations are implementing policies and procedures to tackle issues surrounding disclosed and non-disclosed Language, Literacy and Numeracy (LLN) challenges in the workforce. The policies and procedures identify barriers which may impact workers ability to undertake their roles, and the appropriate steps which need to be taken to ensure workers have an appropriate level of understanding before completing tasks.

The following skills continue to be in increasing demand within the transport and logistics industry and span across driving and non-driving roles: communication; problem solving; compliance; technology; Language, Literacy and Numeracy (LLN). (Logistics and Defence Skills Council's Road Transport Industry Profile (Freight))



Overview

Leadership and management skills encompass a range of skills associated with people management, self-management and change management.

Planning, problem-solving and decision-making are all skills which pertain to leadership and management. Other major aspects of managing and leading include supervision of others, the ability to delegate tasks, and to effectively manage yourself and your workload.



Self-management, planning and people management skills have been necessary to guide teams and co-workers, along with strategic and innovative thinking, to protect and ensure business continuity and recognise potential opportunities. As highlighted in the PwC article, **How to Redefine Employee Experience for the Post-pandemic World**, leaders have been required to rethink processes, physical setups, and safety measures for customer-facing, factory and field workers and create a virtual workplace for remote workers.

The NAB podcast **Small Business View Podcast: leadership and resilience** discusses the importance of leadership and resilience skills of business owners in the pandemic climate and how they can be used to help small businesses in the wake of COVID-19.

The Australian Agriculture, Horticulture, Conservation and Land Management Industry Sector Annual Update 2021: IRC Skills Forecast and Proposed Schedule of Work report reveals with the industry disruption due to COVID-19, it has been very difficult to retain or replace workers with experience in mentoring and leadership. As COVID-19 has accelerated the rate of people exiting industries (those with ageing workforces have been particularly affected), it has left fewer workers who would normally be relied upon to assist in the development of the next generation.

Research shows Indigenous Australians will play an important role in Australia's economic recovery from the COVID-19 pandemic and longer-term economic prosperity. The National Indigenous Australians Agency report **National Roadmap for Indigenous Skills, Jobs and Wealth Creation** outlines how fully activating and supporting Indigenous Australians to gain the skills and confidence needed to enter into jobs, upskill into more technical, managerial and leadership positions and to establish and thrive in their careers, will be a key part of Australian businesses resolving skill and workforce shortages and the Australian economy's future growth.



The 2020 **Future of Jobs Report** by the World Economic Forum shows for Australia, leadership and social influence skills were ranked fourth of the top 15 skills identified as being in high demand by the organisations surveyed. In addition, Leadership and social influence was also identified in the top 10 list of skills currently in focus across reskilling/upskilling programmes.

The podcast **Business View Podcast: 2020 in focus – leadership and resilience** discussed how businesses' leadership skills are critical to taking advantage of emerging opportunities. These skills include sound financial skills, resilience, planning skills and decision-making skills. Communication skills and compassion to their workforce also rated highly.

A **discussion paper** on nursing and midwifery in Western Australia found nurses and midwives must actively engage and contribute at all health leadership and policy levels to determine the way forward for the WA health system. The report also stated nursing leadership is vital in the aged care sector, where clinical leadership and management to address the increasingly complex health issues experienced by this population will enhance care, health outcomes and sustainability. The number of Aboriginal nurses and midwives in leadership roles must increase to ensure a culturally safe and diverse workforce.

The Australian Public Service Commission (APSC)'s report **Delivering for Tomorrow: APS Workforce Strategy 2025** notes long-established leadership capabilities, such as conceptual and analytical thinking and strategic planning, remain essential; however, soft skills - such as the ability to engage with multiple stakeholders and effectively mobilise diverse teams - are core leadership capabilities for the future. The report also identifies the top people management and leadership development needs within the industry as:

- Leadership leading and managing through change, uncertainty and transformation
- People management centred around managing remote teams, developing high-performing teams, staff mental health, coaching and mentoring, psychologically safe environments and career management
- Performance management including high performance and underperformance, and managing complex and challenging staffing issues.



Internet job vacancy postings that contained requests for leadership and management skills were examined for occupational trends. This includes skills in leadership, planning, time management, building relationships, mentoring and decision making. The chart below compares the percentage of internet job postings in each occupation (ANZSCO Major Group) that requested leadership and management skills, including communication.



Internet job postings that requested leadership and management skills, by occupation (2018-21)

Source: <u>Burning Glass Technologies</u>' Labor Insight™ Real-time Labor Market Information tool

Unsurprisingly, leadership and management skills were most often explicitly requested for managerial positions. However, 34% of managerial positions didn't contain an explicit reference to leadership skills. This does not mean these skills were not relevant, but more likely indicates that the employers implicitly assume only those with leadership skills would apply for the position. Leadership and management skills were least often requested for machinery operators and drivers, and labourers, but all catagories of profession (with the exception of Machinery operators and drivers) had these skills requested in 20% or more job postings.

The following graphic shows examples of occupations where leadership and management skills are highly requested, and some examples of the types of requests employers are making for those in these occupations.



Leadership and management skills requested by employers are usually related to communication or planning skills. This ranges from communicating with internal and external stakeholders, training and developing high-performance teams, and demonstrating strategic thinking, analysis, problem-solving and decision-making capabilities.



Government

The Public Sector comprises federal and state/territory governments, statutory bodies and state-owned corporations. Public Sector employees play a key role in the development, review and implementation of government policies and provide an array of services for the community, and incorporates the following areas:

- Government Services
- Interpreting and Translating
- Local Government.



The report **Delivering for Tomorrow: the APS Workforce Strategy 2025** represents an enterprise-wide view on how to equip the Australian Public Service workforce to tackle immediate and emerging challenges. A key area of focus through to 2025 in this report is to 'Strengthen integrity and purposeful leadership'.

The following quotes from the report highlight the importance of leadership and management skills in the industry:

Development of current leaders to build strong future pipelines for senior leadership roles is a key talent management focus in any organisation that emphasises its leadership capability.

Leadership can be exercised by anyone, regardless of position, with the capacity and desire to affect positive change in the APS. Leadership behaviours and attributes which inspire, develop and direct others to achieve APS goals can be built and retained both within the APS and in the market.

Leadership is about inspiring and energising people to tackle challenges and find solutions that benefit the nation. This includes engaging people to bring about change, to innovate, collaborate and move towards a new vision of the future. It also includes challenging current thinking and ways of working to deliver better outcomes for government and community. In this environment, being adept at working with multiple organisations and systems is just as important as technical expertise in delivering outcomes.

Continuing to build leadership capability will be a high priority for the APS as the workforce adapts to rapid change. This must be supported by a range of interventions that encourage individual and organisational commitment to continuous learning.



Overview

Strong science, engineering, technology and mathematics (STEM) skills, are extremely important for the knowledge economy.

While often associated with the university sector, the report **Australia's STEM Workforce**, released by the Office of the Chief Scientist on Australia's STEM workforce shows that the vocational education and training (VET) sector provides more than two thirds of Australia's STEM workforce.

However, different industries have different levels of STEM needs and more work needs to be done with the relevant training packages to specify realistic standards for STEM-related competency requirements.



STEM occupations have continued to unpin many of the essential services required for the public health response to the pandemic, including millions of COVID-19 tests and vaccinations, manufacturers and engineers pivoted their businesses to produce vital PPE products and health and safety equipment, and technology workers shifted operations online to facilitate working from home or business continuity.

The **Laboratory Operations Case for Change** states COVID-19 has resulted in a surge in demand for molecular testing to detect active infections with SARS-CoV-2, and genomic testing for contact tracing.

The National Skills Commission (NSC) publication **The Shape of Australia's Post COVID-19 Workforce**, in their assessment of characteristics associated with the most resilient occupations, finds that a total of 41.3% of the STEM occupations (as classified by the NSC) are on the resilient occupations list, compared with 30.7% of occupations overall, indicating the importance of these skills to the economy.

The **NSC also reports** that prior to the pandemic, between February 2015 and February 2020, employment in STEM occupations grew by 17.7%, representing a growth rate that was 1.5 times faster than that seen in non-STEM jobs. Employment in STEM occupations fell by only 1.9% when economic activity was restricted from February to May 2020, which is less than a third of the 7.0% decrease experienced in employment in non-STEM occupations.



State of Australia's Skills 2021: Now and Into the Future reports that STEM skills form an integral part of the labour market in Australia, facilitating more complex and innovative work in many industries. In the 20 years before the emergence of COVID-19, employment in STEM occupations grew by 85.0% which was more than twice as fast as non-STEM occupations (40.2%). Employment in STEM occupations is projected to grow by 12.9% in the next five years, well above the average of all occupations (7.8%) and more than twice as fast as non-STEM occupations (6.2%).

The **Australia's STEM Workforce** report and the **STEM occupations list** used by the Department of Education, Skills and Employment highlight there is not a single, nationally or internationally, recognised definition of STEM. The findings of **Changing demand for STEM skills in Australia** and gender implications include that technical and trade jobs account for almost the same level of demand for STEM skills as professional occupations, reflecting the importance of including the VET sector in any STEM agenda.

In Australia's STEM Workforce, the term STEM qualified refers to people with the highest level of post-secondary qualification in the broad Australian Standard Classification of Education (ASCED) fields of education of Natural and Physical Sciences, Information Technology, Engineering and Related Technologies, Agriculture, and Environmental and Related Studies. The report states that for the VET STEM qualified labour force, 80% held qualifications within the Engineering field of education, followed by 10% for Agriculture and Environmental Science, 8% for Information Technology and 2% for Natural and Physical Sciences.

The **STEM Equity Monitor** reports that in 2020, many women STEM VET graduates reported their training to have some or high relevance to their jobs. In the field of All STEM, this was 56% of women, compared to 78% of men, 61% in the field of Agriculture, environmental and related studies compared to 81% of men, 69% in Engineering and related technologies compared to 81% of men, 57% in Natural and physical sciences compared to 61% of men, and 56% in Information compared to 49% of men. Comparatively, approximately 75% of women and men who graduated across all VET fields of education reported that their training was relevant to their job.

Some specific examples of industries that have identified STEM skills as important include:

- Agriculture
- Defence
- Electrotechnology
- Food and Pharmaceutical Production
- Government
- Information and Communications Technology
- Manufacturing
- Maritime
- Mining
- Rail





Internet job vacancy postings that contained requests for STEM skills were examined for occupational trends. This includes pathology, chemistry, biology, botany, engineering, and experimental expertise. The chart below compares the percentage of internet job postings in each occupation (ANZSCO Major Group) that requested STEM skills.



Internet job postings that requested STEM skills, by occupation (2018-21)



STEM skills were most often requested for professionals and technicians and trades workers, and were rarely requested for most other types of occupation. Because most STEM skills are relevent to specific technical or professional occupations, it is likely that employers only request them when the occupation directly demands it.

The following graphic shows examples of occupations where STEM skills are highly requested, and some examples of the types of requests employers are making for those in these occupations.



When employers request STEM skills, they often directly request tertiary qualifications in the relevant field. This suggests that employers rely on formal qualifications in order to gauge the STEM skills of potential employees.



Defence

Defence and intelligence organisations, including associated administrative and support functions, is part of the Public Safety industry, which also comprises;

- Police,
- Fire and rescue services,
- Maritime rescue,
- Emergency services and emergency management agencies.



Additionally, the Automotive Manufacturing and the Metal, Engineering and Boating Industries sub-sectors of the Automotive and Manufacturing Industries form part of the Defence Industry supply chain.

The need for STEM and related skills was identified in the **Public Safety 2021 Industry Outlook**, and is highlighted by the following quotes:

Defence continues to invest in development programs aimed at advancing workforce skills by delivering high-quality training to trade apprenticeships, leadership and management in a wide variety of fields, including cybersecurity, intelligence, forensics, health, security analysis and engineering.

The Defence Industry Skilling and STEM Strategy also states:

The modernisation of Australia's defence capability will rely on diverse workforces both in Defence and defence industry and people with skills in Science, Technology, Engineering and Mathematics (STEM). Defence industry comprises thousands of Australian businesses, employing women and men who are not in the Australian Defence Force but use their expertise, technical and trade skills to supply capability and support services. An appropriately skilled and STEM enabled workforce provides Defence and industry with the ability to innovate and solve problems, respond rapidly to changing military requirements and maintain a technological edge for Defence to achieve its mission: to defend Australia and its national interests. As defence capabilities become more technologically complex, the demand for skilled people, including those with STEM skills, within defence and defence industry will increase.

The Western Australia Logistics & Defence Skills Council states in the **Defence Industry Profile**:

> According to the Naval Shipbuilding Plan, the Federal Government will invest up to \$62 million in workforce growth and skilling initiatives to enable the delivery of naval ships, submarines, and modern shipyard infrastructure. The type of the work and the affiliated support services feeding into this industry will generate a growing need for more Science, Technology, Engineering, Mathematics (STEM) skills.

The **Defence Industry Skilling and STEM Support** information provided by the Australian Government Department of Defence includes:

The Australian Government is investing \$270 billion in Australia's defence capability to ensure Australia remains secure, well into the future. This investment is expected to deliver significant opportunities for Australian industry and generate an increasing demand for a highly skilled and STEM specialised workforce.

The 2020 Defence Strategic Update includes:

Science, technology, engineering and maths skills will underpin the industries and jobs of the future, including in the defence sector. The Schools Pathways Program, the Defence Industry Internship Program and a new Skilling Australia's Defence Industry program will continue to equip the defence sector with the skilled workforce it will require to support and sustain the ADF. The Naval Shipbuilding College is also working closely with industry and education and training stakeholders to understand demand and supply requirements of the naval shipbuilding industry throughout all phases of build and sustainment.

Mining, Drilling and Civil Infrastructure

The Mining, Drilling and Civil Infrastructure industry comprises five main industry sectors:

- Civil Infrastructure.
- Coal Mining
- Drilling
- Extractive Industries (Quarrying)
- Metalliferous Mining.

The need for STEM and related skills was identified in the Australia's National

Resources Workforce Strategy, and is highlighted by the following quotes: [The] sector increasingly needs new skills, especially in science, technology,

engineering and mathematics (STEM) fields, driven by the uptake of new technologies and the development of methods to bring new commodities like hydrogen and critical minerals to the market.

The Government is working to remove barriers, break down gender stereotypes and create an inclusive workforce by working with industry to attract women into the resources sector, particularly in STEM fields.

STEM skills underpin a variety of roles in the resources sector, both traditional and emerging. They are fundamental for new jobs being created by technology. STEM skills fuel innovation, leading to new discoveries, products and technologies that ensure Australia remains a world leader in the resources sector.

The Minerals Council of Australia Submission to Indigenous Skills and Employment Program Discussion Paper includes:

Shared focus has resulted in the minerals industry employing a higher proportion of Indigenous Australians than any other sector. Progress is positive. Yet there is more to do, particularly to increase the number of Indigenous Australians in mining leadership, trades and technical, and science (including environmental management), technology, engineering and mathematics (STEM) roles. The growing minerals workforce relies on these roles.

The Resource Industry Training Council Industry **Developments and Workforce Challenges: Mining/ Oil and Gas** includes:

> Improved penetration of the nationally recognized training system will involve industry engaging and creating partnerships with educational providers. The Rio Tinto/ South Metropolitan TAFE VET Collaboration is a positive example of such collaboration in action with the introduction of Australia's first nationally recognised qualifications in automation, providing workers, with the skills and knowledge needed to succeed in an increasingly STEM-based industry.

Sustainability and natural resource management

Overview

Since committing to the Paris Agreement in 2015/2016, Australia has engaged in reducing carbon emissions and combatting climate change. In an effort to deal with the effects of climate change and improve sustainability, there is an increasing need for sustainability and natural resource management skills.

The **2009 Green Skills Agreement** revised training packages to include 'green skills', and the cross-sector project on **Environmental Sustainability Skills** continued the emphasis on sustainability skills by aiming to identify duplication and gaps in sustainability skills which span industries.





The **National Agricultural Workforce Strategy** states consumer expectations and government standards promote the need for end-to-end supply chain traceability and visibility, and the scope of requirements is being extended to support environmental sustainability and social responsibility. With the appearance the pandemic may have its origins in an uncontrolled food market supply chain, there is an increased need to build and maintain the high standards and integrity of Australian supply chains in the current era of global concern about the origin and safety of food.

An increase in demand for complementary skilled landscaping and nursery workers is anticipated in the **Agriculture, Horticulture, Conservation and Land Management IRC's 2021 Skills Forecast**, following the impact COVID-19 has had on peoples' use of domestic space, notably gardens. The skills forecast reports gardening was the second most popular lockdown activity people planned to do after watching television and is predicted to maintain its current surge in popularity due to associated economic, recreational, health and environmental benefits.

The Australian Government's Modern Manufacturing Strategy is a key part of the Government's JobMaker plan, introduced to support economic recovery from the COVID-19 pandemic. The strategy's associated roadmaps related to sustainability and natural resource management include those prepared for Resources Technology and Critical Minerals Processing National Manufacturing and the Recycling and Clean Energy National Manufacturing.

Initial responses to the pandemic by the states and territories included:

- The Western Australian Government recovery plan includes The Green Jobs Plan, and three fee-free skill sets for young people and job seekers were **announced** in support of this plan.
- The Queensland Government **announced** funding for 11 environmental projects in the Great Barrier Reef catchments, which were expected to support around 130 jobs.
- The Jobs for Canberrans Fund supported **a new team** in the ACT Parks and Conservation Service to help maintain the Territory's parks and reserves.
- The Tasmanian Government, as part of its Jobs Plan, announced funding for a

number of industries and projects related to sustainability and natural resource management, including for renewal energy, national parks, and waste management.

- Victoria in particular was harshly affected by health measures introduced to control the spread of COVID-19. Announcements related to building sustainability and natural resource management skills in the state include:
 - The establishment of a Clean Economy Skills and Jobs Taskforce, and the Clean Economy Workforce Capacity Building Fund.
 - The launch of **Australia's first hybrid TAFE and university degree** at Federation University, a dual-sector education provider, which embeds a Diploma of Food Science and Technology into a Bachelor of Sustainable Food Systems.
 - As part of the **2021-22 budget**, the establishment of a traceability information hub, the development of new systems to prove the origin and quality of Victorian produce, and campaigns to promote the paddock-to-plate journey of Victoria's produce.

The **Food, Beverage and Pharmaceutical IRC's 2021 Skills Forecast** highlights changing consumer demands have been accelerated by the pandemic in relation to ethical, sustainably sourced products, and selection of brands that promote transparency and alignment with the consumers' values.



The reviewed literature indicates the primary sustainability and resource management issues impacting the skills requirements of Australian industries: climate change, the circular economy and ethical and transparent supply chains.

The 26th annual UN Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP) in Glasgow, Scotland was held in October 2021, following a deferral in 2020 due to the COVID19 pandemic. The **Outcomes of the UN Climate Change Conference** in Glasgow document states COP26 clearly established 1.5 degrees Celsius of global warming as the limit all countries will need to work toward, and that countries must revisit their Nationally Determined Contributions (NDCs) by the end of 2022.

Australia's **2021 NDC update** committed to net zero emissions by 2050, inscribed low emissions technology stretch goals, affirmed the 2030 target, and reported 2021 projections results showing Australia is on track to exceed this target by up to 9 percentage points. The low emissions technology stretch goals are underpinned by the **Technology Investment Roadmap** and aim to drive priority technologies to cost parity with higher emissions alternatives. The priority technology stretch goals include clean hydrogen production, low-cost solar electricity generation and storage, and low emissions steel and aluminium production.

The Australian Government response to the Inquiry into Australia's Waste Management and Recycling Industries states the circular economy exchanges the typical 'make, use, dispose' cycle with one in which material resources are kept in productive use for as long as possible using processes such as waste avoidance, reuse, repair, repurposing and recycling. The federal government supports the transition to a predominately circular economy to transform waste into sustainable resources and reduce the impact of landfills.

The Sustainability Industry Reference Committee (IRC), supported by IBSA Manufacturing, is **reviewing the MSS Sustainability Training Package**, stating three sets of changes are driving the case for change: the ban on waste, a global shift towards a circular economy and the need to align qualifications to emerging and future job roles:

- Australia is one of around 100 countries impacted by restrictions introduced by China on the import of recyclable materials, and the Australian Government has banned the export of unprocessed waste overseas via the Recycling and Waste Reduction Act 2020.
- There is a global movement towards a circular economy which include recycling, reuse and remanufacturing principles, which if the Australian manufacturing sector keeps pace with the trend and moves toward closed loop systems will enable Australia to offer traceable premium green products and reduce reliance on imported goods and materials.
- Demand for skills in sustainable operations is driving a need for a more sophisticated and strategic skills base including knowledge and understandings such as science-based targets, triple bottom lines, governance, leadership and management, data interpretation and communication. Additionally, the terminology used in the qualifications does not reflect contemporary language and concepts, and, as the entire sustainability sector functions on legislation, the qualifications need to promote greater awareness of government regulations.

A **KPMG report** commissioned by the CSIRO examining the potential economic effects of circular opportunities in the Food, Transport and the Built Environment sectors estimates that a circular economy could increase Australia's GDP by \$23 billion.

The **Supply Chain Leaders' Sentiment Report** states that supply chains can have a direct and tangible impact on the environment, and sustainability is a priority for consumers and businesses. Policies and initiatives that supply chain leaders are implementing include ethical sourcing, sustainable supplier selection and material selection, and the use of recyclables. The environmental impacts of doing business are being addressed through emissions reduction strategies, the use of renewable energy, electric vehicles and alternative fuels. Almost half (48%) of the respondents to **a survey** conducted by Lonergan Research for ELMO Software indicated they would not work for a business that did not take action to address climate change, and 84% believe Australians businesses should do more to reduce their emissions and carbon footprint.

While sustainability principles within supply chains is a whole of industry concern, procurement and supply chain management are specifically delivered under the Transport, Government and Business Training Packages, and have been prioritised in previous year skills forecasts for Manufacturing subsectors including **Textiles, Clothing and Footwear**.

Industries that may experience changes to skills demand in relation to climate change policy include, for example:

- Mining, Drilling and Civil Infrastructure, particularly the Metalliferous Mining and Drilling subsectors, and Process Manufacturing due to increased global demand for materials used in renewable energy technologies such as cobalt, manganese, tantalum, tungsten, and zirconium, outlined in Australia's Critical Minerals Strategy and Resources Technology and Critical Minerals Processing National Manufacturing Priority Road Map.
- Utilities the electricity sector accounts for 33% of Australia's total emissions. The 2021 Industry Outlook for the ESI Generation, the ESI Transmission, Distribution and Rail, and the Gas subsectors of the Utilities industry highlight the shift to renewable energy resources.
- Electrotechnology the Electrotechnology IRC's 2021 Industry
 Outlook states solar installation has been steadily growing, with the
 current two and a half million installations anticipated to double by
 the mid-2020s, and around 50% of clean energy jobs are projected to
 be in operation and maintenance by 2035. Additionally, the phasing
 down of the use of synthetic refrigerants to reduce hydrofluorocarbon
 emissions to refrigerants with a low Global Warming Potential, which are
 more flammable, toxic to humans and operate at extreme pressures.





Some specific examples of industries where sustainability and resource management skills, particularly environmental sustainability, have been identified as important include:

- Agriculture, Food and Pharmaceutical Production and Process manufacturing, particularly in relation to chemical manufacturing (fertiliser and feedstock), due to changing consumer values increasing the importance of the 'social licence to farm/operate' and government policy and regulations. These industries are prioritising environmental sustainability, incorporating ethical treatment, waste minimisation, traceability and provenance, and supply chain management.
- Manufacturing and Related Services, particularly Textiles, Clothing and Footwear are also impacted by the increasing importance of a social licence to operate, which is redefining how, and which kinds of businesses firms operate. Industry and customers are placing greater emphasis on sustainability and product stewardship, minimising waste, recycling, repurposing and ethical sourcing.
- **Business, Government and Financial Services**, due to ethical and environmental sustainability decisions made in procurement and supply chain management, and government policy and regulation. Stakeholders and consumers have increasing expectations that organisations 'make good' on the commitments stated in their corporate social responsibility (CSR) reports.
- **Retail and Wholesale** and **Transport** have a direct and tangible impact on the environment, and are prioritising ethical sourcing, sustainable supplier and material selection, recycling and the use of recyclables. Strategies for the use of renewable energy, electric vehicles and alternative fuels are also being implemented.











Internet job vacancy postings that contained requests for sustainability and natural resource management skills were examined for occupational trends. This includes land and resource management, environmental protection, water treatment, and environmental engineering. The chart below compares the percentage of internet job postings in each occupation (ANZSCO Major Group) that requested sustainability and natural resource management skills.

Internet job postings that requested sustainability and natural resource management skills, by occupation (2018-21)



Source: <u>Burning Glass Technologies</u>' Labor Insight™ Real-time Labor Market Information tool

Sustainability and natural resource management skills are rarely directly requested in job postings. They are requested the most for managers and professionals and almost never for sales workers or community and personal service workers. This suggests employers will only request these skills when the job is environmentally focused.

The following graphic shows examples of occupations where sustainability and natural resource management skills are highly requested, and some examples of the types of requests employers are making for those in these occupations.



Occupations with sustainability and natural resource management skills requested are normally directly within an environmental field, such as environmental advice or management. They are also relevant for policy and planning positions where environmental concerns are a factor.



Food and Pharmaceutical Production and Agriculture

The Food and Pharmaceutical Production industries provide direct employment to more than 215,000 people and food and beverage products are central to the employment and sustainability of the agriculture, meat, seafood, wine, wholesale and retail, and tourism and hospitality industries. This industry includes:

- Food processing and manufacturing
- Beverage manufacturing
- Pharmaceutical and nutraceutical manufacturing
- Feedlots and wild game harvesting
- Wholesaling and retailing.

The **Food, Beverage and Pharmaceutical IRC's 2021 Skills Forecast** has identified sustainability as a priority, with changes in skills requirements for the sector's workforce being led by consumer and industry trends, and the regulatory environment, which is highlighted in the following quotes from the skills forecast:

COVID-19 is accelerating the emerging consumer focus on health and wellbeing and ethical, sustainably sourced products, including from plant-based proteins. There is also a broader trend of caution and selectiveness towards brands that



demonstrate purpose, transparency and alignment with consumers' values, including a renewed emphasis on supporting local, independent manufacturing businesses. Aligned with this, Australia's 'clean and green' identity, which is enhanced by strict biosecurity governance, and its reputation for high-quality, trusted and verifiable products is a unique advantage. This is sustained by 'country of origin' labelling, blockchain, traceability and provenance investments and initiatives that enable the industry to validate sourcing information, meet consumer demands, support smarter value chains and combat food fraud.

The Food and Agribusiness Growth Centre (FIAL) commissioned report **Capturing the Prize** includes the agriculture, fishing and food-related manufacturing value chain, including agricultural machinery, seeds and packaged food products sectors. The report includes the quote:

Training institutions are already observing a shift in the way the Australian workforce is responding to changing skill needs. For example, officials at the Australian Institute of Packaging said in an interview that training courses for workers in the packaging industry are focusing more strongly than in the past on recycling, sustainable materials and technical skills. The type of workers attending these courses has also changed over the past couple of years, according to the Institute: from professionals such as packaging technologists and industrial designers to a greater number of attendees with non-packaging backgrounds (such as quality control professionals, sustainability and environmental professionals, or production staff).

The media release from Federation University, a dual-sector tertiary education provider, **Federation launches Australia's first hybrid TAFE and university degree** includes:

The first half of the degree embeds a Diploma of Food Science and Technology to develop student's knowledge and core practical skills across food testing, quality and sustainability...Graduates of the new Bachelor of Sustainable Food Systems can expect to work in food safety, product research and development, regulatory affairs and quality assurance, and contribute to activities which promote a circular economy.

The Agricultural industry comprises the following industry sectors:

- Production Horticulture
- Broadacre Farming
- Livestock Farming
- Mixed Crop and Livestock Farming
- Agriculture Support Services
- Agricultural Product Wholesaling.

The Agriculture, Horticulture, Conservation and Land Management IRC's 2021 Skills Forecast includes:

[Qualifications that] are intended for employment in a niche occupation or specialist industry... often facilitate socially and environmentally valuable or geographically specific skills that are critical for jobs with few employees nationwide. The Diploma in Organic Farming, for example, not only provides the framework for produce to be grown organically and sustainably, it also imparts the leadership skills for companies seeking to be certified as organic. This industry is projected to grow at an annual rate of 15% - which, according to IBISWorld, is the highest of any industry - over the five years through 2024-25, reaching \$3.7 billion. This reflects rising consumer demand for information about the provenance of their food and assurances that farming practices take into account climate change by harnessing natural capital through methods such as regenerative agriculture.

The National Agricultural Workforce Strategy includes:

Arguably the most important factor impacting on the AgriFood sector in both Australia and globally is the simultaneous challenge to, on one hand, increase productivity to supply enough nutritious food for a global population still growing at around 160 people per minute and, on the other hand, do this in ways and using systems that also enhance ecosystem health...While sustainability challenges must be met both globally and by each country individually according to its own specific needs and circumstances, the 'front lines' of this battle to enhance the sustainability of our AgriFood systems are farms and agribusinesses and they will require much support to do this. An essential component of this support must be an upskilled, fit-for purpose workforce.

Greenhouse gas (GHG) emissions from agriculture are a major issue for the sector. It is estimated that around 14.5% of current global GHG emissions come directly from agriculture...GHG emissions from agriculture must therefore be mitigated and reduced if the social licence to farm is to be maintained... Increasing production, productivity and profitability in the AgriFood sector at the same time as reducing its GHG footprint will clearly not be based on business as usual; new knowledge, skills and technologies will be required for these essential changes to be made. Each of these will require an upskilled workforce if Australia is to maintain and enhance its competitiveness in global markets, which are becoming increasingly discerning in relation to the environmental impacts of agriculture.

Many studies project net adverse impacts on crop yields due to climate change, and many of those adverse effects will be felt in regions that are at the forefront of both food production and food consumption...Most of the indicators for climate change in Australia paint an equally concerning scenario... Effective and efficient adaptation to climate change is a major challenge for the Australian AgriFood sector if it is to remain sustainable and become more resilient to future climatic perturbations...This level of adaptation will have direct workforce implications, most strongly felt at the regional scale, where changes to what is grown and how it is grown will lead to changing demand for skills and workforce profiles.

The strategy also highlights the cross-industry relationship of maintaining sustainable practices with the quotes:

Sustainability transitions are clearly a team effort with significant implications for greater knowledge and a broader range of skills, not just for the on-farm workforce but also for workers in other parts of the value chain and the service sectors such as agronomists, input providers, banks, and farm insurance agencies.

Sustainability transitions will create new job opportunities in the AgriFood sector and require the current workforce to be upskilled. FIAL estimates that opportunities to create healthier soils could increase job numbers by 30% from 2019 to 2030. Equally, it estimates that employment linked to waste collection, disposal and recycling services could double from 2019 to 2030.

Manufacturing and Related Services

The Manufacturing and Related Services industry is very diverse, covering multiple sectors. It forms a large part of the Australian economy and is one of Australia's largest employing industries. Manufacturing has been targeted as an integral part of Australia's economic growth, particularly in the recovery from the effects of the COVID-19 pandemic and addressing the global challenge of climate change. Manufacturing has the potential to increase the demand for sustainability and resource management skills, as shown in the following quotes.



The Recycling and Clean Energy National Manufacturing Priority Road Map includes:

Materials and energy are at the heart of manufacturing. Modernising how we use them is central to building an advanced manufacturing economy that realises more potential from our resources and supports our national resilience, economic recovery and environmental sustainability. The move to more sustainable solutions for materials and energy is happening around the world. Companies committed to greener supply chains - including manufacturers and their customers - collectively wield over \$5 trillion in combined purchasing power. Over 1,100 companies worldwide have now pledged to reduce emissions in line with the Paris Agreement, often by working with their manufacturing suppliers and manufacturing customers. These global demand megatrends are reshaping the landscape for manufacturing, accelerated by market and policy pressure to reduce emissions and waste, the scale of public and private green investment, and the falling cost of technology. Australian manufacturers are well positioned to use our unique industrial advantages - combining innovation, abundant clean energy, material resources, and onshore industrial base - to become competitive global players.

We have barely begun to tap the abundant re-manufacturing potential of our waste streams, especially for plastics, glass and e-waste. Less than 5% of our plastic consumption is currently recycled. CSIRO estimates we could capture up to \$3 billion value each year through lithium battery recycling alone. We have exceptional natural resources which offer significant green manufacturing potential. Our clean energy resources are unrivalled in the developed world. We are also a top producer of critical minerals, rare earths and important base metals that the global energy transition demands. Manufacturing batteries, electric vehicles, solar panels and wind turbines needs specific materials. These include copper, lithium and nickel - all commodities where Australia has worldleading reserves.

On 12 August 2021, the Senate referred the matter of the Australian manufacturing industry to the Economics References Committee for inquiry. The **final report** includes:

Witnesses discussed the manufacturing industry's changing skills and training requirements...The committee heard of the increasing demand for skills in sustainability, advanced maintenance and diagnostics, supply chains, procurement, as well as the demand for management and 'soft' skills.

A number of submitters drew the committee's attention to the opportunities for Australia to maximise its natural competitive advantage for reliable, cheap renewable energy and the role that Australian manufacturing can play in its delivery through the manufacture of supporting technology and products, (such as solar photo-voltaic cells, batteries, electric vehicles, bioenergy, and green hydrogen) - particularly given its reserves of critical minerals, rare earths and base metals - and the export of renewable energy. For example, Science and Technology Australia estimates that the production and export of hydrogen fuel could be worth \$26 billion to the Australian economy by 2050 and the ACTU told the committee: ... hydrogen, green steel, critical minerals, battery manufacturing, education and training as well as other services. Together, that has got the potential to generate \$89 billion of gross value and create nearly 400,000 jobs in Australia up to 2040.

Utilities

The Utilities industry employs over 100,000 people, providing vital services in Fossil Fuel and Renewable Generation, supplying high-voltage electricity from generators to distribution networks and directly to domestic and industrial users, gaseous fuel storage and distribution, gas retail, transmission and distribution, and providing water and sewerage systems to households and businesses, and irrigation water in agriculture. The industry is comprised of four main industry sectors:

- ESI Generation
- ESI Transmission, Distribution and Rail
- Gas
- Water.



The increasing adoption of renewable energy technologies is reshaping the industry's operations and may provide opportunities for some sectors to transition workers from fossil fuels. This is highlighted in the following quotes taken from the three 2021 industry outlooks related to energy.

The ESI Generation IRC's 2021 Industry Outlook includes:

The Renewable sector has the potential to employ over 44,000 by 2025 and with the right policy settings, regional areas are poised to benefit the most with potentially about 70 per cent of these jobs being located in regional areas. The energy sector's transition to renewables is among the top five key shifts in the Australian economy.

Supplying remote areas and communities with affordable and reliable electricity is a significant task. Renewables sources such as wind and solar energy as well as battery storage technology can help in addressing this challenge.

Energy Networks Australia and the CSIRO predict more than 40% of industrial customers will use renewable technologies by 2027, lifting to 60% in the next 30 years. With the expected retirement of several coal generation plants, green energy sources and methods will improve the efficiency of electricity generation...The workforce needs to be skilled in the implementation, operation, and maintenance of renewables technologies to facilitate the transition between fossil fuels to renewables. Workers are also required to be aware of the latest regulatory and compliance issues regarding these technologies.

The ESI Transmission, Distribution and Rail IRC's 2021 Industry Outlook includes:

Electricity networks are being decentralised due to technological changes, customers' taking control of their energy use, and Distributed Energy Resources (DER) such as solar PVs, battery storage, and wind generating units connected to the electricity grid...Changes to the way electricity is distributed requires the workforce to be upskilled in the safe operation and maintenance of new systems and technologies. DERs and other technologies are gaining more traction in Australia. However, energy regulations and policies have been lagging behind. The energy sector has identified policy uncertainty and regulations as a key challenge to address. A coherent energy policy can encourage more investment in DERs and improvement of integration with the grid. The safety of the workforce is highly important in the industry, refresher training is conducted to ensure competency is up to date in this dangerous work environment.

The Gas IRC's 2021 Industry Outlook includes:

Hydrogen is among the top six technologies that will gain more traction in 2021. The hydrogen industry can offer enormous benefits by generating career opportunities such as technicians, tradespeople, and professionals, especially in regional areas. Hydrogen can also enhance Australia's fuel security and add to the country's GDP.

The workforce will need to be qualified to work with hydrogen safely and competently. Workers require skills and knowledge about hydrogen storage optimisation, repair and maintenance of hydrogen storage equipment, requirements for blending hydrogen with gas through gas distribution network, and use of control systems to monitor hydrogen in gas distribution networks. New skills standards should reflect operation and maintenance of equipment and technologies for hydrogen production. The workforce skills and knowledge should cover compliance standards and application of safety regulations, practices, and procedures for handling, transport, and use of hydrogen.

The Australian Gas industry is rapidly moving towards decarbonisation. New innovations include the use of hydrogen and biogas ... Biomethane can be injected into the network and used for heating, cooking, and energy. Carbon Capture and Storage (CCS) is another innovation whereby carbon is captured and stored underground to mitigate the emission risks...The increasing implementation of new technologies and alternative fuels will require the workforce to have the skills and knowledge regarding safety, environmental regulations, as well as operation and maintenance of new systems and technologies which reduce industry's environmental impacts.

Property Services

The Property Services industry comprises five main industry sectors: Architectural, Surveying and Related Services, Cleaning, Pest Control and Waste Management, Property Operations and Real Estate, Property Inspection and Servicing, Security and Investigation.



Sustainability skills were highlighted in the **Property Services IRC's 2020 Skills Forecast (abridged annual update)**, stating one of the five main changes and opportunities in the Property Services industry is:

Consumer (and client) demand: for sustainable, green, energy efficient, and digital technologies, and convergence across these demands.

The skills forecast also includes:

The industry is being impacted by significant continuing technological changes to the built environment, particularly new digital-enabled and green

technologies and emerging environmental risks.

The Property Services sector has been significantly disrupted by crosssector collaboration and convergence of industries. This trend is amplified by the introduction of new technologies and the increase in environmental sustainability regulations and standards for buildings. Such circumstances are changing the necessary skills profile of workers in property services.

The **Recycling and Clean Energy National Manufacturing Priority Road Map** also impacts the Waste Management subsector, as highlighted in the following quotes:

Global markets are gradually transforming from a 'throughput economy' (relying on virgin inputs and generating waste) to a 'circular economy' (where materials are reduced, reused, recycled and remanufactured).

The National Waste Policy aims to reduce waste where possible and make productive use of waste where it is generated. The National Waste Policy Action Plan, Recycling and Waste Reduction Act 2020, and National Product Stewardship Investment Fund will increase material recovery rates, ban the export of key waste streams, support product stewardship initiatives, and boost the role of government as a procurer of recovered materials.

In the recycling sector, large vertically-integrated companies who collect, process and remanufacture waste occupy a strong market position that helps provide the volume, stable demand, and economies of scale needed to make recycling activities viable. This market structure, and the complexity of logistics and processing systems designed around it, can deter new market entrants or make introducing innovations difficult. More competition in materials processing could help drive down costs and improve quality of feedstocks for remanufacturing.

Through the National Waste Policy Action Plan, governments and industry are investing in better collection, sorting, processing and transport systems, generally operated by large companies with extensive infrastructure including material recovery facilities (MRFs). This is reducing contamination and the cost of post-consumer material streams, but while essential, it is not sufficient to seize opportunities.



Methodology

The priority skills framework has largely been based on and adapted from, the skills outlined in the skills chapter of the Miles Morgan report **Future skills and training: A practical resource to help identify future skills and training**. The report outlines a series of skills that workers will need to be effective in Australia's future workplace.

Additional skill areas have been included where IRC Skills Forecasts have consistently identified certain skills needs, which aren't a focus in the Future skills and training report.

In total, eleven priority skills areas have been identified:

- Adaptability and learning skills (i.e. innovation, flexibility, and multiskilling)
- Analytical skills (data analysis, critical and creative thinking, and problem-solving)
- Business and compliance skills (small business skills, and regulatory compliance)
- Collaboration skills (interpersonal skills, communication, and teamwork)
- Customer service and marketing skills (social media, marketing and customer service)
- Digital skills (new technologies, robotics and automation, big data, and cybersecurity)
- Foundation skills (language, literacy and numeracy, including digital literacy)
- Industry and occupation-specific skills (technical skills)
- Leadership and management skills (leadership of self and others)
- STEM skills (Science, technology, engineering and mathematics)
- Sustainability and natural resource management skills (green skills).

For each Priority Skills page, a comprehensive Australian literature and document search was conducted to gather current research or analytical reports pertaining to current and future skills needs and the impact of the COVID-19 pandemic.

Job vacancy data

Job vacancy data have been extracted from Burning Glass Technologies 2021, Labor Insight Real-time Labor Market Information Tool, Burning Glass Technologies, Boston, viewed July 2021, **https://www.burning-glass.com**.

A review of the top 120 baseline skills and top 200 specialised skills in the Burning Glass Skills Taxonomy was undertaken to develop a more granular list of skills allocated to each broader priority skill category. For example, problem-solving, critical thinking, and data analysis skills from the Burning Glass Skills Taxonomy were included under the priority skills category: Analytical skills.

Data shown represent:

- the percentage of internet job postings in each occupation (ANZSCO Major Group) that requested at least one of the granular skills allocated to a broader priority skill category in Australia between July 2018 and June 2021.
- 4-digit ANZSCO occupations where a priority skill category is highly requested by employers, and some examples of the specific types of requests for these skills employers are making for these occupations.

Case studies

The case studies that are presented on each Priority skills page are intended to provide more information about IRC or industry demand for a specific skill (and more detail about why that skill is a priority for that particular industry).



Overview

This section links to information on training package development activities, and initiatives of the Australian Industry and Skills Committee (AISC) and its network of Industry Reference Committees (IRCs).

This includes **cross-sector projects** and other training package review and development initiatives. The cross-sector projects aim to address common skills needs shared across industries. These projects also minimise duplication of units, consolidate existing units and remove units that are no longer being used.



Active cross-sector projects

Digital transformation

The AISC established a Digital Transformation Expert Panel to advise on workforce and vocational skills needs. This includes opportunities arising from Industry 4.0 and evolving technologies such as robotics, drones and remote operation systems. The Panel considered what's already working well, both here and internationally, and consulted with industry to understand 'how Australia's vocational education and training (VET) system can most effectively respond to digital change currently underway across industry and its impact on the nation's workforce'.

For more information, visit the **Digital Skills Formation** website, managed by **Australian Industry Standards**.

Consumer engagement via online and social media

The key aim of the project was to consult with a range of stakeholders and industries to identify the common skills needs of various industries in relation to consumer engagement through online and social media. Findings from the consultations will be used to inform the update of future Training Package products and ensure skills training is in line with workforce needs. Consultations with industry stakeholders have been completed and the Final Case for Change has been submitted to the AISC for endorsement.

For more information and to access the Final Case for Change, visit the **SkillsIQ** website.

Completed cross-sector projects

Environmental sustainability

This project focused on emerging developments in environmental sustainability. Including how industry and occupational skill needs for environmental sustainability can be addressed through the VET system. Its aim is, to identify skills needs shared by multiple industry sectors, related to environmentally sustainable products, manufacturing and waste processes, sustainable energy production, and the natural environment.

Following consultations with the IRCs, particularly related to the skill standards and qualifications for which they are responsible, the Environmental Sustainability Expert Panel identified significant challenges inherent with this project. The project produced a Case for Change, which proposed changes to training package units of competency reflecting current and emerging practices in environmental sustainability across multiple industries. This included reducing the duplication of units of competency that have arisen from a siloed approach to addressing these skills. Based on these findings, a report, including recommendations was submitted to the AISC for consideration.

For more information and to view the Environmental Sustainability Expert Panel Report, visit the **Skills Impact** website.

Big data

This project investigated the emerging developments in big data skills, particularly in relation to data management, data analytics and data-driven decision-making. It identified related skills needs shared by multiple industry sectors. This project intended to significantly reduce duplication across the national VET system, helping to deliver a future-fit Big Data workforce to organisations across multiple industries. In line with the Case for Endorsement, the AISC approved the development of nine new big data cross-sector units and two new skill sets, housed in the **Business Services (BSB) Training Package**.

For more information and to view the Case for Endorsement, visit the PwC's Skills for Australia website.

Cybersecurity

This project sought to reduce duplication across the national VET system by reviewing current and emerging developments in cybersecurity skills, particularly in relation to data confidentiality, protection and privacy. As recommended by the Case for Endorsement, the AISC approved the development of eight new cybersecurity cross-sector units, housed in the **Business Services (BSB) Training Package**.

For more information and to view the Case for Endorsement, visit the PwC's Skills for Australia website.

Supply chains

This project examined the implications of major changes to skills requirements, occurring both across and within supply chains. In particular, this project focused on changes driven by automation, robotics, big data and other new technologies. These disruptive technologies have compelled supply chain related industries to innovate and find new efficiencies to meet consumer demand and remain competitive. This project sought to develop skills sets and units of competency that enable this innovation, and which were applicable to a range of industry sectors. In line with the Case for Endorsement, the AISC approved sixteen new supply chain cross-sector units of competency and ten new skill sets, housed in the **Transport and Logistics (TLI) training package**.

For more information, visit the Australian Industry Standards website.

Teamwork and communication

This project evaluated existing skills gaps, and the benefits/risks of developing generic units for teamwork and communication. The project aimed to provide an evidence-based case along with industry support for common 'teamwork' and 'communication' units that can be used across multiple industries. The AISC approved the development of three new teamwork and two new communication cross-sector units. These five units of competency are now housed in the **Business Services (BSB)** Training Package.

For more information and to view the Case for Endorsement, visit the PwC's Skills for Australia website.

Inclusion of people with disability

This project sought to explore how the development of training packages could increase the participation of people with disability in VET and the workplace. The project aimed to equip vocational educators, employers and customer service providers with the skills and knowledge they need to better include people with disability in education, employment and service contexts. It was also the intention to reduce duplication across the national VET system through the development of common training components on disability-related matters that can be used across multiple industries. The AISC approved the development of four new disability cross-sector units now housed in the **Business Services (BSB) Training Package**, and two units that were added to the **Training and Education (TAE) Training Package**.

For more information and to view the Case for Endorsement, visit the PwC's Skills for Australia website.

Other training package development projects

COVID-19 Emergency Response Sub-committee

The AISC has ensured Australia's national training system is well positioned to address the workforce challenges presented by the COVID-19 pandemic.

The Emergency Response Sub-Committee (the sub-committee) was established on 3 April 2020 under the direction of the Council of Australian Governments (COAG) Skills Council. Operating until 31 December 2020, the sub-committee engaged with industry, government and the Vocational Education and Training (VET) sector to help provide national training solutions to fill critical skill gaps and achieve the best outcomes for industry, students, employers and job seekers. This included enabling fast-tracked adjustments to qualifications and training package requirements, ensuring that Australia's VET sector could quickly respond to areas of workforce and skill needs, thus supporting economic recovery.

For more information on the AISC's response to COVID-19, visit the **AISC** website.

Training packages under review

The **National Schedule** details the training package review and development work currently underway and commissioned by the AISC following advice from its network of IRCs.

For more information on AISC initiatives and any recent announcements please visit the **AISC** website.