![Australian Industry and Skills Committee logo]

National Industry Insights Report

2020/21 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 <https://nationalindustryinsights.aisc.net.au/national>.

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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) in their Skills Forecasts and Proposed Schedules of Work and supports the design and development of training packages that meet the current and future skills needs of industry.

It links the cross-industry analysis on skills needs with the activities and initiatives of the Australian Industry and Skills Committee (AISC) and its network of Industry Reference Committees.

The National Skills Overview consists of four key sections which are listed below.

Contents

Please note, Industry Reference Committees (IRCs) now submit comprehensive Skills Forecasts to the AISC every 3 years, with abridged annual updates submitted in the intervening 2 years. One aspect of the Skills Forecasts which is absent in the abridged annual updates is the Skills Outlook section which summarises priority skills that are in high demand within each industry.

Further to this, many IRCs were not required to submit an annual update in 2020, given the significant impact of COVID-19. As such, the version published in 2019 remains the most recently available Skills Forecast for many industries.

In light of this, the National Skills Overview draws largely on information sourced from the comprehensive Skills Forecasts released in 2019.

Insights and highlights

Overview

This section provides a summary of the top five skills which were highly prioritised across IRC Skills Forecasts, the factors and trends which affect the demand for these skills, and key initiatives underway which aim to address skills needs.

The top five skills, of eleven skill areas, were identified by Industry Reference Committees (IRCs) in their comprehensive 2019 Skills Forecasts. 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, and emerging technology, 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 IRC Skills Forecasts identifying key technical skills in demand. Indeed, 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.

The top five priority skills are summarised on the following pages.

Adaptability skills

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

RANKED 1ST
highest priority generic skill
across all industries

PRIORITY SKILLS

Skills identified by IRCs

- Adapt 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
- Digitisation 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
- High and 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.

Collaboration skills

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, and social and cultural awareness.

RANKED 2ND
highest priority generic skill
across all industries

2

PRIORITY SKILLS

Skills identified by IRCs

- Communication skills
- Cultural and global awareness
- Customer service
- Emotional intelligence
- 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
- 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.

COVID-19 impact

- Virtual collaboration became the 'new normal', involving a massive increase in uptake of collaboration tools and rapid upskilling for many 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.

Analytical skills

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 perhaps also involve other skills, such as data management, information literacy, problem-solving, critical thinking and creative thinking.

RANKED 3RD highest priority generic skill across all industries

3

PRIORITY SKILLS

Skills identified by IRCs

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

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
- Digitisation and the 'internet of things'
- Emerging technologies
- Start-up thinking.

COVID-19 impact

Skills identified as holding increasing importance when navigating the concurrent forces of the 4th Industrial Revolution and COVID-19 are:

- Analytical thinking and innovation
- Critical thinking and analysis
- Complex problem-solving
- Reasoning, problem-solving and ideation.

Digital skills

In a world of rapid technological expansion affecting all industries, it is vital to have a workforce that's agile, with the skills to drive and adapt to new 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'.

RANKED 4TH
highest priority generic skill across all industries

4

PRIORITY SKILLS

Skills identified by IRCs

- Automated design
- Coding and programming
- Cyber security skills
- 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
- Globalisation and its impact on mobility, migration and international markets
- More technologically advanced materials and products.

COVID-19 impact

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

- A decade of digital transformation was achieved within a few months.
- There was increased government assistance for upskilling and reskilling in digital skill areas.
- New skill sets were endorsed for the ICT sector and small business.

Industry and occupation skills

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.

Industry and occupation-specific skills
are important in most industries

PRIORITY SKILLS

Skills identified by IRCs

- 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
- High and 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 and increasing emphasis on sustainable environmental practices, and policy, institutional, 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 released in 2019 and 2020, this section identifies which factors are having a greater impact on different 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

TRENDS IN THE LABOUR MARKET

SOCIETY AND CULTURE

BUSINESS AND ECONOMICS

TECHNOLOGY

RESOURCES AND ENVIRONMENT

POLICY AND REGULATORY

Economic conditions

Australia continues to experience growth and low unemployment. In 2020, the top four industries contributing to this growth were:

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

Gross Value Added (GVA)

All Industries

↓ **0%** 2019-2020 percent change

2000

GVA - Top 3 contributing industries:

Manufacturing		12.6%
Financial and insurance services	$	8.5%
Construction		6.9%

2020

GVA - Top contributing industries:

Mining		11.1%
Financial and insurance services	$	8.9%
Construction		7.7%
Health care and social assistance	+	7.7%

Aug 2020

Unemployment	**Underemployment**
• 6.8% overall	• 11% overall
• 13.8% for 15-24 year olds	• 19.2% for 15-24 year olds

Trends in the labour market

Industry employment level

High employing industries
2000 to 2020 employment level

Legend:
- Manufacturing
- Construction
- Retail Trade
- Professional, Scientific and Technical Services
- Public Administration and Safety
- Education and Training
- Health Care and Social Assistance
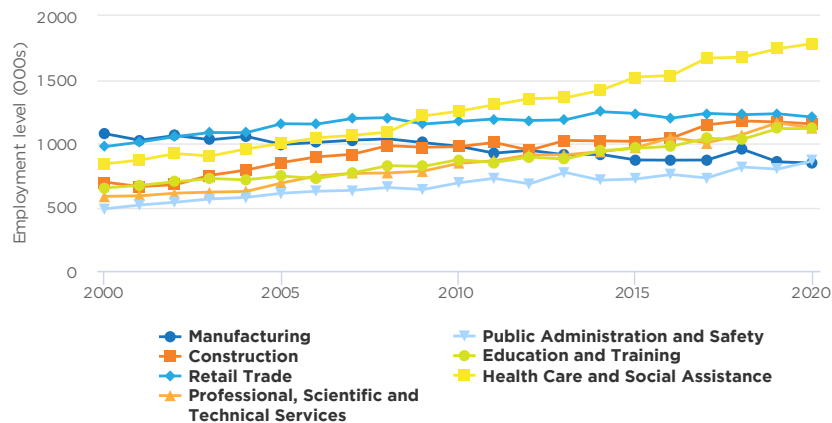
Medium employing industries
2000 to 2020 employment level

Legend:
- Wholesale Trade
- Transport, Postal and Warehousing
- Administrative and Support Services
- Accommodation and Food Services
- Financial and Insurance Services
- Other Services

Low employing industries
2000 to 2020 employment level

Legend:
- Agriculture, Forestry and Fishing
- Electricity Gas, Water and Waste Services
- Rental, Hiring and Real Estate Services
- Mining
- Information Media and Telecommunications
- Arts and Recreation Services
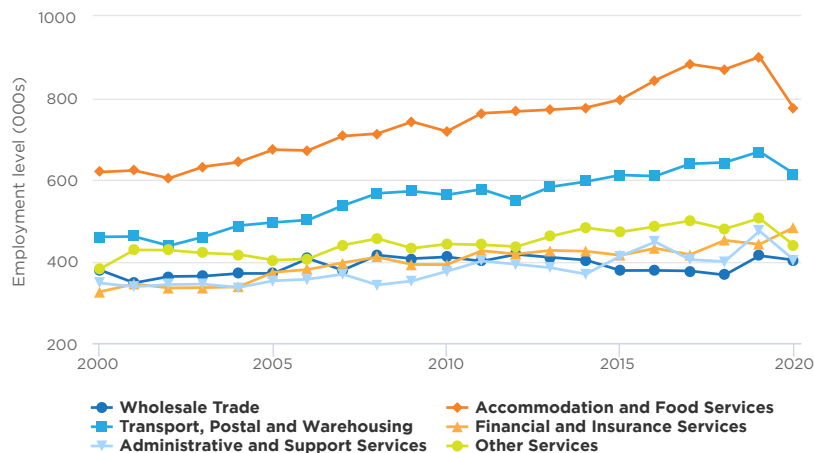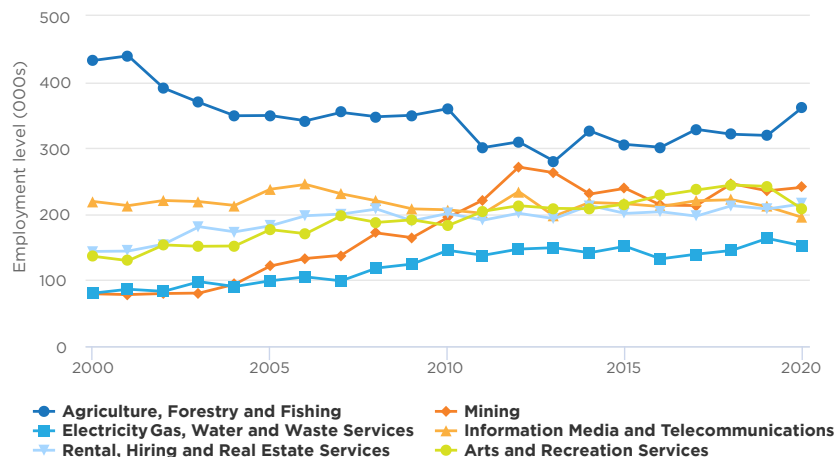
Employment grew in absolute numbers for most industries between 2000 and 2020. The main exceptions being the Agriculture, Manufacturing, and Information Media and Telecommunications industries, which saw a decline in their workforce over this period.

Most industries saw a fall employment between 2019 and 2020, likely due to the impacts of the COVID-19 pandemic. Those industries which still rose in overall employment numbers during this period were:

- Agriculture,
- Mining,
- Financial and Insurance Services,
- Rental, Hiring and Real Estate Services,
- Public Administration and Safety, and
- Health Care and Social Assistance.

The Accommodation and Food Services industry experienced the most profound drop in employment during the 2019-2020 period, falling from 900,400 to 773,200, a lost of over 127,000 jobs.

Businesses, by industry, with reduced employee numbers

Employing businesses, grouped by industry, with lower employee numbers than 12-months ago
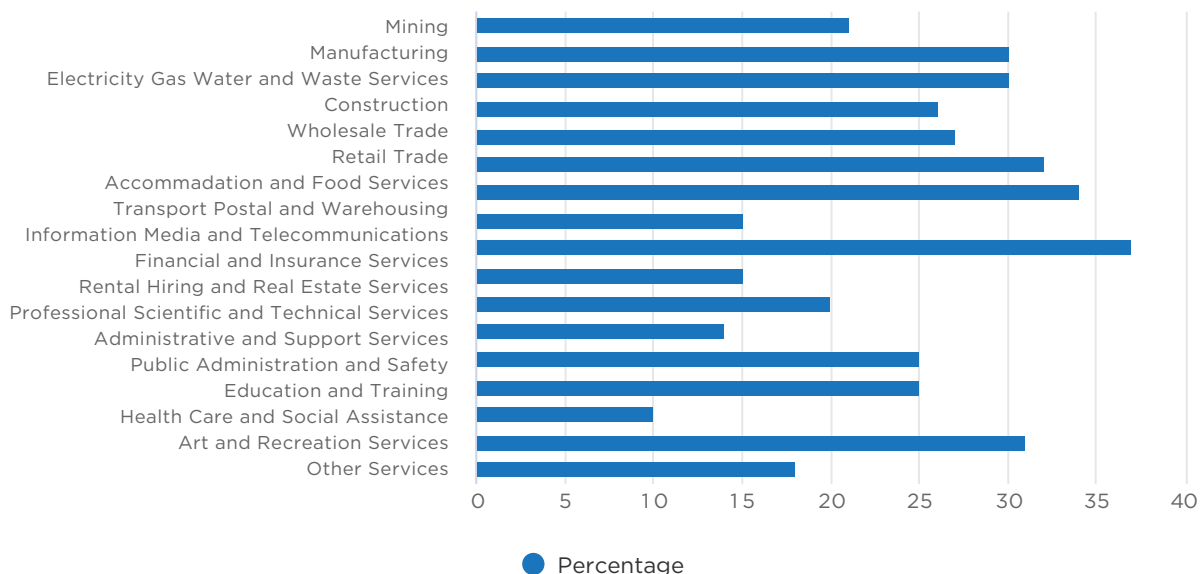
According to a December 2020 survey by the ABS to address the impacts of COVID-19, more than 30% of businesses in certain industries had less employees at that point than the equivalent time in 2019. Those industries with the highest proportion of businesses with the lower employee numbers were:

- Information Media and Telecommunications (37%),
- Accommodation and Food Services (34%),
- Retail Trade (32%), and
- Arts and Recreation Services (31%).

Industry and occupational structural change

Industry structure

Change in industry structure 2000-2020, August quarter, %

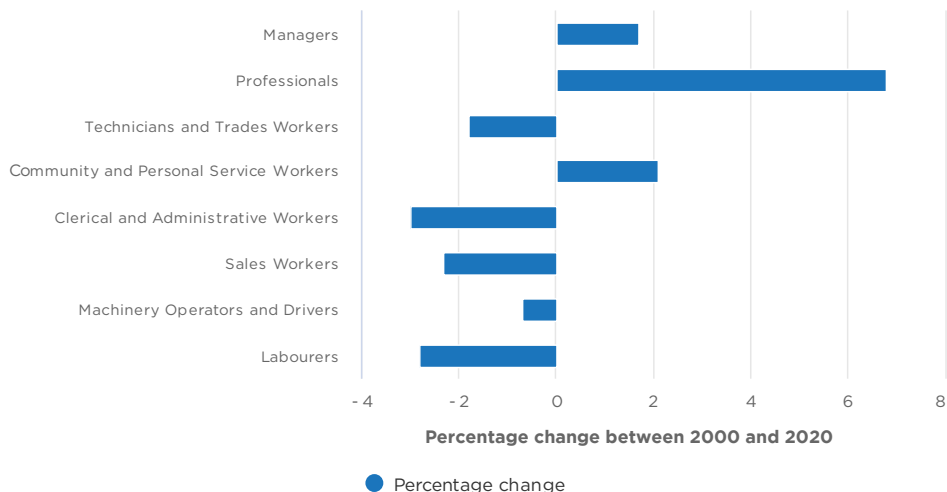|	
Agriculture Forestry and Fishing	
Mining	
Manufacturing	
Electricity Gas Water and Waste Services	
Construction	
Wholesale Trade	
Retail Trade	
Accommadation and Food Services	
Transport Postal and Warehousing	
Information Media and Telecommunications	
Financial and Insurance Services	
Rental Hiring 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	
Art and Recreation Services	
Other Services	

Percentage change between 2000 and 2020

● Percentage change

Occupation structure

Change in occupational structure 2000-2020, August quarter, %

Managers	
Professionals	
Technicians and Trades Workers	
Community and Personal Service Workers	
Clerical and Administrative Workers	
Sales Workers	
Machinery Operators and Drivers	
Labourers	

Percentage change between 2000 and 2020

● Percentage change

Employment status

Increase in part time employment staus between 2000-2020, August quarter, %

Agriculture Forestry and Fishing	
Mining	
Manufacturing	
Electricity Gas Water and Waste Services	
Construction	
Wholesale Trade	
Retail Trade	
Accommadation 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	
Art and Recreation Services	
Other Services	

Percentage change between 2000 and 2019

● Percentage difference

There is an evident shift in industry structure. The industries with the largest decline between 2000 and 2020 (in terms of share of total employment) are:

- Manufacturing (5.4 percentage points)
- Agriculture, Forestry and Fishing (2.0 percentage points).

The industries with the largest increases have been:

- Health Care and Social Assistance (4.8 percentage points)
- Professional, Scientific and Technical Services (2.3 percentage points)
- Education and Training (16 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:
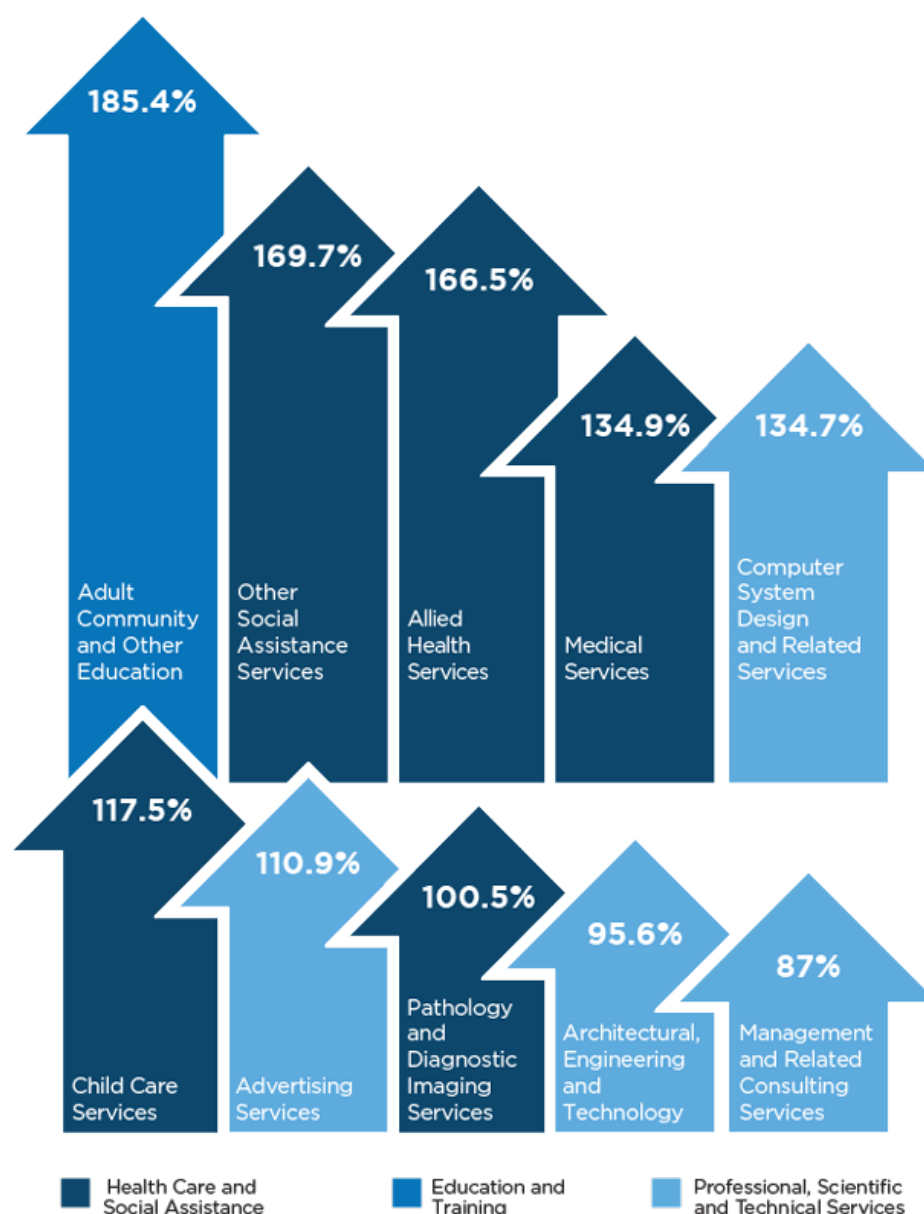
The occupational structure of the labour market has changed over the same period as well, with higher-level skills increasingly more in demand. The occupation grouping with the largest growth is Professionals (increasing their share by 6.8 percentage points). The second largest increase is Community and Personal Service Workers (increasing its share by 2.1 percentage points).

The occupational groupings with the largest decline in labour market share between 2000 and 2020 were Clerical and Administrative Workers (-3 percentage points)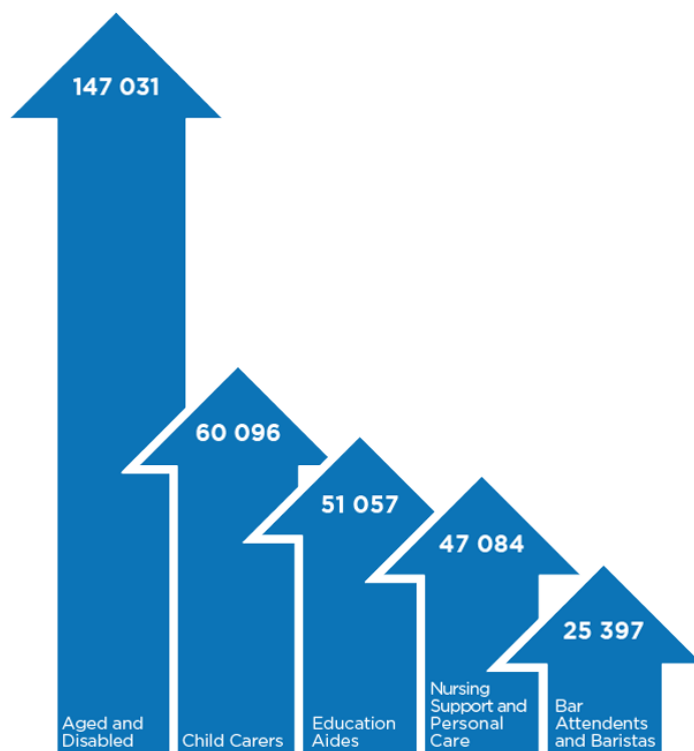, and Labourers (-2.8 percentage points). This reflects the global trend of increasing automation and efficiency for entry level administrative or manual labouring positions.

Within the Community and Personal Service Workers category, for occupations where there were at least 20,000 people employed in 2020, the largest percentage increases between 2000 and 2020 are:

223.4% Aged and Disabled

129.7% Child Carers

102.1% Education Aides

91.1% Bar Attendents and Baristas

86.5% Nursing Support and Personal Care Workers
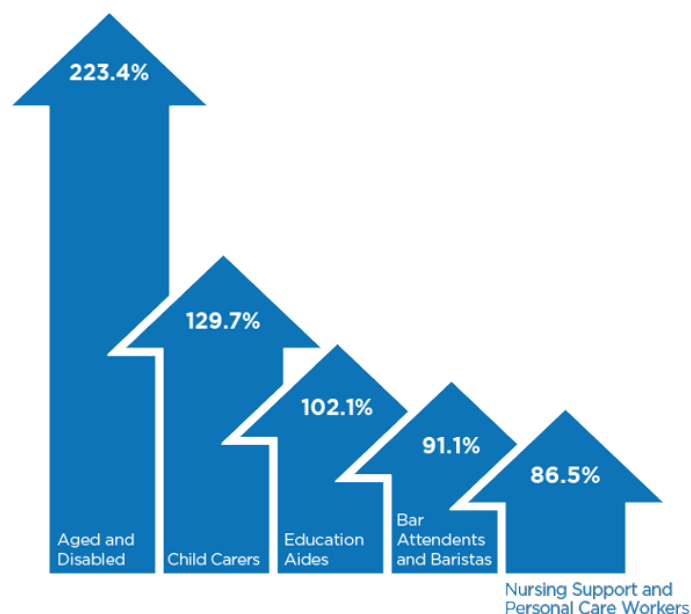
In terms of numbers employed however, the largest increases were:

147 031 Aged and Disabled

60 096 Child Carers

51 057 Education Aides

47 084 Nursing Support and Personal Care

25 397 Bar Attendents and Baristas

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 2000 and 2020) were Accommodation and Food Services (11.8 percentage point increase), and Administrative and Support Services (8.4 percentage point increase). The only industry with a prominent drop in the proportion of part time workers was Financial and Insurance Services (-5.2 percentage points).

Demographic trends

Australia's ageing population and workforce is affecting industries differently. In 2020, there were ten industries with 30% or more of their workforce aged 50 and over. More than half of Agriculture, Forestry and Fishing workers were 50 years or older (50.8%), but only 15.2% of Accommodation and Food Services workers were of that age.

Since 2000, there has been an increase in the proportion of the workforce aged 50 years and over in all industries. The industries which have seen the largest increase in the proportion of the workforce aged 50 and over are:

• Wholesale Trade (15.9 percentage points)

• Agriculture, Forestry and Fishing (14.6 percentage points)

• Public Administration and Safety (12.0 percentage points) Rental, Hiring and Real Estate Services (11.8 percentage points)

• Manufacturing (11.7 percentage points).

Workforce age

Proportion of industry workforce aged 49 and under and 50 and over, 2020, August quarter, %

● 15-49 years ● 50 plus years
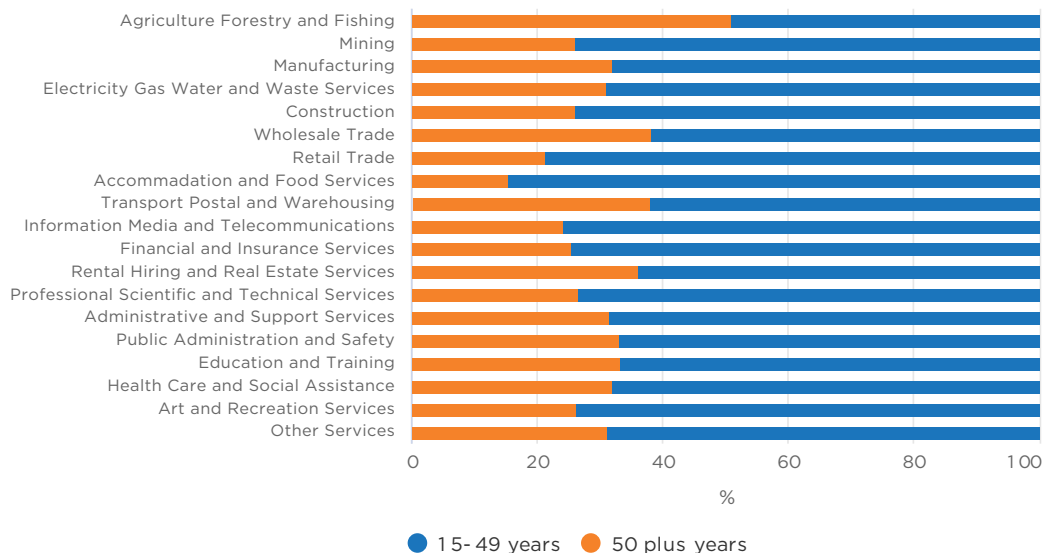
Ageing workforce

Proportion of industry workforce aged 49 and under and 50 and over, 2020, August quarter, %

Percentage change between 2000 and 2020

● Percentage point difference in aged 50 or more 2000-2020
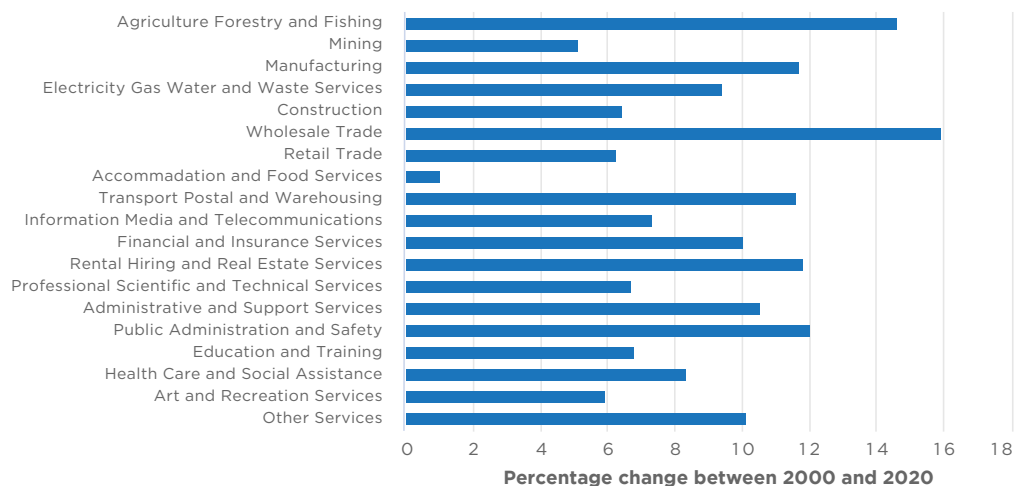
Shifts in gender participation has varied across industry and occupation groups. For many industries, there was little change in the proportion of the female workforce between 2000 to 2020. Industries which have seen the largest growth in the female workforce are Other Services (8.2 percentage points), Electricity, Gas, Water and Waste Services (8.1 percentage points), Public Administration and Safety (7.5 percentage points), and Rental Hiring and Real Estate Services (5.7 percentage points).

Among occupation groups, Managers and Professionals have seen the strongest increase in the female proportion of the workforce between 2000 and 2020, with 7.4 percentage point and 6.5 percentage point increases respectively.

Female participation in industry

Changes in female workforce 2000 to 2020, August quarter, %

Percentage change between 2000 and 2020

● Percentage change
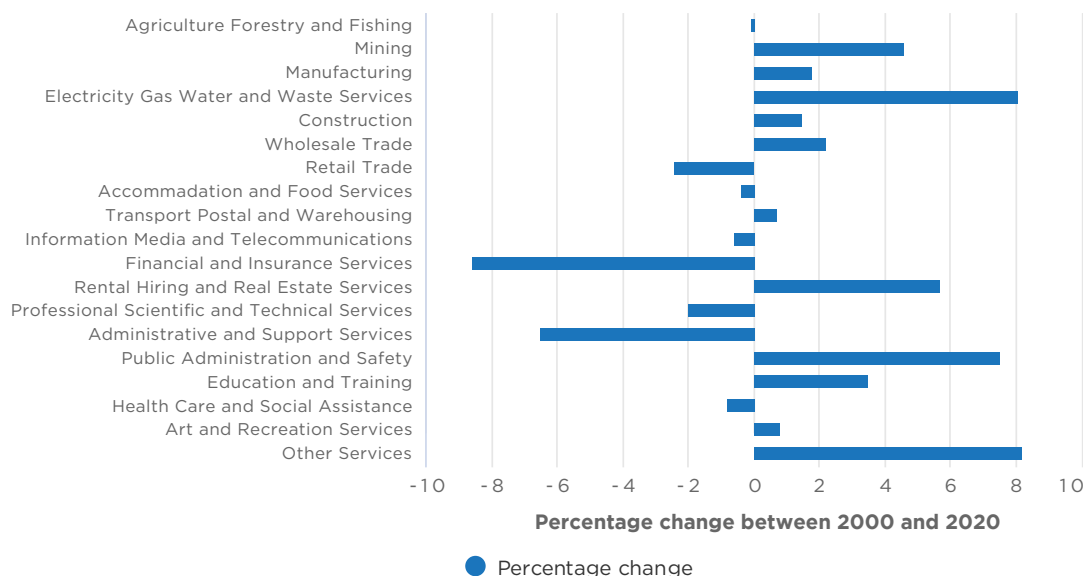
Female participation in occupations

Changes in female workforce 2000 to 2020, August quarter, %

Percentage change between 2000 and 2020

● Percentage change
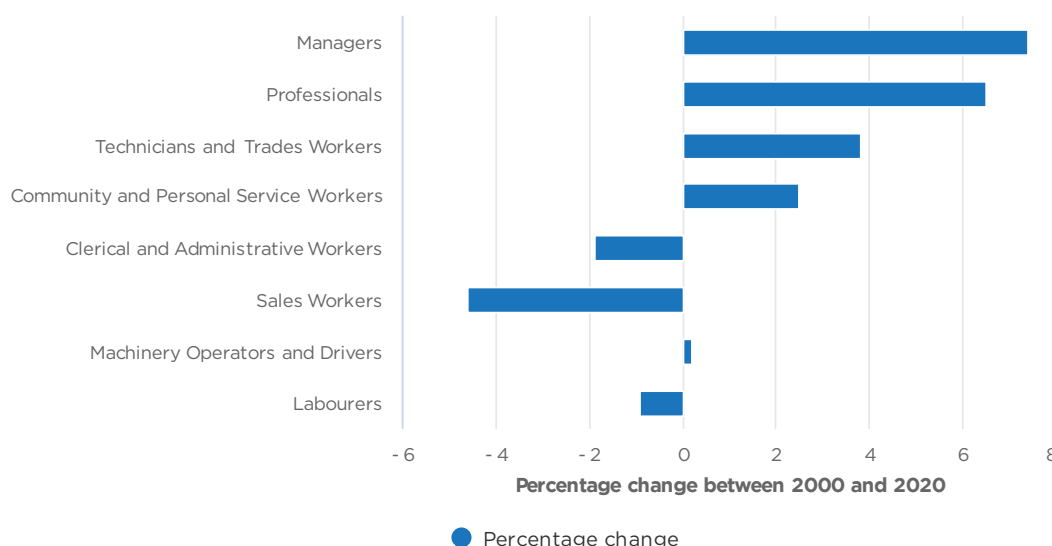
Factors influencing the demand for skills

The Miles Morgan report, **Future skills and training,** identifies a number of 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.

Society and culture

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
- Suitably skilled workforce and access to suitable training
- 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.

The majority of IRC Skills Forecasts identify at least one society and culture factor which has had an impact on their industry sectors. The following industries identified more than one society and culture factor in their recent Skills Forecasts:

- Animal Care and Management
- Aquaculture and Wild Catch
- Business Services
- Community Services
- Construction
- Corrections and Public Safety – Correctional Services
- Education
- Electrotechnology
- Food and Pharmaceutical Product Manufacturing
- Forestry and Wood Products
- Government Services
- Health
- Manufacturing – Textiles, Clothing and Footwear
- Racing
- Retail and Wholesale
- Transport
- Utilities – Water.

The most prominent society and culture factor is demographic changes, particularly Australia's ageing population, but also population growth. 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:

> *The agricultural labour force is aging, with the average age of a farmer 17 years older than the average worker.* (**Agriculture, Horticulture and Land Management IRC's 2019 Skills Forecast**)

> *The implications of an ageing workforce means that the sector is likely to experience high levels of staff leaving the workforce due to retirement or making lifestyle, financial or health based choices to reduce working hours.* (**Direct Client Care IRC's 2019 Skills Forecast**)

> *Such substantial changes in the age of the population will certainly put increasing pressures on health services as the prevalence of chronic pain conditions rises. Demand for ambulance*

services are among the many health services which are expected to significantly increase due to the growing ageing population and the related trend in favour of senior Australians continuing to live independently in their own homes. (**Ambulance and Paramedic IRC's 2019 Skills Forecast**)

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

While purchasing intentions for four- and five-door vehicles remain high, they have declined year-on-year by 18 per cent and 36 per cent, respectively. This trend is likely being supported by stronger SUV demand from baby boomers. For example, survey results suggest almost 38 per cent of baby boomers in the market for a new car are looking to buy a SUV – up from less than 16 per cent a decade ago. (**Automotive Combined IRC's 2019 Skills Forecast**)

Increasing demand for financial advice from superannuates, as growing post-retirement wealth creates a greater incentive to seek professional financial advice. Ability to assist clients through the potential emotional and psychological stress of retirement will also be crucial. (**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**)

Other factors mentioned among IRC Skills Forecasts 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,
- Globalisation and its impact on mobility, migration and international markets
- 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.

Business and economics

These factors relate to trends in business and markets which influences how companies do business. Factors include:

- High-speed competition and workplace dynamics involving re-organisation 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.

Many of the IRC Skills Forecasts discuss business and economics factors affecting their industry sectors. The following industries identify more than one business and economics factor which impacts on their industry:

- Agriculture
- Animal Care and Management
- Aquaculture and Wild Catch
- Financial Services – Insurance and Superannuation
- Food and Pharmaceutical Production – Meat
- Health
- Information and Communications Technology
- Personal Services – Beauty
- Pulp and Paper Manufacturing
- Utilities – ESI Transmission, Distribution and Rail

There were a variety of business and economics-related factors mentioned across the skills forecasts. Some of these factors were named across several IRC skills forecasts while some were identified less often. For some industries factors related to *skills mismatch, shortages or gaps,* including challenges associated with finding an appropriately skilled workforce, and job market demand exceeding the supply of appropriately skilled graduates. A few examples of these business and economics-related factors across some industries include:

> *Similar to other sectors, local government is experiencing significant skills shortages. In a recent ALGA survey, results showed that approximately 70% of councils are currently experiencing skills shortages. The top 10 professional skill shortage occupations uncovered showed that some of the occupations are supported by the Training Package, including Environmental Health Officers and Project Managers.* (**Local Government IRC's 2019 Skills Forecast**)

> *With the current rate of solar uptake, there is a reported shortage of qualified electricians with the necessary skills for the installation and maintenance of solar systems. Consequently, the related skills in the Electrotechnology industry need to change accordingly to meet the industry needs.* (**Electrotechnology IRC's 2019 Skills Forecast**)

> *Agriculture has experienced difficulties in recruiting for skilled (non-labourer) positions, notably in broadacre and dairy farms, due to applicants lacking the required capabilities and experience. Furthermore, skilled visa requirements have tightened in recent years, with few farms employing skilled workers from overseas besides large enterprises with a turnover of greater than $1 million.* (**Agriculture, Horticulture and Land Management IRC's 2019 Skills Forecast**)

> The current shortfall of qualified workers for transmission lines work in Australia is expected to exacerbate during 2021 when projects in transmission lines and distribution run concurrently. The possibility of job openings to overseas workers has been flagged as a barrier for apprentices and trainees to get a job. (**ESI Transmission, Distribution and Rail IRC's 2020 Skills Forecast**)

Other business and economics-related factors mentioned related to:

- 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

Technology

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
- Digitisation 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.

The vast majority of IRC Skills Forecasts identify technology factors as an issue affecting their industry sectors. Indeed, technology-related trends were raised more often than any of the other trends in the IRC Skills Forecasts. The following industries identify more than one technology factor which impacts on their industry:

- Agriculture
- Aquaculture and Wild Catch
- Arts, Culture, Entertainment and Design
- Business Services
- Community Services – Client Services
- Construction
- Corrections and Public Safety
- Electrotechnology
- Financial Services
- Forestry and Wood Products
- Government
- Health – Dental
- Information and Communications Technology
- Manufacturing – Metals, Engineering and Boating Industries
- Mining, Drilling and Civil Infrastructure – Civil Infrastructure
- Printing and Graphic Arts
- Property Services
- Retail and Wholesale
- Tourism, Travel and Hospitality
- Transport
- Utilities.

The most prominent technology factors were *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 streamlining warehousing and despatching processes. However, 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:

> New technological and digital innovations are revolutionising Gas Industry operations, presenting opportunities as well as challenges… Recent research by AlphaBeta reveals that automation technology in resource industries such as Gas is divided into three categories:
>
> • Automated operational hardware tools where digitally enabled tools operate either independently or remotely assisted by workers;
>
> • connected workers where technologies such as tablets, sensors, analytics and wearable technologies enable improved executions of activities; and
>
> • Artificial Intelligence (AI) and connected systems where AI-enabled tools and algorithms process large volumes of data to optimise autonomous equipment and operational performance. (**Gas IRC's 2020 Skills Forecast**)

> Increasingly, employers are describing robotics and automation as imperatives for their businesses. Due to the likelihood that most manual processes will eventually be automated, employers are looking for laboratory services technicians, who are comfortable and practised in their use of automation. These workers will require higher skill levels to maximise the use of new technology. (**Manufacturing and Engineering IRC's 2019 Skills Forecast**)

> These technologies, utilising information from the connectivity of the Internet of Things concept, are changing consumers' behaviour, enabling them to monitor and adjust their electricity usage on-demand. Consequently, the workforce will need to be skilled in digital literacy, cybersecurity, and data analytics to meaningfully interpret data to improve productivity and customer services. (**Electrotechnology IRC's 2019 Skills Forecast**)

> There is pressure on mid-level manufacturers who are leaving the [flour and grain milling industry] and major companies are increasing their market share. This trend favouring major companies has seen large-scale automation and digital equipment increasingly being used to boost productivity, with consequences for the profile of industry worker, though the use of technology extends well beyond major manufacturers. The necessary skills for the workforce are evolving beyond 'traditional' practices to include machinery, supply chain and traceability systems management and food safety regulations compliance. This has increased the need for highly trained and skilled technical millers. (**Food, Beverage and Pharmaceutical IRC's 2020**)

Other technology factors which are mentioned in some of the IRC Skills Forecasts 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 the implication 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.

Less than half of the IRC Skills Forecasts discuss resources and environment factors as an issue affecting their industry sectors. The following industries mention more than one resources and environment factor:

- Amenity Horticulture and Conservation
- Aquaculture and Wild Catch
- Construction
- Forestry and Wood Products
- Printing and Graphic Arts
- Pulp and paper manufacturing
- Utilities.

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 for the industry 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.

Some of the resource and environment factors identified include:

Hybrid and electric vehicles are becoming increasingly attractive alternatives to conventional vehicles. As at July 2018, consumer research indicates that the majority (52 per cent) of Australians aged 18 and over would 'seriously consider buying' a hybrid vehicle, representing a rise since previous survey results. Furthermore, survey results suggest over 60 per cent of Australians are willing to pay more for a car with 'zero emissions', supporting that environmental consciousness is a factor in car purchases. (**Automotive Combined IRC's 2019 Skills Forecast**)

With increasing emphasis on climate change, sustainability and energy consumption, the smart and green construction industry is growing worldwide. Benefits of smart and green buildings include lower operating costs, increased value of buildings, higher rental and occupancy rates, and improved health and productivity of occupants. They also necessitate new knowledge and skills in occupational areas such as energy efficiency, new products and water conservation. (**Construction Plumbing and Services IRC's 2019 Skills Forecast**)

Environmental sustainability will be important skills for workers as the sector continues to advance processes around disposal of waste and environmental hazards. This is reflected in standards and targets set by the industry and organisations such as the Australian Packaging Covenant Organisation to meet in order to reduce the impact of printing and packaging on the environment. (**Printing and Graphic Arts IRC's 2019 Skills Forecast**)

With estimates of more than one billion native animals killed by Australia's bushfires between September 2019 and January 2020, there is extensive short and long-term wildlife rescue, rehabilitation and recovery work ahead. Veterinary services, already experiencing a shortage of skilled workers, especially veterinarians, are likely to be confronted by unprecedented challenges, particularly in RRR areas. As has been reported, alongside the injured animals, there can be a huge impact on the physical and emotional wellbeing of the people working in the response, who can be "scratched, bitten and mauled" while treating animals. (**Animal Care and Management IRC's 2020 Skills Forecast**)

Related to this, the effects of *climate weather shifts and the impact of climate change* were also discussed in a few of the IRC Skills Forecasts. This also 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. Other resources and environment factors identified by a few IRC Skills Forecasts include:

- Improving energy efficiency
- Access to quality internet.

Policy and regulatory

This group of factors covers the policy and regulatory factors which influence the demand for skills, including 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.

More than half of the IRC Skills Forecasts rank policy and regulatory factors as an issue affecting their industry sectors. The following industries mention more than one of these factors:

- Animal Care and Management
- Aquaculture and Wild Catch
- Community Services
- Construction
- Food and Pharmaceutical Production
- Health
- Racing
- Transport
- Utilities – ESI Generation.

The most prominent policy and regulatory factors mentioned across the IRC Skills Forecasts 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 2019 Skills Forecast**)

> *Government policy/legislation changes – a number of national and state/territory-based Royal Commissions into areas of relevance for the CS&D sector (i.e. child protection, family violence, aged care, etc.) have released key recommendations impacting workforce practices...The introduction of minimum requirements for accreditation for providing statutory out-of-home*

care and adoption services (i.e. NSW Child Safe Standards for Permanent Care) will impact training and registration requirements of the workforce involved in child protection services. (**Community Sector and Development IRC's 2019 Skills Forecast**)

The regulatory and policy environment pertaining to the VET sector is complicated, with numerous layers of State and Federal regulation and standards. This creates a complex operating environment for organisations as well as individual trainers and assessors who must stay abreast of varying requirements. (**Education IRC's 2019 Skills Forecast**)

The different state regulatory requirements are becoming a barrier to learners, training and industry; workers cannot freely move across the country or other roles in the energy sector. This is impacting workers flexibility and industry's ability to alleviate skill shortages. (**ESI Transmission, Distribution and Rail IRC's 2020 Skills Forecast**)

In contrast, at least one of the skills forecasts 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.

Method and sources

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 a number of 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 systematic review of the Skills Forecasts from 2019 and 2020 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 also been shaping the workforce between 2000 and 2020.

Sources

Australian Bureau of Statistics 2019, *Gross Value Added (GVA) by Industry,* 5204.0 – Table 5, viewed February 2020
https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/5204.02018-19?OpenDocument

- GVA percentage change, 2018-2019
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Australian Bureau of Statistics 2019, *Underutilised persons by Age and Sex - Trend, Seasonally adjusted and Original,* 6202.0 – Table 22, viewed February 2020
https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6202.0Jan%202020?OpenDocument

- Unemployment August 2019 (all and 15-24 year olds)
- Underemployment August 2019 (all and 15-24 year olds)

Australian Bureau of Statistics 2019, *Employed persons by Industry group of main job (ANZSIC), sex, state and territory, November 1984 onwards,* 6291.0.55.003 - EQ06, viewed February 2020,
https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6291.0.55.003Nov%202019?OpenDocument

- Employed total by ANZSIC 1 digit Industry, 2000 to 2019, August Quarter
- Employed total, percentage change by ANZSIC 1 digit Industry, between 2000 and 2019, August Quarter
- Employed total, percentage change by ANZSIC 3 digit Industry group, between 2000 and 2019, August Quarter, for selected industry sectors
- Employment status, percentage change by ANZSIC 1 digit industry, between 2000 and 2019, August Quarter

Australian Bureau of Statistics 2019, *Employed persons by Industry group of main job (ANZSIC), sex, state and territory, November 1984 onwards,* 6291.0.55.003 - EQ09, viewed February 2020,
https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6291.0.55.003Nov%202019?OpenDocument

- Employed total, proportion of females in workforce, percentage change by ANZSIC 1 digit Industry, between 2000 and 2019, August Quarter

Australian Bureau of Statistics 2019, *Employed persons by occupation group of main job (ANZSCO), sex, state and territory, November 1984 onwards,* 6291.0.55.003 - EQ08, viewed February 2020
https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6291.0.55.003Nov%202019?OpenDocument

- ANZSCO 1 digit occupation, percentage change between 2000 and 2019, August Quarter
- ANZSCO 4 digit occupation unit group, percentage change between 2000 and 2019, August Quarter

Australian Bureau of Statistics 2019, *Employed persons by Age and Industry division of main job (ANZSIC), November 1984 onwards*, 6291.0.55.003 – EQ12, viewed February 2020
https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6291.0.55.003Nov%202019?OpenDocument

- Employed total, proportion of workforce aged 49 and under and 50 and over by ANZSIC 1 digit level, 2019, August Quarter
- Employed total, proportion of the workforce aged 50 and over by ANZIC 1 digit level, percentage change difference between 2000 and 2019, August Quarter

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:

INDUSTRY AND OCCUPATION SKILLS

ADAPTABILITY AND LEARNING SKILLS

ANALYTICAL SKILLS

BUSINESS AND COMPLIANCE SKILLS

COLLABORATION SKILLS

CUSTOMER SERVICE AND MARKETING SKILLS

DIGITAL SKILLS

FOUNDATION SKILLS

LEADERSHIP AND MANAGEMENT SKILLS

STEM SKILLS

SUSTAINABILITY AND NATURAL RESOURCE MANAGEMENT SKILLS

Industry and occupation 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 IRC Skills Forecasts 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.

Industry skills needs

Industry and occupation-specific skills

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:

- Electrical skills
- Health and safety
- Maintenance and servicing
- Testing and diagnostics

Industry-specific knowledge

This refers to the specific knowledge that IRCs identified as a priority for their 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
- Information and Communications Technology
- Laboratory Operations
- Printing and Graphic Arts
- Rail.

Understanding and use of equipment or technology

This refers to examples where IRCs identify skills 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.

COVID-19 impact

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:

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 and the Australian Border Force's (ABF) National Detector Dog Program Facility 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. If successful, the 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 **case study videos** mentioned earlier 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.

• 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. In addition, **ACS Australia's digital pulse** noted an ABS survey, which found that approximately 46% of Australians were working from home in April 2020.

• 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**.

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.

Case studies

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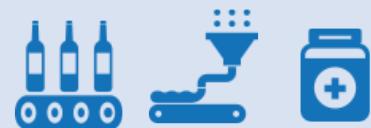
The industry and occupation-related skills identified by these industries were:

- 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 have been sourced from the Process Manufacturing, Recreational Vehicle and Laboratory Operations IRC's 2019 Skills Forecast, and the Food, Beverage and Pharmaceutical Product Manufacturing IRC's 2019 Skills Forecast.

> *Increasingly, employers are describing robotics and automation as imperatives for their businesses. Due to the likelihood that most manual processes will eventually be automated, employers are looking for laboratory services*

*technicians, who are comfortable and practised in their use of automation. These workers will require higher skill levels to maximise the use of new technology. (***Process Manufacturing, Recreational Vehicle and Laboratory Operations IRC's 2019 Skills Forecast***)*

*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 Skills Forecast***)*

Animal Care and Management and Racing industries

This case study includes two distinct industry clusters, both of which identified specific industry and occupation-related skills as priorities for their workforce:

- Animal Care and Management
- Racing.

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

- Animal Care and Management:
  - Ethical animal use
  - Animal awareness and behaviour
  - Emotional intelligence of animals
  - Foundational skills in animal care and management (focusing on the safety, health and welfare of animals, including handling, feeding, grooming, supervision, training and exercise)
  - Advanced skills in veterinary nursing, especially for care in crisis, emergency and serious situations.

- Racing:
  - Animal welfare
  - Integrity and ethical conduct.

The following quotes have been sourced from the **Animal Care and Management IRC's 2019 Skills Forecast**. These highlight the need for industry and occupation specific skills:

Working in animal care and management requires high-level skills and consumers are expecting more from those working within the industry.

Both training and care skills will need to be enhanced to ensure the safe and effective training and utilisation of assistance animals. Assistance Animal Training Organisations are registered, and the expansion of assistance and therapy animal services is likely to increase the demand for skills in these areas.

A few additional quotes from the **Racing IRC's 2019 Skills Forecast** highlight in more detail their priority skills, which are certainly very specific to the industry:

Over the last few years, businesses have had to respond to challenges and opportunities in all related occupations, particularly in relation to the integrity of horse races, and social and workplace obligations in all classes of horse and greyhound racing. Racing businesses and RTOs have been required to embed numerous changes into their operations, including: safe horse riding and handling practices; revised and modernised racing practices including changes to traditional operational structures; greater support for 'new life after racing' options for retired animals.

In each industry, the trainer faces ultimate responsibility for all industry integrity issues. The need for formal training and assessment, recognised by qualifications, Skills Sets and licensing, has grown with the increasing focus on social licence to operate and changing community standards, combined with expansion of fields covered by regulation and changing training skills.

A particular concern over the last few years has been overbreeding and mistreatment of greyhounds. Greyhound racing clubs throughout Australia have set up programs to address overbreeding and encourage adoption of ex-racing dogs as family pets. Greyhounds Australasia announced its endorsement of a National Welfare Strategy in May 2014, and formal training is being developed to support these efforts.

Adaptability skills

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 flexibily and innovation
- showing innovation and creativity
- being entreprenurial.

COVID-19 impact

The Labour Market Information Portal (LMIP) Employers' Recruitment Insights COVID-19 update provides advice to jobseekers, including that employers will be looking for workers who can learn new tasks quickly and adapt to new working environments. A position statement by the Career Development Association of Australia, COVID-19: Reshaping Working Australia, states that the one skill that will be critical is the ability to adapt.

A Seek article The 5 skills employers want now (and how to show them) states in relation to adaptability and learning skills and emotional intelligence:

- Employers needed agile and adaptable employees as they deployed strategies to sustain their businesses.

- Hiring managers are looking for people who have taken the initiative during this time to learn new skills or look for new opportunities – 42% of Australians surveyed learned new skills they wouldn't have if it wasn't for COVID-19.

- It is crucial employees can respond appropriately to the emotions of others in difficult times.

The LinkedIn 2020 Workplace Learning Report is widely cited across business and recruitment articles, with reference to skills in demand by employers due to the pandemic. While their rankings show creativity and adaptability remain in the same positions within the 'top five soft skills in demand' in 2020 (numbers 1 and 4 respectively), this year emotional intelligence replaces time management at number 5.

Industry skills needs

Generic skills

In their comprehensive 2019 Skills Forecasts, IRCs ranked a series of 12 generic skill categories, in priority order.

1	**Learning agility / Information literacy / Intellectual autonomy and self-management**
2	Communication / Virtual collaboration / Social intelligence
3	Design mindset / Thinking critically / Systems thinking / Problem solving
4	Technology use and application skills
5	Language, Literacy and Numeracy (LLN) skills
6	Managerial / Leadership skills
7	Customer service / Marketing skills
8	Science, Technology, Engineering, Mathematics (STEM) skills
9	Data analysis skills
10	Financial skills
11	Environmental sustainability skills
12	Entrepreneurial skills

Learning agility / Information literacy / Intellectual autonomy and self-management (which aligns directly with Adaptability) was, on average, the highest ranked generic skill (out of 12) across all Skills Forecasts.

TOP PRIORITY

Priority skills

In terms of specific references to these skills in the Forecasts, adaptability related skills were also identified to a moderately high degree by industries that reported on priority skills in their 2019 Skills Forecasts.

Moderately High

Priority level according to IRC Skills Forecasts

● Low ● Moderate ● Medium ● Moderately high ● High
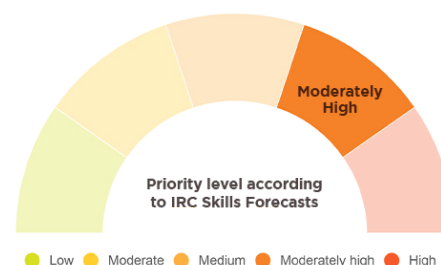
The three main adaptability related skills, which were identified most frequently within priority skills lists in Skills Forecasts were:

- **Emotional intelligence**, identified by the following industries:
    - Community Sector & Development
    - Direct Client Care and Support (Community Services & Health)
    - Personal Services
    - Ambulance and Paramedic
    - Children's Education and Care
    - Complementary Health
    - Enrolled Nursing
    - First Aid
    - Local Government

- **Resilience**, stress tolerance and flexibility, identified by the following industries:
    - Community Sector & Development
    - Direct Client Care and Support (Community Services & Health)
    - Personal Services
    - Aboriginal and Torres Strait Islander Health Workers
    - Children's Education and Care
    - Dental
    - Enrolled Nursing
    - Technicians Support Services
    - Tourism, Travel and Hospitality
    - Retail and Wholesale

- **Self management**, identified by the following industries:
    - Community Sector & Development
    - Direct Client Care and Support (Community Services & Health)
    - Personal Services
    - Aboriginal and Torres Strait Islander Health Workers
    - Ambulance and Paramedic
    - Complementary Health
    - Dental
    - First Aid
    - Technicians Support Services
    - Tourism, Travel and Hospitality
    - Client Services
    - Sport, Fitness and Recreation.

Additionally, 'Use of new technologies and materials' and 'Changing skill needs arising from new technology' were identified by Recreational Vehicles and Textiles, Clothing and Footwear, and the Education Industry identified 'Demonstrating an ability to adapt to changes and continuously deliver high quality training' and 'Undertaking and applying research to training practice'.

Internet job postings

Internet job vacancy postings that contained requests for adaptability skills were examined for occupational trends. This includes change management, process improvement, 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 (2016-20)
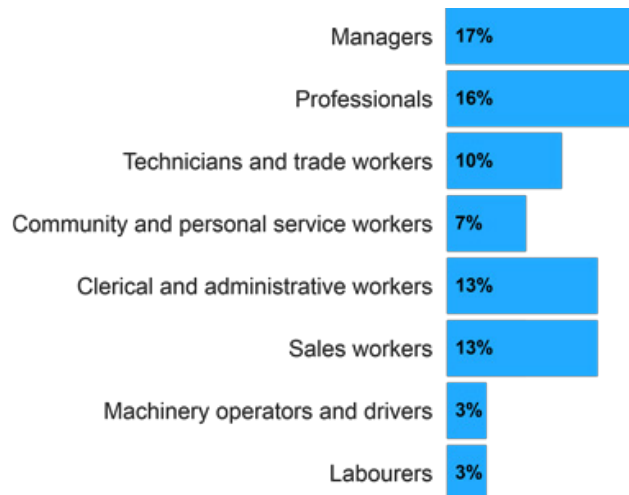
Occupation	Percentage
Managers	17%
Professionals	16%
Technicians and trade workers	10%
Community and personal service workers	7%
Clerical and administrative workers	13%
Sales workers	13%
Machinery operators and drivers	3%
Labourers	3%

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.

I'm looking for a Business Analyst with "A good problem-solving attitude"

I'm trying to hire a Business Analyst who can "Take initiative by reviewing & proposing business improvements based on honest data"

I'm looking for a Graphic Designer and I want someone able to "Conceptualize and develop new creative ideas"

I want a Change Manager who has "Demonstrated experience in project or program management and change delivery"

I'm looking for an Administration Assistant who "Must be computer literate and be a fast learner so they can hit the ground running"

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.

Case studies

Community Services

The Community Services sector is one component of the Community Sector and Development industry, and provides support to individuals, families and groups, enabling them maximise their potential and to enhance community wellbeing. Community support services are diverse and range from care and information activities to referrals and interventions. 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 **Community Sector and Development IRC's 2019 Skills Forecast** identifies the three main adaptability related skills 'emotional intelligence', 'resilience, stress tolerance and flexibility' and 'self-management' as essential skills for the Community Services workforce. This is highlighted in the following quotes taken from the forecast:

> *Whilst technical skills to perform job tasks are imperative, employers in the short-to-medium future will be looking beyond this and have indicated that it will be important for workers in their organisations to be equipped with key soft skills: teamwork and communication, emotional intelligence, resilience, stress tolerance and flexibility and self-management.*

> *The development of skills in caseload management, including self-management, resilience and emotional intelligence, is critically important for community services workers.*

Education

The education industry is broad, encompassing the teaching of primary, secondary, vocational and higher education roles. Within this industry, the vocational education and training (VET) sector contributes to the growth of Australian businesses by preparing workers with the skills that industry needs, providing training to potential and current workers in almost every industry in the Australian economy. The Training and Education (TAE) and Foundation Skills (FSK) Training Packages are critical elements of the Australian training system, playing central roles in the training of all learners that engage in the vocational education and training (VET) sector.

The **Education IRC's 2019 Skills Forecast** has identified adaptability as an essential skill for VET sector workers, which is highlighted in the following quotes from the skills forecast:

> *In addition to specialised skills in subject areas, key current competency needs for VET sector workers include...demonstrating an ability to adapt to changes and continuously deliver high quality training and undertaking* [and] *applying research to training practice.*

> [The] *increasing diversity* [of learner groups] *requires VET practitioners to have the capabilities to understand individual learner needs and implement person-centred strategies to meet them. This requires an emphasis on interpersonal skills in the midst of the technical application of training and assessment capabilities.*

Analytical skills

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 analytical skills are increasingly important, other 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.

Cross sector projects

COVID-19 impact

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.

Further to this, **LinkedIn's 2020 Grad's Guide to Getting Hired** shows analytical skills at number 4 of the top 10 skills.

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.

Industry skills needs

Generic skills

In their comprehensive 2019 Skills Forecasts, IRCs ranked a series of 12 generic skill categories, in priority order.

1 Learning agility / Information literacy / Intellectual autonomy and self-management

2 Communication / Virtual collaboration / Social intelligence

3 Design mindset / Thinking critically / Systems thinking / Problem solving

4 Technology use and application skills

5 Language, Literacy and Numeracy (LLN) skills

6 Managerial / Leadership skills

7 Customer service / Marketing skills

8 Science, Technology, Engineering, Mathematics (STEM) skills

9 Data analysis skills

10 Financial skills

11 Environmental sustainability skills

12 Entrepreneurial skills

The generic skills category focused around Design mindset / Thinking critically / Systems thinking / Problem solving aligns with Analytical skills, and received an average ranking of 3rd (out of 12) across all Skills Forecasts.

RANKED 3RD 3

Data analysis skills, another generic skills category associated with Analytical skills, received an average ranking of 9th (out of 12) across all IRC Skills Forecasts.

RANKED 9TH 9

Priority skills

Analytical skills were also identified to a moderately high degree by industries that reported on priority skills in their 2019 Skills Forecasts.

Moderately High

Priority level according to IRC Skills Forecasts

● Low ● Moderate ● Medium ● Moderately high ● High
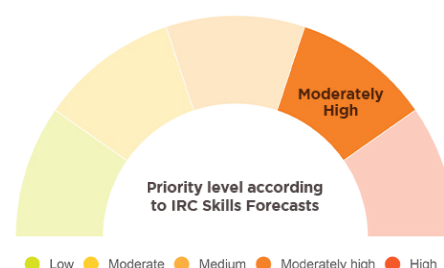
The two analytical skills identified most frequently were:

- **Critical thinking,** identified by the following industry sectors:
  - Arts, Culture, Entertainment and Design
  - Dance
  - Business Services
  - Children's Education and Care
  - Government
  - Ambulance and Paramedic
  - Complementary Health
  - Enrolled Nursing
  - Printing and Graphic Arts
  - Retail and Wholesale.

- **Problem solving**, identified by the following industry sectors:
  - Arts, Culture, Entertainment and Design
  - Dance
  - Automotive
  - Business Services
  - Children's Education and Care
  - Client Services
  - Direct Client Care and Support
  - Financial Services
  - Aboriginal and Torres Strait Islander Health Workers
  - Ambulance and Paramedic
  - Complementary Health
  - Dental
  - First Aid
  - Technicians Support Services
  - Information and Communications Technology
  - Mining, Drilling and Civil Infrastructure
  - Printing and Graphic Arts
  - Retail and Wholesale
  - Sport, Fitness and Recreation
  - Tourism, Travel and Hospitality.

Internet job postings

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. 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 (2016-20)

Occupation	Percentage
Managers	20%
Professionals	24%
Technicians and trade workers	14%
Community and personal service workers	8%
Clerical and administrative workers	20%
Sales workers	14%
Machinery operators and drivers	5%
Labourers	6%

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

Analytical skills were most often requested for professional, managerial or clerical and administrative positions They were rarely requested for machinery operations or driving, labouring or community and personal service postions. 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.

I want to recruit a Business Development Manager with "Ability to apply business, financial and technical strategic thinking concepts"

I'm looking for a Business Analyst with "Excellent analytical skills"

I'm searching for a Data Analyst who has "Previous experience organising and analysing data"

I'm need a Business Intelligence Analyst with "Strong skills in business intelligence dashboard development"

I'm looking for a Registered Nurse with "Demonstrated application of evidence based practice and critical thinking to advocate for and implement individualised person-centred care with a commitment to quality improvement"

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 advantages of analytical and data-based insights in order to improve.

Case Studies

Information and Communications Technology

The Information and Communications Technology industry consists of the five sectors listed below. Each identified analytical and related skills as a top priority for their workforce to keep pace with the rapid evolution of technology.

- Digital media
- ICT networks
- ICT operations and support
- Programming, Software and Web Development
- Telecommunications technology

The need for analytical and related skills are highlighted by the following quotes from the **Information and Communication Technology IRC's 2019 Skills Forecast**:

> *In ICT – and many other sectors – employers are demanding skills that will deliver on the promises of new and emerging technologies, including advanced skills in data analytics, software engineering and cloud computing.*

> *It is anticipated that ICT job roles and skills will be necessary to harness the potential of new and emerging technologies. This includes highly specialised skills, such as in data analytics and software engineering to design, develop and implement new technology, as well as digital literacy, creativity and communication skills to work effectively in future economy that is set to be more automated and digitally connected than ever before.*

Financial Services

The Financial Services industry in Australia is large and includes the following sectors:

- Banking
- Mortgage broking
- Financial markets
- Financial planning and advice
- Insurance
- Superannuation
- Accounting and bookkeeping
- Mercantile agents
- Trust administration.

All sectors identified the need for analytical and related skills in their workforce, to better understand the requirements of their clients or improve internal operations in the business. This is highlighted by the following quotes, sourced from the **Financial Services IRC's 2019 Skills Forecast**:

> *Additionally, proficiency in computing skills, strong analytical skills, and adaptability to understand and embrace new technologies and work environments will enable workers in order to better prepare them for changing industry demands, particularly in the FinTech space with the increasing digitisation of products, platforms, and services.*

There are also increased considerations for mortgage brokers to be aware of in regards to data management and protection, due to the level of personal information collected and stored electronically.

Advances in technology have improved access to customer information and improved processes, and also raise a need for data related training.

Business & compliance skills

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.

Cross sector projects

COVID-19 impact

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.

In the CEDA webinar **The Workplace of the Future**, the shift to flexible work and Agile project management are discussed as trends that may enable businesses to grow through the pandemic. This is supported by the National Skills Commission project **Emerging Occupations: How New Skills Are Changing Australian Jobs**, which identifies **Logistics Analysts** and **Agile Coaches** as emerging occupations; demand for these skills may increase due to the response by industries to the pandemic.

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.

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.

Industry skills needs

In their comprehensive 2019 Skills Forecasts, IRCs ranked a series of 12 generic skills categories, in priority order.

1 Learning agility / Information literacy / Intellectual autonomy and self-management

2 Communication / Virtual collaboration / Social intelligence

3 Design mindset / Thinking critically / Systems thinking / Problem solving

4 Technology use and application skills

5 Language, Literacy and Numeracy (LLN) skills

6 Managerial / Leadership skills

7 Customer service / Marketing skills

8 Science, Technology, Engineering, Mathematics (STEM) skills

9 Data analysis skills

10 Financial skills

11 Environmental sustainability skills

12 Entrepreneurial skills

Financial skills (which are a key component of business and compliance skills) received an average ranking of 10th (out of 12) across all skills forecasts.

RANKED 10TH 10

Priority Skills

Business and compliance skills were also identified to a moderately high degree by industries that reported on priority skills in their 2019 Skills Forecasts.

Moderately High

Priority level according to IRC Skills Forecasts

● Low ● Moderate ● Medium ● Moderately high ● High
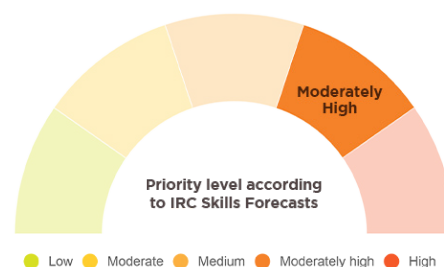
The four broad areas of business and compliance skills identified most frequently were:

- **Regulatory/Legislative/Compliance**, identified by the following industry sectors:
    - Food, Beverage and Pharmaceutical Product Manufacturing
    - Gas
    - Transport and Logistics
    - Education
    - Textiles, Clothing and Footwear

- **Health and Safety**, identified by the following industry sectors:
    - Food, Beverage and Pharmaceutical Product Manufacturing
    - Gas
    - Aviation
    - Maritime
    - Transport and Logistics
    - Correctional Services
    - ESI Generation
    - Electrotechnology
    - Water
    - Automotive
    - Corrections and Public Safety
    - Dance
    - ESI Transmission, Distribution and Rail
    - Financial Services
    - Information and Communications Technology
    - Mining, Drilling and Civil Infrastructure
    - Printing and Graphic Arts
    - Process Manufacturing
    - Rail

- **Risk Management**, identified by the following industry sectors:
    - Food, Beverage and Pharmaceutical Product Manufacturing
    - Maritime

- **General business skills** (for example, financial, organisational, planning, operational), identified by the following industry sectors:
    - Gas
    - Aviation
    - Maritime
    - Transport and Logistics
    - Business services
    - ESI Generation
    - Water
    - Forestry and wood products
    - Furnishing
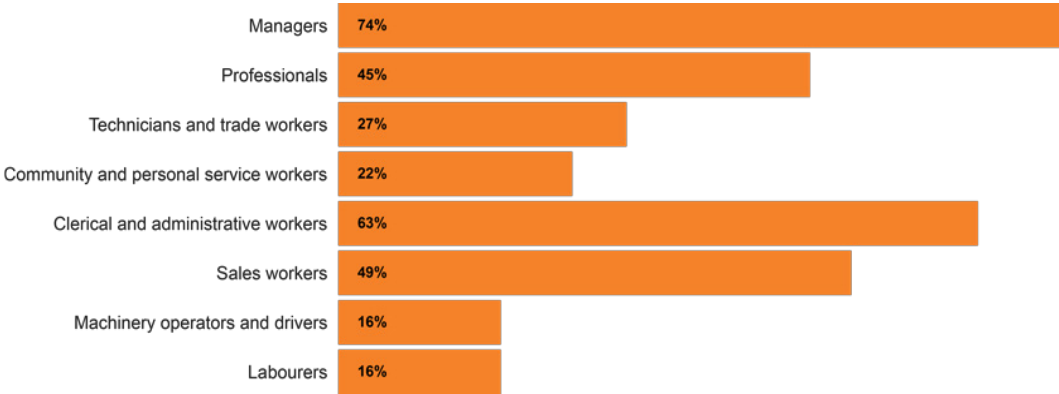   - Textiles, Clothing and Footwear

Internet job postings

Internet job vacancy postings that contained requests for business and compliance skills were examined for occupational trends. This includes planning, prioritising tasks, 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 (2016-20)

Occupation	Percentage
Managers	74%
Professionals	45%
Technicians and trade workers	27%
Community and personal service workers	22%
Clerical and administrative workers	63%
Sales workers	49%
Machinery operators and drivers	16%
Labourers	16%

Source: Burning Glass Technologies' 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.

I need a Project Manager who has "Contract management, planning and financial management experience with a strong focus on managing project costs and revenues"

I need a Business Analyst with "Demonstrable business analysis skills to document, review, analyse and enhance the business requirements submitted"

I'm searching for a Project Manager with "Experience developing and managing budgets"

I'm recruiting for an Executive Assistant with "Deep understanding and application of best practice administration and organisational skills"

I'm looking for a Project Manager with "Experience of project controls, such as scheduling, risk management, cost control, change control and reporting"

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.

Case Study

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.

Work health and safety, and compliance skills (or a combination of both) were reported in the IRC Skills Forecasts for each of these sectors. These quotes highlight why business and compliance skills have been prioritised in the Transport industry cluster:

New Chain of Responsibility (CoR) regulations are aimed at improving safety. The newly amended CoR laws obligate all supply chain participants to ensure safety measures are implemented to prevent speeding, driver fatigue, and breach of Heavy Vehicle National Law (HVNL). New education and training help meet the compliance requirements. The industry workforce will require skills to think critically and creatively to solve problems and respond to unforeseen situations. (**Transport and Logistics IRC's 2019 Skills Forecast**)

Emergency towage is an important part of the Maritime industry operations. It is responsible for assisting a vessel that is damaged or in danger of grounding, sinking, or causing environmental hazards. The industry requires a skilled workforce capable of managing and conducting towage operations effectively to meet regulatory requirements. (**Maritime IRC's 2019 Skills Forecast**)

Safety in the Rail industry is of paramount importance as the industry moves millions of people daily. Harmonising rail safety standards and developing effective national standards and codes of practice are key focus areas to improve industry's safety and efficiency. The Office of the National Rail Safety Regulator (ONRSR) has deemed safety of workers and vehicles a key priority in their 2016-17 annual report. ONRSR is also undertaking a project to make informed safety decisions based on risk-based regulatory intelligence and data to improve compliance and mitigate risks. (**Rail IRC's 2019 Skills Forecast**)

New technologies and the ongoing regulatory changes will require regular revision of the Training Package to ensure a skilled and adaptable workforce. (**Aviation IRC's 2019 Skills Forecast**)

Collaboration skills

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.

COVID-19 impact

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** reports 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.

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.

Industry skills needs

Generic skills

In their comprehensive 2019 Skills Forecasts, IRCs ranked a series of 12 generic skill categories, in priority order.

1 Learning agility / Information literacy / Intellectual autonomy and self-management

2 Communication / Virtual collaboration / Social intelligence

3 Design mindset / Thinking critically / Systems thinking / Problem solving

4 Technology use and application skills

5 Language, Literacy and Numeracy (LLN) skills

6 Managerial / Leadership skills

7 Customer service / Marketing skills

8 Science, Technology, Engineering, Mathematics (STEM) skills

9 Data analysis skills

10 Financial skills

11 Environmental sustainability skills

12 Entrepreneurial skills

Communication / Virtual collaboration / Social received an average ranking of 2nd (out of 12) across all skills forecasts.

RANKED 2ND

Priority skills

Collaboration skills were also identified to a high degree by industries that reported on priority skills in their 2019 Skills Forecasts.

Priority level according to IRC Skills Forecasts

High

● Low ● Moderate ● Medium ● Moderately high ● High

The collaboration skills identified most frequently were:

- **Teamwork and communication**, identified by the following industry sectors:
  - Arts, Culture, Entertainment and Design
  - Dance
  - Automotive
  - Business Services

- Children's Education and Care
- Client Services
- Community Sector & Development
- Direct Client Care and Support
- Financial Services
- Food, Beverage and Pharmaceutical Product Manufacturing
- Government
- Aboriginal and Torres Strait Islander Health Workers
- Ambulance and Paramedic
- Complementary Health
- Dental
- Enrolled Nursing
- First Aid
- Technicians Support Services
- Information and Communications Technology
- Mining, Drilling and Civil Infrastructure
- Personal Services
- Graphic Arts
- Sport, Fitness and Recreation
- Tourism, Travel and Hospitality

- **Social perceptiveness**, identified by the following industry sectors:
  - Business Services
  - Cultural Competence
  - Retail and Wholesale

- **Customer service**, identified by the following industry sectors:
  - Arts, Culture, Entertainment and Design
  - Dance
  - Furnishing
  - Printing and Graphic Arts

Internet job postings

Internet job vacancy postings that contained requests for communications skills were examined for occupational trends. This includes skill 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 (2016-20)

Occupation	Percentage
Managers	50%
Professionals	42%
Technicians and trade workers	30%
Community and personal service workers	37%
Clerical and administrative workers	54%
Sales workers	51%
Machinery operators and drivers	20%
Labourers	21%

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

Collaboration skills were most often explicitly requested for clerical and administative or sales workers, 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.

I'm looking for a Project Manager with "Excellent interpersonal, communication and team management skills"

I'm looking for a Registered Nurse with "Demonstrated communication skills, including negotiation and conflict resolution"

I need a Business Development Manager who can "Work collaboratively and build strong working relationships"

I'm trying to recruit a Project Manager who is an "Effective communicator, self-motivated with a proven ability to work collaboratively and build strong working relationships"

I'm searching for a Business Development Manager with "Strong presentation and negotiation skills"

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, where there will be a need to manage teams, engage with internal stakeholders while also communicating with external clients.

Case Studies

Community Services

The Community Services industry includes workers involved in the sectors of Children's Education and Care, Client Services, Community Sector and Development, and Direct Client Care and Support. These sectors encompass workers who provide a variety of care and support services for a range of community members, including the more vulnerable and less able.

These subsectors are not mutually exclusive in the services they provide, and increasingly the collaboration of people across subsectors is a critical element in individual care and support plans.

Collaboration includes skills relating to teamwork and communication, and the ability to connect with others.

The following quotes from the different Community Services 2019 Skills Forecasts highlight the importance of collaboration skills, including teamwork and communication, for the workforce:

> *In addition to increased skills demand relating to chronic health conditions such as mental health and alcohol and other drugs, there are also deficiencies in skills related to dementia care, palliative care, technological and interpersonal skills (such as communication), most noticeably in the aged and disability care sectors.* (**Direct Client Care IRC**)

> *Perhaps more significant to job roles in the Children's Education and Care sectors is that they have always required strong communication and emotional intelligence skills. The ability to engage with children is a fundamental practical skill with unique factors in the work context. Consultation in relation to the update of existing Training Package Products is highlighting the significance of skills relating to reflection and the role these play in translating theory into practice and the ongoing professional development of educators. Skills such as these can be enhanced over time with practical application and communication with peers and leaders within the workplace.* (**Children's Education and Care IRC**)

> *Job seekers may experience disadvantage in the labour market due to various factors, including disability, mental health issues, age, ethnicity and language. Addressing these barriers can include discussing homelessness, family violence, literacy, motivation and confidence, and numerous other non-vocational support issues. As a result, frontline employment consultants require excellent communication skills, as well as time management skills and an awareness of the policy landscape, to effectively provide opportunities for clients on a case-by-case basis.* (**Client Services IRC**)

Tourism, Travel and Hospitality

The Tourism, Travel and Hospitality industry comprises of the 'people-facing' industry sectors involving tourism, travel, events and exhibitions, accommodation (including hotels, holiday parks and resorts) and hospitality.

These sectors are intrinsically linked and when combined, form one of the largest economic industries in Australia. The strong association and interconnectedness between the five sectors mean that trends and changes in one, will consequently impact the others. As a result, collaboration between sectors is imperative to the success of the industry as a whole.

The quotes below sourced from the **Tourism, Travel and Hospitality IRC's 2019 Skills Forecast**, demonstrate the importance of collaboration for this workforce, including the ability to communicate and work as a team:

Key skills and knowledge gaps voiced by industry as a priority for development in the future workforce are: communication, teamwork, self-management, resilience and business/commercial skills as well as product and service knowledge. For example, demand for cultural tourism, particularly that related to learning about Aboriginal beliefs and connections to the land ('country') is growing and workforce skills development is essential to ensure Australia can provide an authentic experience to visitors.

To achieve growth and success, access to a highly skilled and knowledgeable workforce is fundamental. The sectors however are experiencing significant challenges in accessing and retaining skilled workers. Enrolments in relevant VET qualifications have fallen over the last two reported years (2016 and 2017), and employers are indicating graduates are not equipped with key skills. Some of the common skills and knowledge areas industry has reported shortages in include communication, teamwork and problem-solving.

Customer Service & Marketing Skills

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.

Cross sector projects

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** 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.

Australia Post's **Inside Australian Online Shopping** update for January 2021 shows there were 34.9% more online purchases in December 2020 than in 2019 and 2.1 million households shopped online in December 2020 that didn't in December 2019.

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 has 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. **The Digital Skills for Small Business Skill Set** was endorsed in September 2020 which includes learning how to use social media to engage customers and provide online customer service.

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

Generic skills

In their comprehensive 2019 Skills Forecasts, IRCs ranked a series of 12 generic skill categories, in priority order.

1	Learning agility / Information literacy / Intellectual autonomy and self-management
2	Communication / Virtual collaboration / Social intelligence
3	Design mindset / Thinking critically / Systems thinking / Problem solving
4	Technology use and application skills
5	Language, Literacy and Numeracy (LLN) skills
6	Managerial / Leadership skills
7	Customer service / Marketing skills
8	Science, Technology, Engineering, Mathematics (STEM) skills
9	Data analysis skills
10	Financial skills
11	Environmental sustainability skills
12	Entrepreneurial skills

Customer service / Marketing (which aligns directly with Customer Service & Marketing skills) received an average ranking of 7th (out of 12) across all skills forecasts

RANKED 7TH

Priority skills

Customer Service & Marketing skills were also identified to moderate degree by industries that reported on priority skills in their 2019 Skills Forecasts.

Moderate

Priority level according to IRC Skills Forecasts

● Low ● Moderate ● Medium ● Moderately high ● High
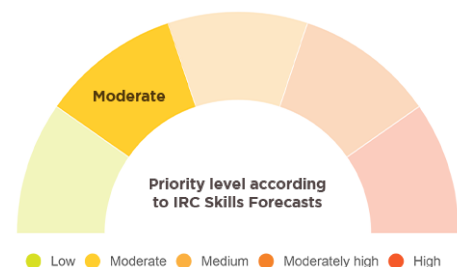
The following industries identified Customer Service & Marketing skills as a priority in their IRC Skills Forecasts:

- Arts, Culture, Entertainment and Design
- Client Services
- Corrections and Public Safety

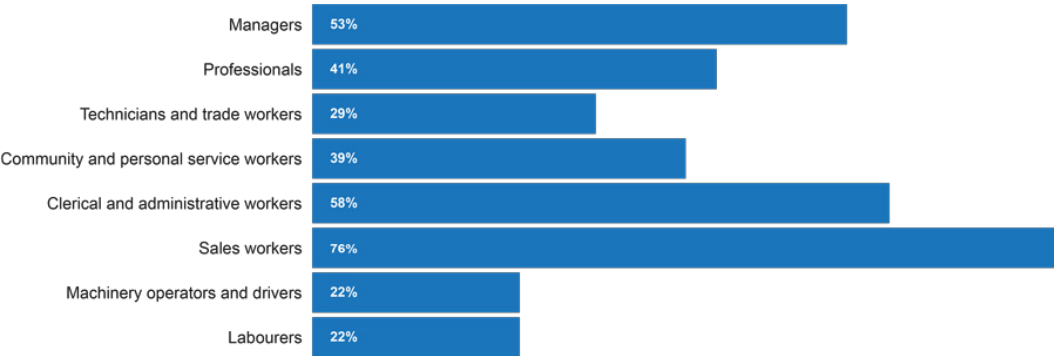These industries focused mainly on the need for skills relating to:

- Self-promotion and marketing
- Online and social media
- Community engagement.

Internet job postings

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 (2016-20)

Occupation	Percentage
Managers	53%
Professionals	41%
Technicians and trade workers	29%
Community and personal service workers	39%
Clerical and administrative workers	58%
Sales workers	76%
Machinery operators and drivers	22%
Labourers	22%

Source: Burning Glass Technologies' 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

I'm looking for a Customer Services Officer with "Experience delivering a high level of customer service via a range of contact channels"

I'm searching for a Business Development Manager with a "Passion for sales and exceptional customer service"

I'm trying to recruit a Customer Services Officer with an "Excellent customer service aptitude"

I need a Marketing Coordinator with "Experience working with design and creation of content for social media and general platforms"

I'm looking for a Marketing Manager with "Significant brand and marketing experience"

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

Case Studies

Arts, Culture, Entertainment and Design Industry

The Arts, Culture, Entertainment and Design industry includes a wide range of individuals and organisations who contribute to the creative economy, and is made up of four distinct sectors:

- Live performance and entertainment: dance and musical theatre, dance teaching, and live production and technical services
- Music: music performance and composition, music sound production, and music business
- Screen, media and broadcasting: broadcast technology, and technical screen and media production
- Visual arts, craft and design: subspecialties across a range of visual art disciplines

According to the **Culture and Related Industries IRC's 2019 Skills Forecast**, customer engagement through online and social media is an imperative skill for workers within this industry, primarily as these workers often are sole operators and need the skills to communicate and engage directly with their customers (and audiences).

The need for customer service & marketing skills are ever increasing with the growth of social media as a platform to promote, distribute and sell art to a wide range of audiences. In addition, the evolution and growth of the gig economy presents a need for artists to be skilled in self-managing their careers as freelance workers.

According to the Culture and Related Industries IRC's 2019 Skills Forecast, the following changes are expected to impact skills needs for workers:

> *Artists, art dealers and galleries utilise technology and social media platforms to promote and distribute art, allowing them to reach a greater range of consumers. For example, 91 per cent of galleries surveyed said that they actively use social media to promote their gallery, art and artists. Therefore, workers in the sector require the skills and knowledge to establish a digital presence, engage audiences through digital platforms, and distribute and promote art.*

> *The changes to the landscape of freelancing work will affect the Culture and Related Industries in different ways based on sub-sector and specific job roles. In some areas it may be prevalent, for example, more visual arts, craft and design professionals, have chosen to self-manage their career rather than to depend on galleries or other third parties to help with management.*

Client Service Sector

The Client Services sector provides an array of essential services to the Australian public, services which are generally provided across the wider Community Services sector, and include:

- Career development
- Employment services
- Counselling
- Financial counselling
- Family dispute resolution
- Celebrancy.

According to the **Client Services IRC's 2019 Skills Forecast**, the widespread use of social media and online activities signifies the importance of establishing and maintaining a profile on social media amongst the Client Services sector:

> *Due to the mass-adoption of online and social media by the general public, it is important for almost every industry today to establish and maintain a high profile on social media. Online and social media is applicable to, and provides benefits to, the Client Services sector, and there is therefore a need for students to develop online and social media skills to aid in their work-readiness.*

These skills are of particular importance for celebrants. As highlighted in the Skills Forecast, Commonwealth-registered marriage celebrants are required to undertake mandatory ongoing professional development each year, and this can include activities relating to customer service and marketing skills, such as:

- Social media marketing
- Knowing how to create appropriate social media content
- Creating and maintaining a social media presence
- Social media as a marketing tool
- Networking using social media.

Digital skills

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.

The Australian Industry and Skills Committee (AISC) is in the process of establishing an **Industry 4.0 Industry Reference Committee**, to help ensure vocational education and training gives students the future-focussed skills they will need, as workplaces become radically transformed by increased automation and digitalisation.

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, 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 identify related skills needs shared by multiple industry sectors

- the purpose of the **Big data** project is to provide 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.

This is supported by Critical Role of Blue Tech and Digital Skills in Australia's Economic Recovery, which confirms 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. Future of Digital Skills for WA highlights how the pandemic has shown the importance of digital fluency, and PwC Australia's 1st Annual Not-for-profit CEO Survey found that 77% of not-for-profit organisations said that the need for digital upskilling of workers has become a higher priority in the context of COVID-19.

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

Industry skills needs

Generic skills

In their comprehensive 2019 Skills Forecasts, IRCs ranked a series of 12 generic skill categories, in priority order.

1. Learning agility / Information literacy / Intellectual autonomy and self-management
2. Communication / Virtual collaboration / Social intelligence
3. Design mindset / Thinking critically / Systems thinking / Problem solving
4. Technology use and application skills
5. Language, Literacy and Numeracy (LLN) skills
6. Managerial / Leadership skills
7. Customer service / Marketing skills
8. Science, Technology, Engineering, Mathematics (STEM) skills
9. Data analysis skills
10. Financial skills
11. Environmental sustainability skills
12. Entrepreneurial skills

Technology use and application skills (which aligns with Digital skills) received an average ranking of 4th (out of 12) across all skills forecasts

RANKED 4TH

Priority skills

Digital skills were also identified by around half of the industries that reported on.priority skills in their 2019 Skills Forecasts.

Medium

Priority level according to IRC Skills Forecasts

Low Moderate Medium Moderately high High
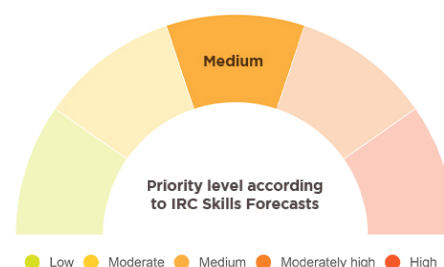
The digital skills identified by the industry skills forecasts could be split broadly into two main categories:

- **Digital skills relating to industry specific software or technology**, identified by the following industries:
  - Business Services
  - Electricity Supply Generation
  - Electricity Supply Transmission, Distribution and Rail
  - Furnishing
  - Process Manufacturing (PMA).

- **General digital skills and literacy**, identified by the following industries:
  - Correctional Services
  - Forestry and Wood Products
  - Gas
  - Maritime
  - Mining, Drilling and Civil Infrastructure
  - Rail
  - 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 techinical 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 (2016-20)

Occupation	%
Managers	19%
Professionals	29%
Technicians and trade workers	15%
Community and personal service workers	9%
Clerical and administrative workers	38%
Sales workers	18%
Machinery operators and drivers	9%
Labourers	5%

Source: Burning Glass Technologies' 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.

I need an Executive Assistant who has "Working knowledge of MS Word, Excel and PowerPoint"

I require a Java Developer who has "Extensive experience with Java programming"

I'm looking for an Accounts Payable Officer who can "Demonstrate experience using SAP (Enterprise Resource Planning) software to manage business data"

I need a Front-End Web Developer who has "Strong experience with JavaScript, React, and Redux frameworks with understanding of HTML and CSS"

I'm searching for a Data Analyst with "SQL experience, including the ability to curate datasets from internal and external databases"

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.

Case Studies

Business Services

The Business Services industry is involved in the operation and management of businesses, and as such it is not an independent industry; rather all Australian industries include workers in Business Services. The industry includes the sub-sectors:

- Business Administration and Governance
- Business Communication
- Business Leadership and Management
- Specialised Business Services.

The skills forecast identifies 'Data literacy' and 'Digital competence' as two of the five key enterprise, or transferrable, skills required by Business Services workers. These are described by the following quotes from the **Business Services IRC 's 2019 Skills Forecast** as:

> *Data literacy – Data literacy is the ability to derive meaningful insights from data. Workers across the Business Services sector have access to more and more data, with a growing emphasis being placed on data-driven decision making. These skills enable a person to effectively identify, locate, interpret, and evaluate information to produce business insights.Digital competency – including skills relating to: cyber security and use of technology to perform tasks. A digitally competent person is able to use new and emerging platforms and digital technologies in a business environment. These systems are used safely and critically, and may enable digital or virtual collaboration. As the Business Services sector becomes increasingly digitally-enabled, broad digital competence becomes imperative for this workforce.*

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 skills forecasts:

> *Digital technologies can offer a potential $1.3 billion of benefit per year for the electrical power sector alone. This will require a digitally competent workforce with a range of skills, from basic ICT skills to specialist skills, to manipulate and interpret data in a meaningful manner and deploy technologies more effectively.* (**ESI Generation IRC's 2019 Skills Forecast**)

The workforce will need to be prepared to work with intelligent technical support equipment (e.g. smart technologies – inverters, meters and new technologies such as storage at various scales)...Recruitment of digitally enabled workforce specialists who also have knowledge of the ESI TDR industry is already being reported as difficult. This has potential to increase over time as the demand for these occupations inevitably continue to grow to meet demands. (**ESI Transmission, Distribution and Rail IRC's 2019 Skills Forecast**)

The increasing adoption of new technologies in the Gas Supply industry has transformed operations, creating new opportunities and requiring new skills and training... To benefit from these opportunities, training and upskilling the workforce in digital literacy, digital map reading, cybersecurity, data analytics and other data-related technologies is deemed essential. (**Gas IRC's 2019 Skills Forecast**)

New technological innovations have transformed the industry's operations, providing opportunities to save costs, improve services, and boost efficiency... In line with these technologies, big data will be a strong focus into the future and the industry will require skills in data analytics, digital literacy, and cybersecurity. (**Water IRC's 2019 Skills Forecast**)

The industry is utilising more digital technology and transitioning away from an asset centric mindset to a customer-centric one. To fully achieve the objectives of a customer centric model, the workforce requires skills such as creativity, problem-solving, critical thinking, and digital skills. (**Water IRC's 2019 Skills Forecast**)

Foundation Skills

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.

COVID-19 impact

In their submission to the Australian Government, **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 states that for all Australians to be able to participate and contribute to economic and social development, they will require some degree of digital literacy.

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.

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**.

Industry skills needs

Generic skills

In their comprehensive 2019 Skills Forecasts, IRCs ranked a series of 12 generic skill categories, in priority order.

1 Learning agility / Information literacy / Intellectual autonomy and self-management
2 Communication / Virtual collaboration / Social intelligence
3 Design mindset / Thinking critically / Systems thinking / Problem solving
4 Technology use and application skills
5 Language, Literacy and Numeracy (LLN) skills
6 Managerial / Leadership skills
7 Customer service / Marketing skills
8 Science, Technology, Engineering, Mathematics (STEM) skills
9 Data analysis skills
10 Financial skills
11 Environmental sustainability skills
12 Entrepreneurial skills

Language, Literacy and Numeracy (LLN) (which aligns directly with Foundation skills) received an average ranking of 5th (out of 12) across all skills forecasts.

RANKED 5TH

Priority skills

Foundation skills were also identified to a low degree by industries that reported on priority skills in their 2019 Skills Forecasts.

Low

Priority level according to IRC Skills Forecasts

● Low ● Moderate ● Medium ● Moderately high ● High
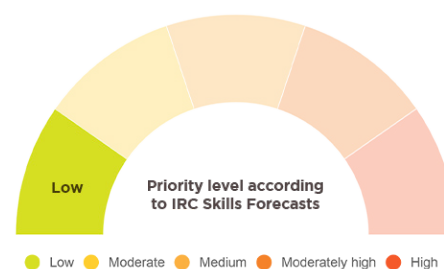
Two foundation skills were highlighted, including:

- **Language, literacy and numeracy**, identified by:
  - Process Manufacturing

- **Employability skills for work readiness**, identified by:
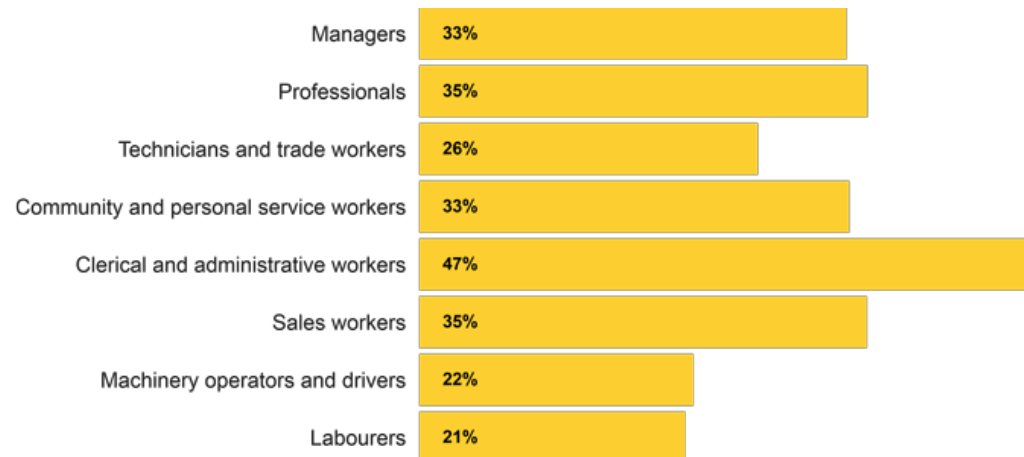 - Furnishing

Internet job postings

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 (2016-20)

Occupation	Percentage
Managers	33%
Professionals	35%
Technicians and trade workers	26%
Community and personal service workers	33%
Clerical and administrative workers	47%
Sales workers	35%
Machinery operators and drivers	22%
Labourers	21%

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

Foundation skills were most often explicitly requested for clerical and administrative positions, and least often for machinery operation or labouring 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.

I'm looking for an Executive Assistant with "Excellent written and verbal communication skills"

I would like to recruit a Cook who is able to "Understand and speak English"

I'm recruiting for a Customer Service Officer with "Computer skills"

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 postions.

Case Study

Manufacturing

The Manufacturing industry is broad and encompasses a variety of sectors and job roles. The **Manufacturing IRC's 2019 Skills Forecast** indicated that continually advancing technology within the industry is having a notable impact on skills needs, particularly within the area of digital literacy. In addition, inadequate literacy and numeracy skills continue to be an ongoing issue for the workforce.

The following are quotes from the skills forecast, which highlight the importance of digital literacy skills to the industry, as well as a need to build on the foundation skills of literacy and numeracy within the manufacturing workforce:

> *Insufficient levels of literacy and numeracy: which was reported as a challenge by 99% of respondents. This was an increase from 92% in the previous year.*

> *IRC members previously observed that although they would expect that learners would already possess the necessary underpinning Language, Literacy and Numeracy (LLN) and STEM skills when enrolling in qualifications, this is often not the case.*

> *Work conducted by CSIRO on advanced manufacturing identified that sustained growth in the sector will require investment and translation of enabling science and technology, including: sensors and data analytics, advanced materials, smart robotics and automation, 3D printing, and augmented, mixed and virtual reality, which in turn has implications for underpinning digital literacy and Science, Technology, Engineering and Mathematics (STEM) skills across the workforce.*

Leadership & management skills

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.

COVID-19 impact

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 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.

Industry skills needs

Generic skills

In their comprehensive 2019 Skills Forecasts, IRCs ranked a series of 12 generic skill categories, in priority order.

1 Learning agility / Information literacy / Intellectual autonomy and self-management

2 Communication / Virtual collaboration / Social intelligence

3 Design mindset / Thinking critically / Systems thinking / Problem solving

4 Technology use and application skills

5 Language, Literacy and Numeracy (LLN) skills

6 Managerial / Leadership skills

7 Customer service / Marketing skills

8 Science, Technology, Engineering, Mathematics (STEM) skills

9 Data analysis skills

10 Financial skills

11 Environmental sustainability skills

12 Entrepreneurial skills

Managerial/Leadership skills (which aligns directly with Leadership and management) received an average ranking of 6th (out of 12) across all skills forecasts.

RANKED 6TH

Priority skills

Leadership and management skills were also identified to moderate degree by industries that reported on priority skills in their 2019 Skills Forecasts.

Moderate

Priority level according to IRC Skills Forecasts

● Low ● Moderate ● Medium ● Moderately high ● High
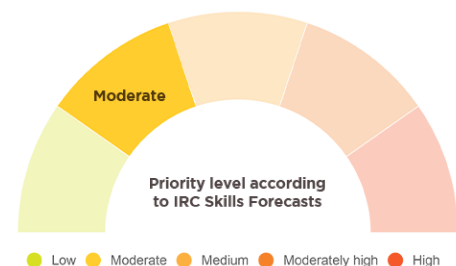
The main leadership and management-related skills, identified most frequently within priority skills lists in skills forecasts, were:
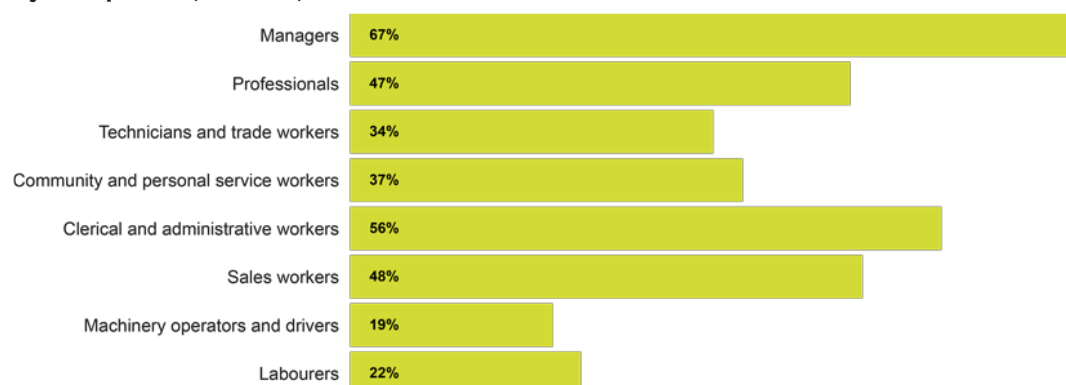
- **Management-related, and planning, scheduling, logistical and supply chain management skills**, identified by:
  - Forestry and Wood Products
  - Manufacturing and Engineering
  - Printing and Graphic Arts.

Internet job postings

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, incluing communication.

Internet job postings that requested leadership and management skills, by occupation (2016-20)

Occupation	Percentage
Managers	67%
Professionals	47%
Technicians and trade workers	34%
Community and personal service workers	37%
Clerical and administrative workers	56%
Sales workers	48%
Machinery operators and drivers	19%
Labourers	22%

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

Unsurprisingly, leadership and management skills were most often explicitly requested for managerial and positions. However, 33% of managerial postions didn't contain an explicit reference to leadership skills. This does not mean these skills were not relevant, but more likely indicates that the empoyers assume only those with leadership skills would apply for the position. Leadership and management skills were least often requested for machinery operators 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.

Case Study

Manufacturing and Engineering

The Manufacturing and Engineering industry includes a variety of business types and occupations, usually associated with designing, making, assembling, installing, maintaining and repairing manufactured products, and incorporates the following sectors:

- Engineering
- Boatbuilding and Shipbuilding
- Jewellery Manufacture
- Locksmithing
- Watch and Clock Service and Repair.

As outlined in the **Manufacturing and Engineering IRC's 2019 Skills Forecast**, business models in the industry are changing, with some businesses developing whole products and integrated solutions as opposed to being component manufacturers, while others are becoming more specialised.

Changing business models also signifies a change in skills demand, particularly around the area of leadership and management. A survey of the Manufacturing and Engineering industry highlighted a significant and growing lack of leadership and management skills among workers, with 62% of respondents indicating that this was having a significant impact on business.

In addition, the Manufacturing and Engineering IRC's 2019 Skills Forecast reported predictions of employment growth for Production Managers and Management Analysists, with these occupations expected to grow by more than 5%.

The following quotes from the Manufacturing and Engineering IRC's 2019 Skills Forecast highlight the changing skills needs and gaps in the industry:

Need for underpinning generic skills, including mathematics, problem-solving (including advanced problem-solving and analytical problem-solving models), interpretation of supplied information, time-keeping, goal-setting, customer service skills, and project management skills.

Projected employment growth of more than 5% for Production Managers, Management and Organisation Analysts, Other Miscellaneous Technicians and Trades Workers and Product Assemblers over the five years to 2023.

Lack of leadership and management skills, with 62% of respondents believing that a lack of leadership and management skills is having a high impact on the business. This was an increase from 56% in the previous year.

STEM Skills

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.

COVID-19 impact

STEM occupations were a priority during the pandemic, from the multitude of COVID-19 tests, the manufacturers and engineers who pivoted their businesses to produce vital PPE products and equipment, to the technology workers who shifted operations online to facilitate working from home or business continuity.

The Professionals Australia submission **Investing in Engineering, Science and ICT to Rebuild Australia's Economy Post-COVID-19** states that STEM skills are a priority area which needs investment. The technical and enterprise skills of engineers and scientists need commitment to career-long learning and as well as the reskilling and upskilling of IT professionals as key enablers of innovation, increased productivity and maximising opportunities that may be presented by the pandemic.

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 science, technology, engineering and mathematics (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.

Industry skills needs

Generic skills

In their comprehensive 2019 Skills Forecasts, IRCs ranked a series of 12 generic skill categories, in priority order.

1 Learning agility / Information literacy / Intellectual autonomy and self-management
2 Communication / Virtual collaboration / Social intelligence
3 Design mindset / Thinking critically / Systems thinking / Problem solving
4 Technology use and application skills
5 Language, Literacy and Numeracy (LLN) skills
6 Managerial / Leadership skills
7 Customer service / Marketing skills
8 Science, Technology, Engineering, Mathematics (STEM) skills
9 Data analysis skills
10 Financial skills
11 Environmental sustainability skills
12 Entrepreneurial skills

Science, technology, engineering and mathematics skills received an average ranking of 8th (out of 12) across all skills forecasts.

RANKED 8TH 8

Priority skills

STEM skills were also identified, but only to a low level, by industries that reported on specific priority skills in their 2019 Skills Forecasts.

Low

Priority level according to IRC Skills Forecasts

● Low ● Moderate ● Medium ● Moderately high ● High
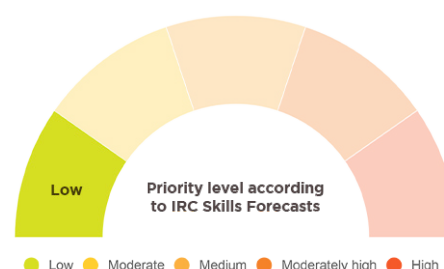
While not highly ranked across all industries, STEM skills are a high priority for a handful of industries, including:

- **Manufacturing**, specifically within the following industry sectors:
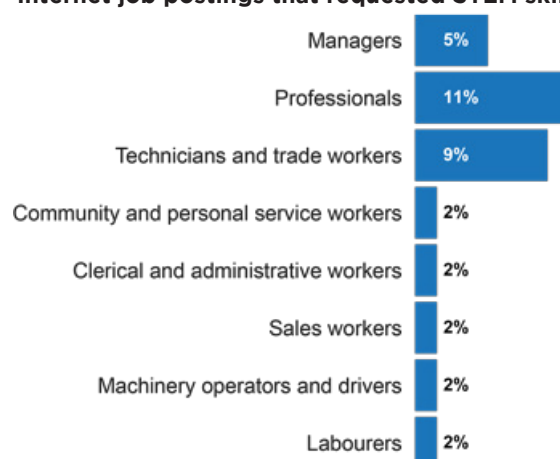 - Textiles, Clothing and Footwear
  - Furnishing.

Interestingly, the value of STEM skills may, in fact, be under-reported in Skills Forecasts – this is supported by a statement in the **Textiles, Clothing and Footwear 2019 IRC's Skills Forecast**, which notes that employers believe "*STEM and Language, Literacy and Numeracy (LLN) skills are vitally important in the TCF workforce, but employers have an expectation that new workers have developed these skills to a suitable entry level before they commence work*". This explains why STEM skills were not ranked as highly by the Textiles, Clothing and Footwear industry, and perhaps by other industries also.

Internet job postings

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 (2016-20)

Occupation	Percentage
Managers	5%
Professionals	11%
Technicians and trade workers	9%
Community and personal service workers	2%
Clerical and administrative workers	2%
Sales workers	2%
Machinery operators and drivers	2%
Labourers	2%

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

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.

I'm trying to recruit a Science Teacher with an "Ability to teach Chemistry, Physics or Psychology is highly desirable"

I'm looking for a Environmental Scientist with a "Qualifications in environmental science / management (or equivalent)"

I need a Laboratory Technician with "Technical and analytical experience in chemical analysis including wet chemistry, AAS, and density determination"

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.

Case Study

Textiles, Clothing and Footwear

The Textiles, Clothing and Footwear industry is grouped into three broad areas:

- Production of clothing, textiles, footwear, leather goods and technical textiles
- Provision of services including fashion and textile design, dry cleaning operations, laundry operations and clothing and footwear repairs
- Processing and manufacturing of natural (wool, cotton and leather) and synthetic materials such as polyvinyl chloride (PVC) and shade cloth.

This industry is evolving, partly due to new technologies and materials such as technical textiles and nonwoven fibres, which has led to further increases in the demand for a STEM-skilled workforce. The following areas are experiencing growth as a result of research and development:

- Carbon fibres and composites in clothing and footwear
- Functional fibrous materials used in medical textiles, super hydrophobic textiles and protective garments and gloves
- Nanofibers used in filtration, tissues engineering, energy generation and reinforcement sensors
- Biomedical applications of natural fibre structures.

According to the **Textiles, Clothing and Footwear IRC's 2019 Skills Forecast**:

> *Australian operators are using new technology to develop high performance fibres with improved durability, strength, moisture absorption and flame resistance. New manufacturing management software is also being used to optimise production processes allowing better inventory management, faster turnaround times and greater market responsiveness.*

Further, in their 2019 Skills Forecast the Textiles, Clothing and Footwear IRC identified the following skills Diploma graduates can bring to newly established businesses:

> *Diploma graduates are securing jobs with young designers who have established businesses after graduating with a university degree. The experience has been that university graduates have business skills but little practical skill in pattern making, product development and the development of Tech Packs77 for overseas production. Diploma graduates can bring these skills to the business.*

The forecast goes on to explain that:

> *With a predominantly female workforce in some sectors of the TCF industry, Vogue Australia has identified the need to increase the number of women with the STEM skills to support technological development in the industry.*

And,

> *A shift in Australia to more niche and bespoke products in the TCF industry relies on the availability of quality craftsmanship and strong technical skills. The Alvanon survey of the international apparel industry found that respondents emphasised the need for technical training rather than leadership or soft skills.97 In their resulting report, the authors stated that because technical skills are outsourced by many businesses, universities have stopped providing these skills in fashion qualifications. Additionally, the introduction of sophisticated digital technologies into the industry has made it hard for educators to keep pace with the technical skills that are applied in the 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 current cross-sector project on **Environmental Sustainability Skills** continues the emphasis on sustainability skills by aiming to identify duplication and gaps in sustainability skills which span industries.

Cross sector projects

COVID-19 impact

Several state and territory governments have introduced additional measures within their economic recovery plans that include the requirement to build sustainability and natural resource management skills. For example:

- 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 are expected to support around 130 jobs.

- The Jobs for Canberrans Fund supports **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.

The notable **reduction in pollution** during the world-wide lockdown early in 2020, the **climate change conference** (deferred to 2021 due to the pandemic), and high unemployment has increased debate over sustainability and a need – as stated by the **OECD** – to "build back better". Australian examples of this discussion include the reports by the **Clean Energy Council** and the **Climate Council**, and the article **Sustainable success for Australian business**. Government economic stimulus funding, and industry responses to this debate along with conforming to the requirements of operating in a globalised economy, may prompt demand for sustainability and natural resource management skills at a higher rate than was seen prior to the pandemic

Industry skills needs

Generic skills

In their comprehensive 2019 Skills Forecasts, IRCs ranked a series of 12 generic skill categories, in priority order.

1 Learning agility / Information literacy / Intellectual autonomy and self-management

2 Communication / Virtual collaboration / Social intelligence

3 Design mindset / Thinking critically / Systems thinking / Problem solving

4 Technology use and application skills

5 Language, Literacy and Numeracy (LLN) skills

6 Managerial / Leadership skills

7 Customer service / Marketing skills

8 Science, Technology, Engineering, Mathematics (STEM) skills

9 Data analysis skills

10 Financial skills

11 **Environmental sustainability skills**

12 Entrepreneurial skills

Environmental sustainability skills (which aligns directly with Sustainability and Natural Resource Management) received an average ranking of 11th (out of 12) across all skills forecasts.

RANKED 11TH 11

Priority skills

Sustainability and Natural Resource Management-related skills were also identified, but only in a few instances, by industries that reported on specific priority skills in their 2019 Skills Forecasts.

Moderate

Priority level according to IRC Skills Forecasts

● Low ● Moderate ● Medium ● Moderately high ● High
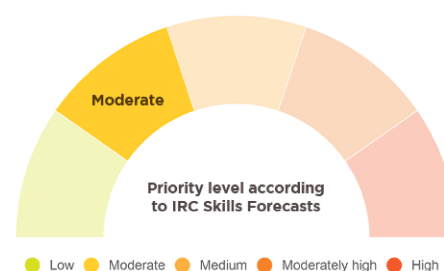
While not highly ranked across all industries, environmental sustainability is prioritised by the following handful of industries:

- **Food, Beverage and Pharmaceutical Product Manufacturing**, which prioritises best practice recycling and waste minimisation, sustainable manufacturing processes, and responsible consumption of energy and minimisation of energy waste

- **Mining, Drilling and Civil Infrastructure** and **Process Manufacturing**, particularly the Chemical, Hydrocarbons and Refining sector, which both prioritise environmental sustainability

- **Sustainability**, which prioritises sustainable operations, generic skills related to manufacturing and sustainability, competitive systems and practices (increased focus on advanced manufacturing and sustainable manufacturing processes), energy management, use and procurement (options for maximising energy efficiency, increased focus on renewables technology) and environmental monitoring and technology.

- **Textiles, Clothing and Footwear**, which prioritises ethical sourcing and supply chain management

Internet job postings

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 for sustainability and natural resource management skills, by occupation (2016-20)

Occupation	Percentage
Managers	2%
Professionals	2%
Technicians and trade workers	1%
Community and personal service workers	0%
Clerical and administrative workers	1%
Sales workers	0%
Machinery operators and drivers	1%
Labourers	1%

Source: Burning Glass Technologies' 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.

I need an Operations Officer with "Knowledge and experience in of one or more environmental protection areas, including: air, water, noise, waste, chemicals, hazardous materials, radiation & environmental planning"

I need to recruit a Ranger with a "Certificate or Diploma in Environmental Science, Natural Resource Management and/or equivalent experience in a similar field"

I need to recruit an Environmental Advisor with a "Demonstrated experience in environmental management systems and their application"

I'm recruiting for an Project Engineer with a "Industrial brownfields experience"

I'm looking for a Ranger with a "Certificate or Diploma in Environmental Science, Natural Resource Management and/or equivalent experience in a similar field"

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.

Case study

Food, Beverage and Pharmaceutical Product Manufacturing

The Food, Beverage and Pharmaceutical Manufacturing 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 manufacturing
- Nutraceutical manufacturing
- Wholesaling and retailing.

The **Food, Beverage and Pharmaceutical IRC's 2019 Skills Forecast** has identified sustainability as a priority, particularly best practice recycling and waste minimisation, sustainable manufacturing processes, and responsible consumption of energy and minimisation of energy waste. Changes in skills requirements for the sector's workforce are being led by consumer and industry trends, and the regulatory environment, which is highlighted in the following quotes from the skills forecast:

The food and beverage industry has experienced many key changes in the skills and tasks performed by the food processing workforce since 2011. These range from regulatory changes affecting food safety and manufacturing processes to trends in what consumers want to eat and drink. In particular, there is a need to consider…Sustainable work practices and efficient energy consumption.

More advanced skills are required in more senior job roles, and can be driven by changing consumer trends, technological development and improvements in health and safety and regulation changes.

The Australian food, beverage and pharmaceutical industry operates under a high level of regulation…Businesses signatory to the Australian Packaging Covenant, an agreement between government, industry and community groups, are obliged to find and fund solutions to address packaging sustainability issues.

There are continuing and growing changes in consumer demand, and food and beverage trends that have influenced this Skills Forecast, including but not limited to: a desire for healthier, 'clean' and natural food, beverages and pharmaceutical products; interest in gluten-free, non-dairy and allergen-free foods, and personalised nutrition; the desire to know where food and beverages have come from and how it was transported and processed; the preference for ethical practices in food and beverage production; a desire to reduce the carbon footprint and environmental effects of food and beverage production and product transportation; a desire to reduce or manage waste, including food and beverage waste and packaging.

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Priority skills

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 skills 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).

Allocation of skills

Each priority skill area aligns closely with one of the generic skills ranked by IRCs in their Skills Forecasts, and reflects a range of relevant 'free-text' examples of more specific skills, requested by IRCs throughout their forecasts. For example, the generic skill 'Communication / virtual collaboration / social intelligence'; and IRC demand for 'active listening', 'communication skills', 'collaboration skills' and 'social perceptiveness' in the Skills Forecasts are captured within the 'Collaboration skills' area. Best judgement was used to allocate 'free-text' responses to the most appropriate skill area from the list above.

The priority skill area 'Industry and occupation specific skills' has been created to capture all the specific and technical skills IRCs have identified which are relevant to their industry or occupation.

Skills ranking

Industry Reference Committees (IRCs) submit comprehensive Skills Forecasts to the AISC every 3 years, with abridged annual updates submitted in the intervening 2 years. One aspect of the Skills Forecasts which is absent in the abridged annual updates is the Skills Outlook section which summarises priority skills that are in high demand within each industry.

Further to this, many IRCs were not required to submit an annual update in 2020, given the significant impact of COVID-19. As such, the version published in 2019 remains the most recently available Skills Forecast for many industries.

In light of this, a systematic review of the comprehensive Skills Forecasts released in 2019 has been undertaken, to identify which priority skills areas are ranked most highly by IRCs.

Generic skills have been consistently ranked by all IRCs in their comprehensive Skills Forecasts. These have been used to determine the average ranking of priority skill areas across all Skills Forecasts.

In addition, other skills identified as a workforce priority in the Skills Forecasts have been counted and converted into a low/medium/high 'gauge level'. Gauge level classifications are based on the proportion of all skills forecasts which identify and prioritise skills within a specific skill area. For example, a skills forecast may refer multiple times to different 'digital skills' in their skills outlook (for example coding skills, digital literacy and automation), but this is only counted once, against the 'Digital skills' area. The priority skills area appearing in the most IRC skills forecasts was allocated the highest level on the gauge scale, while the skills area prioritised the least in IRC skills forecasts ranked the lowest.

The case studies that are presented in 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).

Key initiatives

Overview

This section links to information on training package development activities and initiatives of the Australian Industry and Skills Committee 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. Cross sector 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, and opportunities arising from Industry 4.0 and evolving technologies such as robotics, drones and remote operation systems. The Panel's approach will consider what's already working well, both here and internationally, consulting with industry to understand *'how Australia's vocational education and training (VET) system can most effectively respond to digital change 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**.

Environmental sustainability

This project focuses on current and emerging developments in environmental sustainability skills, the skills required to support transition to a sustainable economy. Its aim being, 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 about environmental sustainability, 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. Based on these findings, a report, including recommendations was submitted to the AISC for consideration. The AISC have proposed the formation ofan expanded panel to coordinate future work on environmental sustainability, including considering the findings of the report and progressing priority areas for new training product development. This expanded panel will also develop a reporting framework for environmental sustainability skills to be reflected in future IRC skills forecasts.

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

Consumer engagement via online and social media

Through extensive consultations this project sought to identify the common skills needs of industries in relation to consumer engagement through online and social media has occurred. The intent being, to modernise Training Package Products related to online and social media engagement skills. 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

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. 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. In line with 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 are 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.

Other training package development projects

COVID-19 Emergency Response Sub-committee

The AISC is ensuring Australia's national training system is well positioned to address the workforce challenges presented by the COVID-19 pandemic and the subsequent economic downturn.

An AISC Emergency Response Sub-Committee was established on 3 April 2020 under the direction of the COAG Skills Council to enable short-term and urgent adjustments to qualifications and training package requirements to respond to areas of critical workforce and skills needs during the COVID-19 pandemic.

The sub-committee recognises that there is a greater need than ever to reskill and upskill workers, particularly where their jobs have been impacted by the COVID-19 pandemic. The sub-committee notes that young people and women have been particularly affected.

The sub-committee is also exploring opportunities to support any urgent and unmet skills needs of businesses as they seek to adjust to the significantly altered economic environment.

For more information and an update on progress, 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 Australian Industry and Skills Committee (AISC) following advice from its network of Industry Reference Committees (IRCs).

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