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Getting to 1.2 million

Our roadmap to create a thriving Australian tech workforce

The Digital Employment Forum brings together major employers of tech-jobs from across the economy

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About the Tech Council of Australia

The Tech Council of Australia (TCA) is the peak industry body for Australia's tech sector. Providing a trusted voice for Australia's technology industry, with over 100 members, the TCA comprises the full spectrum of tech companies.

We aim to advise and engage with Australian governments, businesses, and the wider community to help support the ongoing creation, development, and adoption of technology across industries.

Our vision is for a prosperous Australia that thrives by harnessing the power of technology.

About the Digital Employment Forum

The Digital Employment Forum has been established by the TCA and the Digital Skills Organisation to bring together major tech employers and educators from across the economy to transform the way Australia attracts and trains tech workers. It brings new approaches to solving the pain points that prevent Australians from getting into high-value, high wage tech jobs and enable businesses to employ more Australians.

The TCA and the Digital Skills Organisation would like to thank our generous Anchor Partners of the Digital Employment Forum, who continue to demonstrate exceptional leadership to grow Australia's tech workforce, and to Accenture for their significant contribution to the Digital Employment Forum. We would also like to thank our members who have contributed their expertise to the respective working groups, and look forward to continuing to work together to grow tech jobs in Australia.

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Authorship

This report has been authered by the TCA, together with Accenture. The report has been developed through contributions from Digital Employment Forum members, and features research and analysis conducted by Accenture. Where this is the case, it has been denoted in source notes or foot notes.

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Executive summary

Realising the 1.2 million tech jobs opportunity

The Australian Government and the Australian tech sector have a shared commitment to achieve 1.2 million tech jobs in Australia by 2030.[1]

Meeting this goal is critical to improving Australia's living standards and to creating economic opportunity for Australians.

While Australia is on track to create these jobs, filling them will be challenging. We forecast that Australia will need to employ an additional 653,000 tech workers to meet this goal by the end of the decade (representing an increase of 186,000 over business-as-usual approaches).

Tech jobs are amongst the most well-paid, stable and flexible jobs in the Australian economy. Tech jobs are also among the most productive in Australia – with productivity growing at four times the rate of the market sector as a whole in the decade leading up to the Covid-19 pandemic.[2]

These jobs are accessible to people from all walks of life, have a variety of skills, and there is little discrimination in pay based on education or socioeconomic status once people break into the sector.[3]

Tech jobs exist across the economy, in every state and territory, in every industry - from government and health, to retail, banking, mining, professional services, and software and digital companies.

This report defines tech jobs as all jobs in companies in the direct tech sector (for example software companies) and online commerce jobs in retail and wholesale trade, and tech-related roles in sectors such as banking, mining, the public sector and professional services.

As the economy becomes increasingly digital, missing out on this opportunity would leave Australia – and Australians - behind.

This report sets out what Australia's tech workforce needs will be by 2030, the opportunity this presents for Australians to get a good and well-paid job, the barriers to people moving into these jobs, and what industry and government can do to enable more Australians to benefit from the tech jobs opportunity.

Australia's tech jobs opportunity

- The tech sector has experienced strong growth in the last decade and is now the seventh biggest employing sector in Australia. There are now 861,000 people employed in tech jobs across Australia.

[1] Announcing Labor's Plan for Australia to Reach 1.2 Million Tech Jobs by 2030.

[2] ABS 5260.0.55.002, Estimates of Industry Multifactor Productivity, December 2021. Note: There are significant impacts on labour productivity statistics due to social distancing. Therefore the most recent financial year has been excluded from this analysis.

[3] Australia's Tech Jobs Opportunity, Tech Council of Australia, 2021.

- 1 in 16 working Australians now work in tech jobs. Australia has more software engineers and developers than solicitors, plumbers, or hairdressers.
- These jobs, and the workers who perform them, are spread across every state and territory in Australia.

There are significant shortages, particularly for technical and experienced roles

- Vacancy rates in tech are 60% higher than the national average and tech jobs are forecast to grow at triple the rate.
- The most severe shortages are in technical occupations like software programmers and computer network professionals but there are also big gaps in commercial and creative roles like product managers.
- Job advertising data shows that both technical and non-technical occupations require more experience and higher levels of qualifications, compared to the national average.

We have identified 5 key barriers that prevent Australians from seizing our jobs opportunity

1. Australians lack awareness about what tech jobs exist, or how to get into them.
2. Current training products and pathways into tech jobs are not fit for purpose.
3. There are strong demographic skews in tech jobs, with women, older Australians and regional Australians being under-represented.
4. There is a small talent pool of people with the skills and experience needed to work in experienced technical roles, which have boomed.
5. Australia lacks coordinated effort, analysis and planning for the tech workforce.

Government and industry need to work together to break down these barriers

Things industry can do without assistance from government

There is a continued, significant role for tech employers to ensure that they attract and retain the best talent, in terms of providing entry level pathways, supporting internal workforce development and continuing to offer flexible conditions and meaningful work.

We have also identified measures requiring coordinated action from industry, which will deliver benefits to the sector as a whole:

- Design and implement a nation-wide awareness campaign on the benefits of tech jobs.
- Establish a virtual work experience program for secondary students to ensure all Australians, regardless of where they live, can be exposed to the benefit of tech jobs.
- Make a public commitment to improving diversity within the tech workforce.

Things we need to do together with government

We have identified the following priority solutions which will require industry working in partnership with Government:

- Deliver a new modern Australian Digital Apprenticeship, to better meet the future needs of tech jobs.
- Define skills standards and pathways into tech jobs.
- Better identify and recognise innovative training solutions.
- Improve support for women to transition into tech jobs.
- Conduct ongoing data analysis and tech workforce planning in conjunction with Jobs and Skills Australia.

Things government needs to do

The Australian Government has the most direct control over skilled migration, to ensure it better targets the areas of highest need and greatest demand. The priority solutions in this category are:

- Streamline skilled migration for high salary, experienced technical roles.
- Provide tech workers with pathways to permanent residency, and address barriers to work for international students studying tech related courses in Australia.

Australia's tech jobs opportunity

What is the tech jobs opportunity?

Tech jobs are an important new source of opportunity for Australians.

The tech sector has experienced strong growth in the last decade, and is now the seventh biggest employer.

Tech jobs grew by 66% from 2005, almost double the average growth rate across the Australian economy.[4] In 2020, during the first year of the COVID-19 pandemic, 65,000 tech jobs were created despite global headwinds.

This surge means there are now 861,000 people employed in tech jobs across Australia today. That makes the tech sector equivalent to Australia's seventh biggest employing sector (see **Exhibit 1**).

It means that 1 in 16 working Australians work in tech jobs, and there are more software engineers and developers in Australia than solicitors, plumbers, or hairdressers.

Tech jobs are spread throughout the economy.

- Tech jobs cover all jobs in companies in the direct tech sector (for example software companies), and online commerce jobs in retail and wholesale trade.
- Tech jobs also include tech-related jobs in sectors such as banking, mining, the public sector and professional services. In fact there are more tech jobs outside software companies than in them (see **Exhibit 2**).

A diagram showing which jobs are considered tech jobs is in the technical appendix of this report.

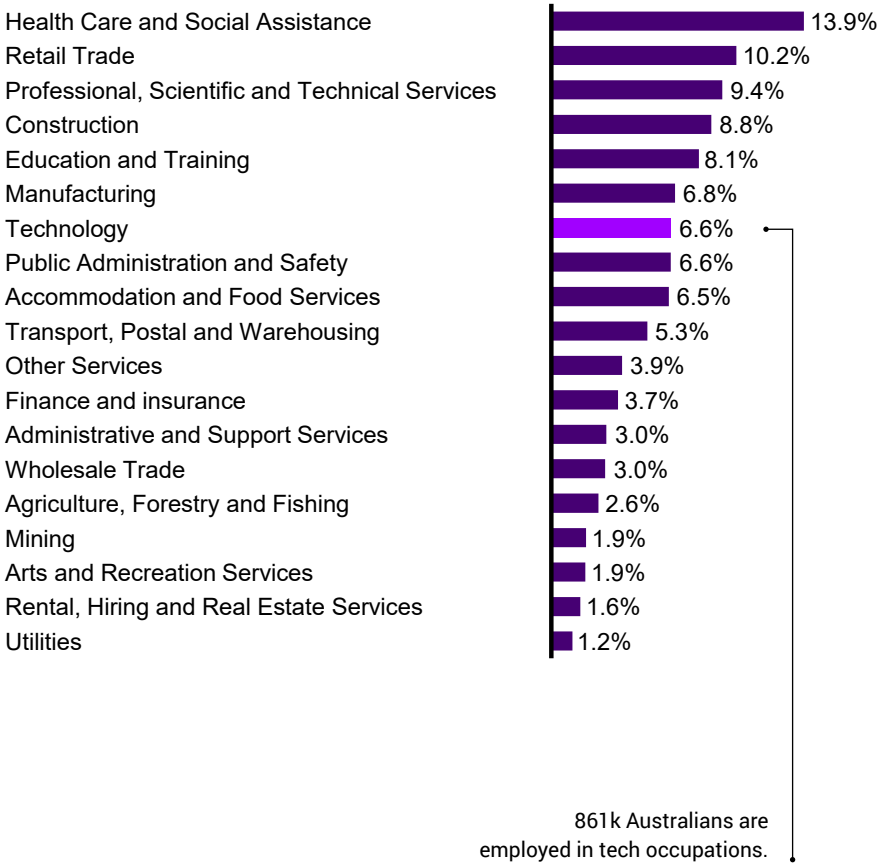
1 in 16 working Australians work in tech jobs, and there are more software engineers and developers in Australia than solicitors, plumbers, or hairdressers.

[4]The Economic Contribution of Australia's Tech Sector, August 21.

Exhibit 1

Tech is equivalent to Australia's seventh largest employer.

Share of Australian Workers by Industry, February 2021.

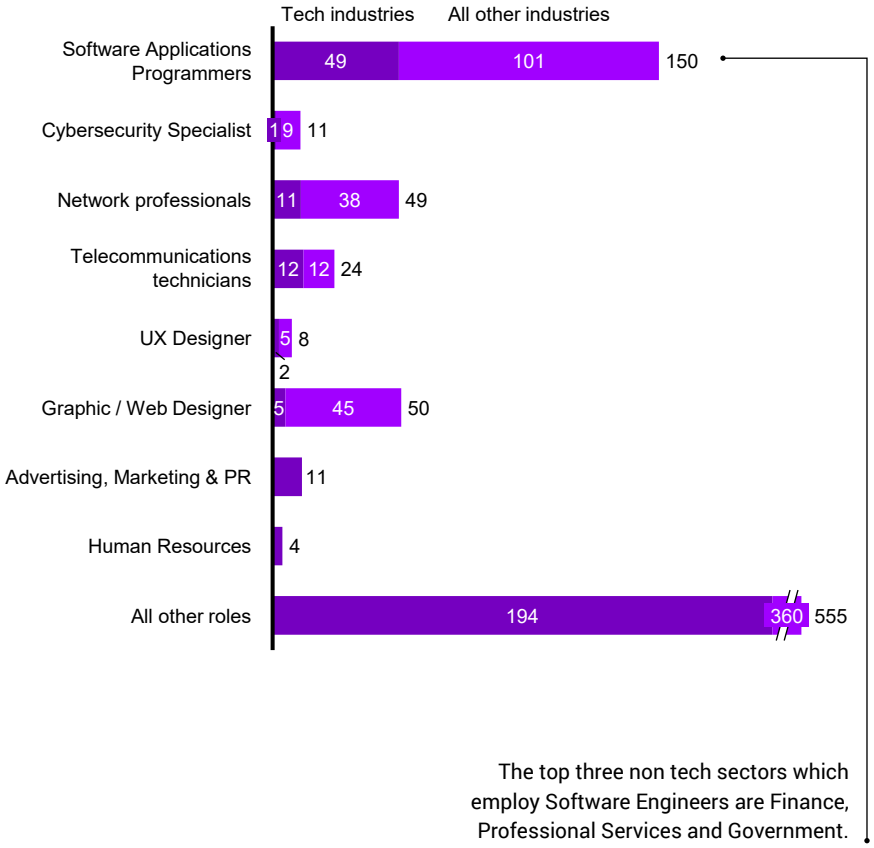


Source: ABS, Accenture Analysis.

Exhibit 2

More software programmers are employed in other industries than within tech companies.

'000s, number of people employed in occupation, 2021.

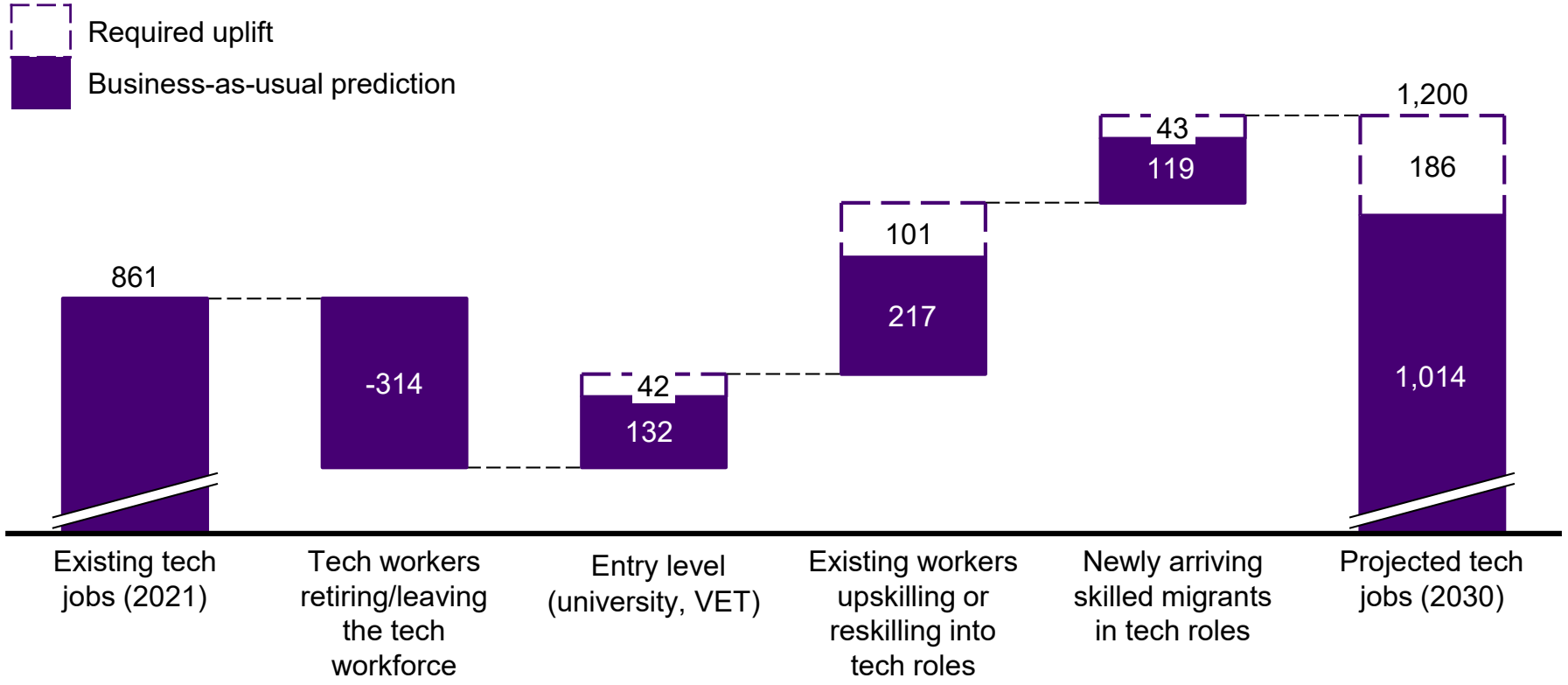


Source: ABS, Accenture Analysis.

Exhibit 3

Australia needs an extra 653,000 people to join the tech workforce in the next eight years.

Projected tech sector jobs in 2030, number of tech sector workers, 000s.



Source: TCA Roadmap to Deliver One Million Tech Jobs, October 2021, Accenture analysis.

Australia will need an additional 650,000 tech workers by the end of the decade (requiring an uplift of 186,000 above business-as-usual.)

Reaching 1.2 million workers in Australian tech jobs by 2030 will be challenging.

Australia currently has 860,000 people working in tech jobs. If by 2030 there are 1.2 million tech jobs in the economy, that will require around an extra 650,000 people to move into these roles over the next eight years (see **Exhibit 3**). That figure includes people entering the tech workforce to fill newly created roles as well as people replacing an estimated 314,000 workers forecast to retire or exit during that period.

Under a business-as-usual scenario where Australia does not make policy changes, we will fall 186,000 people short of this goal.

This means Australians would miss out on accessing these highly paid, flexible, and stable jobs. It would also mean that the Australian economy as a whole misses out on productivity gains from deeper technological transformation.

Significant numbers of additional workers are required through three sources:

1. Entry level through university and VET

We forecast that by 2030, Australia would expect to generate approximately an additional 132,000 entry level workers through university and VET pathways. This will need to grow by a further 42,000 to put us on track to reach the jobs goal.

2. Upskilling and reskilling existing workers into tech roles

The main source of future tech workers will come from people transitioning from other parts of the economy. The tech sector's attractive wages and conditions are forecast to bring in around 217,000 additional workers.

However this area is also where we need the strongest uplift compared to present transitions, with an additional 100,000 workers required to transition into tech roles.

As the economy goes through transition – and workers need to have new jobs to move into – ensuring that these pathways work is critical for social equity and Australia's standard of living.

3. Migration

Migration will play an important role in providing highly specialised and experienced workers, who can manage and mentor junior Australian employees and people reskilling to new jobs in the sector.

Approximately 43,000 additional skilled migrants are required on top of a forecast 119,000 under a business-as-usual scenario.

“

“To have a job where I have been able to upskill has been invaluable. I don’t need to spend every waking moment either working or studying; I can go home and spend time with my kids. Having a job that helps me develop and upskill without impacting my time with family is fantastic. I really can’t put a price on that.”

“Demonstrating the ability to learn has been key for progressing my career in tech. Before my skills training, I didn’t have a background in coding; now, after upskilling, I can use software such as Python and pursue more technical roles.”

Rob Campbell: Upskilling opportunities for those re-entering the workforce

After a career in customer support, Rob took a seven-year break to be a stay-at home dad. However, he struggled to find a job once he decided to re-enter the workforce. After job hunting for nine months, Rob was offered a client support lead position at MaxMine, a technology platform that performs advanced analytics and data science on mining equipment. Since beginning work at MaxMine, Rob has been provided with opportunities to learn new programming skills and has now moved into a more technical role within the company.

Rob is grateful that he can continuously upskill on the job while still being able to obtain a healthy work life balance. His favourite part of the role is that each day presents opportunities for professional development, where he can apply his skills to provide tech solutions to solve new challenges.

Rob Campbell
MaxMine

Categories of tech workforce jobs

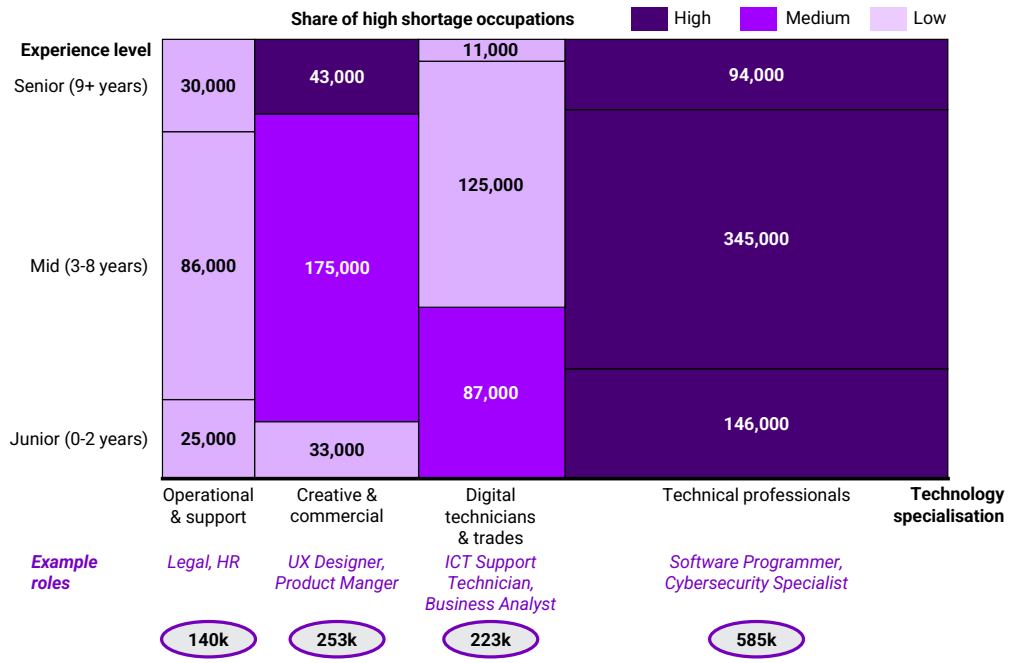
The tech workforce has an amazing range of diverse careers – and it is important to dispel misconceptions that all jobs are highly technical. We have grouped these jobs into four categories, in descending order of technology specialisation (see **Exhibit 4**):

1. Technical professionals;
2. Digital technicians and trades;
3. Creative and commercial; and
4. Operational and support.

Exhibit 4

There are four broad categories of jobs in the tech workforce, with distinct differences in demand, skills, pathways, mobility, and shortage risks.

Demand for tech jobs by 2030 by experience and specialisation number of tech employees.



Source: Burning Glass, ABS, Accenture analysis. Note: columns may not sum to total due to rounding.

Technical professionals

By far the largest, and the category with the most significant skills shortages, are technical professionals. Typical job roles in this category include software programmers, network professionals and cybersecurity specialists.

We forecast that by 2030 there will be 585,000 people working in these roles across the Australian economy – comprising roughly half of the total tech jobs. These job roles have high degrees of technology specialisation, and generally require a university degree.

In the short-term there are significant barriers to increasing the number of people in these roles because there are few people in other parts of the labour market with similar skills, and the graduate pipeline takes time to grow.

It is not possible to meet the required increase in this category in the short-term through training alone – skilled migration must also play a role. Experienced professionals are critical to bringing in new Australian workers, as they provide mentoring and management support for junior staff and mid-career workers transitioning from other industries.

Providing a strong pipeline of graduates to meet medium- and longer-term needs will require boosting domestic student numbers and retaining the international students that study in Australia.

Digital technicians and trades

We forecast that by 2030 we will require approximately 220,000 digital technicians and trades. These are occupations with less technically intensive skills and knowledge requirements, and lower barriers to entry than technical professionals, meaning the VET system can play a larger role in meeting training demand.

Typical occupations in this category include IT support technicians, business analysts and data analysts.

There is significant demand for junior roles in this category, however given shorter training times, improved VET and retraining options, rather than skilled migration, are more appropriate for this category.

Creative and commercial

In addition to the technically specialised roles, there is a significant number of roles that are a hybrid of creativity, design skills and the ability to translate user needs to a technical audience. Typical roles in this category include product managers and user experience designers.

Many of these job types have only emerged in the last decade, and Australia has not had a sufficiently large domestic tech sector to have developed enough experienced workers in this job type. Skilled migration will have a role to play to ensure that there are enough senior employees to bring on and mentor junior talent.

This category of job roles is also a good candidate for retraining as there are stronger skills matches with managerial and design roles outside of tech. However there can be low awareness of these roles as they are relatively new, with fewer formal training pathways into them.

Operational and support

On the least technically intensive end of the tech jobs spectrum are employees in operational and support positions employed in direct tech sector companies. These roles include legal and human resources.

While these roles may not be as specialised to the tech sector, there will nonetheless be a significant numbers of workers required with these skills both now and into the future. We forecast approximately 140,000 people will be needed in these roles by 2030.

These jobs are less likely to require specific retraining to enter, and as such are an opportunity to enter the tech sector and start a career in the industry without needing to take time out of the workforce to retrain.

Prioritising effort

While tech jobs offer an incredible range of careers, this report has identified the key priority roles requiring immediate action. There are eight technical occupations, and four non-technical occupations which are experiencing the most significant pressures, and requiring action to improve talent pathways (see **Exhibit 5**).

While there are pressures, it is also important to note that Australians do move into less technically-intense tech roles from a wide-range of different jobs (see **Exhibit 6**), and are able to leverage the skills they have developed throughout their career, particularly soft skills (see **Exhibit 7**).

Exhibit 5

Of the key jobs in the tech sectors, 12 jobs are experiencing the greatest tech worker shortages.

Occupation rank by shortage index and measure.

8 technical occupations have a high shortage index

Shortage index	Role	No. of job ads	Vacancy rate	Growth in demand*
1	Network Professionals	2	2	2
2	ICT Support Engineer	5	3	1
3	Software and Applications Programmers	1	6	3
4	Database Administrator	3	4	6
5	Cybersecurity Specialist	6	5	5
6	Web Developer	7	9	4
7	ICT Support Technician	7	9	4
8	Data Scientist	15	1	13

4 non-technical occupations have a high shortage index

Shortage index	Role	No. of job ads	Vacancy rate	Growth in demand*
1	Business Analyst	1	1	1
2	UX Designer	4	2	2
3	Product Manager	2	3.5	5.5
4	ICT Project Manager	6	3.5	5.5

High shortage occupations were aligned with views expressed by TCA members

High Medium Low

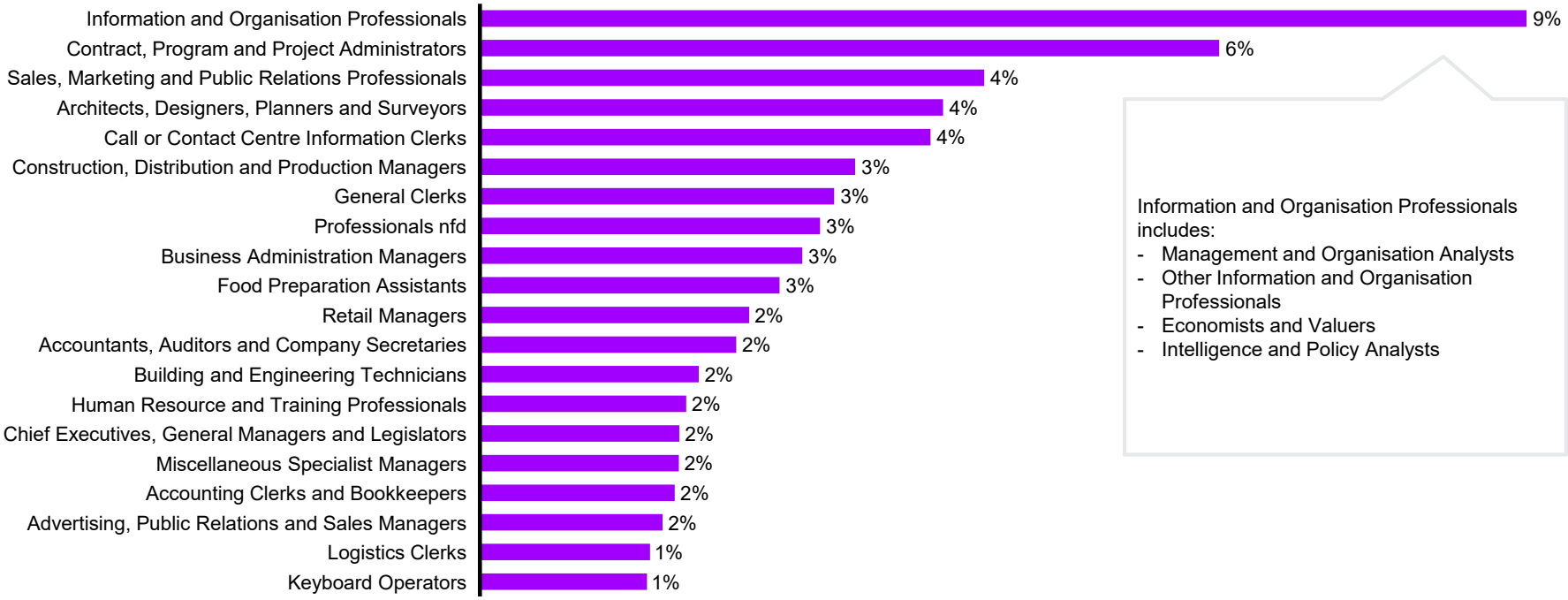
Note: *Growth in demand is for 2020-2025.

Source: Burning Glass, ABS, National Skills Commission, Accenture Analysis.

Exhibit 6

Individuals move into tech roles from a range of different occupational groups.

Top non-tech occupations that move into tech.
% High shortage tech workers (2016) from non-tech occupation (2011), by non-tech occupation.



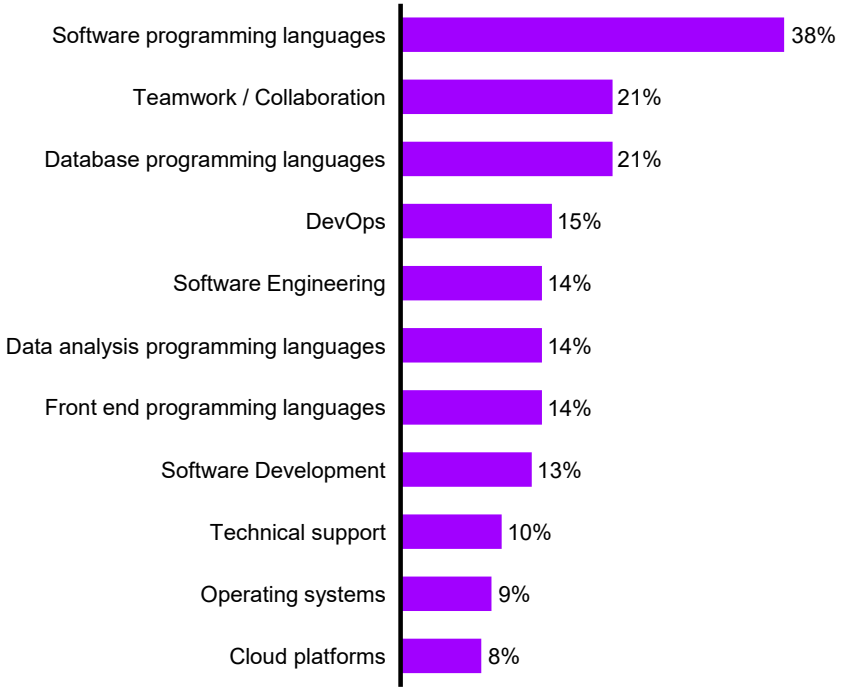
Source: ABS, Accenture Analysis.

Exhibit 7

The most sought-after skills for tech jobs include technical skills and soft skills.

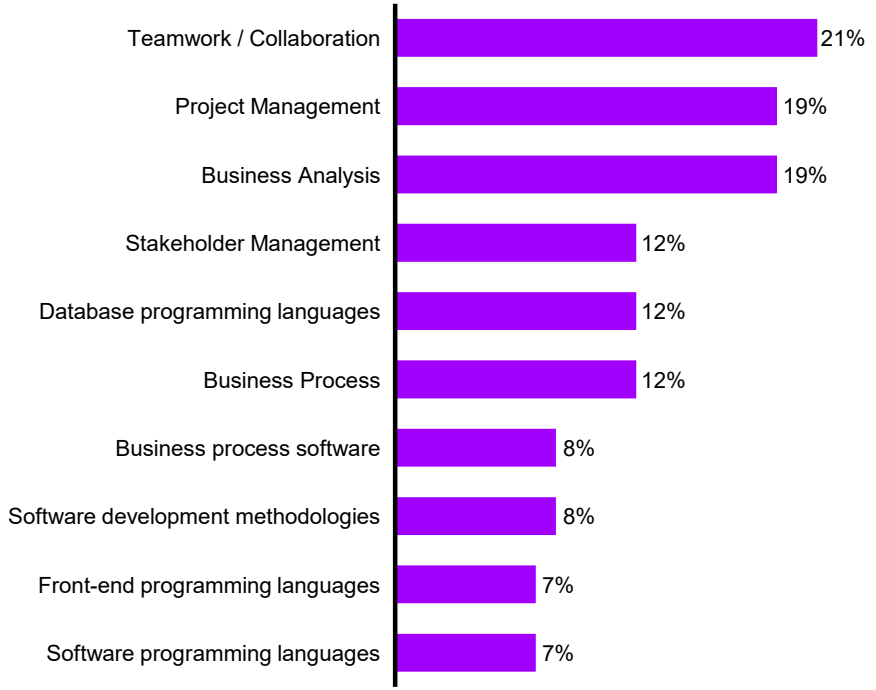
Top 10 skills required for technical high shortage occupations

Share of job advertisements* by years of experience required



Top 10 skills required for non-technical high shortage occupations

Share of job advertisements* by qualification required



Source: Burning Glass, Accenture Analysis.

“

“The beautiful thing about the Springboard to Tech Program is that it allows women who have foundational strategic, analytical, and soft sills to pursue a career in tech by equipping them with technical knowledge. Once this layer of technical know-how is introduced, they can go on to have amazing tech careers.”

“Technology moves quickly, so, as a developer, I am always learning, problem-solving, and considering the impact of implementing new features and changes. I enjoy these aspects of my job and have satisfaction knowing that I am making a meaningful contribution to Rea Group’s goals.”

Stacey Lewis: Transferring skills to high-priority tech roles

After working for ten years as a consultant in the market research industry, Stacey decided to pursue a career in tech. This seemed like a natural transition – she already had analytical experience from her background in consulting, and she knew that working as a program developer would be a good fit for her.

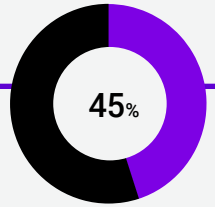
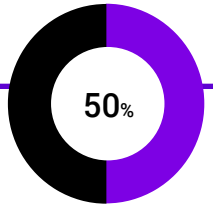
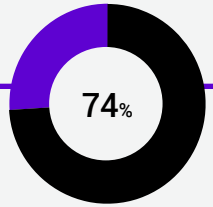
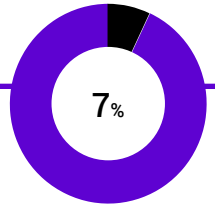
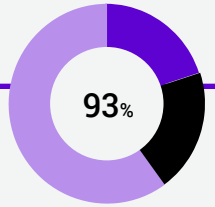
After completing a tech course, Stacey found employment at the Springboard to Tech Program, an initiative designed to bring gender balance to the tech industry by supporting women to either transition to or re-enter the industry. Stacey now works as a developer at Rea Group, a global online real estate advertising company.

Stacey Lewis
REA Group

Barriers to realising the opportunity

Exhibit 8

To address the tech workforce shortfall, we need to overcome five key barriers.

1	2	3	4	5
Lack of awareness of jobs	**Gaps in training products and pathways into tech jobs**	**Limited representation**	**Limited talent pool for technical and experienced roles**	**Lack of coordinated effort, analysis and planning**
• Many Australians don't understand what tech jobs are, or how to get into them. • There is also limited ongoing data collection on the key workforce requirements and shortages.	• Training models and qualifications haven't kept pace with emerging jobs and skills, or transitions. • 40% of Australians are open to working in tech, but 70% say they need to reskill to do it. • 90% of major corporates interviewed wanted to see improvements to current training and qualifications.	• There are strong skews in who works in tech jobs, with women, older Australians, and regional Australians all under-represented.	• Limited skills matches on technical roles with other parts of the economy mean there are not ready-made workers that can transition. • Border closures have reduced access highly-skilled, experienced roles.	• There is a lack of co-ordination between government, education providers and industry. • This means that effort, analysis and planning does not work effectively as it could.
Key stats				
				
of students are not taught about digital careers in school.	Less than 50% of IT VET students reported improved employment status after completing their qualification.	of tech workers are men.	Only 7% of the non-tech workforce has a strong skills match with tech occupations.	We identified 93 measures designed to address tech jobs delivered by industry, education providers or government.

Barriers to overcome

Lack of awareness of tech jobs

A challenge that is particular to the tech sector is that many Australians do not understand the opportunity that tech jobs present, or how they might access these opportunities if they are aware of them.

On one level this is intuitive, as many of these jobs are relatively new, and the mentors that students turn to such as parents, teachers and career counsellors are not aware of the career opportunities in tech.

Nonetheless it represents a significant barrier – you can't be what you can't see.

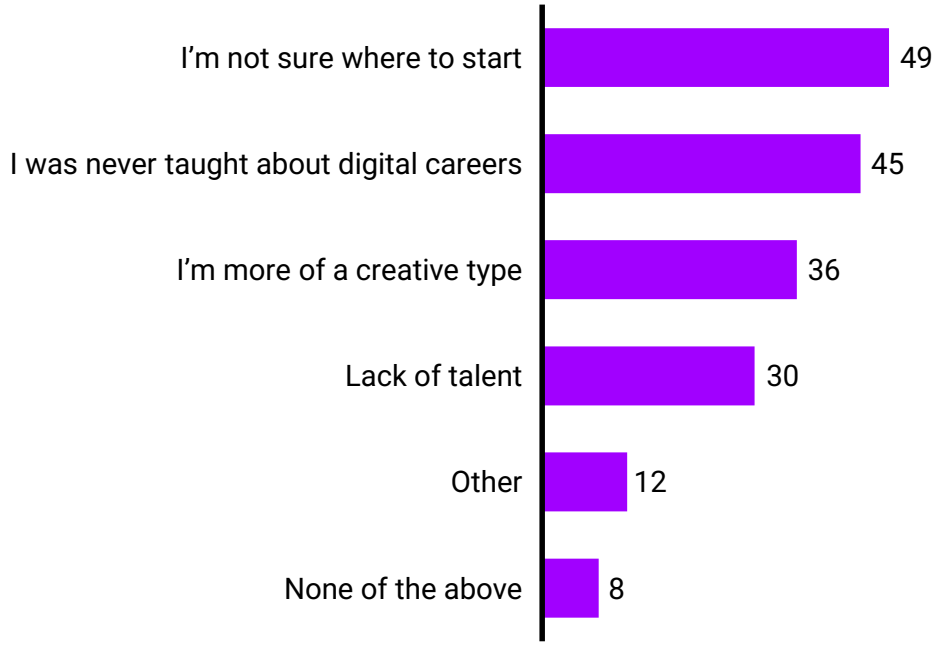
Year 13, in conjunction with the Digital Skills Organisation, surveyed 1,000 students about the perception of various career paths. The survey showed many students were not aware of digital careers, with 1 in 2 students stating that they had never been taught about digital careers.

In separate survey research conducted by YouGov and commissioned by the TCA, 40 per cent of those interviewed would consider moving into tech, but 70 per cent of people believed they would need to reskill in order to work in tech jobs.

Exhibit 9

Barriers to digital careers identified by school students.

% of students surveyed.



Source: Year13, YouGov.

Gaps in training products and pathways into tech jobs

Course content

The skills needs of tech jobs have changed rapidly as new technologies are adopted by industry. However, training models and qualifications have not kept pace with the needs of industry.

As part of a series of interviews we conducted in developing this workforce strategy, industry respondents consistently identified that course content has not evolved in line with industry needs.

Furthermore, new qualifications have not emerged to train people in new jobs and roles. For example, there are no accredited courses for emerging creative and commercial roles such as product managers, user experience designers and business analysts. This is despite these occupations facing some of the strongest shortages.

Student experience

Students' experiences of ICT qualifications in both VET and Higher Education need improvement.

Higher Education programs have expanded in response to the growth in jobs – with bachelor completions growing by 67% between 2016 and 2020. Postgraduate completions have grown significantly faster – increasing by 180% over the same period. However this has been predominantly driven by enrolments from international students – 50% of which leave Australia upon graduating, in part due to visa conditions.

Over the same period, VET course completions are declining against a backdrop of increasing skills needs (see **Exhibit 10**).

VET students in IT related courses report poor employment outcomes, with only 1 in 2 going on to get a better job once they've completed their study.[6]

These poor outcomes, and lack of supply-response from the VET sector presents significant risk of inequality – as it precludes young Australians that do not wish to undertake university study from having an effective pathway into tech jobs. An ineffective VET pathway also makes it almost impossible to achieve the scale required.

The private sector has responded to these gaps, with the tech sector utilising non-accredited training to deliver industry relevant skills to individuals. However there are opportunities to support more students to understand and access these programs, and more strongly integrate them as part of diverse learning pathways into tech jobs.

Attraction of workers

Attracting the most promising students into tech careers is important in turning successful students into successful employees. However, as a whole, the tech sector is not as proactive in this as other industries such as financial and professional services.

This may in part be due to a greater number of smaller firms in the tech sector, with smaller firms and start-ups not having the capacity to deliver talent development and graduate programs.

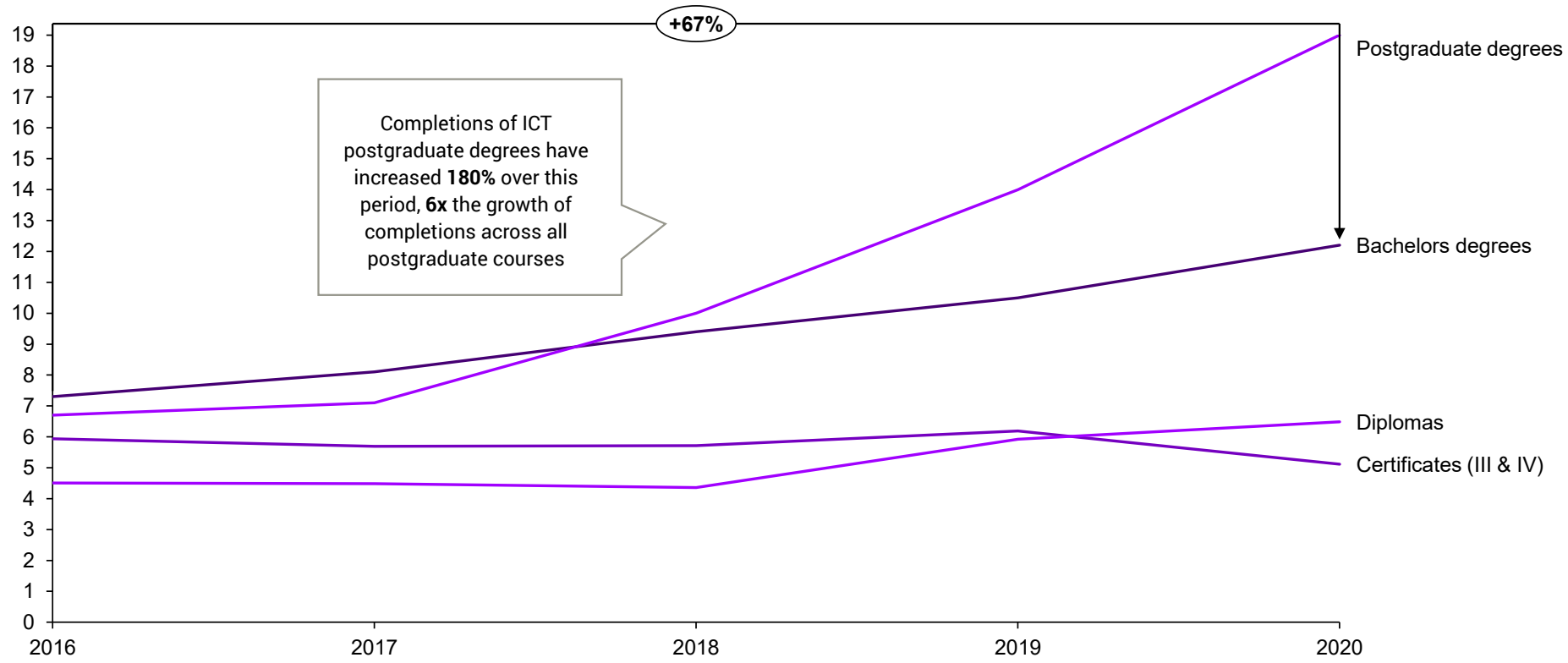
This leads to significant numbers of students in ICT related bachelor's degrees not working in tech related occupations. 4,600 of the 12,200 ICT related bachelor's degree holders in 2021 took up a job in a role that is neither in a tech company nor in a tech job in the broader economy (see **Exhibit 11**).

[6]NCVER, VET Student Outcomes 2021.

Exhibit 10

ICT course completions by qualification.

Number of course completions, '000s, 2016-2020.



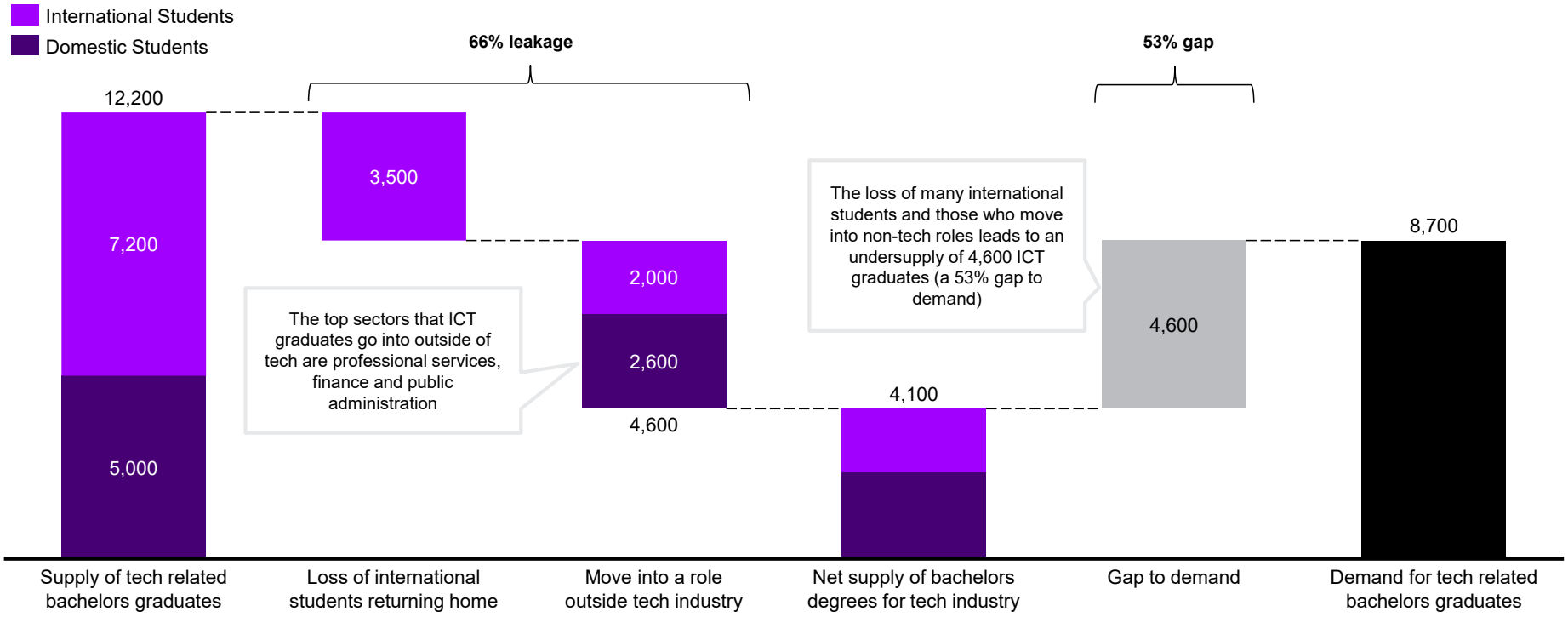
Note: VET completions (Certificates, Advanced Diplomas and Diplomas) are those graduating with qualifications which NCVER defines as matching the closest matching ANZSCO occupations (4 digit) for high shortage occupations. Bachelors degrees are those categories in 'Information Technology' as the primary broad field of education by the Department of Education, Skills and Employment.

Source: NCVER, DESE, ABS, Accenture Analysis.

Exhibit 11

Supply of ICT related bachelors graduates into tech related occupations.

Annual supply and demand of graduates, 2021.



Source: ABS, NCVER, DESE, Burning Glass, Australian Universities International Directors Forum (2018) Accenture Analysis.

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“When I decided to pick coding back up, I applied for the General Assembly Bootcamp, and it was awesome. It was only three months long, which is what I really liked about it. After graduating from the bootcamp, I had confidence that there was a clear way forward for my career in tech."

“In the Envato Apprentice Program, you rotate across six teams and work on real world problems that aren't time sensitive, so you can really learn things along the way. I’m satisfied knowing that I am making a positive contribution to the company.”

Faith Sylvia: Clear career pathways in the tech sector

Faith was introduced to tech when she studied a coding course at university. While she loved the content in her course, the competitive environment left her feeling defeated and she decided to pursue a career in finance and insurance instead. After a few years, Faith decided she wanted to start a new career working in an area she loved. She decided to return to coding and subsequently enrolled in a 12-week General Assembly Coding Bootcamp.

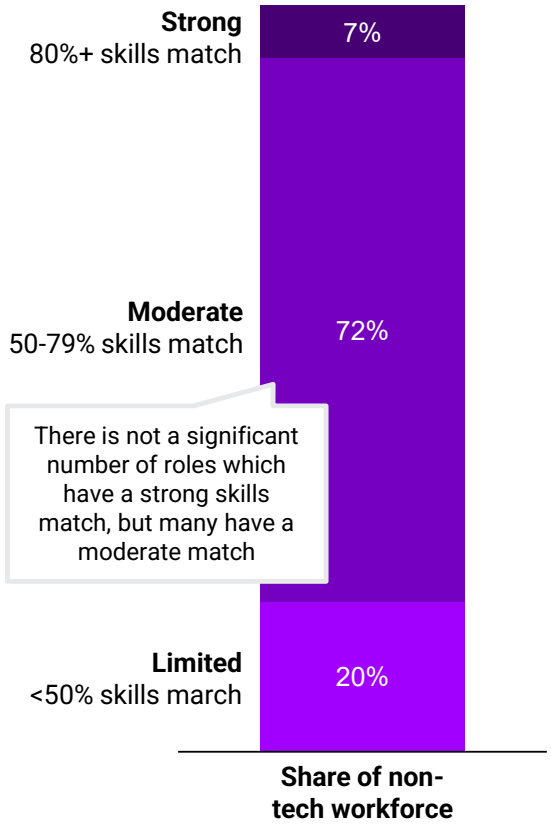
Faith is now undertaking an apprentice development program at Envato, an Australia-based company providing digital marketplaces for creative assets. She describes coding as a combination of both logic and creativity, and hopes to add as much value to Envato as they have added to her life.

Faith Sylvia
Envato

Exhibit 12

Skills match of workforce with high shortage jobs.

Share of non-tech workforce, by skills match.



Source: Burning glass, Accenture Analysis.

Limited representation

Previous TCA research identified that once people are employed in tech, they are much less likely to face discrimination on the basis of gender or educational background. Entry level wages in the tech sector are almost the same regardless of whether individuals trained at university or VET, and the gender pay gap is half that of other high-paid sectors. The research also identified that people from a non-English speaking background were over-represented in tech when compared with the economy as a whole.[7]

However, there are significant groups that are under-represented in the tech sector, whose talents and interests are not being identified and promoted.

The starkest example of this is the under-representation of women in tech jobs. Just 1 in 10 people studying a university qualification in tech are women,[8] and only 1 in 4 people working in the industry are women. More equal representation in training pathways would significantly grow the tech workforce in Australia.

Only 33% of young women consider a career in tech, compared to 69% of men.[9] The top reasons students do not consider tech are:

- 50% are already set on something else.
- 49% think it sounds boring.
- 43% don't know much about tech careers.

Limited domestic talent pool for technical and experienced roles

The Australian labour market is dynamic. As tech jobs boom, more Australians can choose to work in them, particularly as they are amongst the highest-paid, most secure and flexible jobs in the economy. This transition is positive for the economy, as tech jobs are highly productive and present in every major industry, and therefore all industries benefit when more workers move into them.

As the demand for skills in the tech sector has grown, salaries have increased rapidly, including by 22% in the last two years,[10] well above average wage increases for other roles. However, this has not led to a commensurate up tick in the number of Australians moving into these roles.

[7]Tech Council of Australia, Tech Jobs Opportunity 2022.
[8]ABS, Accenture Analysis.
[9]Year 13, 2022.
[10]ABS 2022, Weekly Payroll Jobs and Wages in Australia – Payroll jobs index by industry subdivision.

This is due to two key reasons:

1. **Jobs boom:** Growth in demand outstripping growth in supply in previous years, meaning that there are insufficient numbers of people with significant experience
2. **Skills shortages:** There is a low number of workers with adjacent skills who can easily re-train into high demand tech roles, or who understand the jobs exist and how to re-train to access them.

We analysed job skill matches and found that only seven percent of the non-tech workforce have a strong skills match with in-demand tech roles (see **Exhibit 12**). This has limited the extent of retraining into technically intensive roles, for example software programmers or network professionals (see **Exhibit 13**).

This low-skills match is also evident when we analyse transitions into and out of roles in high demand. Workers in highly technical roles were almost twice as likely to remain in their occupational grouping than the economy wide average (**Exhibit 14**).

Migration has traditionally played a critical role in supplying experienced and highly skilled tech workers to Australia. However, borders have been closed for the last two years due to the COVID-19 pandemic, meaning there is a backlog of demand for these skills.

Efforts to restart Australia's migration program have run into significant issues with processing delays. The average time to process a short-term skilled visa is three months, and one in four applications take over a year. We have much room to make up ground compared to our peers. For example, in the UK, the expected processing time for a skilled visa is just 3 weeks.

Australia's ability to retain tech talent and provide a clear pathway to permanent residency is limited. Of the 12 tech roles facing the most acute and ongoing shortages, just three — business analysts, network professionals and software programmers — are on Australia's Medium and Long-term Strategic Skills List that enables permanent residency.

Lack of coordinated effort, analysis and planning

There is a large number of existing initiatives designed to address the tech skills shortage. As part of the research to develop this strategy we identified 93 different programs underway by either government, industry or education providers.

Of these measures, 47 were targeted at retraining workers from other sectors and outside the labour force, and 46 were targeted at developing a pipeline of graduate and trainee school leavers.

However, while many of these initiatives are showing signs of success, they are not currently being delivered at a sufficient scale to substantially address the skills needs of the industry.

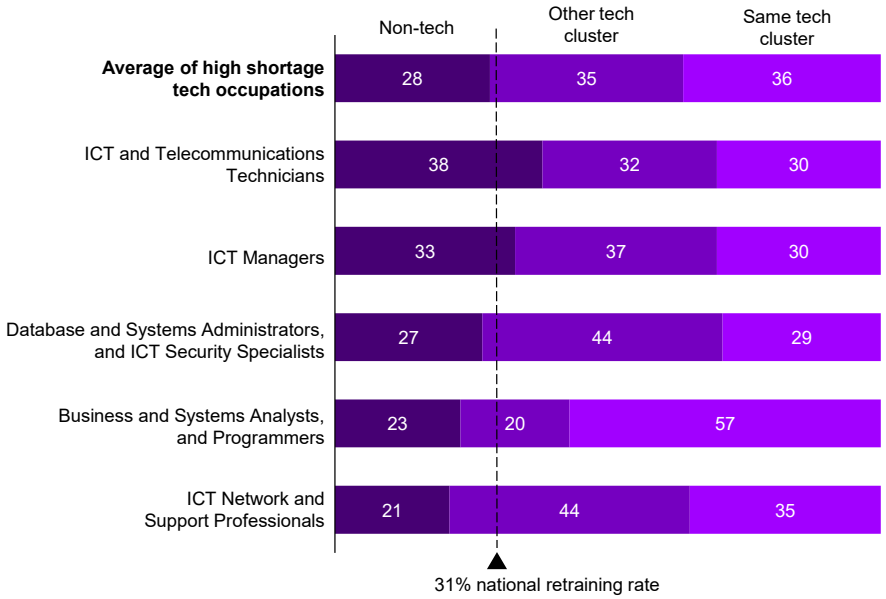
In addition to this lack of coordination, there have not been any centralised efforts to evaluate which programs are achieving the greatest degree of success.

Finally, there are opportunities to improve strategic workforce planning and coordinated action for tech jobs, particularly to take a workforce approach across the economy (rather than a vertical perspective within the ICT industry).

Exhibit 13

Retraining rates by occupation.[1]

% High shortage tech workers in 2016 by job type in 2011.



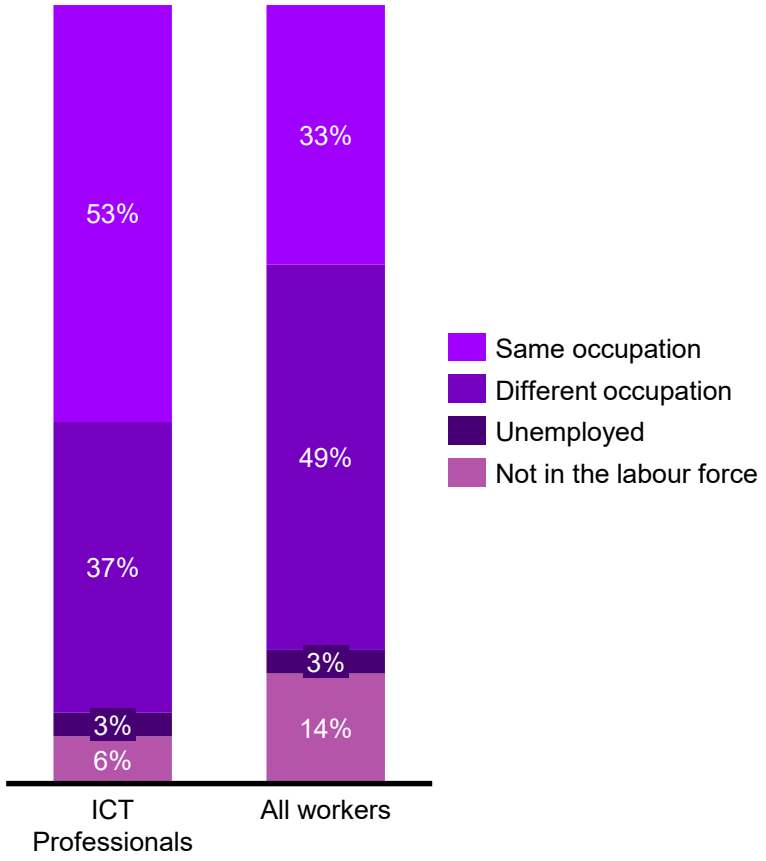
Notes: (1) Occupations are 2-digit ANZSCO codes based on data availability.

Source: Accenture analysis of ABS.

Exhibit 14

Retention of the tech workforce compared to the average.

% Employed ICT professionals (2011) by labour force outcome (2016).



Source: ABS, Accenture Analysis.

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“Within one month of arriving in Australia, I received job offers from five different tech companies.”

“In tech, employers look for what you can bring to their company and if you are coming from overseas, you may have some different skills to bring to the table. Working in Australia’s tech sector, I have been able to apply my skills in areas I am passionate about. I am excited to pursue a rewarding career path and see where it leads.”

Erfana: Tech opportunities for skilled migrants

Erfana grew up in Bangladesh where she graduated from university with a computer science degree. After eight years of working as a software engineer in Bangladesh, Erfana moved to Australia on a skilled migration visa and quickly found that the tech sector offers an abundance of diverse opportunities for those coming from abroad with tech skills.

Erfana now works as an Engineering Manager at global e-commerce company Rokt, where she leads a team responsible for developing scalable testing solutions. Erfana enjoys the freedom she has to pave her own path within Rokt and the unique opportunities she is given to work on innovative concepts.

Erfana Skider
Rokt

A joint industry and government strategy to overcome these barriers

Exhibit 15

The following priority solutions will address the most urgent barriers and set Australia up for success in the long term.

Increase awareness and understanding of job opportunities in Tech

● **Nation-Wide Campaign**

Industry to design and implement a nation-wide awareness campaign to improve and demystify the tech sector for Australians.

● **National Work Experience Program for Secondary School**

Industry to establish virtual work experiences for priority tech roles, and work with government to make these available to secondary school students.

Fix gaps in education and training products and pathways

○ **Defined and Managed Skills Standards and Pathways**

Industry to define job, position, capability descriptions, skills standards and pathways to provide a consistent reference point for skills and workforce development/ reskilling for high-shortage roles.

○ **Digital Apprenticeship Model**

Industry and government to co-design and implement a digital apprenticeship model at scale for new entry-level technical roles.

○ **Innovative learning and recognition options**

Better identify and utilise innovative learning options, and improve recognition arrangements to support individuals to upskill, reskill and have their skills recognised throughout their career.

Improve diversity of the tech workforce

● **Public commitment to diversity targets and reporting for the industry**

Industry to demonstrate commitment to improving diversity within the tech workforce, through company specific targets/statements and reporting.

○ **Improved support for women to transition into tech**

Improve support for women considering a transition into tech through information, reskilling and mentoring to improve attraction and retention of women in tech.

Target skilled migration to areas of high-need and greatest shortage

● **Streamlined skilled migration**

Government to streamline skilled migration for high-salary, experienced technical roles with chronic shortages – i.e. through committing to specific processing times.

● **Improved retention of international student graduates in Australia**

Governments to simplify pathway to permanent residency, and industry to improve employability for international student graduates in tech fields to retain capability in Australia.

Improve industry-level workforce supply and demand analysis

○ **Develop plan to achieve 1.2m tech jobs by 2030**

Industry and government conduct ongoing data analysis and tech workforce planning and progress monitoring, in conjunction with Jobs and Skills Australia.

● Primarily Industry
○ Government & Industry
● Primarily Government

Priority solutions

We have developed the following shortlist of initiatives that we believe, based on research and consultation will be most likely to 'shift the dial' and make significant improvements in the short-term. These have been developed in conjunction with a coalition of tech employers and educators from across Australia, and a range of industries, through the Digital Employment Forum.

Some of these initiatives can be implemented by industry without government assistance, while others will require working with government to ensure success.

Increase awareness and understanding of job opportunities in tech

Nation-wide awareness campaign

A co-ordinated awareness campaign would demystify the tech sector and build public awareness about diverse tech jobs opportunities and pathways. Key audiences include Australians looking to reskill, students and parents.

Primarily industry driven, this campaign would seek to leverage collective effort, and may utilise government channels where these are the most effective at reaching target audiences.

National Work Experience program for secondary school students

Industry should develop virtual work experience programs for priority tech roles, and to work with government to make these available free of charge to secondary school and post-school students. This is intended to build awareness of tech careers within secondary school students, and early-stage talent pipelines.

Virtual work experiences enable students to experience what tech roles are like in practice, and to get a feel for what it is like to work in tech. As they are available online, they offer opportunities to students located anywhere in Australia – and not just those located in metropolitan areas.

Fix gaps in education and training products and pathways

Defined and managed skills standards and pathways

Industry should define skills standards and pathways for the identified priority roles/capabilities, which will provide a simple, consistent reference point for skills and workforce development, and allow for a diverse range of education and training approaches.

Nationally recognised, contemporary skills standards can be used to inform position descriptions, workforce capability assessments, and used as a reference point to align accredited and non-accredited training.

Digital Apprenticeship model

Industry and government should co-design and implement a modern digital apprenticeship model at scale for entry-level technical roles. This program would deliver a 12-month, diploma equivalent, work-integrated learning model that utilises a blend of VET, Higher Education and vendor-certification options aligned to industry requirements.

These apprenticeships would be focused at a broad range of entry level roles, such as data analysts or cyber analysts in addition to ICT support technicians, and provide critical pathways for young Australians into tech jobs.

Innovative learning and recognition options

Improving pipelines into tech jobs will require innovative learning options and improved approaches to recognising the skills that individuals already possess.

This will require strong engagement within industry to map different learning programs against agreed skills standards and pathways, action to update the Australian Qualifications Framework to enable greater flexibility, and ongoing engagement with government to ensure funding programs can respond flexibly to industry-relevant training needs.

Target skilled migration to areas of high-need and greatest shortage

Streamlined skilled migration

Streamlining skilled migration for high salary, experienced technical roles is required to provide an immediate pressure-relief valve to support Australian businesses to attract global tech talent and build entry and mid-level domestic capability.

This will require significant acceleration of visa processing times by the Australian Government, and should also be complemented by actions to provide clear pathways to permanent residency for all skilled migrants in tech roles.

Leveraging Australia's international student capability

Reform to international student visa settings will be required if we are to leverage the capability of international student graduates – who represent two thirds of tech students undertaking higher education programs in Australia.

Tech employers and educators should identify approaches to improve student experiences and graduate employability. Action by the Australian Government is also needed to simplify pathways to permanent residency for international students in tech fields.

Improve diversity of the tech workforce

Public commitment to diversity and reporting for the industry

Increasing female participation in tech is critical to growing the sector to 1.2 million jobs by 2030, and to realise the significant benefits that diversity within the workforce can deliver.

Tech employers represent a broad range of business sizes and industries, at varying levels of maturity. This means company specific commitments will vary, but will be supported by ongoing reporting of progress, tools and advice within the industry to improve women's employment in tech.

Improved support for women to transition into tech

Women are significantly under-represented in the tech workforce, and research has shown that twice as many women join after the age of 25 as they do prior to age 25.

Supporting more women to transition into tech roles will require a dedicated program to communicate the benefits of mid-career transitions into tech jobs for Australian women and provide advice and reskilling options to enable more women to make the switch to deliver 1.2m tech jobs by 2030.

Improve industry-level workforce supply and demand analysis

Establish framework and governance for continuous strategic workforce planning for tech

Strengthening strategic workforce planning, coordination and alignment within the industry will be essential to underpin effective workforce development.

The implementation of the Industry Cluster reforms by the Australian Government, and establishment of Jobs and Skills Australia will be important in underpinning this, as will ensuring ongoing monitoring of progress toward the 1.2m tech jobs target.

Industry still have a critical role to play in developing demand forecasts, and contributing to building the evidence base to inform effective workforce planning.

Exhibit 16

The immediate priorities form part of a comprehensive range of initiatives to be progressed over the next five years.

Increase awareness and understanding of opportunities in Tech

- ● **Implement a nation-wide awareness campaign** to improve and demystify the tech sector for Australians (including the diverse range of careers).
- ● **National virtual work experience program** for secondary school students in priority tech roles.
- ● **Coordinated engagement with tertiary students** (not limited to tech student) to demystify graduate opportunities in diverse tech roles.

Fix gaps in education and training products and pathways

- ○ **For high shortage roles,** industry to define the **job/ position/ capability descriptions, skills standards and pathways** to provide a consistent clear reference point for skills and workforce development/ reskilling.
- ○ Industry and Government to develop and implement a **digital apprenticeship** model at scale for new entry-level technical roles –leveraging the right type of learning to meet industry needs.
- ○ Better identify and utilise **innovative learning options and improve recognition arrangements** to support reskilling and upskilling into tech jobs –full quals and rapid training (in particular roles with strong skills similarity, or targeted toward diversity groups).
- ● Industry to **improve transition of graduates** from ICT bachelor courses into tech employment through internships and grad places.
- ● Industry to **improve retention through professional mentoring, networking and development program** for different experience bands.
- ● **Improve the delivery of digital technologies education in schools,** including supporting teacher capability.

Improve diversity of the tech workforce

- ● Public commitment to **diversity** and reporting for the industry.
- ○ Improve support for **women transitioning into tech through information, retraining, and mentoring.**
- ● Identify effective partnerships to **improve tech employment for Indigenous Australians.**
- ● Increase employment opportunities for **humanitarian visa holders with overseas qualifications.**
- ○ Engage with social and community and industry groups to **enhance digital literacy.**
- ● Identify effective partnerships to **increase tech employment opportunities for Australians with disabilities.**
- ● Industry to develop and share advice and resources that support tech companies to **successfully onboard new starters from diverse background.**

Target skilled migration to areas of high-need and greatest shortages

- ● **Streamlined skilled migration** visa for high-salary, experienced technical roles experiencing chronic shortages.
- ● Simplify **pathway to permanent residency** and improve employability for international student graduates in tech fields to retain capability in Australia.

Strengthen industry-level workforce planning, coordination and alignment

- ● **Develop and maintain a comprehensive list of current initiatives** to solve tech workforce priorities, and disseminate best practice approaches.
- ○ Industry and Government commit to 1.2m jobs target, and establish **the governance and framework for continuous strategic tech workforce planning** and on-going assessments of initiatives.
- ○ **Strengthen coordination** across the tech/digital industry and government to improve alignment of professional standards, workforce planning, education and training development and skilled migration standards.
- ● **Organisations to use workforce analytics** to identify internal supply, demand, reskilling opportunities and the potential to optimise demand.

● Primarily Industry
○ Government & Industry
● Primarily Government

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"With minimal work experience in tech, my key goal was to show companies that I had initiative and a hunger to learn. I started looking around for the sorts of things I could do to gain experience and to demonstrate my interest in tech, either during the winter break or for one day a week during study, and that’s when I came across Forage.”

“What I liked about Forage’s program is that it exposed me to different areas of what a tech career could look like. Despite not having studied anything tech-related before enrolling in the program, I was also able to gain key tech skills and insights, including an understanding of the inner workings of coding!”

Madeleine Clunies-Ross: Work experience solutions

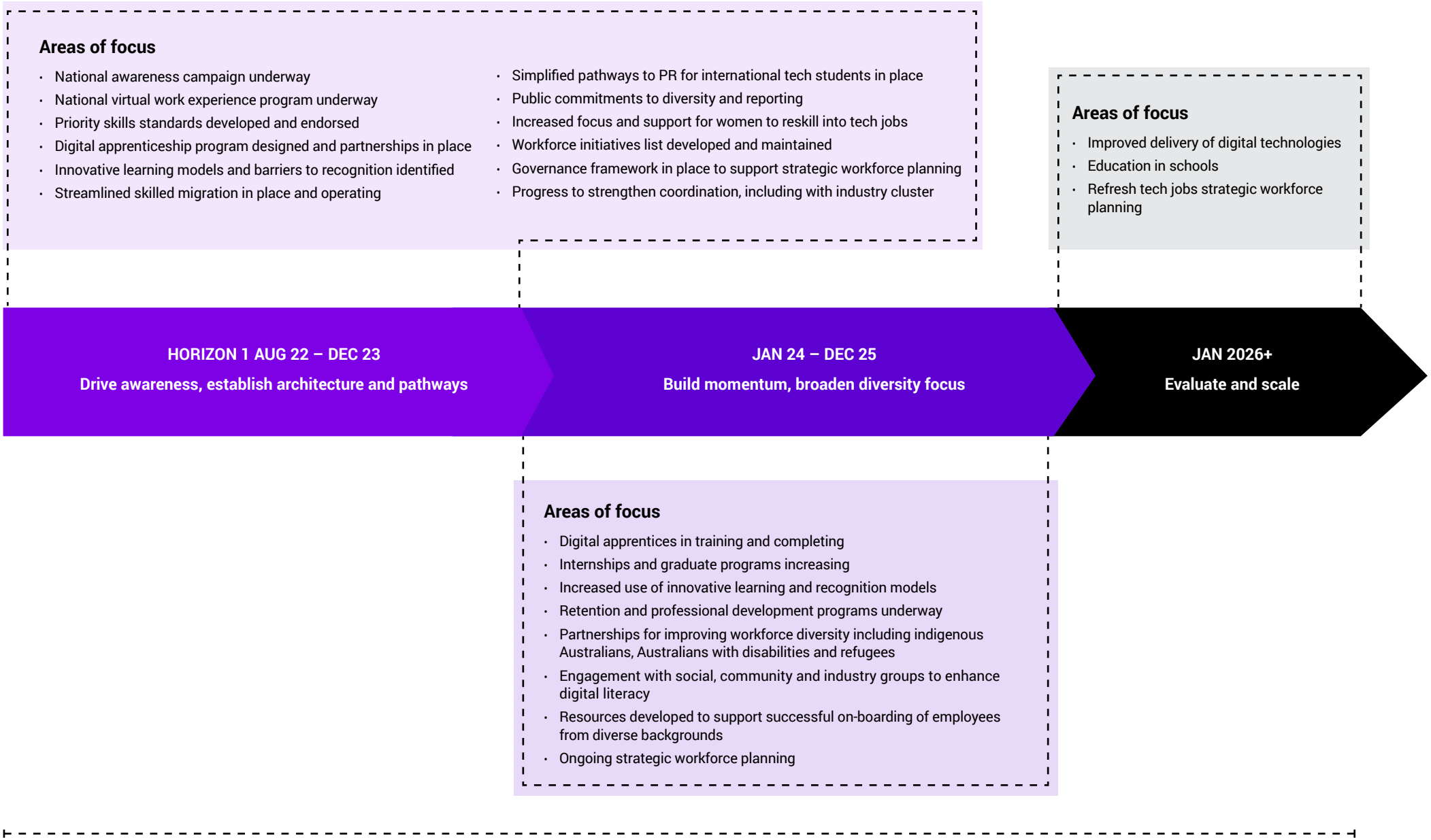
Although she studied communications and law at university, Maddie was never really interested in what she was learning and was uncertain about her career path. In her final year, she realised that she didn’t have any experience in a job or industry sector that she was passionate about and subsequently decided to take a leap of faith and pursue a career in tech. Knowing that she would need to stand out as a candidate in a highly competitive industry, Maddie enrolled in a virtual work experience program hosted by Forage.

After gaining the experience and skills needed to work in tech, Maddie is now employed as a Strategy and Operations Associate at Australian tech start-up JigSpace, which provides 3D knowledge-sharing platforms.

Madeleine Clunies-Ross
JigSpace

Exhibit 17

Roadmap



Getting to 1.2 million

Realising the 1.2 million tech jobs opportunity

Tech jobs are highly paid, stable, and flexible, and will be a driving force for the economy into the future. Tech jobs offer opportunities to transform the lives of Australians, and support broader digital transformation within businesses of all sizes.

However, ensuring we get the policy settings right is vital if we're to achieve our target of 1.2 million tech jobs in Australia by 2030, and contribute to growing the economic contribution of the tech sector to $250 billion by 2030.

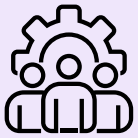
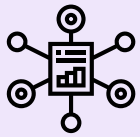
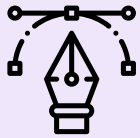
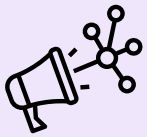
There are a number of actions required by industry and government to build awareness of tech jobs, enhance current education and training pathways, improve opportunities for all Australians, and strengthen coordination across the sector.

We look forward to working together across employers, educators and governments to ensure more Australians are employed in tech jobs, and contributing to a prosperous Australia that is able to thrive by harnessing the power of technology.

Technical Appendix

Definition of tech sector workforce.

Components of tech sector definition by industry and occupation.

	Direct Tech Industries	All Other Industries
	· Internet publishing and broadcasting · Telecommunications services · Internet Service providers, Web Search Portals and 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.** Software and Applications Programmers  ICT Project Manager ICT Support Technicians  UX Designers  Graphic / Web Designers Cybersecurity Specialists	
Non-technology Occupations	**Non-technology occupations are only included in tech industries.** Human Resources  Advertising and PR Legal	N/A

Source: ABS, Accenture Analysis.

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