Growing Australia's digital workforce

June 2023

DIGITAL SKILLS ORGANISATION

About the Digital Skills Organisation

The Digital Skills Organisation (DSO) was established in 2020 by the Department of Employment and Workplace Relations (DEWR; formerly Department of Education, Skills and Employment) as one of three industry-led Skills Organisation Pilots, alongside Human Services and Mining.

Its establishment was as a result of the Australian Government's 'Strengthening Skills: Expert Review of Australia's Vocational Education and Training System' 2019 report. This recognised emerging evidence of a growing supply and demand gap for workers with digital skills, and system barriers to closing this gap.

DEWR described DSO's remit to "shape the national training system, testing innovative solutions to ensure digital training meets the skills needs of employers and builds Australia's digital workforce".

The funding period was for three years to June 2023. Subsequently, the introduction of ten Jobs and Skills Councils (JSCs) from June 2023 provides the opportunity to consider how learnings from the DSO trials can inform work priorities for the Finance, Technology and Business (FTB) JSC.

DSO DIGITAL SKILLS ORGANISATION

Contents

Acknowledgements

The DSO acknowledges the collaboration and input to the work of the DSO of the Tech Council of Australia (TCA), Australian Computer Society (ACS), Australian Information Industry Association (AIIA), Digital Employment Forum (DEF), VET (Vocational Education and Training) peak associations, including the TAFE Working Group, the Australian Government departments and agencies, state and territory governments, training providers, community groups and schools. The DSO also acknowledges the range of organisations and individuals who have contributed to, or participated in, the trials undertaken as part of the DSO's work.

About this report

This report is a contribution to fulfilling the DSO's remit. Specifically, it seeks to:

- Define Australia's current and future digital skilling needs, including assessing supply and demand gaps
- Synthesise the activities and progress the DSO has made to address Australia's digital skilling needs, and the potential to close the skilling gap
- Identify opportunities for the JSC for FTB to continue collaboration with governments, industry, unions, registered training organisations, community groups and the other nine JSCs to progress Australia's national approach to digital skilling.

The report draws on a range of quantitative and qualitative research and analytics inputs. This includes workforce and skills data insights, analysis of data from the training sector, insights from industry engagement, and evaluation of DSO trials.

Further information about the technical elements of the method is included in **Appendix A.**

Executive summary

Growing Australia's Digital Workforce

Infographic Summary

Australia is facing a critical digital worker shortfall

12%
increase in demand for digital skills across the economy since 2016

47%
growth is projected for the digital expert workforce by 2026

370k
digital worker shortfall projected for Australia by 2026

Through research and consultation, the DSO distilled three core digital skilling challenges, with underlying contributing factors, limiting Australia's ability to meet future digital skill demand

Insufficient pipeline of workers
- Low awareness
- Complex pathways

Low job relevance and transferability of digital skills
- Inconsistent and outdated skills
- Lack of industry endorsed skill assessment

Rigidity of the skilling sector to be responsive to industry needs
- Rigid and occupation focused approach to training
- Ineffective industry engagement

To address the skilling challenges, the DSO sought to test the components of a system that is:

- Employer-led
- Skills-focused
- Underpinned by uniform Digital Skill Standards

The DSO worked with training providers and employers and consulted and engaged with industry representatives to develop and test new approaches to digital skilling across seven priority areas, with trials and evaluations providing important insights for future work

Industry consultation and collaboration

1. Established forums for collaboration and consultation with industry partners
2. Commissioned research and data assets for industry insights

Awareness and pathways

3. Rolled out awareness raising campaigns
4. Developed and tested digital career pathways

Relevance and transferability of skills

5. Developed and tested Digital Skills Standards

Improving training delivery

6. Developed and tested Networks of Digital Excellence (NoDEs) approach
7. Tested different approaches to training delivery

There is an opportunity for the Jobs and Skills Council for Finance, Technology and Business to consider how learnings from the DSO trials can inform its work priorities

Transitioning to Industry Steward

1. Build and sustain engagement and representation from industry, unions, government and training providers
2. Work with JSA and other JSCs to develop a Digital Workforce Strategy

Continuing and scaling

3. Develop and implement a digital careers campaign
4. Continue to identify and define digital career pathways

Extending and scaling

5. Establish and measure a national standard for workplace digital literacy
6. Trial and evaluate Digital Skills Standards at scale

Extending and scaling

7. Surface agile and adaptable forms of training through innovation
8. Scale the trial of Networks of Digital Excellence (NoDEs)
9. Optimise training offerings

Australia's future digital skilling potential will be achieved with continued close collaboration and cooperation from state, territory, and federal governments, training providers, unions, community groups and, importantly, industry.

Surging demand for digital skills is pushing Australia towards a critical shortage of over 370,000 digital expert and digitally enabled workers by 2026

Over the last five years, the workforce has transformed with growth in demand for digital skills across all roles – this trend shows no signs of slowing down. There is a projected **47 percent growth in the digital expert workforce**. There is also increasing use of digital tools in jobs across the economy as more workers need to become **digitally enabled**.

However, Australia's supply of skilled workers by 2026 will fall short by 130,000 digital expert and 242,000 digitally enabled workers.

There aren't enough people training to become digital workers

School leavers and people returning to the workforce or transitioning from other roles or industries are important workforce supply sources, alongside migration.

Enrolments in VET IT programs decreased by 19 percent between 2017 and 2021 despite growth of the technology sector and increasing demand for digital skills.

Learners in VET are not being taught the skills that industry demand, resulting in suboptimal training and employment outcomes

Despite 62 percent of people completing VET IT qualifications for employment reasons in 2021:

- 1 in 2 learners reported the skills are not relevant to their current job
- less than 1 in 10 reported to be employed in an occupation aligned to the training
- less than 1 in 3 reported improved skills from training
- less than 1 in 2 reported an improved employment status after training

All of these student outcomes are lower than the VET average. These outcomes also indicate that employers are not valuing the people coming through the VET system relative to other training pathways.

There is also limited coverage of digital skills training in VET non-IT programs, which does not reflect increasing digital skills demands across industries.

The training system isn't flexible enough to quickly adjust to what industries need

On the whole, the training system isn't flexible enough to quickly adjust to what industries need. Contributing factors include ineffective industry input and ineffective collaboration in determining training content and approaches.

VET regulation contributes to some of these challenges. These include being too rigid, continuing with outdated qualifications, and varying quality because competencies aren't applied consistently.

In the context of digital skills, these limitations are especially problematic given the dynamic and rapid pace of change.

▼130k

Australia falling short of digital expert workers

▼242k

Australia falling short of digitally enabled workers

growth in the size of the digital expert workforce

Definitions and sources for data and evidence can be found in the body of the report.

The DSO undertook research and consultation to establish a hypothesis that was tested through trials and initiatives

In an economy with on-going skill shortages the focus needs to be on skill possession, less on how skills are acquired. Accordingly, the DSO sought to trial approaches to test the following hypotheses:

- Re-orientating training from a qualification to a skills focus enables more responsive and adaptable skilling.
- Employer-led approaches to identify skilling needs, and collaborating on skilling responses, increases training effectiveness and impact, and improves learner outcomes.
- Digital Skill Standards describing skills and levels of proficiency helps align industry, learners and the training sector on skills and skilling expectations.

The DSO took a multi-channel approach to address the identified digital skilling challenges and test the skilling hypothesis, comprising activities related to:

- Industry consultation and collaboration
- Awareness and pathways
- Relevance and transferability of skills
- Improving training delivery

Progress has been made with new approaches, and learnings will be valuable in designing and refining future initiatives.

The path to a digitally optimised workforce for Australia requires continued collaboration, innovation, testing and learning

There are strong foundations upon which to transition to the Jobs and Skills Council (JSC) for Finance, Technology and Business (FTB). Focus can be sustained by seeking to scale existing approaches and assets, while pursuing new ground in addressing Australia's digital skilling challenges.

Transitioning to a skills-based approach requires continued close collaboration and cooperation from state, territory, and federal governments, training providers, unions, community groups and importantly, industry.

Australia's Digital Workforce

01

Demand for digital skills is increasing across the economy

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.

Digital skills are skills required to be digitally engaged; that is to "identify and use technology (including hardware and software) confidently, creatively and critically."[1] Digital skills are separated into baseline digital skills (e.g. digital literacy) and specific digital skills which are required for more technical jobs.[1]

The analysis in this report has defined eight categories of specific digital skills (see Appendix A) and the digital intensity of roles based on the proportion (or percentage) of skills demanded for a role that are specific digital skills.

The digital intensity of the workforce has increased by 12 percent over the last five years. Development and Implementation; Delivery and Operations; and Analytics, have dominated demand for digital skills over this period. See Exhibit 1.

This demand is in addition to the baseline digital skills of literacy and enterprise which are considered a requirement across the vast majority of the Australian workforce. See Appendix A for more detail on digital skill definitions.

This growth means the digital workforce now accounts for half of Australian workers

The analysis of the eight categories of specific digital skills and the two categories of baseline digital skills enabled the identification of three types of digital workers: digital expert workers, digitally enabled workers and digitally informed workers. The digital workforce encompasses the digital expert workers and digitally enabled workers.

Digital expert workers require specific digital skills as central functional skills. They comprised seven percent of the workforce in 2021, including ICT network and support professionals; and business and systems analysts, and programmers.

Digitally enabled workers rely on digital skills to augment their functional skills, and comprised 43 percent of the workforce in 2021, including occupations such as engineering professionals; legal professionals; sales, and marketing; clerical and office support workers; and machine operators.

It is estimated there were 6.6 million digital expert and digitally enabled workers in Australia in 2021 (representing 50 percent of the country's labour force). See Exhibit 2.

The remaining 50 percent are **digitally informed workers**, requiring digital literacy and enterprise skills but negligible need for specific digital skills. In 2021 they included occupations such as real estate agents, midwifery and nursing professionals, and plumbers.

Digital worker definitions

The Digital workforce comprises:

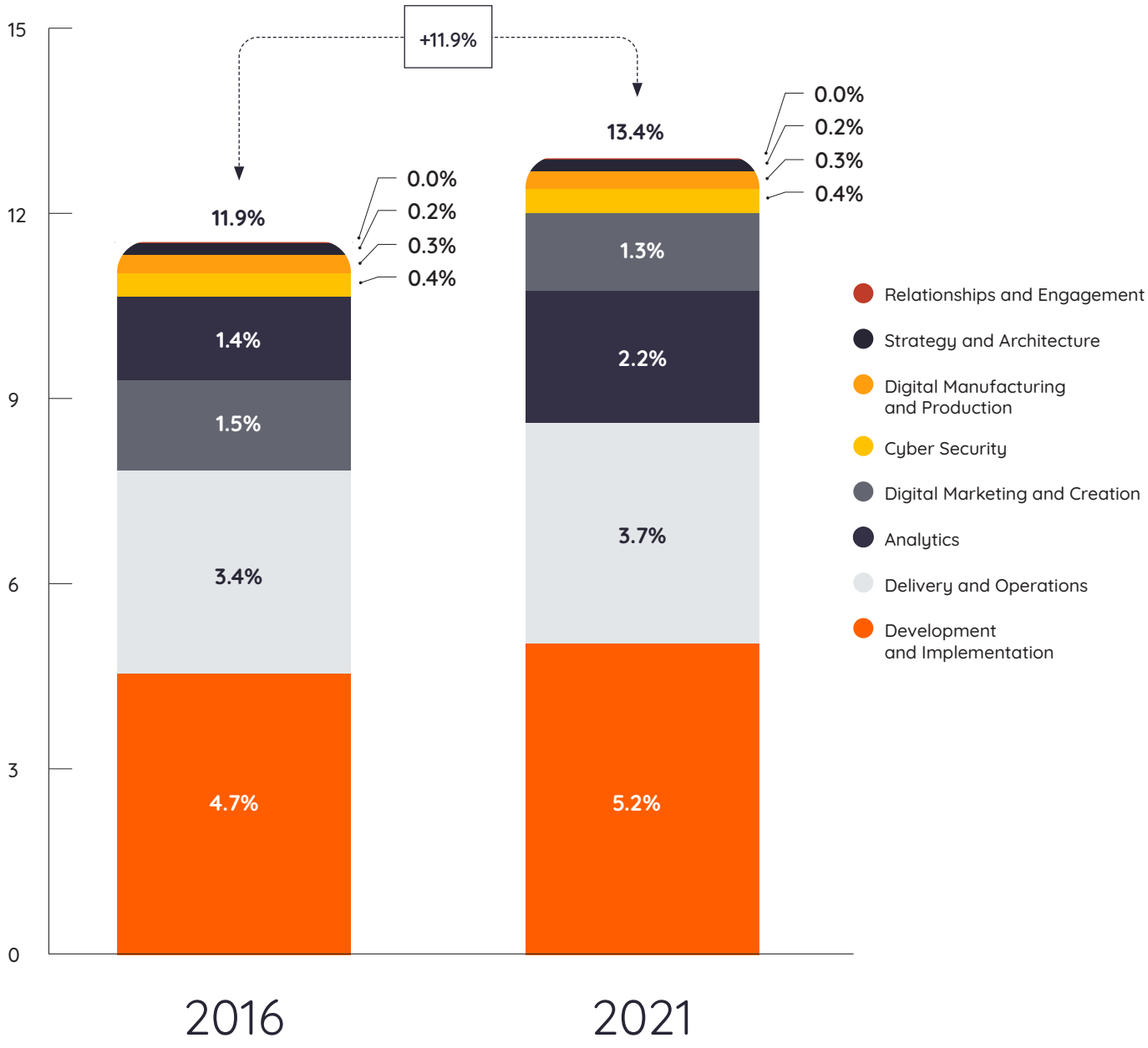
- **Digital expert workers** – those requiring specific digital skills as central functional skills
- **Digitally enabled workers** – those relying on digital skills to augment their functional skills

The remainder of the workforce are considered digitally informed workers, requiring digital literacy but negligible need for specific digital skills.

1. National Skills Commission, 'State of Australia's Skills 2021: now and into the future. Digital skills in Australia and internationally

Exhibit 1: The increasing demand for digital skills*

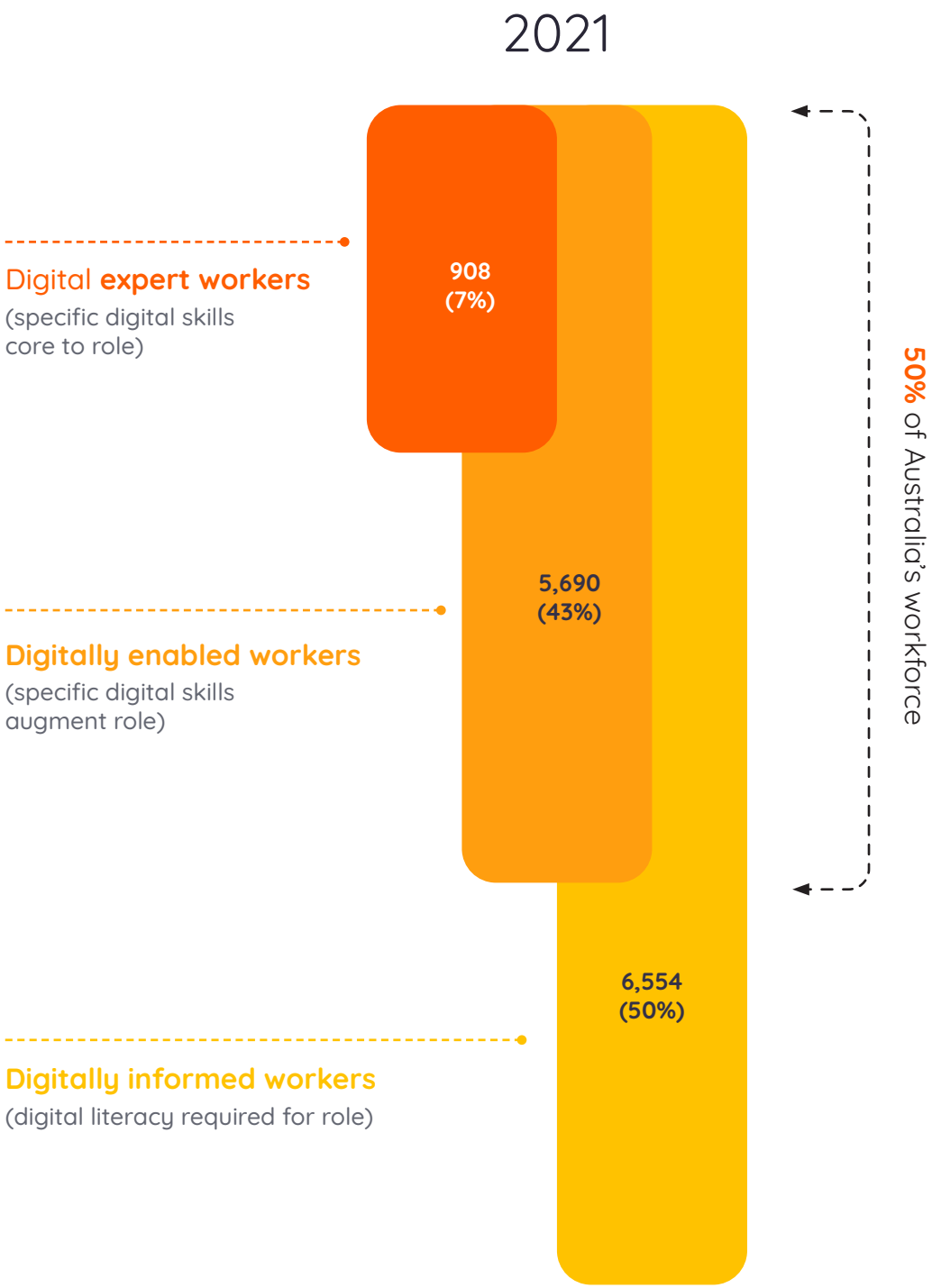
Demand for digital skills (% of all skill mentions), 2016-2021



Source: Nous analysis; Lightcast, ABS
*Notes:
a. See Appendix A for methodology.
b. Totals may not add due to rounding; difference between 2016 and 2021 may not compute due to rounding.

Exhibit 2: The composition of Australia's workforce*

Digital workers by segment ('000 [% of whole workforce]), 2021



Source: Nous analysis; Lightcast, ABS
*Notes:
a. See Appendix A for methodology.
b. Totals may not add due to rounding.

Demand for digital expert workers and digitally enabled workers is expected to grow

The growth in demand for **digital expert workers** is expected to continue to grow at a faster rate than the economy over the next five years.

This growth is due to two factors. First, a rapid increase in demand for technology occupations contributes an extra 184,000 digital expert workers. Second, increasing demand for digital skills in non-technology roles (e.g. marketing and arts professionals) contributes an extra 215,000 workers through these occupations forecast to progress to digital expert roles by 2026. See Exhibit 3.

Increasing demand will see this segment of the workforce grow by 47 percent, from 0.9 million to 1.3 million, to comprise nine percent of the workforce in 2026. See Exhibit 4.

For **digitally enabled workers**, increasing reliance on digital skills to augment functional skills is projected to transform a range of jobs from informed to enabled, including Retail Managers; Farm, Forestry and Garden Workers; and Real Estate Sales Agents. This contributes an additional 558,000 workers into the digital workforce from these occupation groups alone. See Exhibit 3.

The projected decrease in the proportion of digitally informed workers highlights the increasing expectations of workers across the economy to be enabled. It also reinforces the need for baseline digital literacy across the economy to be the foundation for specific digital skills to be more productive and innovative. See Exhibit 4.

The forecasts to 2026 in this report are based on a continuation of 2016 to 2021 trend analysis. This analysis may underestimate the 2026 digital workforce profile. This is due to the inherent uncertainties of such future workforce estimates due to the difficulty projecting rapid economy wide uptake of digital skills and fast emerging digital technologies such as artificial intelligence, robotics and automation.

Exhibit 3: Occupation groups changing digital workforce segment, 2021–2026*

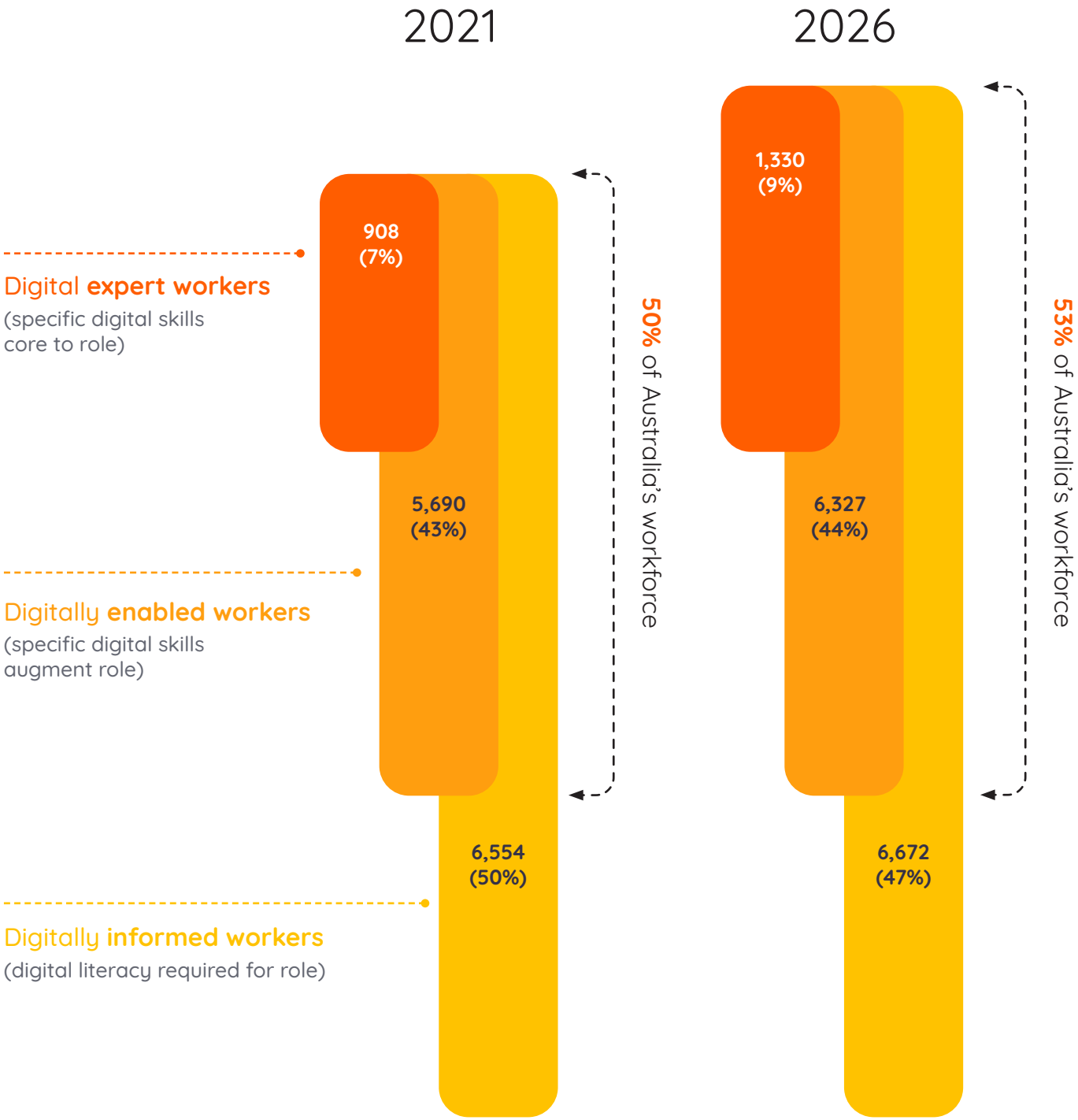
Select occupation group by digital intensity segment, 2016–2021

Occupation group	2021	2026 (Projected)	Projected size of workforce 2026 ('000s)
Retail Managers	Informed	Enabled	236
Real Estate Sales Agents	Informed	Enabled	120
Personal Services and Travel Workers	Informed	Enabled	90
Farm, Forestry and Garden Workers	Informed	Enabled	112
Sales, Marketing and Public Relations Professionals	Enabled	Expert	154
Arts Professionals	Enabled	Expert	61

Source: Nous analysis; Lightcast, ABS
*Notes:
a. See Appendix A for methodology.

Exhibit 4: The growing size of Australia's digital workforce by segment*

Thousands of workers, 2021–2026



Source: Nous analysis; Lightcast, ABS
*Notes:
a. See Appendix A for methodology.

The digital skilling challenge

02

Australia is facing a shortage of over 370,000 digital expert and digitally enabled workers by 2026

Australia's digital expert and digitally enabled workforce is expected to grow by 16 percent to almost 7.7 million workers by 2026. See Exhibit 5. This represents more than 1 million extra digital workers.

While projections indicate there will be a supply of 902,000 workers over this period from higher education, vocational education, and skilled migration, in the same period it is expected 620,000 digital workers will retire.

This results in a shortfall of over 370,000 digital expert and digitally enabled workers by 2026.

The shortfall is most pronounced for digital expert workers, with a predicted ten percent shortage by 2026 in this segment. See Exhibit 5a.

Research published by the TCA in 2022 estimated that to meet Australia's technology sector aspirations by 2030, there would be a 186,000 worker shortage.[2] This comprises mostly digital expert workers ("technology occupations"), with a smaller number of digitally enabled workers ("non-technology occupations") working in the tech sector, such as HR, legal and administrative personnel.

The DSO economy-wide analysis complements the TCA research, reinforcing the earlier analysis of the shortage Australia faces in digital expert workers to fill roles in the tech sector. It also surfaces broader challenges across the economy as industries advance their demand for digital skills, and the implication this has for skilling millions of other workers.

This is consistent with research published by RMIT which found that 58 percent of businesses reported insufficient or out of date digital skills of their workforce.[3] The Productivity Commission's Advancing Prosperity report has also highlighted the growing need for upskilling and reskilling, calling out the rising importance of digital skills as one of the driving factors.[4]

Taking a skills-driven approach to workforce analysis

This report is anchored by workforce analysis undertaken using a skills-driven approach to identify and segment the workforce.

This is distinct from using an occupation and/or industry driven approach because it recognises digital skills are in demand across the economy and patterns of demand will continue to change.

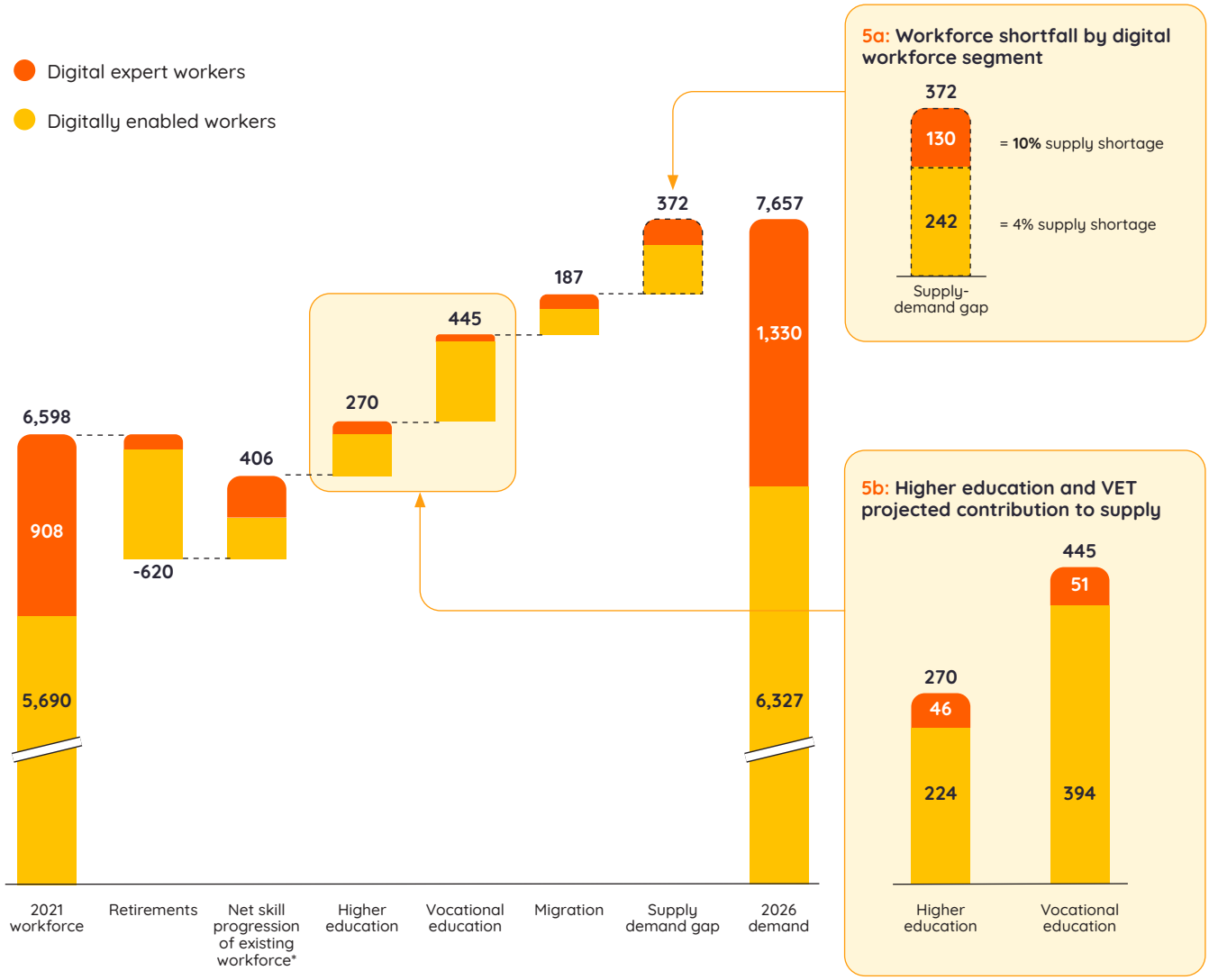
Given the scope of the DSO's remit in skills and training, it was necessary to look beyond the skilling requirements of technology workers and the technology sector.

See Appendix A for further methodological detail.

2. Tech Council of Australia, 'Getting to 1.2 million. Our roadmap to create a thriving Australian tech workforce', 2022
3. RMIT, 'Digital skills gap costing Australian businesses $9 million per day', 2023
4. Productivity Commission, 'Advancing Prosperity', 2023

Exhibit 5: Project supply and demand of digital expert and digitally enabled workers*

Thousands of workers, 2021–2026



Source: Nous analysis; Lightcast, ABS; See Appendix A for methodology
*Notes:
a Totals may not add up due to rounding.
b. Net skill progression of existing workforce comprises workers in occupations that due to increased or decreased digital intensity will change classification between 2021 and 2026. It is assumed these workers will acquire those digital skills on-the-job.

There is an insufficient pipeline of digital workers due to low awareness of digital careers and complex training pathways

The insufficient supply pipeline shown in **Exhibit 5** has two contributing factors; low awareness of digital careers, and complex and fractured career and skilling pathways.

Low awareness

School leavers and people returning to the workforce or transitioning from other roles or industries are important workforce supply sources, alongside migration.

For the school leaver cohort, the DSO worked closely with school leaver service Year13 to identify barriers to awareness and test pilots to improve awareness. Research found that almost half of surveyed school students reported not being taught about digital careers.

The TCA's research highlighted that many Australians don't understand what tech jobs are, or the pathways to pursue them.[5]

Considering the contribution of VET to the pipeline of workers, this is observed in the number of people enrolling in IT related programs in VET over the recent past, 2017 to 2021. Despite the growth of the technology sector and increasing demand for digital expert workers over this period, enrolments have declined by 19 percent. **See Exhibit 6.**

Complex and fractured pathways

The TCA and YouGov research found approximately 40 percent of Australians are open to moving into digital expert roles, but many more (70 percent) cited a need to reskill to make this transition.[5] With complex and fractured pathways, there is a lost opportunity to capture this substantial supply source for the future digital workforce.

Beyond digital expert workers, millions of workers will need to acquire digital skills to meet expectations of digitally enabled workers. However, 83 percent of Australian workers don't feel equipped to learn these digital skills.[5]

Strengthening Skills cited there is a 'lack of clear and useful information' for prospective students to make the right training decisions on what training pathway is required for a job.[6] Clarity and transparency of information about skilling pathways and options have also been highlighted as limiting lifelong learning in *Advancing Productivity.*[7]

Research undertaken by the DSO and Year13 revealed almost half of students were not sure where to start when considering a digital career.[5] This impacts their ability to make decisions about training for digital careers.

This complexity is demonstrated in the volume of underutilised VET IT training programs that have the potential to confuse learners and employers. Over the period of 2017 to 2021 there were 19 active IT training programs in VET, yet over 75 percent of completions in the last five years came from just three programs.[8]

Another nine programs produced fewer than 100 completions over this period; and six programs had 30 or fewer completions. **See Exhibit 7.**

This complexity can contribute to poor alignment between occupational aspiration and education or training pathways. One indicator of this is completion rates, which has been less than 50 percent for the last three recorded years.[9]

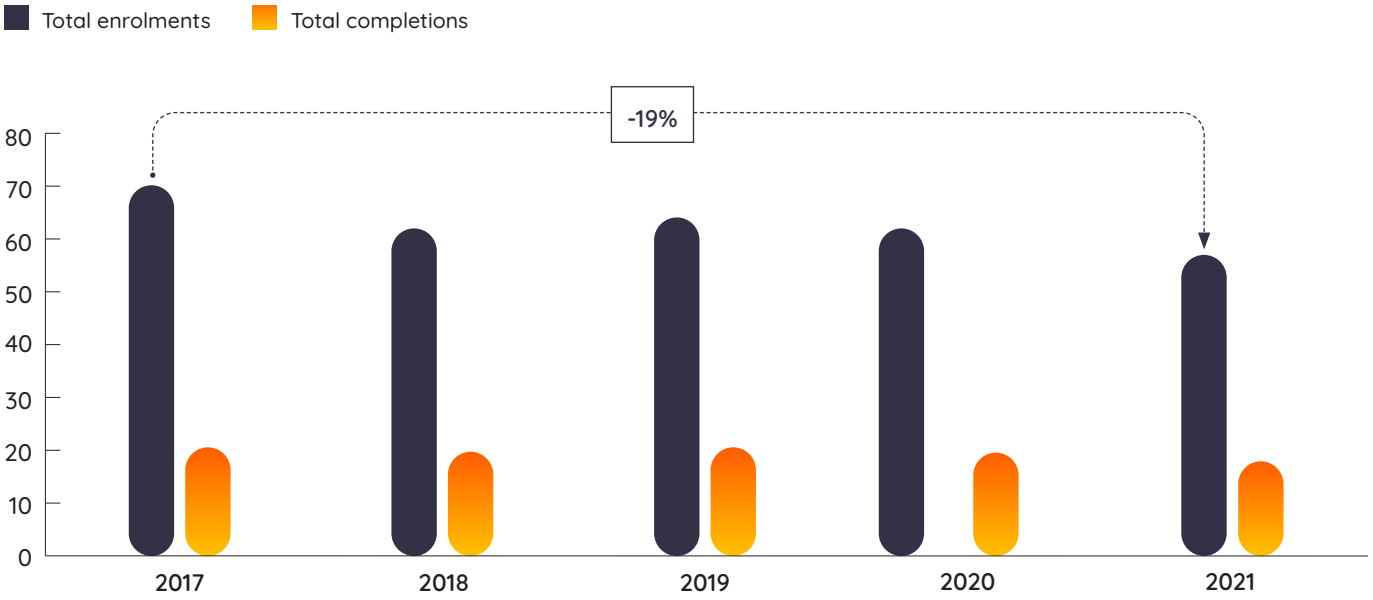
This inefficiency in the training system can slow the pipeline, with productivity impacts across industries.[7]

Simplifying pathways to skill into digital careers and for digital upskilling of the workforce is fundamental to overcoming Australia's digital skills shortfall.

5. Tech Council of Australia, 'Getting to 1.2 million. Our roadmap to create a thriving Australian tech workforce', 2022
6. Joyce, S., 'Strengthening Skills. Expert Review of Australia's Vocational Education and Training System', 2019
7. Productivity Commission, 'Advancing Prosperity', 2023
8. NCVER 2022, Total VET students and courses 2021, NCVER, Adelaide
9. Data available for 2017, 2018 and 2019; NCVER 2022, VET qualification completion rates 2021, NCVER, Adelaide

Exhibit 6: VET IT programs enrolments and completions*

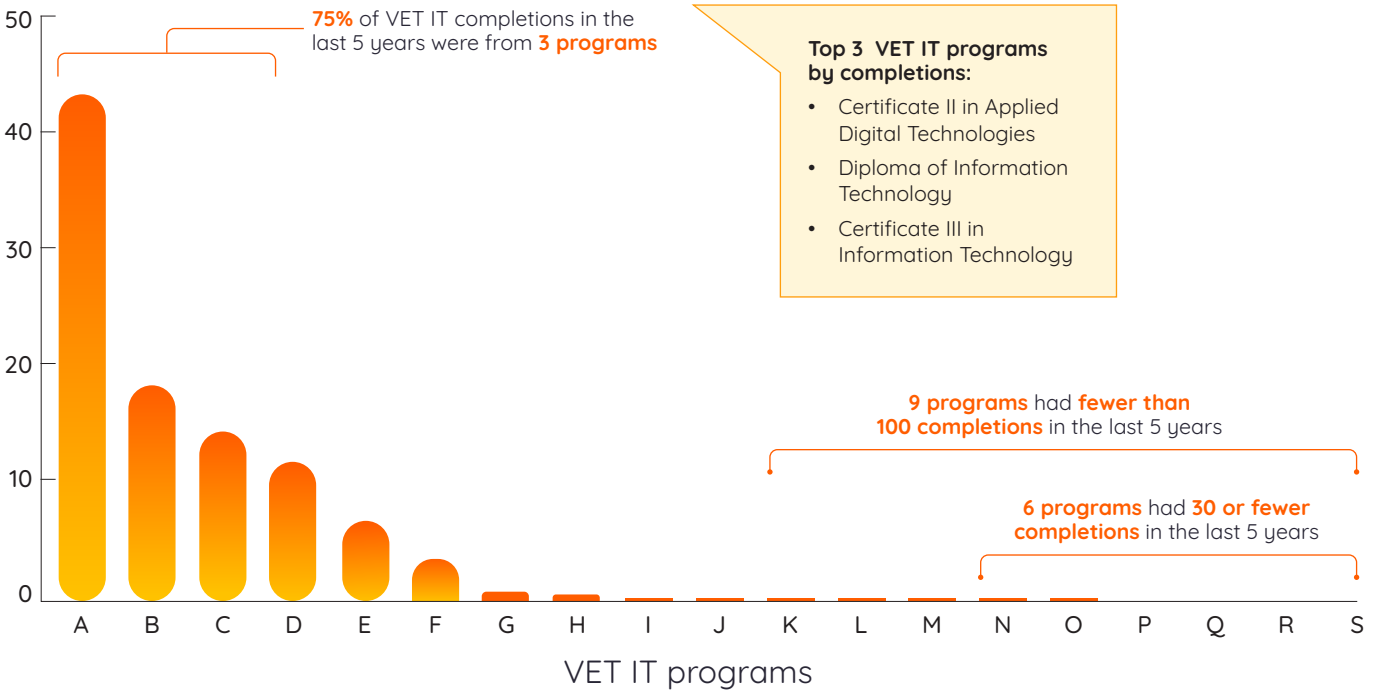
Enrolments and completions ('000) (2017–2021)



Source: NCVER 2022, Total VET students and courses 2021, NCVER, Adelaide.
*Notes:
a. VET programs with field of education "02 – Information technology."
b. 2021 completions are preliminary and will be revised upwards in 2023 to include completions that were advised after the reporting deadline.
c. Program enrolments and program completions cannot be used to derive a completion rate.

Exhibit 7: VET IT completions by program, 2021*

Total completions ('000) 2021, by VET IT program



Source: NCVER 2022, Total VET students and courses 2021, NCVER, Adelaide
*Notes:
a. See Appendix B for program list key.
b. 2021 completions are preliminary and will be revised upwards in 2023 to include completions that were advised after the reporting deadline.
c. Completions in superseded programs have been included under the most recent program.

Learners are not being taught the skills that industry demand, resulting in suboptimal training and employment outcomes

Overall satisfaction and achievement of training goals are high for VET IT qualification completers. However, they have consistently ranked among the poorest in training and employment outcomes compared to other VET fields of education for the last few years.[10] See Exhibit 8.

Despite 62 percent of people completing VET IT qualifications for employment reasons in 2021:

- 1 in 2 learners reported the skills are not relevant to their current job
- less than 1 in 10 reported to be employed in an occupation aligned to the training
- less than 1 in 3 reported improved skills from training
- less than 1 in 2 reported an improved employment status after training.

All of these student outcomes are lower than the VET average.[11] These outcomes also indicate that employers are not valuing the people coming through the VET system relative to other training pathways.

These factors may be contributing to the observed decreasing enrolments numbers and, with completion-rates less than 50 percent, suboptimal completion numbers. See Exhibit 6.

There is also limited coverage of digital skills training in VET non-IT programs, which does not reflect increasing digital skills demands across industries.[11]

A contributing factor to these skills training and industry demand mismatches is the absence of a shared and unified language describing digital skills and standards. This creates confusion and misalignment for learners, employers and the training sector.

This also hinders workforce agility, including the ability to consistently recognise skills obtained outside the accredited training sector.

The training system is not responsive and agile enough to keep pace with the rate of change

Research by the TCA revealed that 90 percent of major tech industry representatives interviewed wanted improvements to training and qualifications.[12] This is evident in the industry's trend towards use of non-accredited training to skill their workforce. See Exhibit 9.

This includes industry proprietary training providing relevant digital skills through short courses or industry microcredentials.

While VET subjects are bundled into short courses, research suggests "in the main, the most popular subject bundles do not appear to be focussed on developing new technology and digital literacy skills, nor are they focused on soft skills. There is a role for governments to stimulate training in this area."[13]

Broad consultation and research across sectors have found that industries lack control over qualification development. Contributing factors include ineffective industry input and ineffective collaboration in determining training content and approaches.[14]

Approaches to facilitate more effective collaboration between registered training organisations (RTOs) and industry can make some progress; however, alternative regulatory, compliance and funding models are key to incentivising and sustaining innovative and responsive training solutions.

The regulatory and policy environment for VET has contributed to challenges of rigidity, outdated qualifications and inconsistencies in quality resulting from inconsistent application of standards.

Translating skilling requirements into training delivery can take several years, which puts the training system at risk of rapid obsolescence.[14]

In addition, the training system's focus and structure around occupations and qualifications rather than skills further contributes to rigidity. It means the system has less flexibility to be responsive to changing industry needs and evolution and creation of job roles across the economy.

This contrasts with a skills-based approach emphasising the development of skills that are transferable across jobs and industries, and the ability to recognise skills regardless of how these were acquired, and how skills are built up through life-long learning.

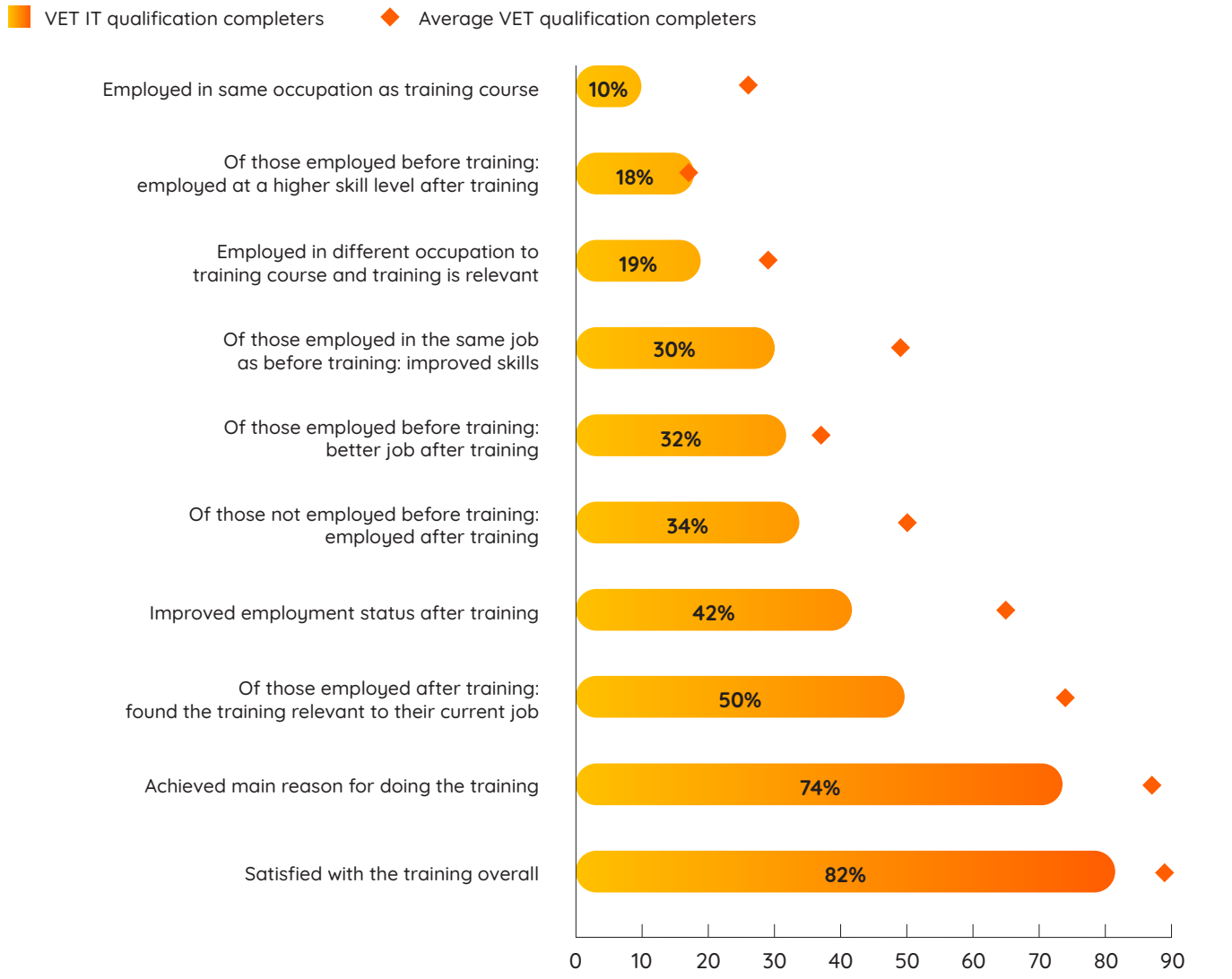
The VET funding model has also heightened focus on qualifications and compliance, leaving little margin or flexibility for innovation to meet industry and labour market needs.

In the context of digital skills, these limitations are especially problematic given the dynamic and rapid pace of change. These issues are also more pronounced in the formal training sector compared to providers of non-accredited training with more flexibility to respond and adapt to changing demands.

10. NCVER 2022, VET student outcomes 2022: DataBuilder, Category, Outcome by Year; Survey fielded in 2022 to completers from 2021
11. NCVER 2022, National VET Provider Collection 2017-2021, NCVER, Adelaide
12. Tech Council of Australia, 'Getting to 1.2 million. Our roadmap to create a thriving Australian tech workforce', 2022
13. NCVER, An analysis of 'micro-credentials' in VET, 2021
14. Joyce, S., 'Strengthening Skills. Expert Review of Australia's Vocational Education and Training System',2019

Exhibit 8: VET Student outcomes for IT qualification completers*

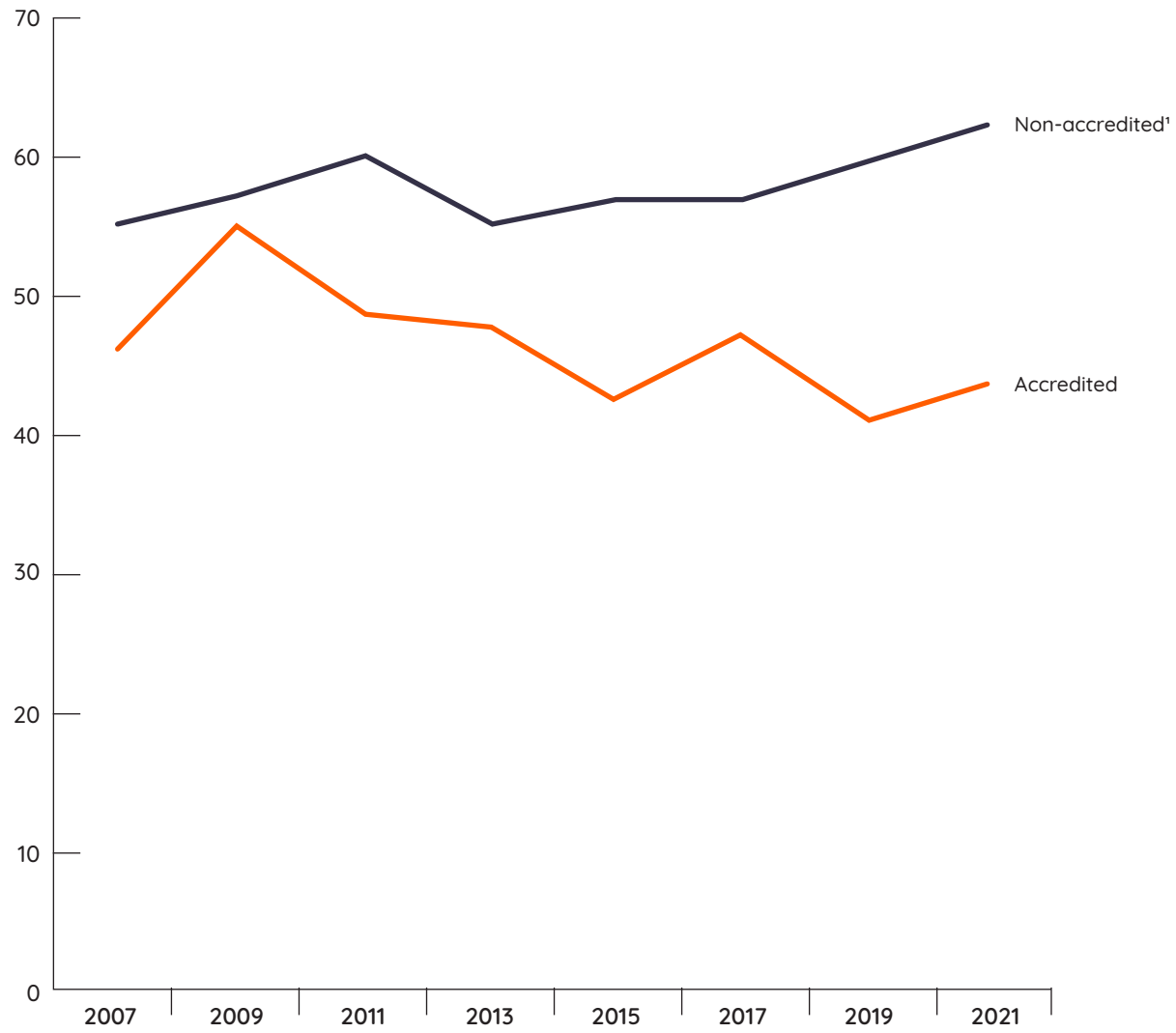
% of qualification completers, 2021



Source: NCVER 2022, Total VET students and courses 2021, NCVER, Adelaide.
*Notes:
a. VET programs with field of education "02 - Information technology".
b. 2021 completions are preliminary and will be revised upwards in 2023 to include completions that were advised after the reporting deadline.

Exhibit 9: Employer use of VET accredited and non-accredited training*

% of employers in the Professional, scientific and technical services industry, use of training, 2007 - 2021



Source: NCVER 2021, Employers' use and views of the VET system 2021, NCVER, Adelaide
*Notes:
a. Non-accredited training includes any training that does not lead to a nationally recognised qualification or award.
b. Whilst several industries require significant digital skills, the Professional, scientific and technical services industry (defined by the Australian and New Zealand Standard Industry Classification (ANZSIC 2006)) was selected as a proxy for digital skills training as it is one of the most digitally intense industries. This industry covers a range of training that is not limited to digital skills, so caution should be used when drawing conclusions about the proportion of Accredited vs Non-accredited training in relation to digital skills specifically, using this data.
c. The values presented for 2007 have high margins of error and therefore need to be interpreted with caution.

The DSO's actions to address challenges

03

The DSO consulted and collaborated with industry to develop industry-led and informed responses to advance digital skilling in Australia

It is evident that demand for digital skills is evolving, dynamic and increasingly ubiquitous. It is also evident that current approaches to accredited qualification-centric skilling is not meeting the needs of learners or industry.

In an economy with on-going skill shortages the focus needs to be on skill possession, less on how skills are acquired, and how skills are built up through life-long learning.

Accordingly, the DSO sought to trial approaches to test the following hypotheses:

- Re-orientating training from a qualification to a skills focus enables more responsive and adaptable skilling.
- Employer-led approaches to identifying skilling needs and collaborating on skilling responses increases training relevance and improves learner outcomes.
- Digital Skill Standards describing skills and levels of proficiency helps align industry, learners and the training sector on skills and skilling expectations.

Overall this approach seeks to create a framework that can underpin a more adaptable and outcome focused skilling ecosystem.

In consultation with industry, the DSO established a multi-channel approach to address the identified digital skilling challenges and test the skilling hypothesis. See Exhibit 10.

1. Established forums for collaboration and consultation with industry partners

The DSO put collaborative industry engagement at the centre of its work. This collaboration and consultation were with the objectives of :

- Gathering evidence and intelligence to understand more about industry issues
- Amplifying industry and employer input into ideating and testing solutions and new models
- Elevating the conversation and engagement around an employer-led, skills-based approach to digital skilling
- Establishing a single industry forum to listen to and work with industry to reduce further fragmentation and complexity.

The Digital Employment Forum (DEF) was established as a joint venture between the Tech Council of Australia (TCA) and the DSO. The DEF brings together major tech employers and educators to transform the way Australia attracts and trains workers.

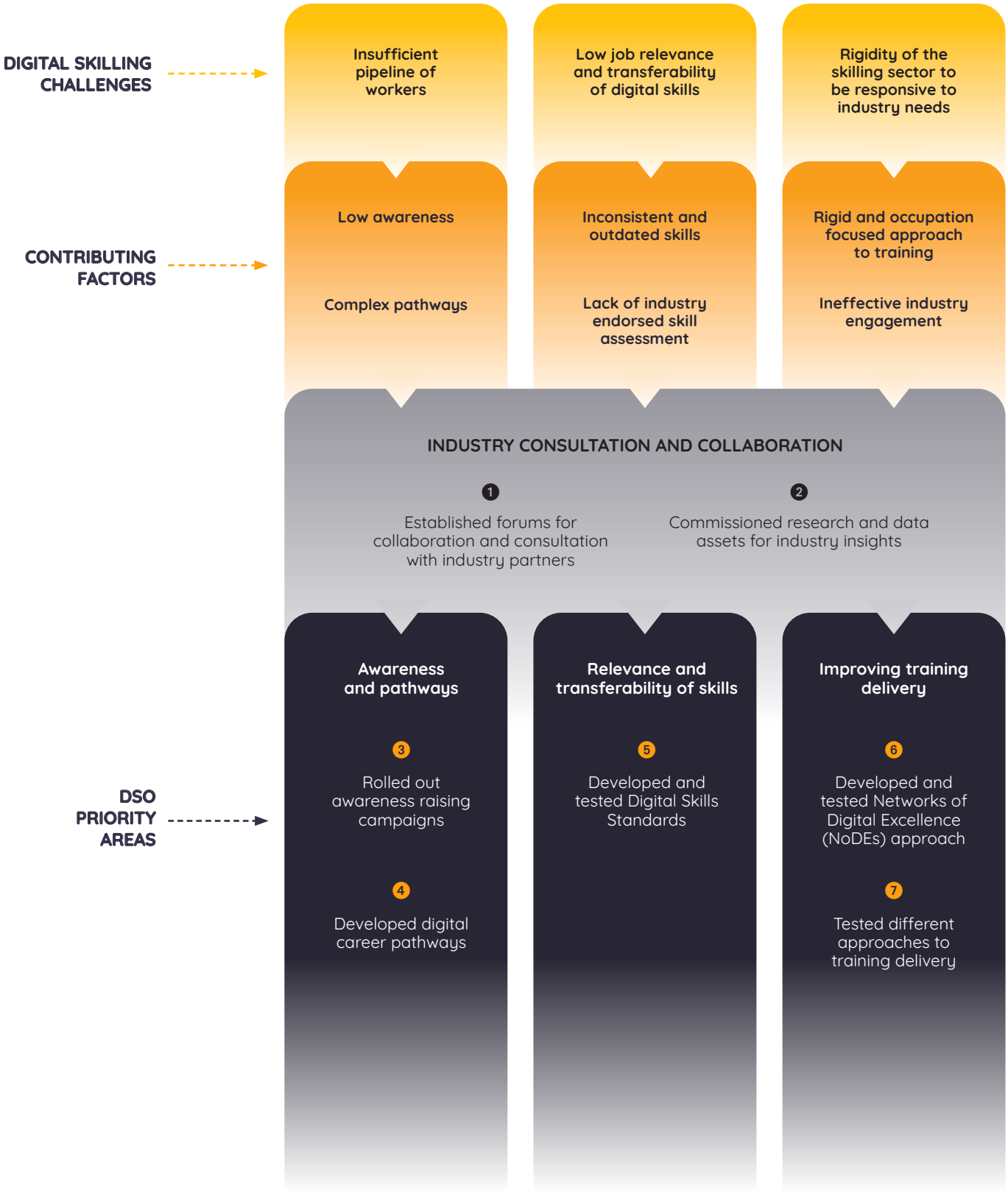
Other forums established to facilitate collaboration and consultation included employer working groups and DEF working groups, as well as ongoing industry and government engagement. Formal collaboration with the DEF and the TCA aided in the streamlining and simplification of engagement and added to the DSO's standing in the sector.[15]

Evaluation and research regarding the DSO's collaboration and consultation activities found the DSO's convening power to be a distinctive value proposition – bringing employers and training providers together at a micro level through trials, and facilitating macro level working groups and other events and engagements.[15]

This has highlighted the potential that comes from strong leadership and how much this is valued across governments, industry and training providers.

15. dandolopartners, Evaluation of Digital Skills Organisation: Summary of Findings 2023

Exhibit 10: Digital skill challenges and DSO focus areas



Case Study 1 provides an example of DSO facilitated industry and government collaboration.

The DSO tested and tried new approaches, with varying levels of influence and success. For example, events such as industry panels created good engagement and amplification of the DSO's message, in contrast to other less successful approaches such as podcasts. [16] The DSO identified these shortcomings and responded accordingly.

In future, it will be important for the Finance, Technology and Business (FTB) Jobs and Skills Council (JSC) to be increasingly selective on which events, engagements and communications it participates in, and which stakeholder groups have been more effectively engaged.

Overall, while stakeholders were positive about the DSO's potential to achieve policy impact, this was limited. Evaluation findings highlight that, despite limited progress to date, the DSO and, therefore, the JSC for FTB should not shy away from continuing to focus on system change, recognising policy change takes broad consensus, time and long-term commitment.

2. Commissioned research and data assets for industry insights

Employer and industry input have been key to helping shape the digital career pathways, standards and RTO support models. See Exhibit 10. It has also resulted in delivery of a range of activities and important data and research assets, including:

- **Data cube on digital skills:** The Nous Group data cube combines ONET, NCVER, Lightcast, and ABS data sets, amongst other sources, to provide faster and deeper insights to enable a data-driven strategy. It is an asset for maintaining current insights about the supply and demand for digital skills, identifying emerging issues, and informing future strategies.
- **Reaching 1.2 million (report):** The DEF commissioned research informs planning for meeting the potential of Australia's tech sector through a thriving workforce.[17]
- **Growing Australia's Digital Workforce:** An articulation of Australia's digital challenges and required changes (this report).

Recommended future focus areas for industry collaboration and consultation

1. Build and sustain engagement and representation from industry, unions, government and training providers
2. Work with JSA and other JSCs to develop a Digital Workforce Strategy

See chapter 4 for further detail

16. dandolopartners, Evaluation of Digital Skills Organisation: Summary of Findings 2023
17. Tech Council of Australia, 'Getting to 1.2 million. Our roadmap to create a thriving Australian tech workforce', 2022

Case Study 1

Partnership and purpose drives scale and efficiency

The digital skills training space comprises many initiatives across Commonwealth, state and territory governments. Although all focussed on digital skills training, these are often developed independently and in different ways. This has prevented digital training programs from scaling up.

To begin to change the way in which digital skills are designed, delivered and assessed, the DSO has acted as the bridge between governments, industry, and key training providers to find a more coordinated approach.

Off the back of the 2022 Australian Government's Jobs and Skills Summit, the DSO brought together over 40 leaders, from across the states and territories, to explore opportunities for collaboration. Topics included how to increase awareness of job opportunities in technology and how to improve education, training products, and pathways. The outcome was an agreement to get behind three initiatives in 2023 and make them more efficient, scalable and easier to deliver successfully. The first is focussed on digital literacy.

"The roundtable has played an important role at this critical time. It has been an opportunity to build upon the work of the 'Getting to 1.2 million' report and enabled identification of issues and opportunities for national action. Only by working together can we truly hope to scale up proven programs and work on solutions."

NSW GOVERNMENT

Trish Mullins
Director Skills Policy
NSW Department of Education

"The responsibility for developing digital skills cannot be solely placed on any one group, be it government, industry, education institutions or community. Instead, it is essential that these groups come together and collaborate to surface best practices and practical solutions to address the issues. By working together, we can build the digital skills needed to thrive in the modern economy and ensure Australia remains globally competitive."

Microsoft

Tiffany Wright
Director Education
Australia Microsoft

To increase the volume of people with digital skills, the DSO delivered awareness raising activities, and developed digital career pathways

3. Rolled out awareness raising campaigns

The DSO delivered a range of awareness raising campaigns with a variety of audiences to increase the pipeline of workers with digital skills from the school leaver cohort and under-represented groups.

This encompassed broad reaching media and awareness raising, as well as more targeted trials.

For broader awareness raising, the DSO provided content and talent for the 2022 National Skills Week podcast and website which received over 100,000 views. The DSO also held a number of digital career showcases, reaching nearly 20,000 people.

Targeted trials included the **DigiSkills Academy trial**, which reached 1.7 million young people through 600 schools. There were 40,000 unique users on the academy site and 4,000 course completions. Young people completing the course demonstrated improvements in their view and understanding of the digital sector and were twice as likely to consider a digital career after completion.[18]

Case Study 2 and Case Study 3 provide examples of awareness raising initiatives.

4. Developed and tested digital career pathways

Streamlined and transparent pathways are critical for prospective learners to become skilled workers.

To address the shortfall of the existing system, the DSO worked closely with employers to develop job profiles, which underpin digital skill pathways to jobs.

These profiles set out clearly the digital skill requirements for jobs, utilising the DSO digital skill taxonomy and standards (see Appendix A for further detail on the skill taxonomy and standards). These then inform learner pathways for acquiring these skills through different training avenues.

Learning is aligned to the minimum skills pathway required to obtain the desired job role. Further learning enables development of skills through lifelong learning rather than requiring a predetermined qualification. This can be a complementary pathway to a qualification. See Exhibit 11.

The DSO tested and refined these pathways in real-world scenarios through trials with employers and RTOs. The focus of these pathways to date has been on digital expert roles, where the projected worker shortfall is most pronounced.

Pathway assets were developed to enhance navigation of the different ways to digitally upskill into digital careers.

For example, one early trial was the SkillUp pilot. DSO and Skill Finder partnered to offer employers and employees across industries an easy way to identify digital skills gaps and find courses that provided them with new practical digital skills.

The pilot did not reach its potential, with challenges establishing employer engagement and maintaining the list of courses. Key lessons from the trial were the importance of employer and employee alignment on digital skilling needs, and curation of training options to minimise further confusion.

More recently, industry co-developed job profiles and skilling pathways have been brought together in an interactive digital expert jobs pathway map, which aims to make it easier for learners, employers and RTOs to navigate skills pathways. See Case Study 4.

This is a new and important asset to help interested people understand how they might enter and build a career as a digital expert worker. The pathway map demonstrates that numerous entry opportunities exist for digital careers through disaggregated job roles, within connected skills pathways enabled by technology.

These vary based on acquired knowledge and skills, aptitude, desire, and interest. Some of the acquired knowledge and skills are transferable to different job roles and entry points, e.g., common core skills or human skills.

This asset also aligns expectations of employers and learners on the digital skill requirements of job roles, and the associated pathways to acquire these roles.

The impact of streamlined pathways on the digital skills pipeline will rely on engagement and uptake from learners, employers and training providers at scale. The JSC will also need to consider efficient ways to ensure pathways remain current and reflective of changing industry needs.

As firms and industries restructure and job roles rapidly change, the linking in VET of qualifications to occupations is becoming more challenging, and less reflective of industry demands.[19]

Recommended future focus areas for awareness and pathways

3. Develop and implement a digital careers campaign
4. Continue to identify and define digital career pathways

See chapter 4 for further detail

18. dandolopartners, Evaluation of Digital Skills Organisation: Summary of Findings, 2023
19: Skills Development Scotland, Skills for a Changing World: Strategic Plan, 2022-27.

Case Study 2

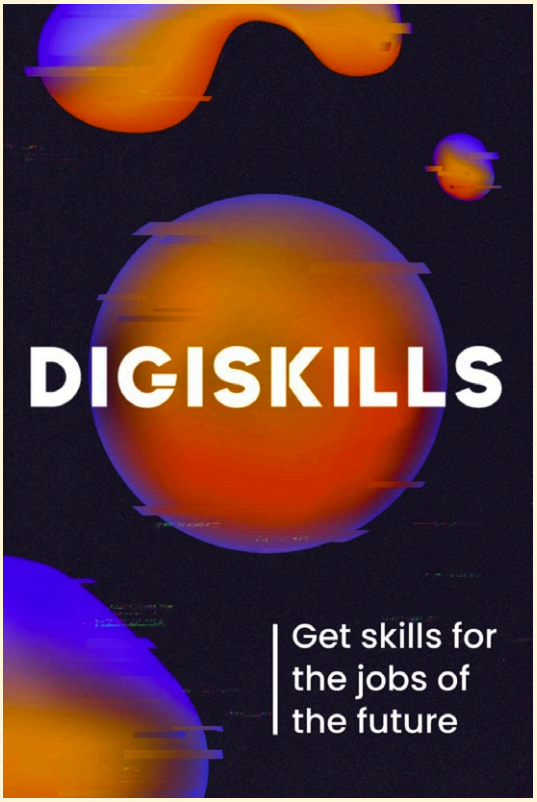
Pilot boosts consideration of digital careers by 29%

Every young Australian has been born into the age of the Internet, PCs and smartphones. Despite this, many don't think of a career as a digital professional or know where to start.

Therefore, the DSO ran a pilot for young Australians aged between 17 and 24 to showcase what it is like to have a career as a digital professional.

Run in partnership with school leaver service Year13 and presented through a series of online courses and social content, it equipped young people with the knowledge required to pursue a career as a digital professional.

The program resulted in a rise of 29% in the consideration of digital careers, from 27% to 56%, amongst the 4,200 participants. In addition, 95% of the participants reported their understanding of digital careers and of the technology sector had improved somewhat or significantly.



"It [DigiSkills] taught me there are multiple pathways and digital skills can actually involve more than just software and programming."

21 year-old participant
Queensland Metropolitan

"This DigiSkills Academy course greatly impacted my understanding of the industry, as before I was uneducated and quite stagnant to the concept of working in the digital industry."

16 year-old participant
Victoria Metropolitan

Case Study 3

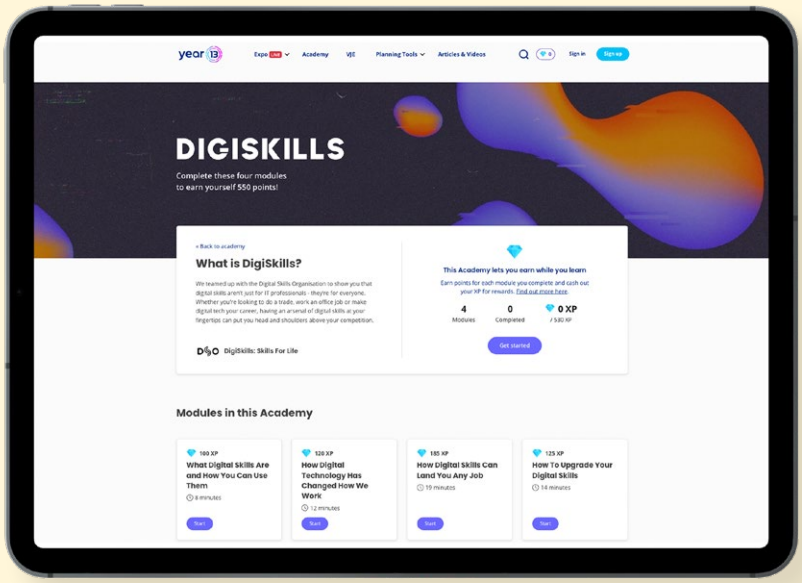
Students inspired by Tech Expo

Informing and inspiring young people to consider a technology career is vital for Australia's economic future. A recent survey found 45% of students say they did not learn enough about digital skills in high school – despite the ever-increasing demand for technology across the Australian economy.

For this reason, the DSO partnered with school leaver service Year13 to create Tech Expo. Its aim was to inspire young people with the opportunities available to them in technology, and the pathways to get them into great tech careers.

Tech Expo provided rich digital and social content that showcased the breadth of opportunity in technology as well as the need for digital skills in every industry.

The tech expo received over 15,500 visitors and 1.3 million reached on the audience's preferred channels - Facebook, Instagram and TikTok.



"Love hearing real stories from people that have different paths and showing there are such a range of careers in tech."

Student

"This is awesome, I had no idea about the different options."

Student

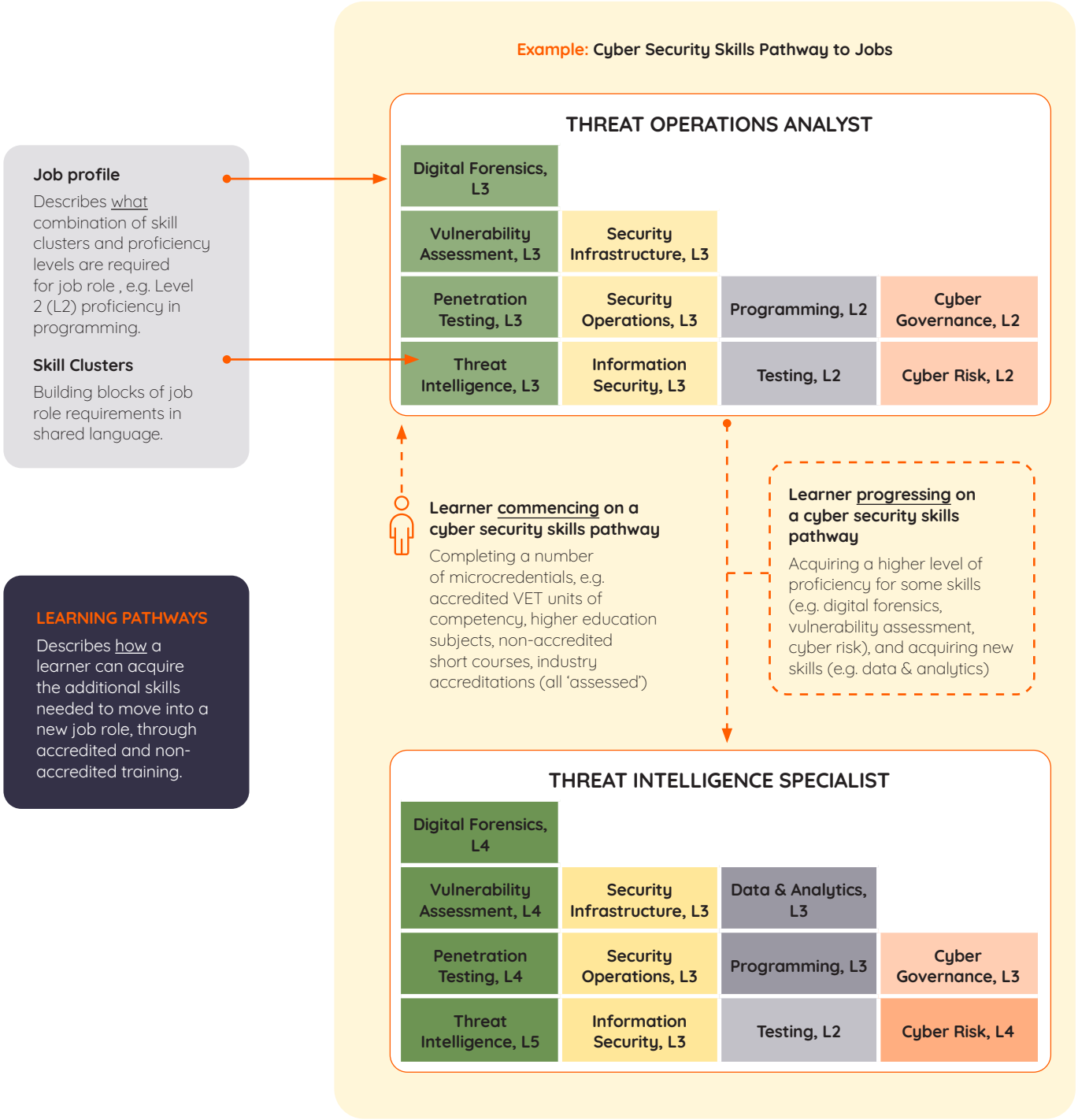
"Love it, an easy hub with real and practical advice for students."

Careers Adviser

Exhibit 11: Digital skills pathway to jobs

To address the shortfall of the existing system, the DSO worked closely with employers to develop job profiles, which underpin digital skill pathways to jobs. See Case Study 4.

These profiles set out clearly the digital skill requirements for jobs, utilising the DSO digital skill taxonomy and standards. These then inform learner pathways for acquiring these skills through different training avenues to move into and progress between job roles.



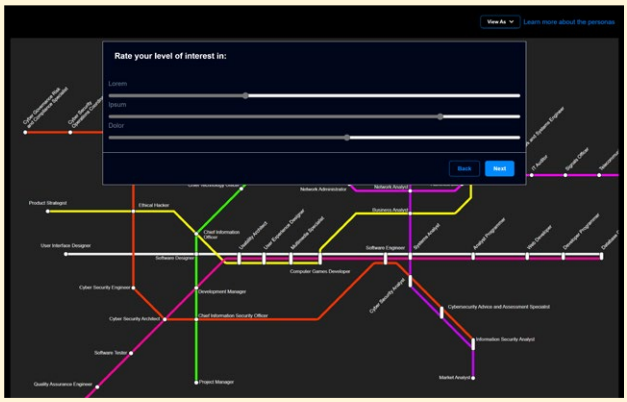
Case Study 4

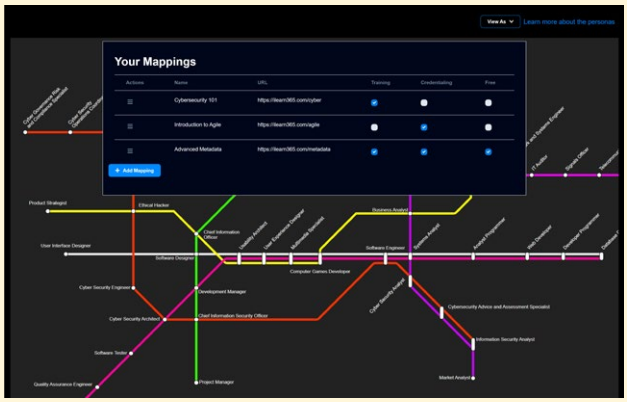
Innovative approach helps get tech careers on track

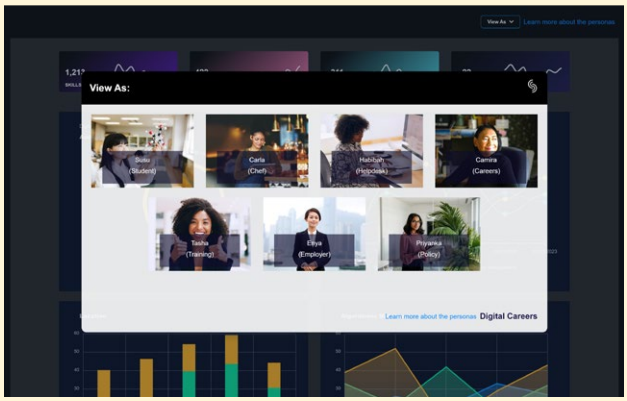
For many careers it is possible to map a typical pathway, along with appropriate qualifications and entry level jobs. With tech, and other careers however, it is less clear and unfamiliar terminology can be confusing.

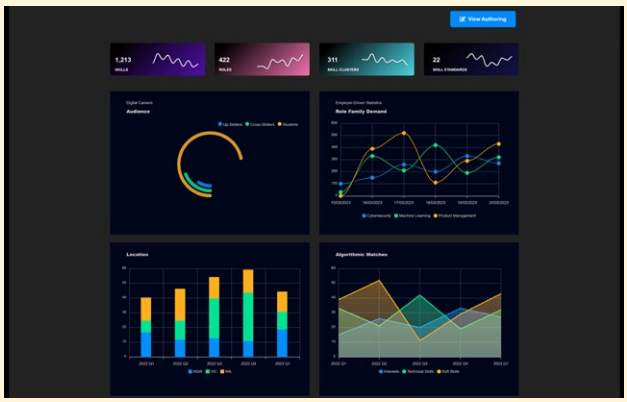
Therefore, to help those wanting a tech career, DSO defined roles, skills and pathways, working with industry and TAFEs. The career information is shared via a dynamic visual that mimics a metro map, encouraging students and career transitioners to explore their options in an engaging way.

The innovative resource, co-created with SkillSchema, was tested with students. There was an immediate connection with the dynamic metro map and tech jobs as stations. All were intrigued as to how to navigate the lines and access the job role information.









"Students and career counsellors find tools like this valuable. There's a good opportunity to broaden this tool to include jobs that aren't specialist tech roles, but still require an element of tech and digital skills."

Mark Samaha
Director of Customer and Stakeholder Relations
TAFE NSW
Western Sydney Region

"Early findings from the research suggests the pathways model has clear potential in bridging the gap between industry and education and training; building awareness of digital jobs and pathways that young people currently do not discover until after they enter the workforce."

Madelyn Sands
Research Specialist
YouthInsight (Student Edge)

To improve relevance and transferability of skills, the DSO developed the Digital Skills Standards

5. Developed and tested Digital Skills Standards

Through the development of industry informed Digital Skills Standards, the DSO has begun the development of a common language to provide a link between learners, industry and training providers (both registered and non-registered).

The DSO's testing of different approaches to training delivery found that training outcomes were positive when employers had the tools to accurately describe their digital skill needs.

Development of Digital Skills Standards

The Digital Skills taxonomy and Digital Skills Standards were developed, tested and iterated in collaboration with industry partners, and grounded in research-based learning and skilling models. This included working with the IBM Talent Transformation Team, and through the ACT Cyber Hub trial (standards for Cyber Security) and the Cremorne trial (standards for Software Development).

One of the challenges in the digital skills space is the range of frameworks available, which can lead to confusion and inconsistency. These frameworks were a key input to establishing a standard way to describe skills at varying levels of proficiency.

The Digital Skills Standards comprise seven digital skill job families, with each encompassing skill clusters and associated skill standards. Regardless of the type of training provided, a skills standard represents an industry-determined level of proficiency for skills in relation to a job function. See Exhibit 12.

The DSO has developed skill standards to be applicable in articulating requirements for digital expert workers, as well as for digitally enabled workers and digitally informed workers. As shown in Exhibit 12, the digital skill job families include digital literacy, digital fluency and core digital skills alongside more advanced specific skill domains.

The digital literacy standard is an important foundation for addressing the digital literacy shortfall that exists for many workers that limit productivity and can contribute to inequities in opportunity. See Case Study 5.

To date, this standard has been trialed through the Batchelor Institute Digital Literacy Training for remote communities. See Case Study 6.

Benefits of shared standards

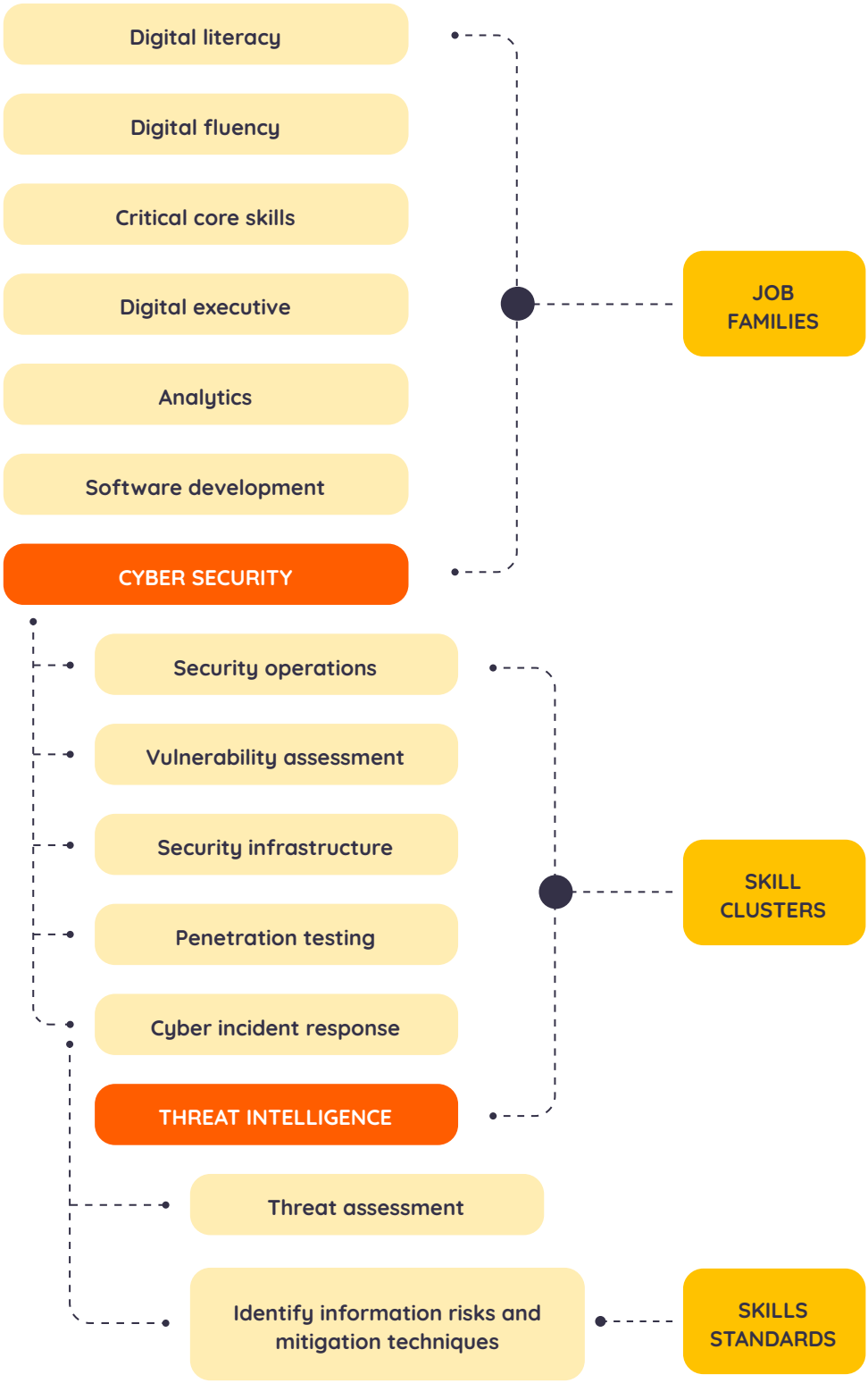
To enable a more efficient, effective and innovative training ecosystem, the established skill standards are agnostic about how people are trained, instead focused on the outcomes of the training process. This means the standards can operate within the existing training system and continue to be relevant as the training ecosystem and methods evolve.

The skill-focused approach has several key strengths that are important in establishing a sustainable and adaptable digital workforce in Australia:

- Uses external instruction to assist skill development, mainly in the form of work integrated learning.
- Skill development progresses through five proficiencies: novice, advanced beginner, competent, proficient, and expert (Dreyfus Model of skill acquisition), rather than applying a framework based on competent or not competent.
- Skills required for job families are defined within Digital Skills Standards to align employers, training providers and individuals on a common skills taxonomy, rather than relying on existing qualifications aligning with changing job roles.
- Uses practice-based dynamic work-integrated assessments reported against Digital Skills Standards (skill and achieved proficiency of the skill), rather than rely just on static industry informed practice.
- An assessment of the proficiency level of skills in a work setting, irrespective of how the skill was developed, demonstrating the ability to apply the skill using any available and applicable method rather than taking a purely prescriptive approach to assessment.

Exhibit 12: Taxonomy of skills-based approach*

Taxonomy and structure[1]



Description

Skills standards have been developed for 7 job families

Skill Clusters depict groups of related skills, mapped to a **job profile**. These skills are highly transferable. **Assessment** is undertaken against a skills cluster to determine the fit for the job profile

A skill standard is defined by a skills statement with levels of proficiency. These skills are then grouped into skills clusters.

*Note: Sample of skills clusters and skills sections shown for demonstration purposes. Source: DSO Skills Standards.

Case Study 5

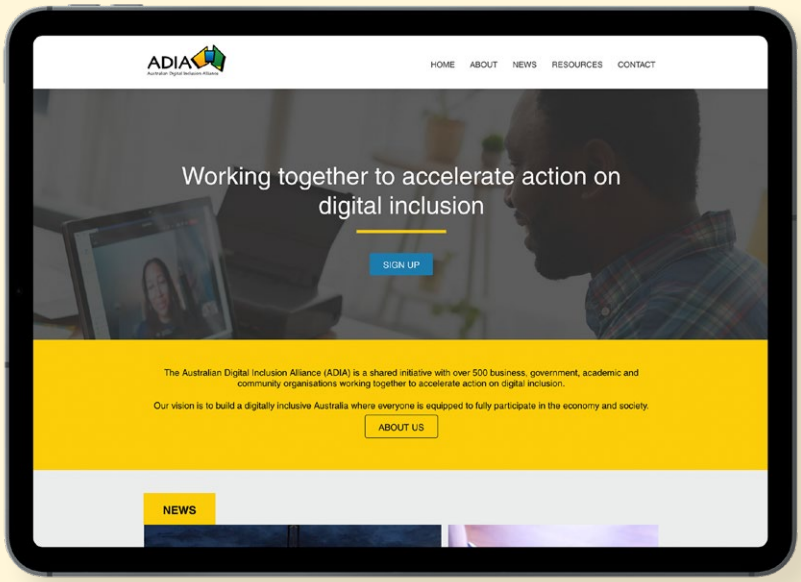
North star guides the way to digital skills for all

The Australian Digital Inclusion Alliance and DSO have joined forces with industry, community, training providers, government and unions to establish a single benchmark for the skills required to be digitally capable.

The term 'digital literacy' means different things to different people, and currently, there is no widely accepted standard to unify around.

A simple national benchmark that defines what it means to be digitally capable will provide the 'North Star' to close the nation's digital literacy gap by identifying learning pathways for individual cohorts to reach the benchmark.

This will help to inspire all Australians to get the digital skills needed to fully participate in the community, the workforce and in all aspects of life.



DSO DIGITAL SKILLS ORGANISATION

"Our vision is an Australia where everyone is equipped to meaningfully participate in the economy and society. Our partnership with DSO takes us towards a national common language around digital capability, and a shared understanding of what it means to have the essential digital capabilities to engage online, access services and opportunities."

Ishtar Vij
Convenor
Australian Digital
Inclusion Alliance

ADIA
Australian Digital Inclusion Alliance

Case Study 6

Pilot helps First Nations peoples

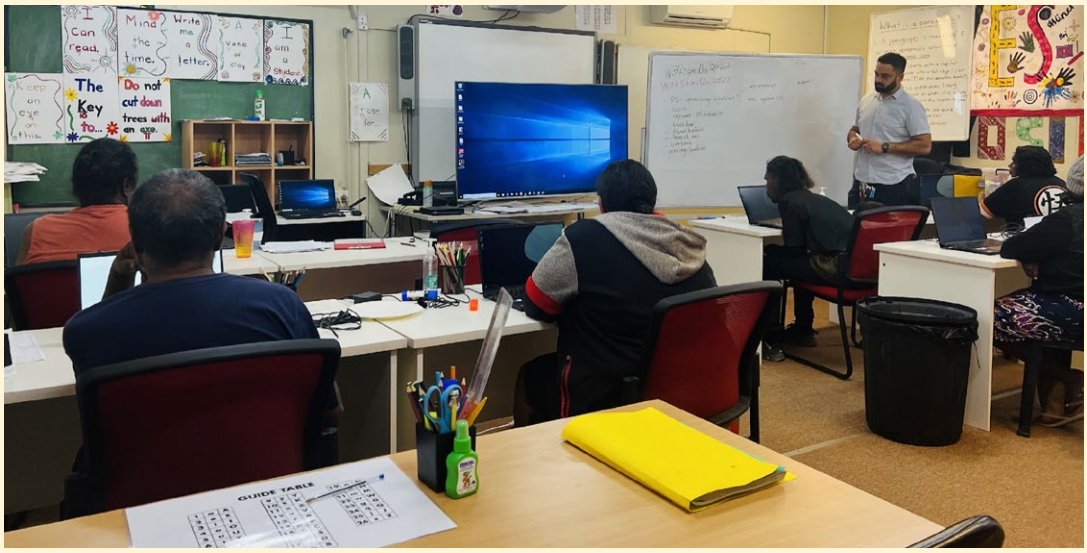
The Batchelor Institute partnered with the DSO to run a pilot program to teach digital literacy skills to First Nations peoples in remote communities, who can face some of the greatest challenges in terms of confidence and skills for digital inclusion.

This pilot commenced with engaging stakeholders like the Central Land Council and community groups at Santa Teresa to identify needs to ensure the most appropriate training model was delivered in the area.

The pilot program was designed to increase the digital literacy of residents in remote areas of the Northern Territory. It was completed by 32 students in Santa Teresa and Tennant Creek.

After completing the course, students were better equipped to use computers, mobile phones and tablets - skills that not only support everyday tasks like banking transactions or medical appointments, but also enable further study or work prospects.

The lessons from this pilot model are expected to be expanded to other remote Territory communities.



"Fundamental digital skills are a step towards learning lots of other new things. They can improve confidence in people from First Nations and remote communities to use technology for everyday life, learning and work"

Palwinder Grewal
Batchelor Institute lecturer

Learnings

Overall, through trials and testing, stakeholders have engaged with the Digital Skills Standards, recognising the problems in the existing system and buying into the industry-led skills-based approach the DSO advocated for as best meets employer needs.

The impact of the standards relies on a network effect, i.e. their value and benefit will increase as more stakeholders, such as employers and training organisations, use them. As a result, industry support and implementation is critical including for delivering on employment outcomes. There are some key learnings from these trials that will be important to maximise the impact of the Skills Standards.

There remains some confusion about the Standards, including what these are used for, and where these fit within and how these are intended to complement and/or substitute other parts of the skills ecosystem.

Evaluation findings have distilled important considerations for potential future work of the JSC for FTB, including:

- Emphasis and clarity regarding what the Skills Standards (and other relevant DSO responses) do and do not do, and how this fits in with the broader skilling system and the Australian Skills Classification
- Development of use cases to demonstrate applicability and value of the Digital Skills Standards to different stakeholder groups
- Identifying options to 'productise' and market the Digital Skills Standards
- Considering mechanisms for wider adoption (e.g. providing scaffolding tools to enable RTOs to use the standards without support).[20]

There are also important sustainability considerations, such as those related to maintaining the relevance, accessibility, and usefulness of the standards – as well as who will be responsible for these actions.

Recommended future focus areas for improving relevance and transferability of digital skills

5. Establish and measure a national standard for workplace digital literacy
6. Trial and evaluate Digital Skills Standards at scale

See chapter 4 for further detail

20. dandolopartners, Evaluation of Digital Skills Organisation: Summary of Findings, 2023

The DSO supported RTOs by testing new approaches to industry collaboration and improving training delivery

6. Developed and tested Networks of Digital Excellence (NoDEs) approach

The NoDE approach was developed in response to identified challenges with training sector collaboration with industry, drawing on best practice experience learned by Generation Australia. See Case Study 7.

The approach involves training organisations working with employers to co-design digital skilling solutions, and was tested through the Canberra Cyber Skills trial. See Case Study 8.

The NoDE workshop process is primarily used as the approach to collaboration. See Exhibit 13. It also builds on best practice being delivered across Australia such as the TAFE Cyber network and Victorian Tech Schools which seek to ignite interest and inspire achievement in STEM.

The NoDE approach supports training providers in collaborating with employers to develop training strategies and solutions that align with the specific skill requirements of the industry. By co-designing the training solutions, trainers and educators are able to leverage their expertise to create personalised learning pathways that cater to the unique needs of learner cohorts to develop skills for industry.

Networks of Digital Excellence (NoDEs) are based on the following key principles:

- **Collaboration:** Facilitating partnerships between training providers and employers
- **Co-design:** Developing skills pathways tailored to specific job roles and to cohort training needs
- **Customisation:** Adapting job-role profiles to the local context
- **Tailoring**: Designing network-based training solutions that meet actual skill needs
- **Skills alignment:** Emphasising the alignment of skills with job requirements, beyond qualifications
- **Sharing:** Training providers and employers are willing to share information, insights, and best practice within a NoDE and across NODEs
- **Velocity** – Accelerating digital skills development and employability

The listed principles form the foundation of digital excellence within and across NoDEs, promoting effective collaboration and skills development.

Early trial results suggest NoDEs have the potential to form a network of networks, allowing solutions and strategies from one NoDE to be used in another. This could lead to the creation of an "off-the-shelf" blueprint that can be used by training providers and industry partners to quickly address local skill needs.

One of the key benefits of this approach is that it allows training providers to showcase their expertise through input into the creation of training products, materials and processes.

Overall, the NoDE approach provides a powerful framework for creating effective and relevant training solutions that can help bridge the skills gap in various industries.

Case Study 7

Networks of Digital Excellence support RTOs

A key objective is to make it easier for registered training organisations (RTOs) to deliver relevant digital and technology skills training. To do this the DSO partnered with Generation Australia (GA), an education to employment provider.

The goal was to create a formal process for the DSO's future pilot projects with RTOs. This meant bringing together GA's experiences with the activities, outputs and lessons learned from the DSO's completed projects.

Six RTOs trialed the method and process as part of a course to teach people how to be a threat operations analyst or a software developer. It was also used by a large organisation upskilling customer facing staff.

Based on the trials and RTO feedback, GA has supported the evolution and expansion of the process into Networks of Digital Excellence (NoDEs), to support RTOs delivering employer-led skills-based approaches. Plans are now in place to scale NoDEs to support RTOs and surface agile and adaptable forms of training.

"We are part of a global network of Generation affiliates, which have created employment pathways for 70,000 people around the world. We see a lot of different training approaches and are confident that Networks of Digital Excellence can become a class leading capability which bring value to RTOs."

Malcolm Kinns
CEO
Generation Australia

Generation AUSTRALIA

Case Study 8

'Earn while you learn' approach to help close cyber skills gap

The cyber threat is becoming more sophisticated every year and the cyber security sector is suffering from a skills deficit.

DSO joined forces with the Canberra Cyber Hub to create the Cyber Security Work Integrated Learning Pilot. Co-designed with industry, its aim is to help close the skills gap between training, education and the workplace – delivering job-ready employees to employers, fast.

The pilot offers Canberra cyber businesses the opportunity to work with capable interns, some holding security clearances and with prior learning in the industry, to expand their business offerings and Canberra's cyber workforce.

For interns, it provides a combination of on-the-job training and world-class training, enabling them to earn while they learn and get certified to secure their future.

The pilot started in April 2023. Demand from employers and interns exceeded the places available by more than 100%.

"This is proving to be a great opportunity for companies to access funded cyber training so they have staff with the right skills to hit the ground running. This training is skills led and uses micro-credentials, which we think is the way to go"

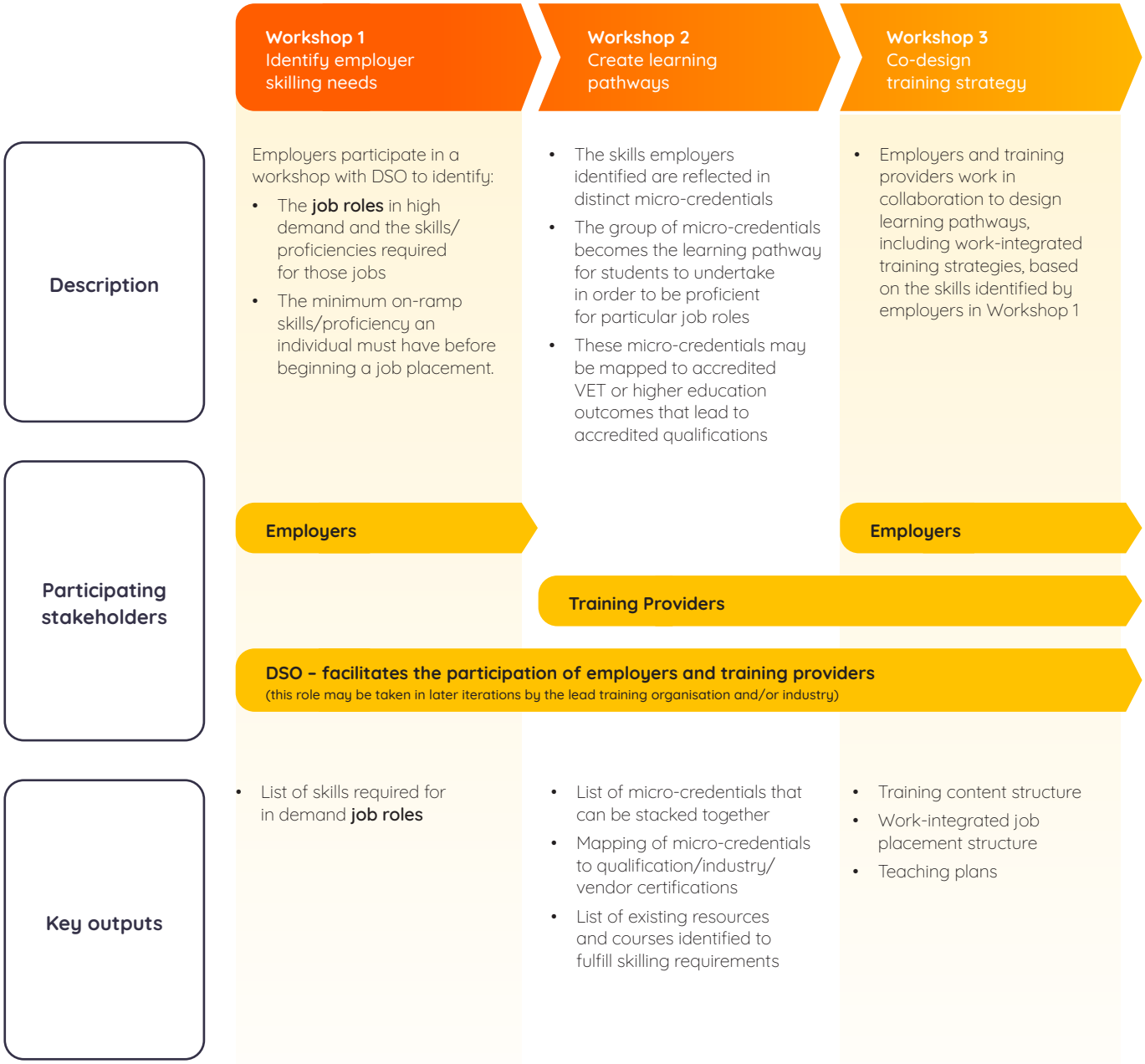
Karen Schilling
Director
Canberra Cyber Hub

CANBERRA CYBER HUB

Exhibit 13: The Networks of Digital Excellence (NoDE) approach

The NoDE approach in practice.

Excellence in Digital Skilling requires the close collaboration between employers and training providers to ensure the skills trained are relevant. This is achieved through the three workshop approach .



7. Tested different approaches to training delivery

To build an evidence base about effective training delivery for digital skilling, the DSO tested different approaches.

Utilising the skills standards as a uniform measure of digital skill acquisition, the effectiveness of a range of training delivery modalities were tested through trials, including accredited and non-accredited, single and multiple employers.

These trials had some key learnings set out in Exhibit 14; further detail is included in Appendix C.

Recommended future focus areas for industry collaboration and improving training delivery

7. Surface agile and adaptable forms of training through innovation
8. Scale the trial of Networks of Digital Excellence (NoDEs)
9. Optimise training offerings

See chapter 4 for further detail

Exhibit 14: Tested approaches to training delivery*

Approaches tested	Learnings
Non accredited training focused on specific job roles delivered by registered and non-registered training providers, public and private.	• Employer lead training is more successful • Gaining employer commitment
Utilising a free online platform for delivering personalised learning pathways tailored to individual skill requirements.	• Linking candidates with training related to skill gaps • A polarising observation is that digital fluency has various interpretations
Commercial off the shelf online platform with personalised modules based on skill self-assessment, with hackathons to solve workplace aligned projects.	• Training outcomes were positive when employers had the tools to accurately describe their skill needs • Learners have a positive experience when engaging with high quality and up to date course material, curated for cohort requirements • A digital badge for each skill cluster obtained is an effective way to encourage progression and completions
Accredited modules / VET qualifications mapped to skills standards within an industry context.	• The ability to access resources and choose an individual learning pathway is a significant enabler • A robust self assessment is critical to ensure that contextualised learning delivers fit for purpose training to the employee
Digital skills training for leaders in partnership with Microsoft and AWS	• The demand for executive level training is high and there are limited contextualised work relevant training opportunities available
Non-accredited, employer driven microcredentials with higher education and VET accredited pathways	• The importance of establishing clear roles and responsibilities when working across multiple education and training providers • Employers welcomed the tool kit as it clearly articulates the training requirements aligned to the job role (cyber analyst), quantifies employer effort required, and provides the tools for managing the internship • integrating non-accredited training with accredited training can achieve targeted outcomes while mitigating higher costs associated with non-accredited training
Skill Standards to inform capability assessment within existing training programs.	• Digital Skill Standards provide a mechanism to enable benchmarking to increase the value of existing programs in a digital context

*Note: See Appendix C for more detail.

Path to a digitally skilled economy

04

There are opportunities to extend and scale the progress to date in responding to Australia's digital skilling challenges

The progressive standing up of ten JSCs from June 2023 offers an opportunity for continuation and extension of responses to Australia's digital skilling challenges.

JSCs have a mandate through strategic industry engagement to "ensure Australia's VET sector delivers stronger outcomes for learners and employers."[21]

This will be achieved by a range of actions including identifying skills and workforce needs, training product development, supporting industry and training provider collaboration, and being a source of industry insights and intelligence.

The DSO's efforts to enhance digital skilling in Australia during the past three years have provided important foundations and lessons for future work.

The lessons learned and evaluation results have been used to identify activities and projects that have the potential to make an impact. To make sure they are aligned with industry priorities, these have been tested with a small group of stakeholders. See Exhibit 15.

There will also be opportunities to share the approaches, successes and learnings with other JSCs through the Cross Council CEO network and working with Jobs and Skills Australia (JSA).

In addition, there may be opportunities as the JSC to consider these learnings to skilling approaches more broadly with the finance and business sectors alongside the technology sector.

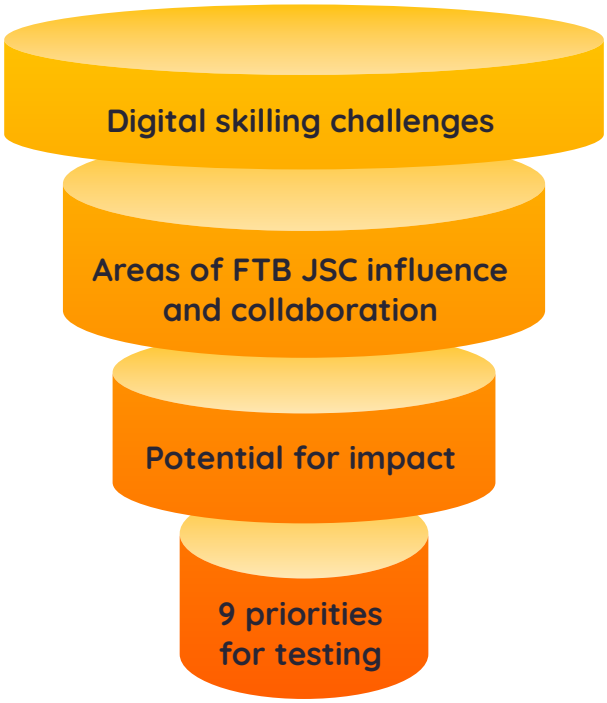
From evidence of the roll out to date, the DSO has identified action areas to be considered in the JSC context.

Nine priorities have been identified to extend and enhance work across existing workstreams to continue addressing identified challenges of:

- Insufficient pipeline of workers
- Low relevance of digital skills
- Skilling sector responsiveness

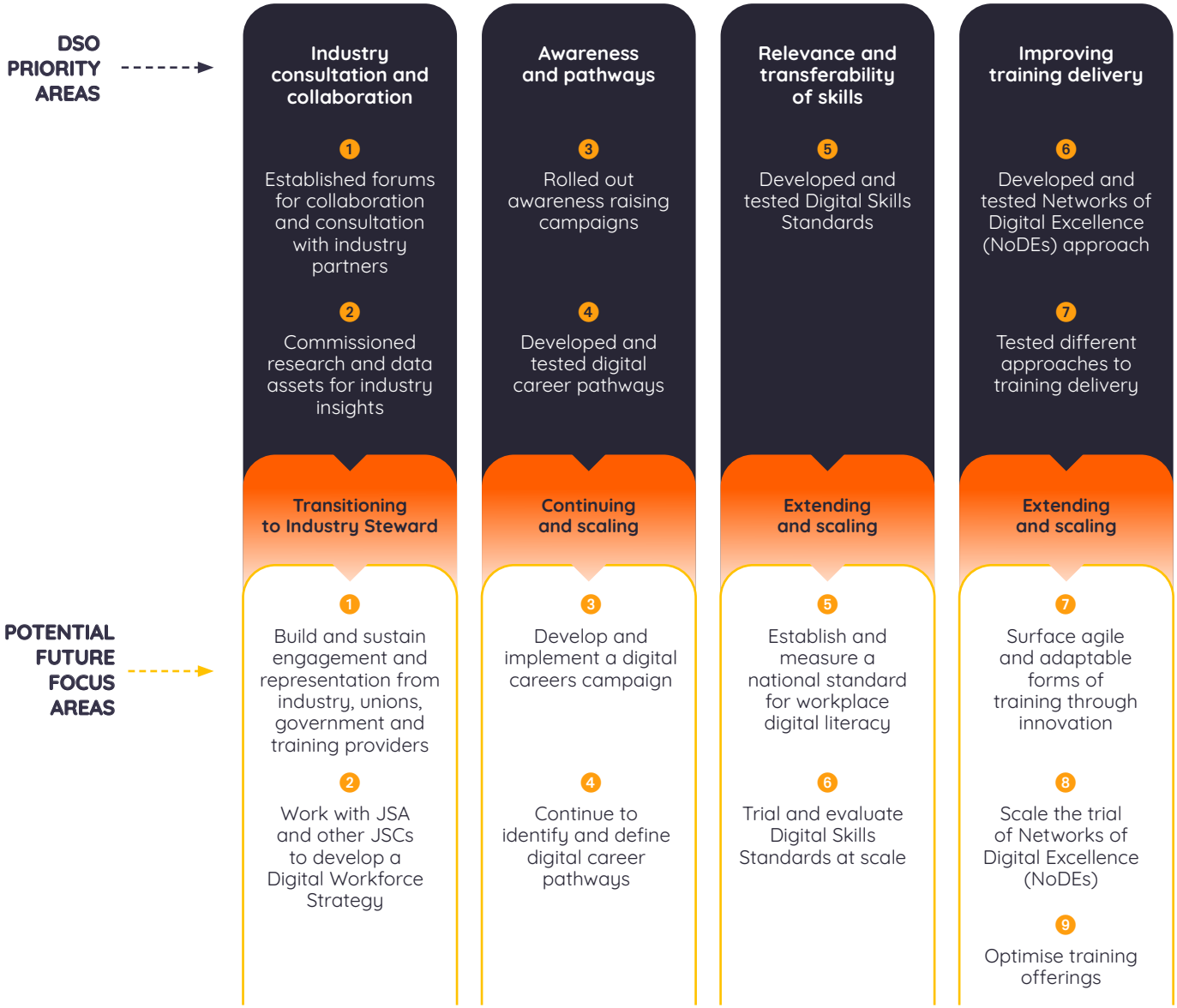
See Exhibit 16.

Exhibit 15: Priority area selection approach



21. Department of Employment and Workplace Relations, Industry Engagement Reforms webpage, 2023

Exhibit 16: Building on DSO priority areas to inform potential future focus areas



An industry-led approach should continue to be underpinned by effective tripartite collaboration and consultation

1. Build and sustain engagement and representation from industry, unions, governments and training providers

Ongoing and strengthened collaboration and consultation across industry, unions, governments and training providers is critical to the success of Australia's future digital workforce.

There are existing consultation and collaboration forums established by the DSO in partnership with the TCA that have been effective at engaging multiple employers at once, and for testing approaches.

There are opportunities to continue developing these types of partnerships and associated forums as a mechanism to amplify industry stewardship and credibility.

As such, continuation of existing consultation and collaboration mechanisms, including the Digital Employment Forum and Digital Leaders Forum, may be of value. Evaluation findings also highlight opportunities to enhance the impact and reach of these forums, including:

- Replicating with parts of the sector that have been harder to engage to date
- Leveraging the outcomes of meetings of the Digital Employment Forum
- Giving small and medium size enterprises a greater role within the Digital Employment Forum
- Encourage employers to take on more of an advocacy role in promoting system change

It is important that future stakeholder engagement ensures the JSC governance model provides the main engagement vehicle. See Exhibit 17.

2. Work with JSA and other JSCs to develop a Digital Workforce Strategy

It is evident digital skilling challenges are no longer confined to the technology sector. So, whilst there will be a JSC for FTB, digital skill challenges will manifest across all JSCs.

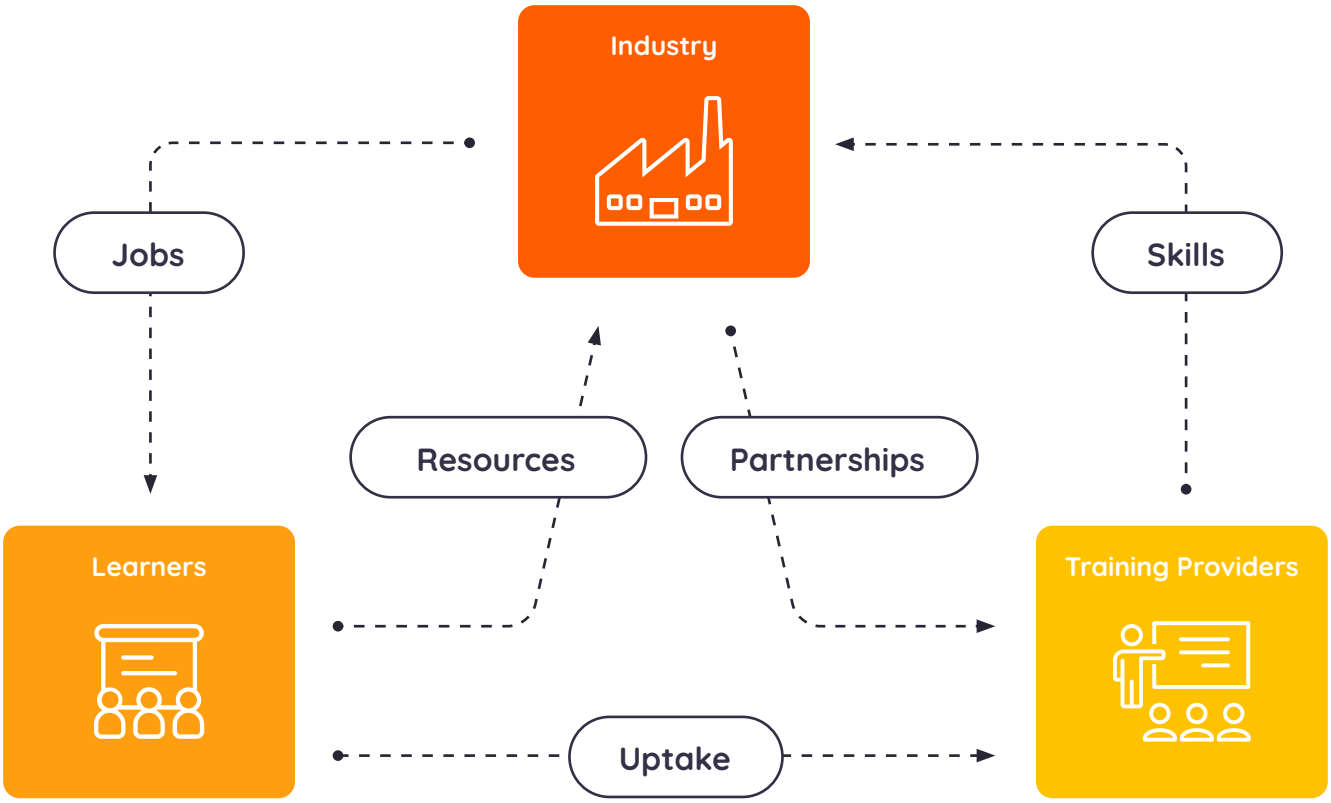
Accordingly, a Digital Workforce Strategy developed with other JSCs, through the Cross Council CEO network, and with JSA has the potential be a valuable asset for digital workforce planning and skilling across the economy.

There are clear advantages from tackling this collaboratively, including leveraging the assets the DSO has produced, such as the data cube on Digital Skills (see p.27), and the Digital Skills Standards, to enhance transferability across sectors; building on lessons learned from trials; and minimising duplication across JSCs.

A Digital Workforce Strategy could:

- Leverage and reference existing relevant workforce strategies by states, territories and industry bodies
- Include supply gaps in digital skills across both basic digital skills and specific digital skills utilised across all digital workforce segments
- Consider workforce cohorts across JSCs with comparable skilling challenges and where efficiencies across solutions may be achievable
- Consider workforce mobility across sectors and any implications for skill transferability and skilling solutions
- Promote the use of Pathways and Standards as workforce planning tools, as applicable to sectors, to allow training providers to more effectively respond to demand
- Promote tools, such as the Australian Skills Classification, for industries and employers to accurately describe their skill needs through a common language
- Appropriately leverage the full capacity of the higher education and skilling system identifying hybrid and agile skilling and workforce responses.

Exhibit 17: Collaboration and interaction of the ecosystem



Awareness raising and skilling pathway development should continue in order to increase the pipeline of digital workers

3. Develop and implement a digital careers campaign

There is a projected shortfall of digital expert workers and digitally enabled workers over the next five years. To increase the pipeline of digital workers, a digital careers campaign could be developed and implemented.

This campaign could:

- Bring to life real-world opportunities through a consistent language and skilling narrative
- Unify effort and action across training organisations, industry and government
- Target prospective workers currently underrepresented in these occupations (gender, disability, diversity and disadvantaged)
- Emphasise the relative remuneration and security of digital expert roles
- Be multifaceted for different target cohorts; building on learnings and successes of school leaver trials, but also developing targeted campaigns for mid-career professionals
- Clearly link through to relevant information about pathways to convert prospective workers into skilling opportunities
- Be transferable and accessible for scaling through different states, territories and industry groups

4. Continue to identify and define digital career pathways

Digital skills pathways signpost the skilling of the economy. Pathways enable workforce planning by informing the skills that provide entry to and movement along pathways to a range of jobs.

Pathway development and the SkillSchema prototype have shown promise (see Case Study 4), however further development and testing would be required.

Identification and definition of digital career pathways will assist further pathway development, and could:

- Prioritise high demand job roles for digital expert workers
- Move more into a co-design approach to maintaining / further development of Pathways
- Get employers to start using the Pathways model as champions
- Test and roadshow Pathways to iteratively maintain / commercialise the product
- Consider the role JSA may play at a national level (industries / economy) and linking of Pathways to the Australian Skills Classification (ASC) under JSA

For the SkillSchema pathways prototype, the JSC may consider positioning it as a technology demonstrator. This could include:

- Promoting the product as a tool to assist employers and industries with their workforce planning, including internal and external skills recruitment
- Publicising the application of the product as a tool to assist individuals navigating skilling pathways for job roles
- Encouraging feedback from users to contribute to further develop and enhance the product
- Considering broader applications beyond digital careers, with lessons and assets shared across other JSCs as appropriate.

To uplift digital skills across the economy, a national standard for workplace digital literacy should be established and the Digital Skills Standards scaled

5. Establish and measure a national standard for workplace digital literacy

Jobs are becoming more digitally intensive, especially as expectations of workers' utilisation of digital tools and technologies become fundamental to an increasing number of roles.

Digital literacy is a foundational building block for more advanced, specific digital skills. It is therefore key to ensuring equity of opportunity for people to thrive in their jobs – whether as digitally enabled workers, or those pursuing careers as digital expert workers.

There is a need for stakeholder consensus on establishing the essential skills for digital capability for work, learning and life as the basis for a national workplace digital literacy standard.

A national standard could:

- Be anchored by the Australian Digital Capability Framework
- Be used to measure the status of digital literacy of worker cohorts
- Identify critical gaps in digital literacy by worker and/or demographic segments
- Leverage learnings from digital literacy trials to inform strategies to address gaps
- Be used to monitor digital literacy over time.
- Support the Australian Curriculum for Schooling, and the uplifting of digital confidence and digital skills for pre-service teachers, and in teacher professional development.[22]

22. Looking to the future: Report of the Review of secondary pathways into work, further education and training, 2020

6. Trial and evaluate Digital Skills Standards at scale

The establishment of a shared language to describe digital skills and levels of proficiency has been welcomed by industry and training stakeholders in trials to date.

Digital Skills Standards could be trialed and evaluated at scale to enhance the benefits for workers and employers across job roles and industries.

In doing so, scaling of the Digital Skills Standards could:

- Continue defining linkages of Standards to job roles
- Link skills clusters to job roles via pathways
- Formalise links between skill clusters and the Australian Qualifications Framework (AQF)
- Determine the role Skills Standards could play in the different VET system components so Standards can be integrated into the system
- Be sponsored by training providers
- Be supplemented with supporting materials which enables effective utilisation and application
- Link to qualification reform
- Identify top five Standards and bring them to market
- Consider relevant interfaces and application by other JSCs, including as it relates to the Digital Workforce Strategy.

To contribute to a more responsive training system, training providers should be supported to innovate and collaborate with industry

7. Surface agile and adaptable forms of training through innovation

The Skills Standards provide a framework for training delivery innovation focused on meeting a skills outcome rather than the means of training.

As training providers adjust to the implementation and application of Digital Skills Standards, trials have indicated support and facilitation is valued and inherently important to the momentum and success of trials.

As the approaches and concepts are still in development, continuation of the facilitator role should be considered.

Future progression of surfacing agile and adaptable forms of training could:

- Focus on strengthening RTO capability to foster effective and deep connections with industry, supported by JSC-led industry stewardship and the collaborative application of Skills Standards
- Proactively work with jurisdictions that pursue innovation
- Bring together accredited and non-accredited training to meet the needs of the sector
- Explore the opportunity to bring together VET and Higher Education to deliver digital training
- Providing additional customisable support, guidance, and toolkits for RTOs to engage with employers without direct participation from a third party
- Encourage change in the VET system to be less compliance driven.

8. Scale the trial of Networks of Digital Excellence (NoDEs)

Surfacing agile and adaptable training methods through innovation requires localised collaboration through a localised network. As these evolve, NoDEs will support one another as networks share lessons learned.

Continued implementation and testing of NoDEs as a mechanism to facilitate engagement between RTOs and employers may be considered.

Continued implementation of the NoDE approach could:

- Identify and connect with other existing arrangements (which are functionally similar to NoDEs), such as TAFE Cyber network, and the Office of TAFE Coordination and Delivery in Victoria
- Seek buy-in from other JSCs on the NoDE approach
- Incorporate the NoDE approach in the Commonwealth state funding agreement
- Formalise the concept and develop terms of reference.

9. Optimise training offerings

Workforce planning may be informed by digital career pathways and Digital Skills Standards. It is expected this would identify gaps in training product provision where employers have unmet skills needs.

Analysis also indicates there are many undersubscribed programs, and there may also be instances of duplication between existing products.

As such, to improve responsiveness and effectiveness of the training system, optimisation of offerings is recommended. Optimisation could:

- Map existing training products to the skills standards
- Consider offerings and capacity of the broader skilling sector, accredited and non-accredited, to meet identified skilling demands.

Conclusion

The foundations for the future of digital skilling

Over the last three years, the DSO has collaborated with industry, RTOs, schools, community groups and governments to fulfil its remit of "shaping the national training system, testing innovative solutions to ensure that digital training meets the skills needs of employers and builds Australia's digital workforce."[23]

This has seen a number of valuable assets and approaches to digital skilling co-developed, trialed and refined to increase the pipeline of digital workers, to increase the relevance and transferability of digital skilling, and to improve the capacity of the training sector to be responsive to industry needs.

Through trials and initiatives, stakeholders have valued a unified voice and forum to identify digital skilling challenges and solutions. School leavers have increased their awareness of digital careers. Industry has started embracing a shared language and defined standards of digital skills. Learners have acquired digital skills and employment through innovative training approaches. RTOs have collaborated effectively with industry to identify skilling needs and develop training responses.

These are strong foundations upon which the work of the DSO could be considered under the JSC FTB. This could include particular focus on seeking to further test and scale existing approaches and assets, to pursue new ground in addressing Australia's digital skilling challenges.

To translate intelligence and options into action, the JSC for FTB may consider:

- Growing collaboration and consultation with industry, unions, states and territories, JSA, JSCs, training providers and the Australian Government
- Increasing the volume of people with digital skills through digital careers campaigns and continuing to identify and define digital career pathways
- Transforming digital skills training by scaling digital skills standards and measuring digital literacy to an agreed standard for the workplace
- Supporting the training sector in its capacity and capability to deliver agile and adaptable forms of training.
- Uplifting the digital confidence and digital skills of the teaching profession.

This will be achieved with continued close collaboration and cooperation from state, territory, and federal governments, training providers, unions, community groups and importantly, industry.

Cross JSC collaboration will also be fundamental in a whole of economy approach to achieving a digitally optimised workforce for Australia.

"We will know that JSCs are fulfilling their potential when we have high levels of engagement across all industries, feeding in real, actionable intelligence about the economy and to develop options and solutions to translate this into action in the training sector."

The Hon Brendan O'Connor MP
Minister for Skills and Training[24]

23. Department of Employment and Workplace Relations, Industry Engagement Reforms webpage, 2023
24. The Hon Brendan O'Connor, Address to the Jobs and Skills Councils Onboarding Forum, 28 February 2023

DIGITAL SKILLS ORGANISATION

APPENDICES

Overview of approach

This analysis uses skill mentions in job advertisements as the base for understanding skill, and therefore workforce, demand.

Explicit digital roles, such as software engineer, are straight forward to identify but it is much harder to identify the digitalisation of many job roles across the economy. To address this challenge, the analysis uses Lightcast job advertisement data to understand what skills employers seek; this in turn enables identification of the level of digitalisation of different job roles and how that has changed since 2016 (the start of the period used in the analysis).

Lightcast (lightcast.io) collect real-time data from numerous sources to create a database of job advertisements and other sources. We know job advertisement data has limitations:

- Employers don't refer to a taxonomy when they run advertisements
- Employers often mention tools or products as a proxy for skills
- Some skills become 'table stakes' and cease to be mentioned in advertisements
- Some employers run recurrent advertisements that can inflate numbers
- Some roles (and entire sectors) are rarely advertised digitally, excluding them from the data set.

The analysis mitigated (1) and (2) by creating a taxonomy of eight skills areas (see p59). The other three limitations have not been mitigated but are noted for caution.

The analysis used digital intensity: Digital intensity is the share of digital skill mentions as a proportion of all skill mentions for a given occupation. The digital intensity was calculated for all occupations at ANZSCO minor group level for 2021 and projected for 2026. This became the basis for workforce demand analysis.

Source data and classifications of analysis

See p.57

Create a skills taxonomy that structures the skills mentioned in job advertisements

See p.58

Using skills mentions, determine 2021 and 2026 digital intensity of occupations

See p.60

Calculate 2021 and 2026 workforce demand and retirements

See p.61

Calculate net workforce supply 2022-2026 across HE,VET, migration and on the job progression

See p.62 and p.63

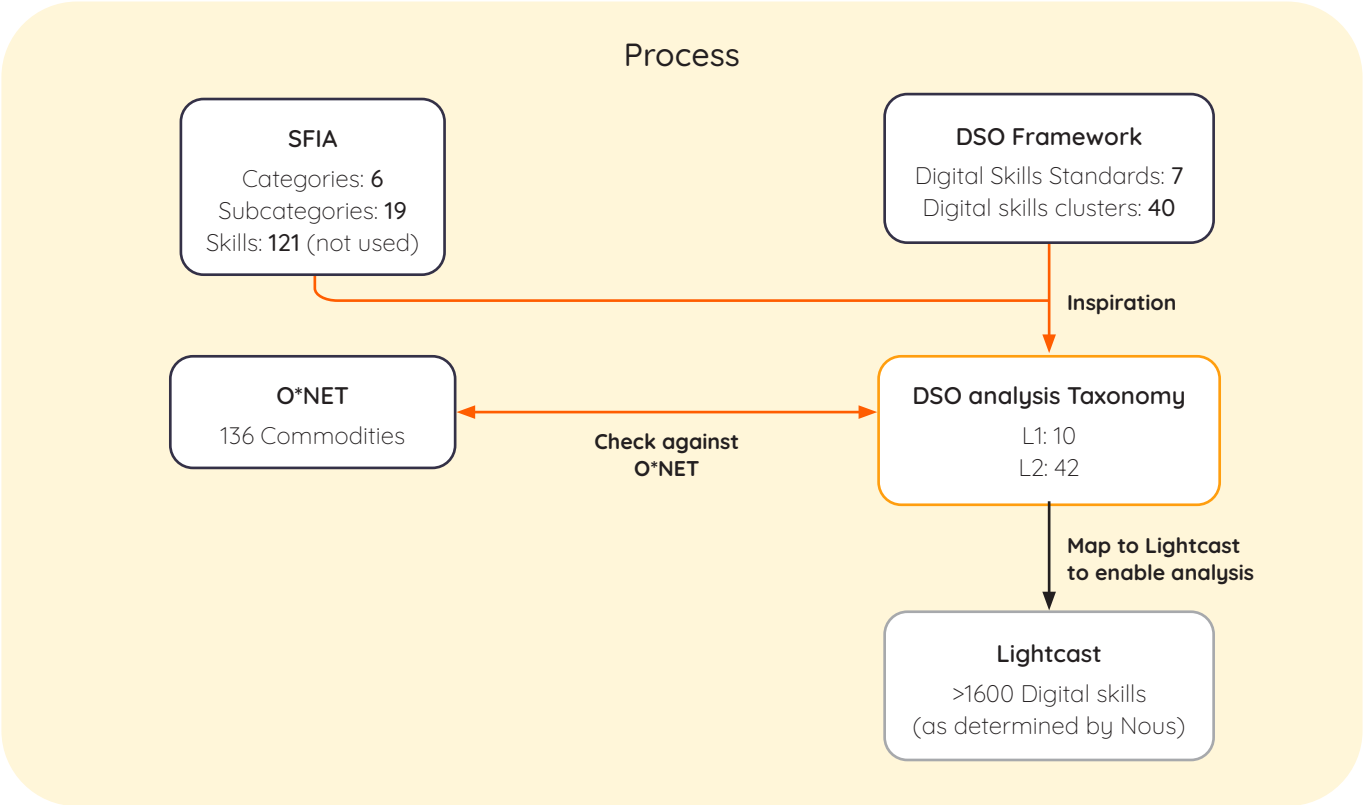
Data sources

Data category	Data type	Originator	Source
Job Advertisements	Lightcast (Formerly known as Burning Glass) Data used: Skills required, field of education required, occupation	Lightcast	lightcast.io/
Workforce	ABS Household Labour Force Survey Historical workforce numbers by occupation	Australian Bureau of Statistics (ABS)	www.abs.gov.au/statistics/labour/employment-and-unemployment/labour-force-australia-detailed/latest-release
Employment Projections	NSC employment projections Workforce numbers by occupation by ANZSCO 3	Jobs and Skills Australia (JSA)	labourmarketinsights.gov.au/our-research/employment-projections/
Education and Training	VET program completion rates	National Centre for Vocational Education Research (NCVER)	www.ncver.edu.au/
	Higher education award course completions in bachelors degrees	Department of Education	www.education.gov.au/higher-education-statistics/student-data/selected-higher-education-statistics-2020-student-data-0
Migration	Australian Migration Statistics: Visas granted grouped by nominated occupation	Department of Home Affairs	data.gov.au/data/dataset/australian-migration-statistics
Retirements	Employed persons by Age, Occupation sub-major group of main job (ANZSCO) and Sex, August 1986 onwards	Australian Bureau of Statistics (ABS)	www.abs.gov.au/statistics/labour/employment-and-unemployment/labour-force-australia-detailed/latest-release

Classifications of analysis

Classification	Detail	Source
ANZSCO	Analysis based on ANZSCO minor group.	www.abs.gov.au/statistics/classifications/anzsco-australian-and-new-zealand-standard-classification-occupations/latest-release
SFIA	Three level taxonomy used to inform the skills taxonomy used in this analysis. Categories: 6, Subcategories: 19, Skills: 121	SOFIA 8 https://sfia-online.org/en/sfia-8/skills/information-systems-coordination
O*NET	List of 136 Commodities (technical skills) used to inform the skills taxonomy used in the analysis	www.onetcenter.org/
DSO Taxonomy	Two level taxonomy used to inform the skills taxonomy used in the analysis L1: 10, L2: 42	Digital Skills Organisation

Skills taxonomy development



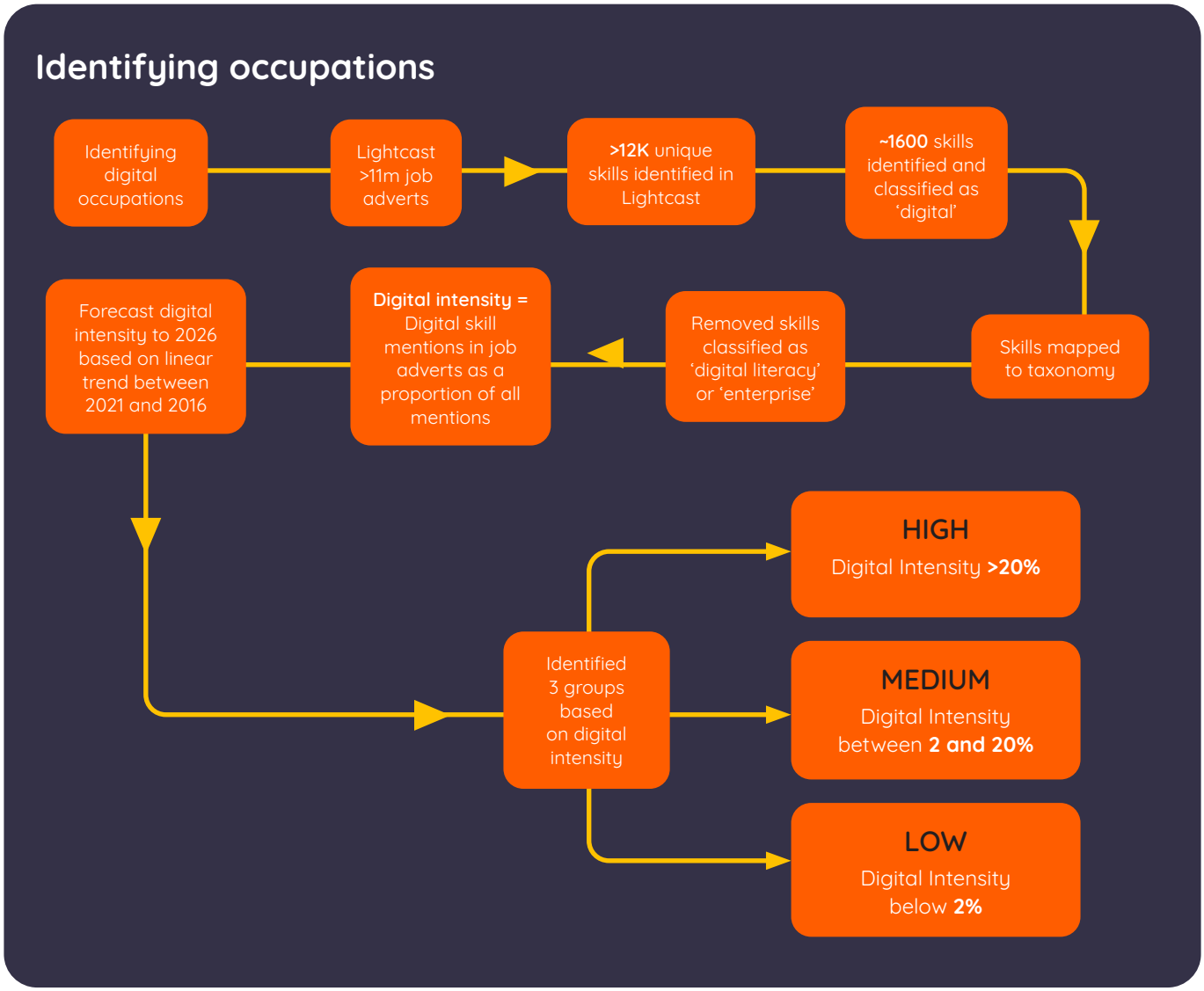
Skill Area

Taxonomy L1	Notes
Digital Literacy	This is a hybrid from DSO Literacy and Fluency. Many of the fluency skills have been moved to the Enterprise L1 category below. Added the Cyber security literacy to create a cyber skill for general employees.
Enterprise	Nous based on ONET frequencies.
Development & implementation	This is a hybrid of DSO and SFIA. Analytics has been moved out from here and elevated a level, and content management and computation science - both present in SFIA - have been left off. Added systems design from DSO.
Analytics	The SFIA Analytics category has been moved out from Development and Implementation and three distinct tools added to L2.
Delivery and operations	This is based on SFIA with Cyber separated out and elevated one level.
Cyber security	A new category with L2 derived from the DSO taxonomy.
Industry specialist tools	A new category to distinguish from Enterprise and Literacy. Based on analysis of ONET frequencies.
Digital marketing and creation	A new category created to encompass digital marketing and creation.
Strategy and architecture	Based on SFIA Strategy and Architecture Security with privacy items moved to Security Infrastructure.
Relationships and engagement	Combines SFIA People and Skills, and Sales and Marketing.

Lightcast digital skill categorisation within the skills taxonomy

Level	Taxonomy	Description	Example Lightcast skills	Proportion of skills mentions in Lightcast
Baseline digital skills	Digital Literacy*	Fundamental workplace skills such as email, word processing, internet searching and other typical office tools. Includes familiarity with user interface elements and how to interact with them.	Microsoft Office, Microsoft PowerPoint, Typing, Spreadsheets	18%
	Enterprise*	The set of skills associated with management of an organisation encompassing finance, HR and operations. Includes use of ERP, CRM and content management systems.	SAP, MYOB, ERP, PeopleSoft	10%
Specific digital skills	Development & implementation	Capability to use programming languages and development platforms. Know how to design, develop or deploy digital products.	Java, Software Developments, ITIL, Version Control	27%
	Analytics	Capability to manage data through the lifecycle from capture to insight, apply analytic techniques to generate insights, and to present the insights in a meaningful way.	Data Analysis, Tableau, Extraction, Transformation and Loading (ETL), Variance Analysis	10%
	Delivery and operations	Systems administration, application support, and other roles typically associated with the CIO function in an organisation.	Microsoft Active Directory, Configuration Management, Routers, Relational databases	21%
	Cyber security	Establish security infrastructure and the monitoring and response to cyber activity. A set of specialist skills related to delivery and operations but split out to aid analysis.	Network Security, SSL, Systems Centre Operations Manager (SCOM), Information Governance	2%
	Industry specialist tools	Apply industry specific methods and use related tools such as CAD, digital imaging, manufacturing control. Tightly coupled to a profession.	AutoCAD, SCADA, ArcGIS, Computerised Numerical Control Lathes	2%
	Digital marketing and creation	Skills associated with the design and management of digital interaction between organisations and their stakeholders, from communication and engagement to use of commerce and social media platforms.	Adobe Photoshop, Google AdWords, A/B testing, E-commerce	8%
	Strategy and architecture	Executive level skills for the application of digital across an organisation and typically supplements one of the other categories. Includes planning, governance and compliance.	System Architecture, ISO 27001, IT Strategy, TOGAF	1%
	Relationships and engagement	The soft skills required to manage stakeholders in digital context including customers, vendors and staff. Typically supplements the other categories.	Training, Software sales, Technical services marketing	0.3%

Notes: *Digital Literacy and Enterprise were excluded from subsequent analysis



Intensity classification	Workforce segment classification	Proportion of workforce (2021)	Example Occupations
High	Digital workforce: Digital expert workers	7%	Computer programmers, ICT security, architects
Medium	Digital workforce: Digitally enabled workers	43%	Construction managers, engineers, marketing and public relations, accountants, electricians
Low	Non-digital workforce: Digitally informed workers	50%	Construction and mining labourer, midwifery and nursing professionals, school teachers

Assumption:

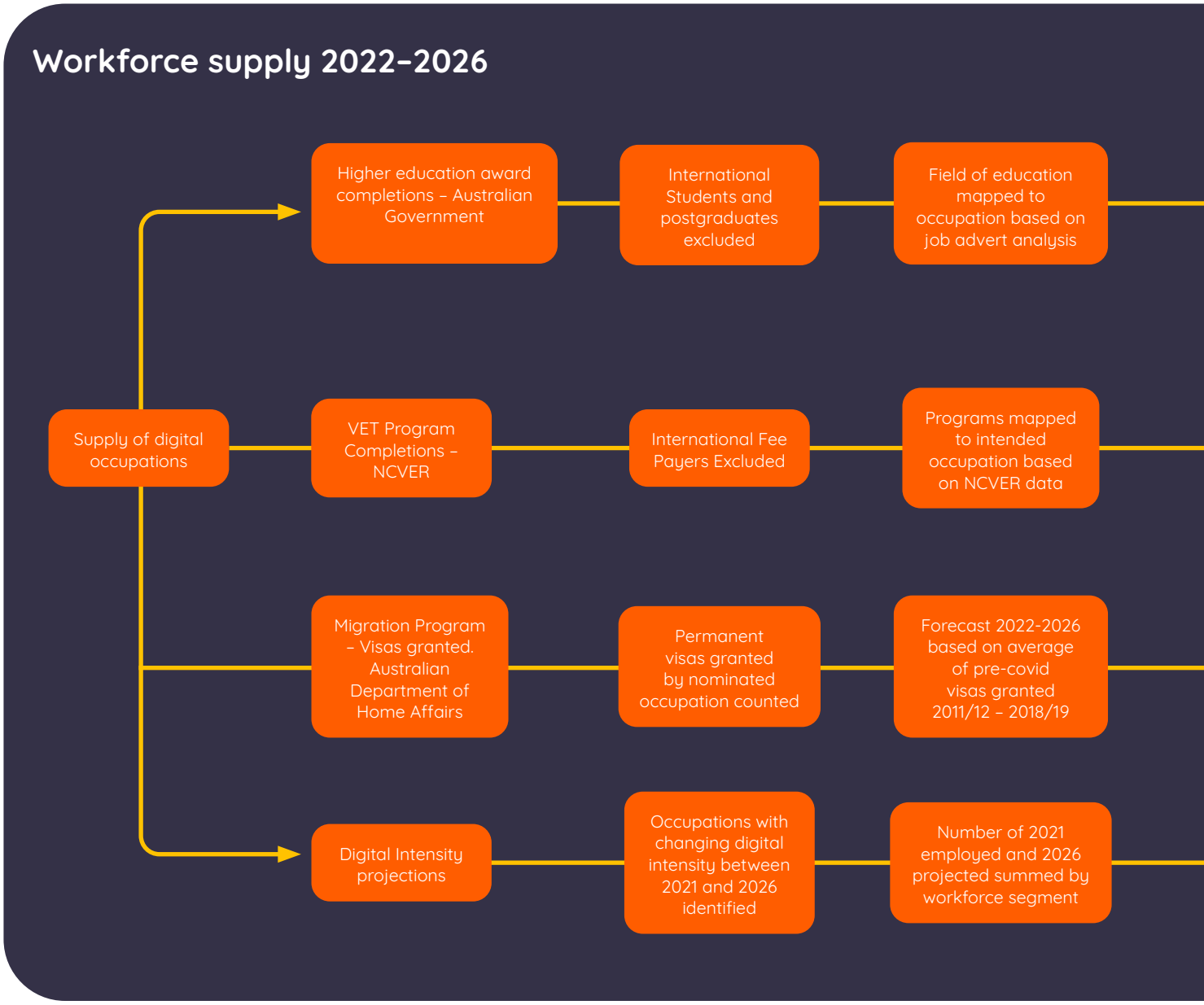
- The mapping of skills to jobs is an accurate reflection of the skills required to undertake related occupations

Workforce demand

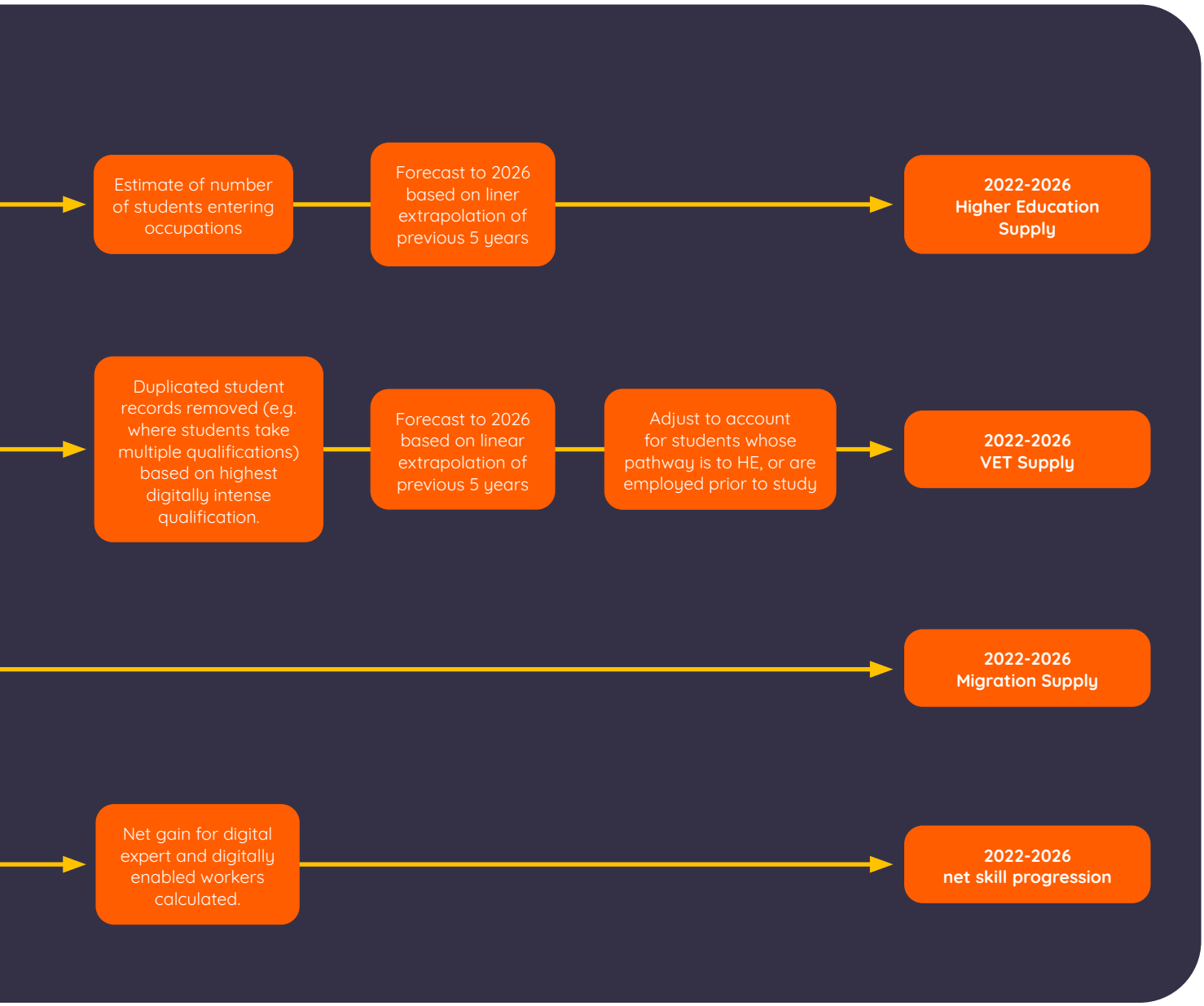
Digital workforce segment	2021 Workforce (000s)	2026 Projection (000s)	2022–2026 Retirements (000s)
Digital expert workers	908	1,330	77
Digitally enabled workers	5,690	6,327	543
Total digital workforce	**6,598**	**7,657**	**620**

Assumption:

- The number of job advertisements for a given occupation is an appropriate indicator of demand
- Retirements assume 56-65yos will exhibit same retirement pattern as since 1986
- Digital intensity increases in occupations between 2021 and 2026 at the same rate as between 2016 and 2021



Digital workforce segment	Higher Education (000s)	Vocational Education & Training (000s)	Migration (000s)	Skill progression (000s)
Digital expert workers	46	51	71	202
Digitally enabled workers	224	394	116	204
Total digital workforce	**270**	**445**	**187**	**406**



Assumption:

- Mapping of program to intended occupation by NCVER is an appropriate method to estimate skills supplied by VET programs
- The mapping of required Field of Education by Lightcast is an appropriate method to estimate the skills supplied by higher education courses
- The occupations as nominated by skilled visa recipients are accurate
- Temporary visas assumed to constitute a consistent share of the workforce in 2021 and 2026 and so not modelled
- Net skill progression of existing workforce comprises workers who are employed in roles that will require greater digital skills by 2026, with these workers acquiring those digital skills on-the-job

VET IT program key (referenced in Exhibit 7)

Chart ID	Program name	Program cluster code
A	Certificate II in Applied Digital Technologies	ICT20120
B	Diploma of Information Technology	ICT50220
C	Certificate III in Information Technology	ICT30120
D	Certificate IV in Information Technology	ICT40120
E	Advanced Diploma of Information Technology	ICT60220
F	Certificate IV in Cyber Security	22603VIC
G	Advanced Diploma of Professional Game Development	10343NAT
H	Advanced Diploma of Professional Game Development	10702NAT
I	Certificate II in Emergency Communications	22456VIC
J	Advanced Diploma of Cyber Security	22445VIC
K	Certificate III in Emergency Communications	22457VIC
L	Graduate Certificate in Networking and Cyber Security	10907NAT
M	Certificate II in Emergency Communications	21728VIC
N	Certificate III in Emergency Communications	22148VIC
O	Advanced Diploma of Games Development	52703WA
P	Graduate Diploma of Virtualisation Technologies	10180NAT
Q	Advanced Diploma of Screen and Media	CUA60620
R	Certificate III in Information Technology (General)	ICA30299
S	Advanced Diploma of Applied Blockchain	10747NAT

Tested approaches to training delivery

Approach Tested	What the DSO did	What was learned
Non accredited training focused on specific job roles delivered by registered and non-registered training providers, public and private. **Train 100; Department of Jobs, Precincts and Regions Victoria**	Train 100. Worked with 3 providers (1x TAFE and 2 private training organisation) to trial 3 approaches to training entry level data analysts. DSO provided assessment guidelines aligned to data analyst roles subsequently VETASSESS moderated the assessments and determined valuable insights. Training providers were encouraged to approach employers to understand the details of role requirements and shape training content. Evaluated results. Out of 120 participants, 86% completed the program and 63% secured employment with marked differences between the different providers. DSO observed DJPR digital jobs and skills programmes which have engaged over 5000 Victorians.	The need for: • Engaged partners • Momentum and consistent engagement • Clearly defined roles and responsibilities The DSO approach was proven to be useful for approaches that involve non-accredited training and/ or have a single employer. Employer lead training is more successful when there is an existing employer engagement process prior to training. Participants completed the Train 100 courses at a much greater rate than a comparator VET Certificate III. A majority of Train 100 course completers gained – and kept employment in a digitally relevant field. Gaining employer commitment to employ students prior to training commencement was a challenge due to perceived risk.
Utilising a free online platform for delivering personalised learning pathways tailored to individual skill requirements. **SkillUp/Skill Finder**	Working with the Skillfinder platform (free courses provided by industry) the DSO developed an assessment tool, which people could use to focus on the most relevant courses. Marketed and shared the platform to employers, schools and other community groups to assess relevance and take up. Accessible online training platforms, such as Skillfinder, have the potential to contribute to flexible approaches to digital upskilling; 75% of the participants agreed the course length was appropriate with 60% being exposed to new knowledge and practices. Engaged a small group of aligned employers and individuals to pilot and test the online platform. This included 17 organisations and 507 registered users.	SME employers did not see sufficient value in such training when competing against existing high workloads amongst staff. Organisations with in house training structures, such as schools, reacted more positively towards the product. Linking candidates with training related to skill gaps increases the likelihood of candidates beginning and finishing the training, especially if the training is of a short duration. A polarising observation is that digital fluency has various interpretations or no understanding at all. This observation makes it difficult for learners and employers to be clear on what their skill requirements are in their desired profession.

Tested approaches to training delivery (cont'd)

Approach Tested	What the DSO did	What was learned
Commercial off the shelf online platform with personalised modules based on skill self-assessment, with hackathons to solve workplace aligned projects. **Department of Employment, Small Business and Training (DESBT)** **National Apprentice Employment Network**	In a codesign process between Go1, the DSO and the employer an online self assessment tool aligned to the digital fluency skill standard was designed which enabled participants to connect to the relevant training that best met their needs based on the assessment of individual knowledge. Forty-nine DESBT employees with a wide range of skill levels went through the program (leaders, support workers, managers and 'Superusers' e.g., ICT staff). Performance was recognised through the awarding of digital badges. The Tasmanian Building Group utilised this co-design process with Go1 to establish an ongoing facility to upskill literacy and fluency skills of staff and apprentices.	Training outcomes were positive when employers had the tools to accurately describe their skill needs. But participants valued a combination of online and facilitated teaching techniques. Learners have a positive experience when engaging with high quality and up to date course material, curated for cohort requirements. A digital badge for each skill cluster obtained is an effective way to encourage progression and completions and was an effective way for employees to promote the skills they had obtained through digital networks like LinkedIn. It was also a good demonstration that encouraged the extension of the approach by DESBT to leadership and business skills.
Accredited modules / VET qualifications mapped to skills standards within an industry context. **National Apprentice Employment Network** **Cremorne**	The DSO tested Digital Literacy and Fluency Skills Standards in the context of apprenticeships. Student self-assessments to understand their skill needs using a skill standard assessment tool. No adjustment to the training options was made to take account of individual skill level The 44 participants consisted of 9 trainees and 35 field workers, to enable skills that would facilitate train the trainers. This same approach was also applied to software development in an industry context through the Cremorne trial in Melbourne.	Training provided through accredited skills sets can provide the employer with recognised training outcomes, including resulting in full qualifications. Independent learning will assist in individual success. The ability to access resources and choose an individual learning pathway is a significant enabler. The flexibility provided through DSO skill clusters and proficiency levels enables contextualising at the individual level. Identification of well matched cohorts simplifies the design and delivery of training. A robust self assessment is critical to ensure that contextualised learning delivers fit for purpose training to the employee. Satisfaction with the training was high, with one participant noting: "Flexibility of the learning program was important for me, as it enabled me to work independently and apply problem solving. Cyber Security helped me to identify what I didn't know but gave me practical ideas and links to help me secure my information and identity."

Tested approaches to training delivery (cont'd)

Approach Tested	What the DSO did	What was learned
Digital skills training for leaders in partnership with Microsoft and AWS **Digital Confidence for Executive Leaders in Government Programme**	Application of digital fluency within Executive Leaders articulated through a DSO digital confidence standard which was developed with Microsoft and AWS. The course was delivered to 3 cohorts (150+) of leaders from a range of Government organisations.	Participants rated the sessions 4.7 out of 5. They also rated the content and presenters as 5/5. Participants noted the content was presented with practical, real world focus rather than a purely theoretical one. The demand for executive level training is in high demand and there are limited contextualised work relevant training opportunities available. Whilst tested utilising the government sector, informal approaches have indicated a very high level of interest for continuation of this concept within the commercial sector.
Non-accredited, employer driven microcredentials with higher education and VET accredited pathways **Canberra Cyber Hub**	Multiple education and training providers were engaged to deliver training solutions for cyber security skill shortage. A structured approach was tested for practice based work integrated learning through paid internships . This was facilitated through a DSO created work integrated digital skilling toolkit. The toolkit was created based on the DSO cyber security digital skills standards at an advanced beginner performance level. A digital credentialing platform was established to aggregate student achievement of each component of the skill pathway.	The importance of establishing clear roles and responsibilities when working across multiple education and training providers. 'Multiple training provider - multiple employer' training solutions requires technology enabled monitoring, controlling and scheduling eg: LMS integration. Employers welcomed the tool kit as it clearly articulates the training requirements aligned to the job role (cyber analyst), quantifies employer effort required, and provides the tools for managing the internship. Training providers have seen the value in collaborating around an industry need as it showcases best-practice products that are available. By integrating non-naccredited training with accredited training, we can achieve targeted outcomes while mitigating the higher cost associated with non-accredited training.
Skill Standards to inform capability assessment within existing training programs. **Australian Army; Services Australia**	DSO Skill Standards were provided so the Army could use these as a mechanism to benchmark digital skill delivery within their existing training programs. The Army's programs were able to be benchmarked against the digital standards and the programs able to be adjusted to address any digital skilling gaps.	Digital Skill Standards provide a mechanism to enable benchmarking to increase the value of existing programs in a digital context. Application of Skill Standards can be used for training interventions, and also for uplifting the approach and content of existing programs.

DIGITAL SKILLS ORGANISATION