FUTURE SKILLS ORGANISATION
Finance Technology Business

Jobs and Skills Councils
An Australian Government Initiative

Initial Workforce Plan

‘Building a skilled workforce’

Tech Occupations

December 2023

Tech Occupations

While tech occupations are filled by people from many backgrounds, participation rates by women and other minority groups are very low[1]

39
is the median age of the workforce[2] (lower than the average across all occupations)

12%
of the workforce is aged 55+ (lower than the average across all occupations)

21%
of the workforce are women (lower than the average across all occupations)

<1%
identify as First Nations peoples (lower than the average across all occupations)

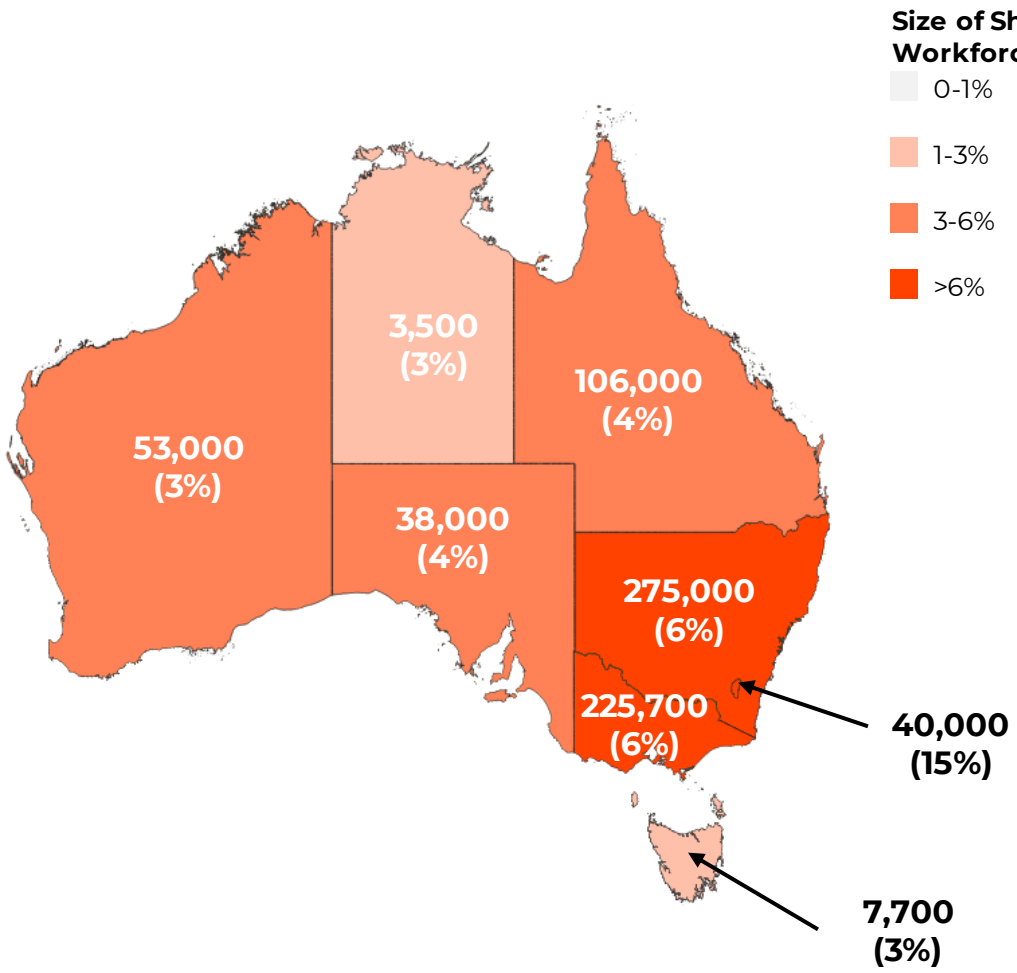
41%
of the workforce is linguistically diverse (higher than the average across all occupations)

56%
have a HE qualification as their highest qualification (higher than the average across all occupations)

23%
have a VET qualification as their highest qualification (lower than the average across all occupations)

The tech workforce makes up 1-15% of each state and territory's total workforce

Number of tech workers, share of state/territory workforce, 2023[3]



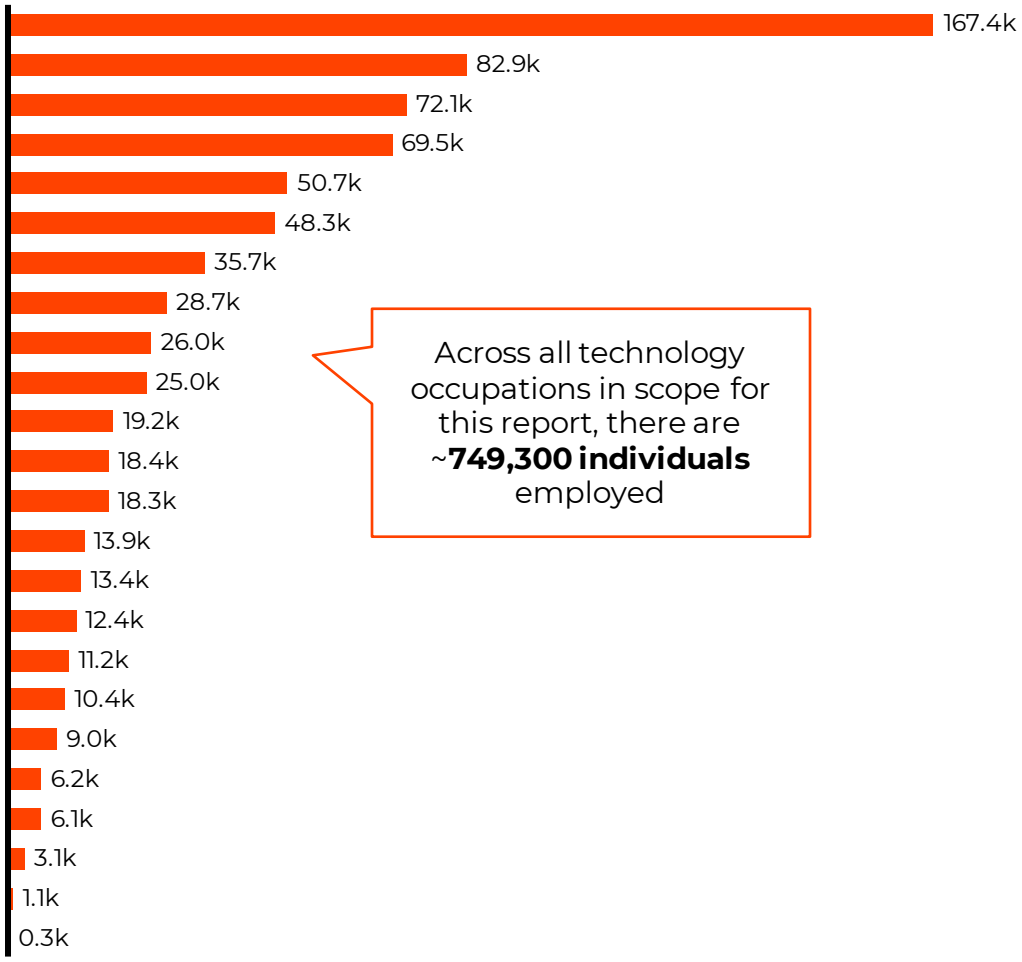
Note: 1. Occupations included in scope of technology identified at pages 103-104. 2. Demographic analysis uses ABS Census 2021 data. 3. Map data uses ABS Labour Force Survey data and is proportioned by state/territory using historical ABS Census 2021 state splits.

Sources: 2. ABS Census 2021 (Employment and Income data, Education and Qualifications data, Cultural Diversity data, Age and Sex data, Aboriginal and Torres Strait Islander Peoples data) - Tablebuilder; Accenture analysis. 3. Four quarter average (Aug 22 – May 23), ABS Detailed Labour Force Survey (Table EQ08).

Software Engineers are the largest occupation group among the 749,300 workers in tech occupations, with industry demand increasing

Workers in tech occupations

Number of workers (000s), 2023[1]



Across all technology occupations in scope for this report, there are **~749,300 individuals** employed

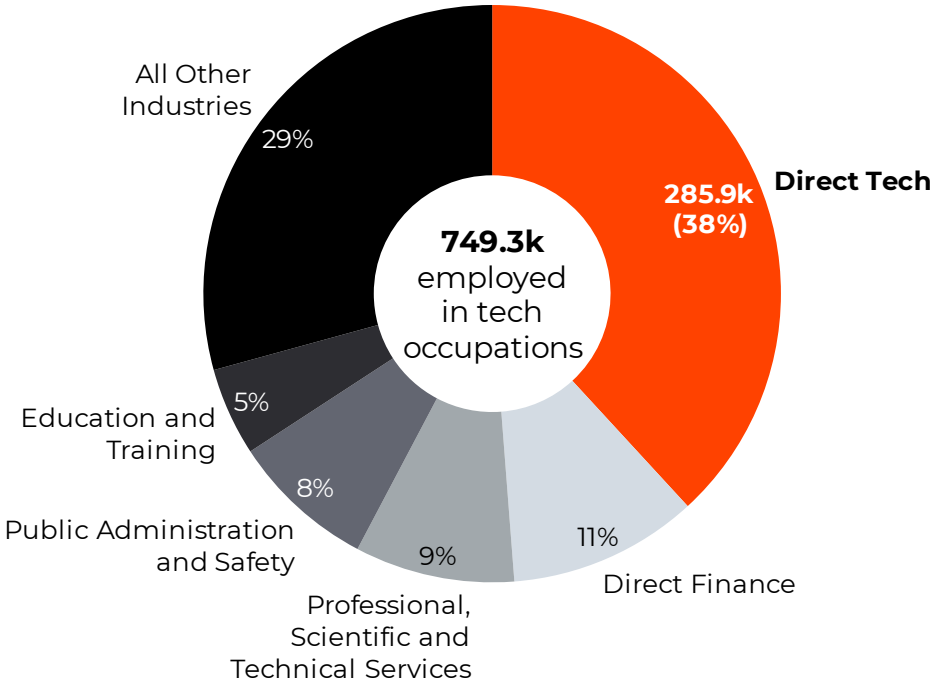
Occupation[2]	Current vacancy rate[3]	12-month change in vacancy rate
Software and Applications Programmers	3.9%	-1.7%
ICT Managers	0.9%	-0.2%
Cybersecurity Specialist	1.8%	-0.1%
ICT Support Technician	2.5%	-0.1%
Business Analysts	6.6%	-0.4%
Graphic / Web Designer	1.6%	-0.3%
Network Professionals	1.8%	-0.1%
Engineering Managers	1.6%	0.0%
Electronics Equipment Technician	0.8%	-0.1%
Electrical Engineers	3.0%	0.6%
Telecommunications Technician	0.9%	0.2%
ICT Professionals	N/A	N/A
Other Engineering Professionals	2.9%	-0.9%
Web Developer	1.6%	-0.3%
ICT Support and Test Engineer	6.9%	1.4%
Quality Controller	5.3%	-8.9%
Data Scientist	2.6%	-2.0%
Electrical Engineering Draftspersons and Technicians	1.8%	-0.8%
UX Designers	N/A	N/A
Electronics Engineers	1.2%	-0.1%
Electronic Engineering Draftspersons and Technicians	1.5%	0.0%
ICT Trainers	1.5%	0.0%
Engineering, ICT and Science Technicians	N/A	N/A
Business and Systems Analysts, and Programmers	N/A	N/A

Sources: 1. Four quarter average (Aug 22 – May 23), ABS Detailed Labour Force Survey (Table EQ08) 2. See page 104 for occupation display name concordance to ANZSCO occupations 3. Jobs and Skills Australia, Internet Vacancy Index (as at May 2023); Accenture analysis

Over 6 in 10 people working in tech occupations are employed outside the direct tech industry, with finance being the largest non-tech industry employer

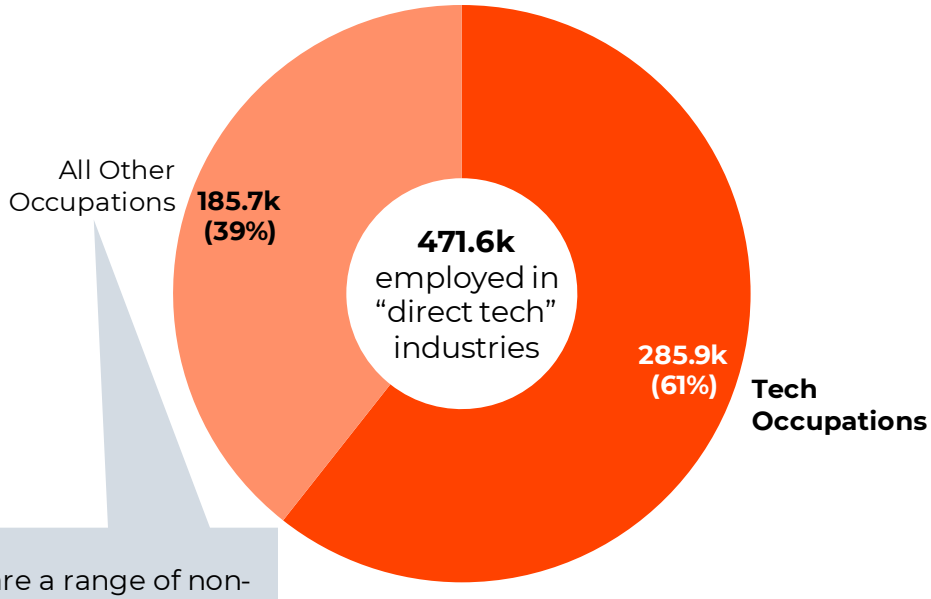
Industry concentration of workers employed in tech occupations

Percentage (%), Australia, FY2023[1]



Occupation concentration of workers employed in the direct tech industry

Percentage (%), Australia, FY2023[1]



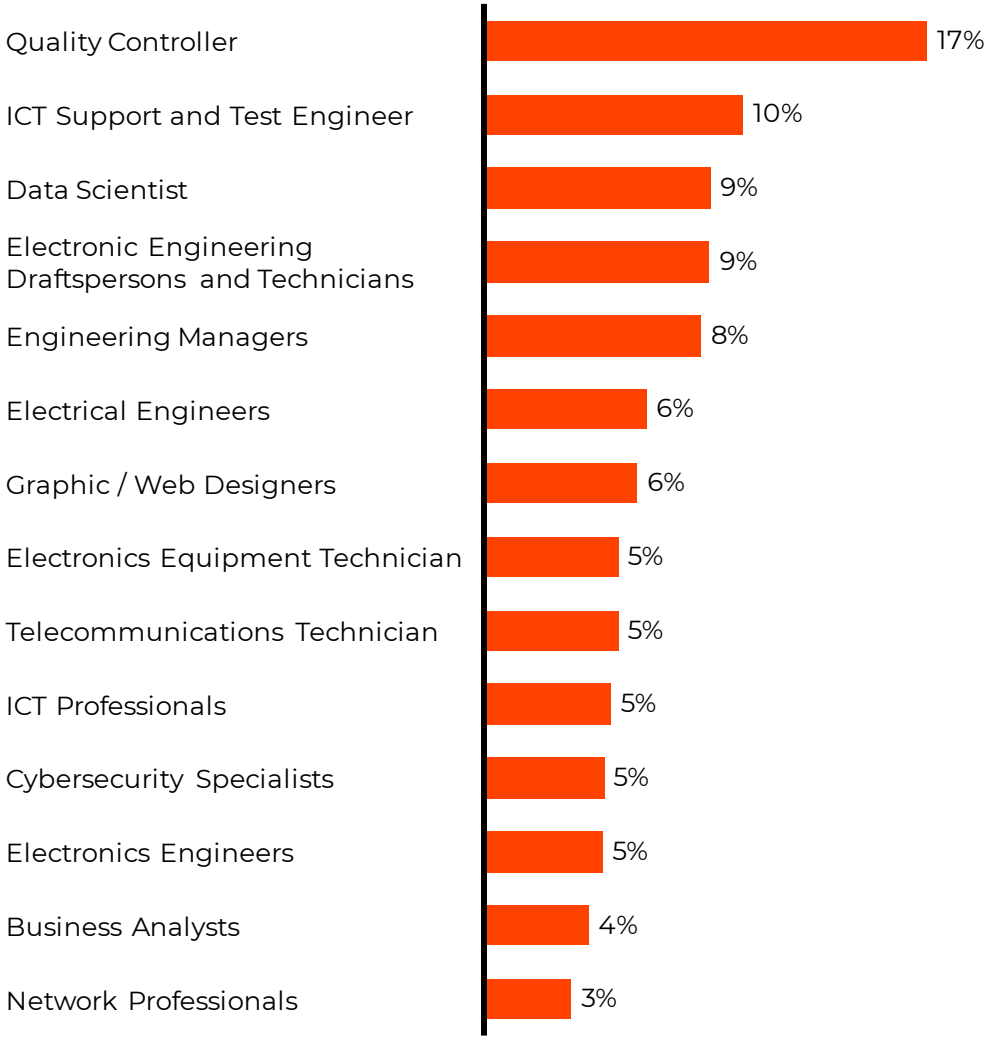
There are a range of non-technology occupations working alongside technology occupations in the "direct tech" sector (e.g. workers in business and finance occupations)

Note: 1. Industry splits use ABS Labour Force data and are proportioned by ABS Census 2021 industry splits. Industries have been defined based off 1-digit ANZIC codes, except 'Direct Tech' and 'Direct Finance'. See page 102 for definition of these industries.
Sources: Four quarter average (Aug 22 – May 23), ABS Detailed Labour Force Survey (Table EQ08); ABS Census 2021 (Employment and Income data) - Tablebuilder; Accenture analysis

On average, 6% of workers in tech occupations move to non-tech occupations annually, with business occupations a key destination

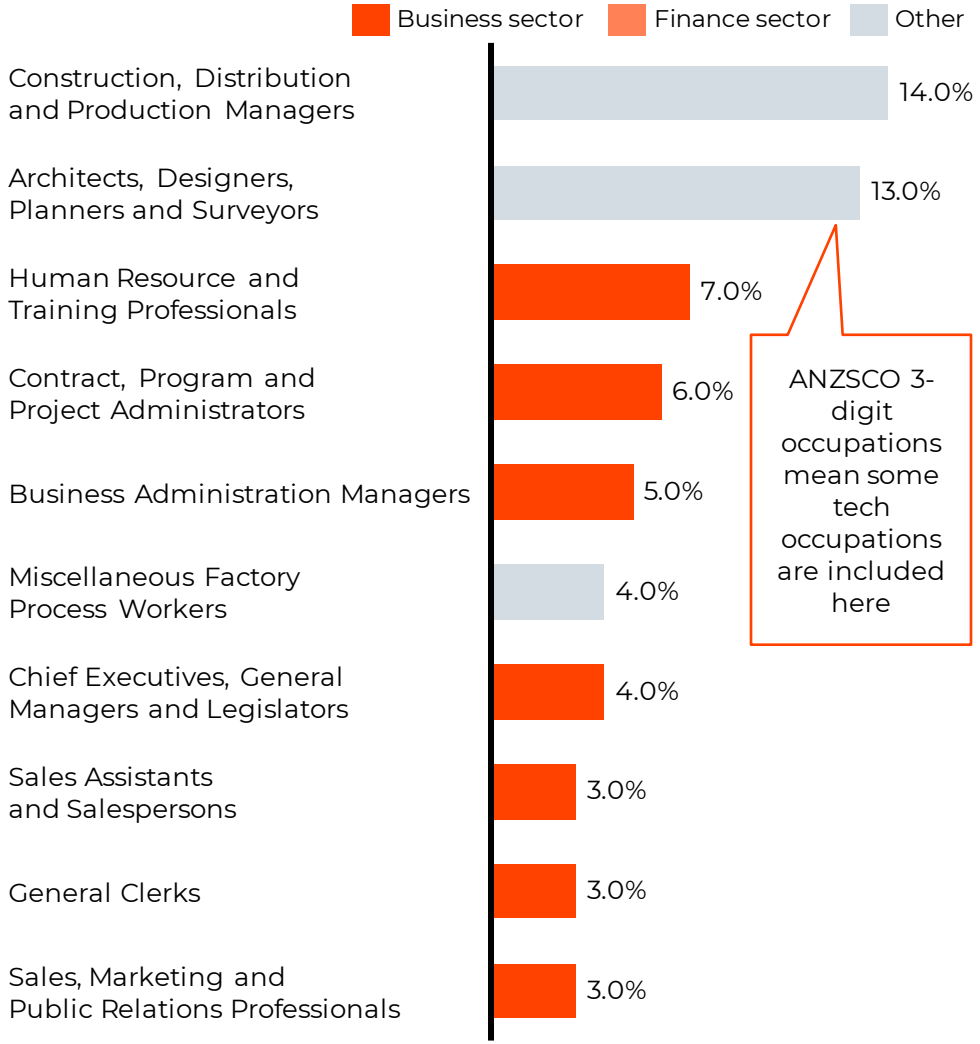
Top 14 tech occupations that move to non-tech occupations

Percentage of workers (%), by 4-digit ANZSCO 2011-2016



Top 10 non-tech occupations that tech workers exit into

Percentage of workers (%), by 3-digit ANZSCO 2011-2016



Sources: ABS Census Longitudinal Data 2011-2016 (Employment and Income data); Accenture analysis

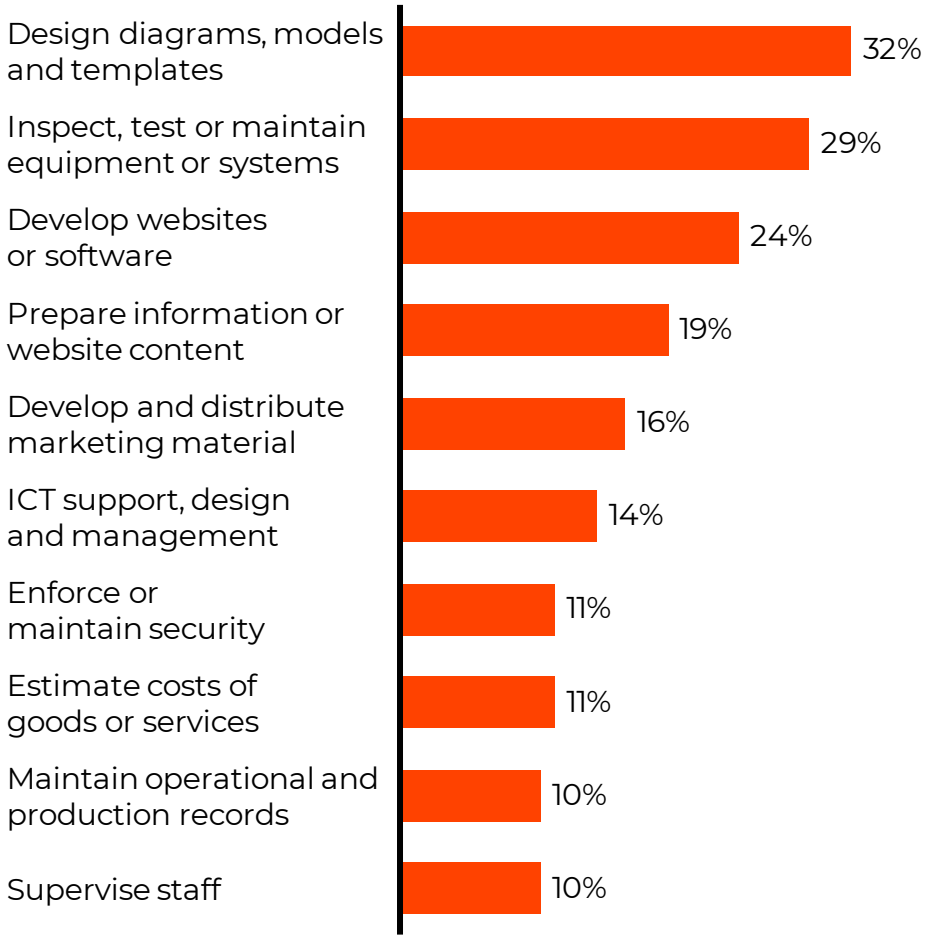
Tech workers require deep capability in digital engagement and innovation, with a breadth of knowledge of tech specialist tasks required

Core competency requirements of tech workers

Proficiency level, 1-3: Basic; 4-7: Intermediate, 8-10: High

Key specialist tasks performed by tech workers

% of time a tech sector worker spends on average on specialist task clusters



Note: Proficiency levels have been rounded to whole numbers

Source: Australian Skills Classification Occupation Profiles, November 2022; Accenture analysis.

While supply of university-trained tech workers is increasing, VET completions have fallen

VET could play an important role in meeting demand for tech occupations, but this will require a reversal of the decline in ICT qualification completions

VET plays a crucial role in meeting demand for lower-skilled tech occupations such as digital technicians and trades roles.[2] 39 tech occupations are already in shortage (see page 17).

However, VET completions in ICT are declining while university completions have risen significantly. Stakeholders reported that those wishing to enter tech occupations are also opting for industry-led options such as industry accreditations and micro-credentials.

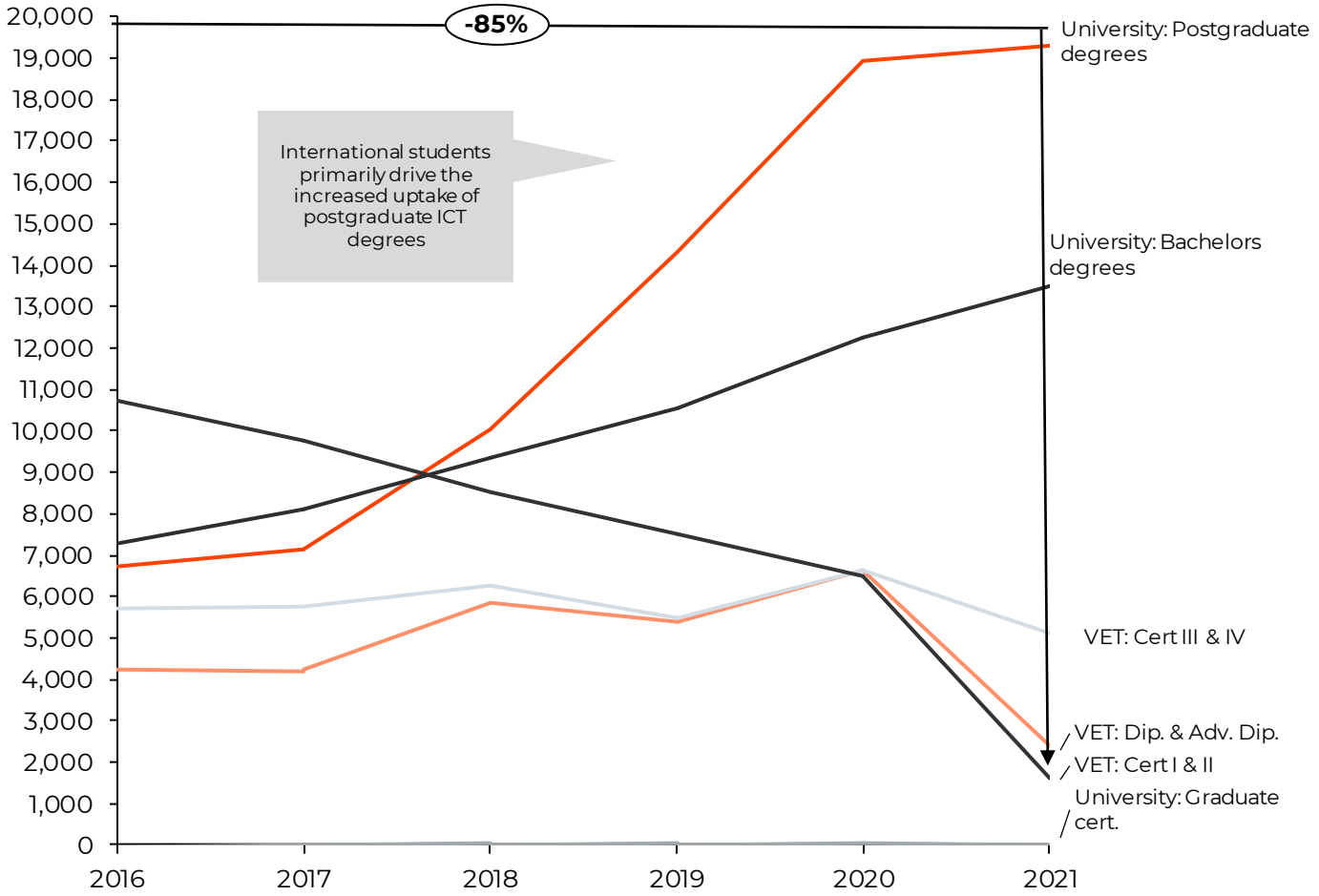
Demand for VET is low among students and employers

VET completions at lower levels have fallen by around 85% since 2016. Of significant concern is also the recent fall in Diploma and Advanced Diploma completions. While it is unclear whether this decline is due to student or employer preference, industry stakeholders at least partly attributed it to the ICT training package not providing students the skills needed in many tech occupations. This trend may also be driven by underlying policy reasons such as availability of funding or access to education loans.

Stakeholders also reported that VET lacks clear pathways into tech occupations, driving students towards other pathways such as university education. Additionally, stakeholders noted that many tech employers prefer university qualifications and industry-led training over VET, although the reasons for this were unclear. Addressing these issues will require significant action to shift both reality and perception.

Number of ICT course completions[1]

International and domestic students, 2017-2022



Note: Digital technicians and trade roles include roles such as ICT Support Technician and Business Analyst
Sources: 1. Total VET student outcomes 2016-2022, NCVER VOCSTATS. 2. Digital Employment Forum's (DEF) roadmap – Getting to 1.2 million: our roadmap to a thriving tech workforce; Accenture analysis
Future Skills Organisation

The ICT training package must improve relevance to industry

The VET ICT training package is not providing industry-relevant training for tech occupations.

The ICT training package is falling behind in providing relevant training that meets industry skills requirements, particularly for core competencies as well as specialist and emerging skills like AI and cyber security, as evidenced by VET student outcomes data and stakeholder insights.

Only **7% of ICT training package qualification completers were employed in the same occupation as their qualification**, and only 1 in 2 found the training relevant to their current job. This hinders students' post-training employment prospects and diminishes employers' perceptions of the VET system's utility for tech training.

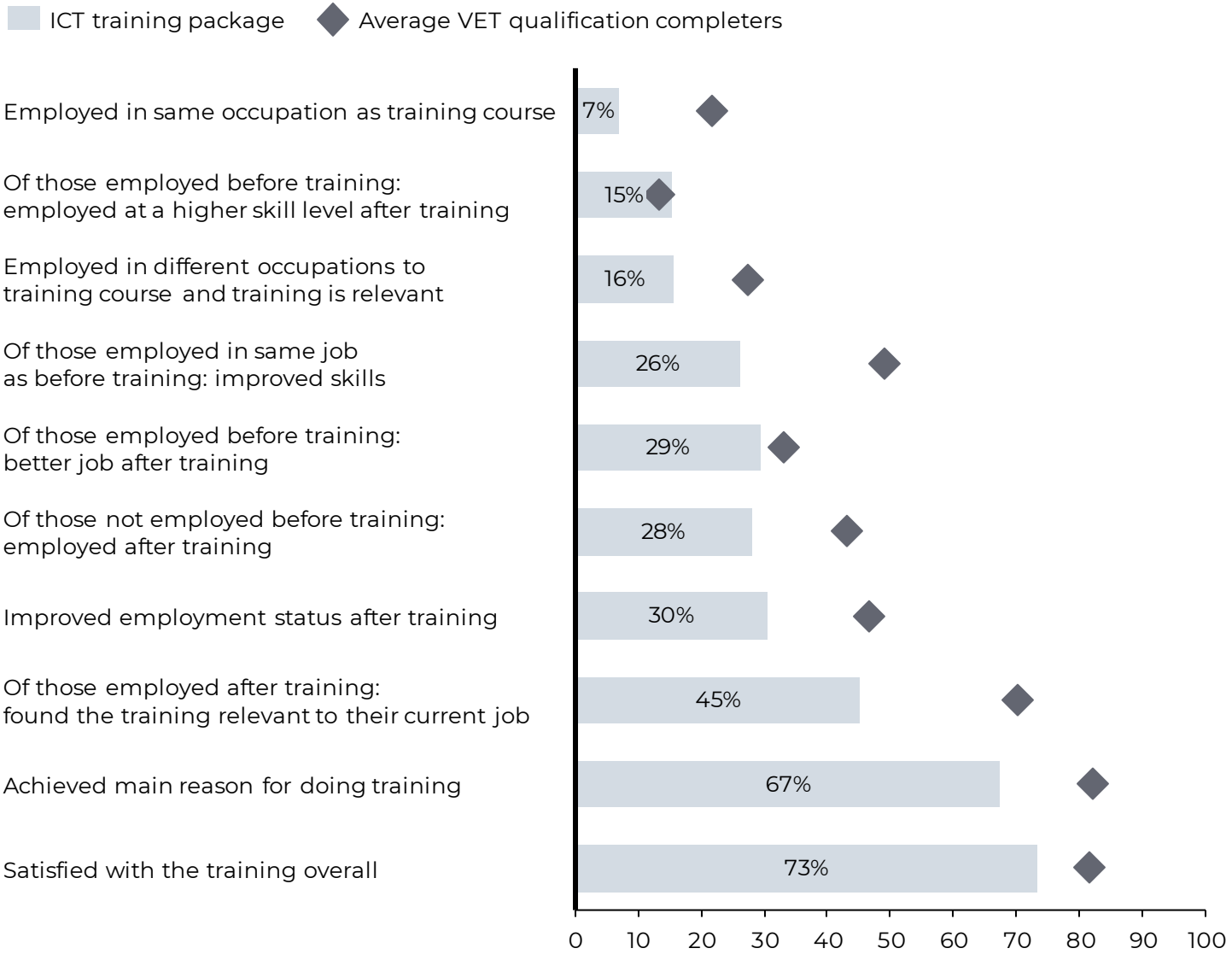
Industry is addressing this gap through industry-led training, including in partnership with VET providers.

Stakeholder consultation highlighted that the VET ICT qualification did not align with the skills demanded by industry. In response, industry has taken initiatives to develop alternative approaches, ranging from short courses to non-accredited vocational options. Some tech companies, including Microsoft, Cisco and WiseTech have partnered with VET providers to design and deliver courses.

It is worth noting that the ICT package has recently been reviewed and there is no data available yet from those completing the updated version. This will be explored during the Year 2 WFP to check whether this gap still exists.

VET ICT qualification completer outcomes

% of qualification completers, 2016-2022



Sources: Total VET student outcomes 2016-2022, NCVER VOCSTATS.

The Australian Government is committed to achieving 1.2 million workers in the tech sector by 2030

The Australian Government and the Australian tech sector have a shared target to achieve 1.2 million tech jobs in Australia by 2030.

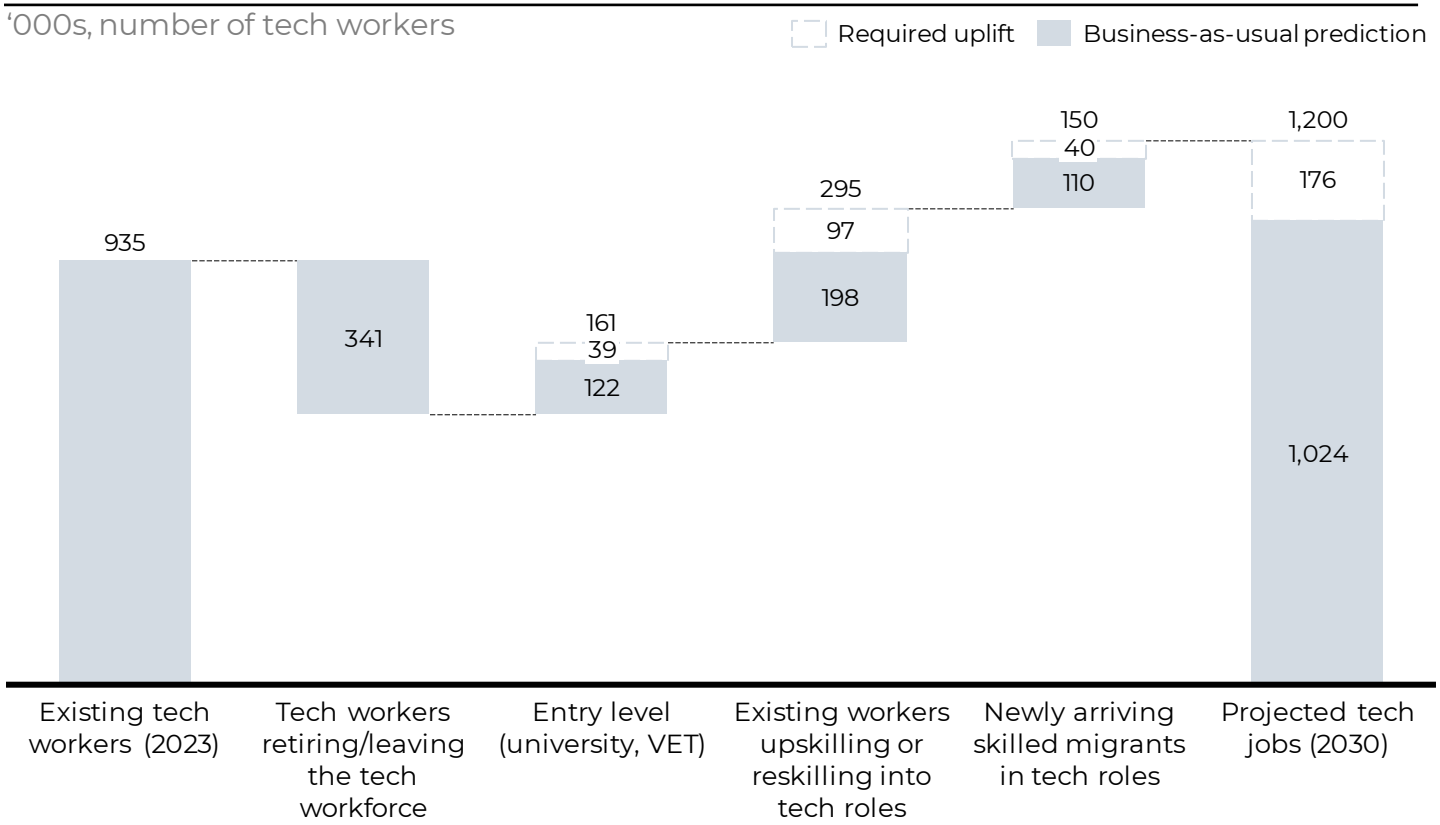
The Digital Employment Forum's (DEF) roadmap – *Getting to 1.2 million: our roadmap to a thriving tech workforce*[1] detailed how the tech industry and government would work together to deliver on this goal.

As the roadmap explains, the tech industry creates high-quality jobs for workers across a range of occupations and the 1.2 million job target includes not just workers in tech occupations, but also those in non-tech occupations in the tech sector.

The Tech Council of Australia released a Tech Jobs Update in May 2023 documenting the progress of the tech industry towards this goal, finding that 935,000 workers now work in the tech industry. That update stated that to reach the target of 1.2 million tech workers by 2030, Australia needs an additional ~600,000 people to join the tech sector. This is detailed further in the graphic on this page which was directly sourced from that report.

Projected tech sector workers in 2030[2]

'000s, number of tech workers



Sources: 1. Digital Employment Forum's (DEF) roadmap – Getting to 1.2 million: our roadmap to a thriving tech workforce. 2.Tech Council of Australia, Tech Jobs update, May 2023.

This workforce plan uses a subset of the entire tech workforce

Tech sector definition

Components of tech sector by definition occupation and by industry

	Direct tech industries	All other industries
	▪ Internet publishing and broadcasting ▪ Telecommunications services ▪ Internet Service providers, Web Search Portals & Data Processing Services ▪ Computer System Design and Related Services	This includes but is not limited to: ▪ Retail ▪ Agriculture ▪ Mining
Technology occupations	Technology-specific occupations, including technical, creative and commercial, are counted across all industries.[1] Software and Applications Programmers; ICT Project Managers; ICT Support Technicians; UX Designers; Cybersecurity Specialists	
Non-technology occupations	Non-technology occupations that exist within the tech industry are outside the scope of this workforce plan. These include: Human Resources; Advertising & PR; Legal	

Scope of this Workforce Plan

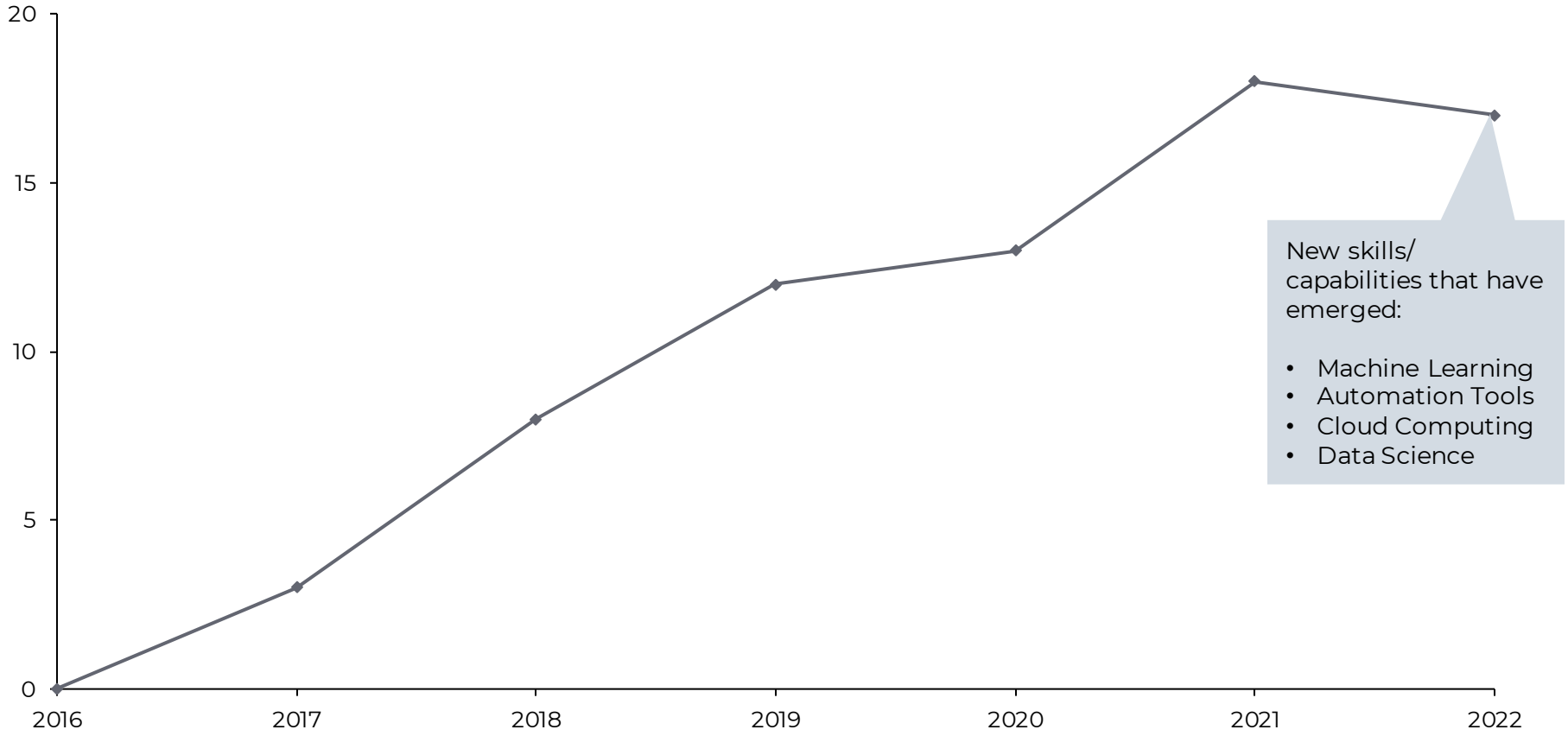
Note: This is not an exhaustive list of all technology occupations included for the purposes of this report. The full list can be found on pages 103-104.

Source: 1. DEF roadmap – Getting to 1.2 million: our roadmap to a thriving tech workforce

Skills mix in tech occupations has changed by 18% since 2016 with new skills and capabilities required in machine learning, automation and cloud computing

Change in skills mix

% change in skills demanded by employers for technology occupations, 2016-2022

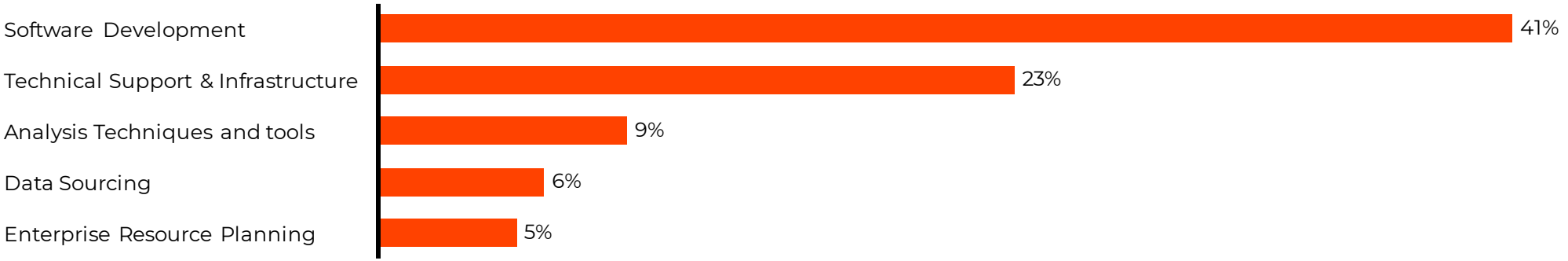


Source: Lightcast Job Advertisement data, mapped to occupations in scope; Accenture analysis

Demand for software development and technical support and infrastructure has significantly increased

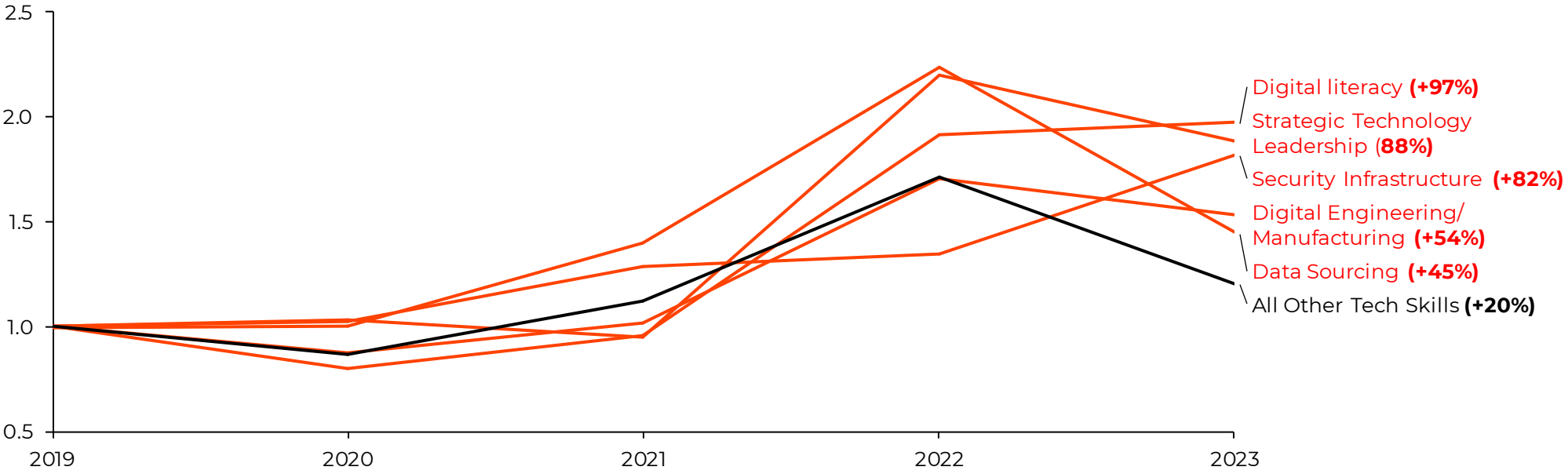
Top 5 required skills in job advertisements for tech occupations

Penetration of skills, percentage (%), Australia, FY2019-2023[1]



Skill mentions in job advertisements for tech occupations

(indexed; 1=FY2019), Australia, FY2019-2023[1]



Sources: 1. Lightcast with tech skills mapped to FSO Tech Skill Mapping; Accenture analysis

Few tech occupations are impacted by regulatory requirements

Technology has transformed the way we work and do business. The increasing ubiquity of digital tools across all roles and industries has meant almost all workers now require at least baseline digital literacy to perform their job. This has been driven by increasing digital transformation of business, and the non-market sector, with associated trends in automation, artificial intelligence, big data, and the growing threat of cyber-attacks. More acutely, the forced and rapid transition to remote work accelerated the need for all workers to be able to use and interact with digital communication and collaboration platforms, and to have a degree of cyber literacy. These trends have increased the demand for digital skills across the economy and growth in the level of digital skills required.

Regulatory requirements for tech occupations vary, although workers in ICT occupations generally do not require a license, except primarily in the communication sector. These requirements have resulted in registration requirements in certain occupations, such as cablers.

The Australian Communications and Media Authority (ACMA) regulates communications and media infrastructure, services and content. Within telecommunications, specified cabling work must comply with the Telecommunications Cabling Provider Rules 2014. Cablers must have the right registration for the type of work they are doing, such as whether they are installing and maintaining communications cables in lifts or elevators and lift wells.

ACMA oversees the registration process for cablers but does not manage registrations or renewals. It has authorised five registrars to manage cabling registrations on its behalf. Registrars also manage applications for recognition of prior learning (RPL).

Training requirements for registration can be met through, for example, ICTSS00084 - Basic Open Cabler Registration Skill Set. This skill set addresses the skills and knowledge required to install, maintain and modify telecommunications customer cabling in domestic and commercial premises in accordance with ACMA requirements.

Of note, whilst not regulatory, there are a range of industry-based certification programs in the ICT sector that are designed to validate an individual's knowledge and skills in certain areas.

Recent and upcoming national policies will increase demand for tech workers

Australian Skills Guarantee

The Australian Skills Guarantee applies to approaches to market (ATMs) issued from 1 July 2024, wholly delivered in Australia for major information and communication technology (ICT) projects with an estimated procurement value of $10 million and above (GST inclusive).

Targets for major ICT projects will be negotiated on a project-by-project basis, and potential suppliers will be required to propose these targets during the submission stage. What we do know is that the targets will encompass both apprentice and ICT cadet labour hours, including a target specifying the number of labour hours that will be undertaken by apprentices and ICT cadets, and a target specifying the number of labour hours that will be undertaken by women apprentices and ICT cadets.

Australian Cyber Security Centre (ACSC) Essential 8

The Australian Signals Directorate (ASD) has devised a set of prioritised mitigation strategies called the Essential Eight to help organisations safeguard their internet-connected information technology networks against cyber threats. While the Essential Eight principles can be applied to various technology environments, they are primarily intended for internet-connected IT networks. To facilitate the implementation of the Essential Eight, ASD has introduced the Essential Eight Maturity Model, which draws from the organisation's extensive experience in producing cyber threat intelligence, responding to security incidents, conducting penetration testing, and assisting organisations in adopting these strategies. The Essential Eight comprises eight key mitigation measures, including application control, patch management, Microsoft Office macro settings configuration, user application hardening, administrative privilege restriction, operating system patching, multi-factor authentication, and regular data backups. To assist organisations with their implementation of the Essential Eight, four maturity levels have been defined (Maturity Level Zero through to Maturity Level Three). The maturity levels are based on mitigating increasing levels of tradecraft (i.e. tools, tactics, techniques and procedures) and targeting.

2023 – 2030 Australian Cyber Security Strategy

The Australian Government has initiated the development of the 2023-2030 Australian Cybersecurity Strategy, aiming to establish Australia as the most cybersecure nation by 2030. Despite being ranked as the world's fifth most powerful cybernation, the country faces increasing cyber threats, with a cybercrime reported every 7 minutes. The strategy focuses on core policy areas, including enhancing regulatory frameworks, strengthening international cybersecurity strategy, and securing government systems. It aims to clarify cybersecurity obligations, streamline regulatory frameworks, and address deficiencies in government cybersecurity posture.

In addition to the core policies, various potential actions have been outlined to support the cybersecurity strategy's objectives. These actions include improving public-private collaboration in cyberthreat sharing, supporting the cybersecurity workforce and skills pipeline, establishing national frameworks to respond to major cyber incidents, increasing community awareness and victim support, and promoting investment in the cybersecurity ecosystem. The strategy also emphasises the need to design and sustain security for emerging technologies like quantum, Internet-of-Things (IoT), AI, and machine learning. To ensure the strategy's success, robust implementation governance and ongoing evaluation mechanisms are essential for achieving the government's vision and maintaining cyber resilience into the future.

The Strategy is expected to be released before the end of 2023.

Additional initiatives relevant to tech occupations including the Small Business Skills and Training Boost and other relevant strategies are detailed at pages 86-96.

Overall, there are 3 key workforce challenges having a significant impact for tech occupations

KEY CHALLENGES ACROSS ALL SECTORS

	VET completions are low compared to demand and have fallen dramatically since 2016	Gap between training provided via VET and skills demanded by employers	Impact of generative AI
NEW TECHNOLOGIES			✓
JOB AND CAREER PATHWAYS	✓	✓	
DIGITAL CAPABILITY GAP			✓
TRAINING SUITABILITY	✓	✓	✓
ENHANCING TRAINER AND TEACHER CURRENCY	✓	✓	✓

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