Future Capabilities:

Automation, workforce disruption and quantifying the reskilling task and capability requirements

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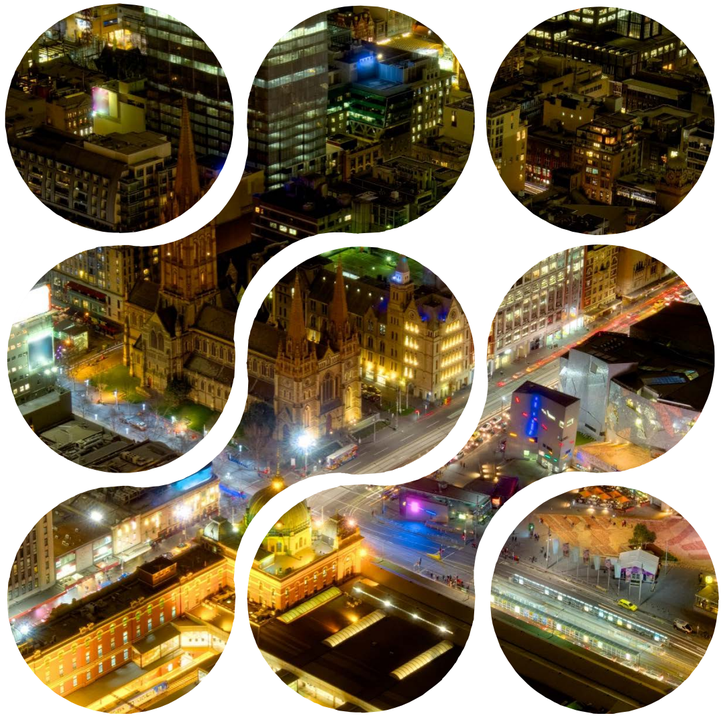


Why research future capabilities?

> *With the wave of automation and digitalisation sweeping across every facet of business today, how do we navigate the disruption and future-proof ourselves and our employees?*

Participant, industry focus group, May 2018

Our focus

Despite claims by high profile journalists and policy makers to the contrary, researchers do have insights that offer insights into the future of work and skill requirements.

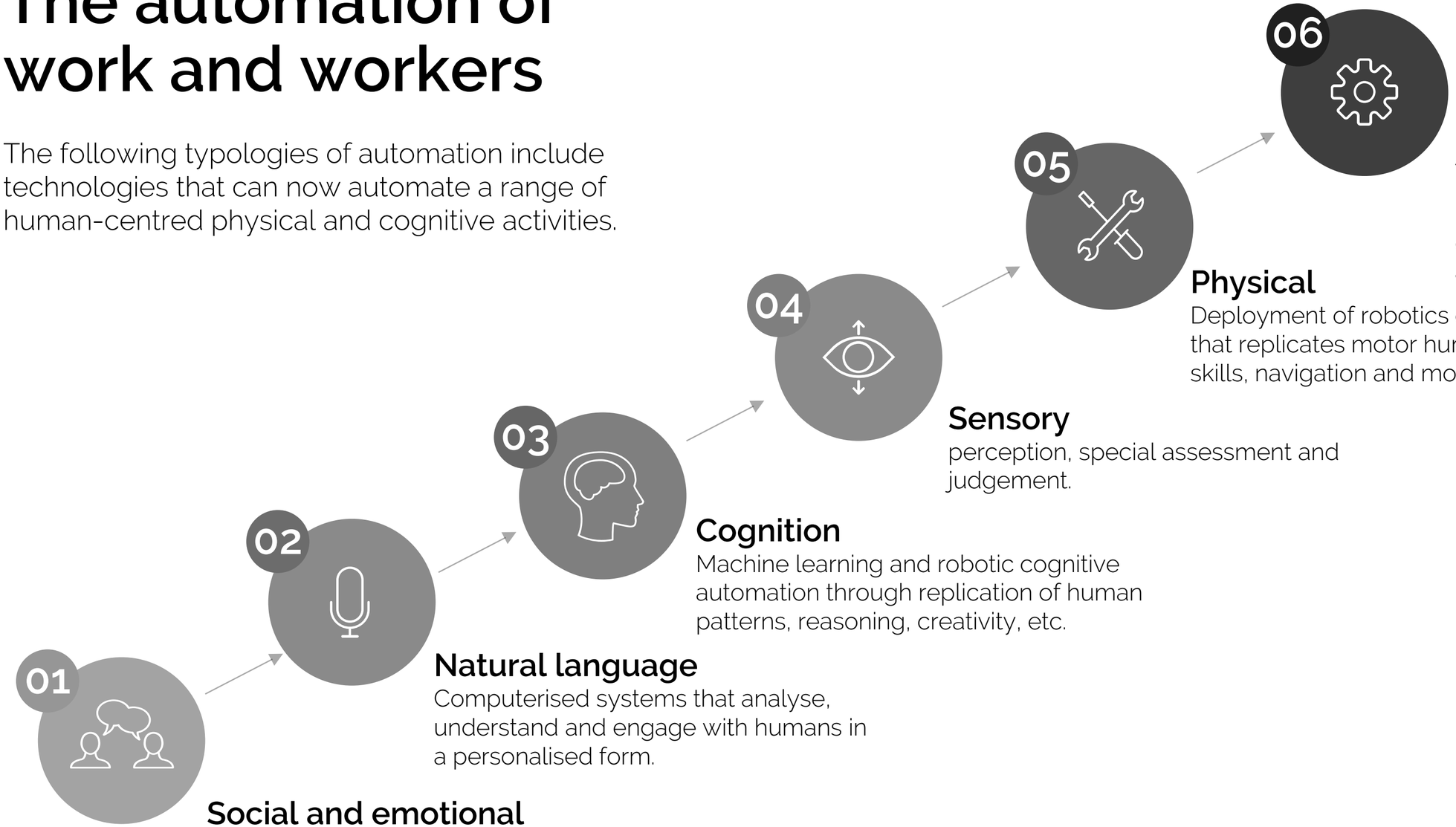
Drawing on over two decades of research into workforce capabilities, predicative analysis and occupational foresighting this document answers two important questions:

1. In light of automation and job disruption, how large is the reskilling task facing the Australian labour force?
2. What capabilities will underpin future work and employability?

Answers to both there questions should be used to better inform how we reinvent the higher education system to be more relevant and responsive to market demand.

The automation of work and workers

The following typologies of automation include technologies that can now automate a range of human-centred physical and cognitive activities.



Social and emotional
Output, reasoning and sensing.

Natural language
Computerised systems that analyse, understand and engage with humans in a personalised form.

Cognition
Machine learning and robotic cognitive automation through replication of human patterns, reasoning, creativity, etc.

Sensory
perception, special assessment and judgement.

Physical
Deployment of robotics or AI that replicates motor human skills, navigation and mobility.

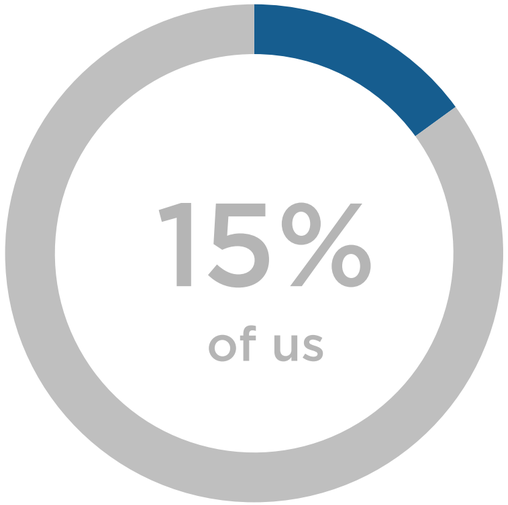
Process
Automate routine processes such as robotic process automation (RPA) of physical, informational and transactions systems.

Within 6 years

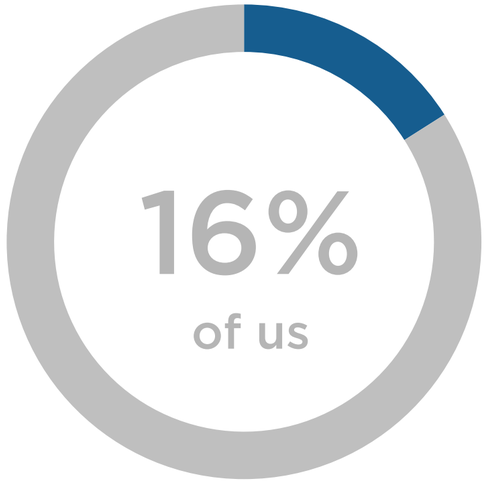
2019 to 2025

While job loss is of great concern, the belief that 40% of all jobs will be lost due to automation by 2016, causes anxiety but is substantially inaccurate.

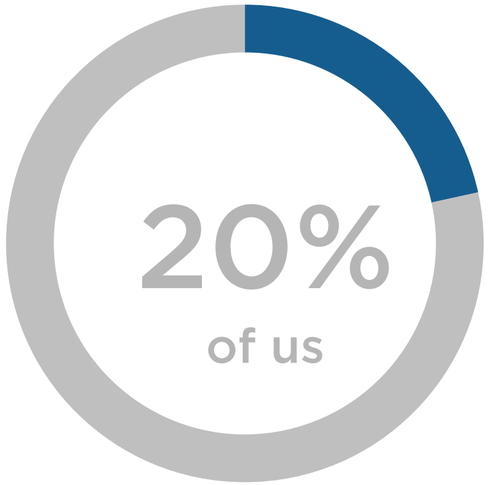
Using the Australian Bureau of Statistics data (6202.0 - Labour Force, Australia, October 2018) there were 12,665,800 employees in the Australian workforce in October 2018. Applying the data from Faethm for the future workforce, we have a much clearer idea of the job loss, job creation, and the skilling task Australia will face. The major debate has to focus on how we will transform the existing workforce capabilities to stay in work and assure the capabilities of all new graduates who can no longer rely on technical skills to access employment in occupations that may no longer exist.



1.9m workers will lose current jobs as machines replace human tasks

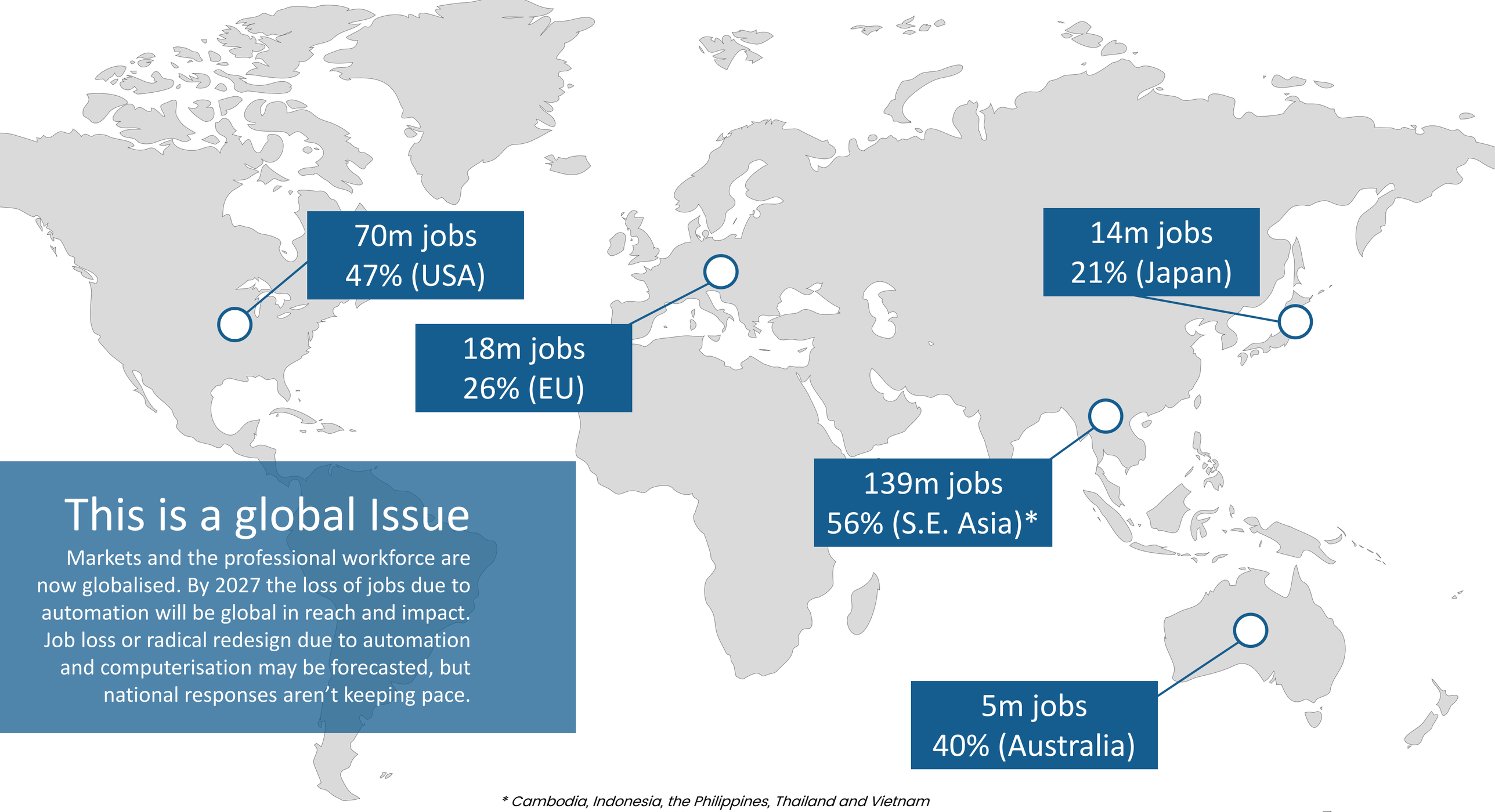


Over 2m workers will require major reskilling to stay in their current job as technology significantly augments certain jobs



2.4m workers will move to a job that doesn't exist today as jobs emerge

Source: Faethm data using their predictive platform, released 18 December 2018; data modelling employment in all industries, Australia November 2018 to November 2025. Numbers of workers based on ABS (2018) 6202.0 *Labour Force Australia October 2018* reporting total employment of 12,665,800 workers.



This is a global Issue

Markets and the professional workforce are now globalised. By 2027 the loss of jobs due to automation will be global in reach and impact. Job loss or radical redesign due to automation and computerisation may be forecasted, but national responses aren't keeping pace.

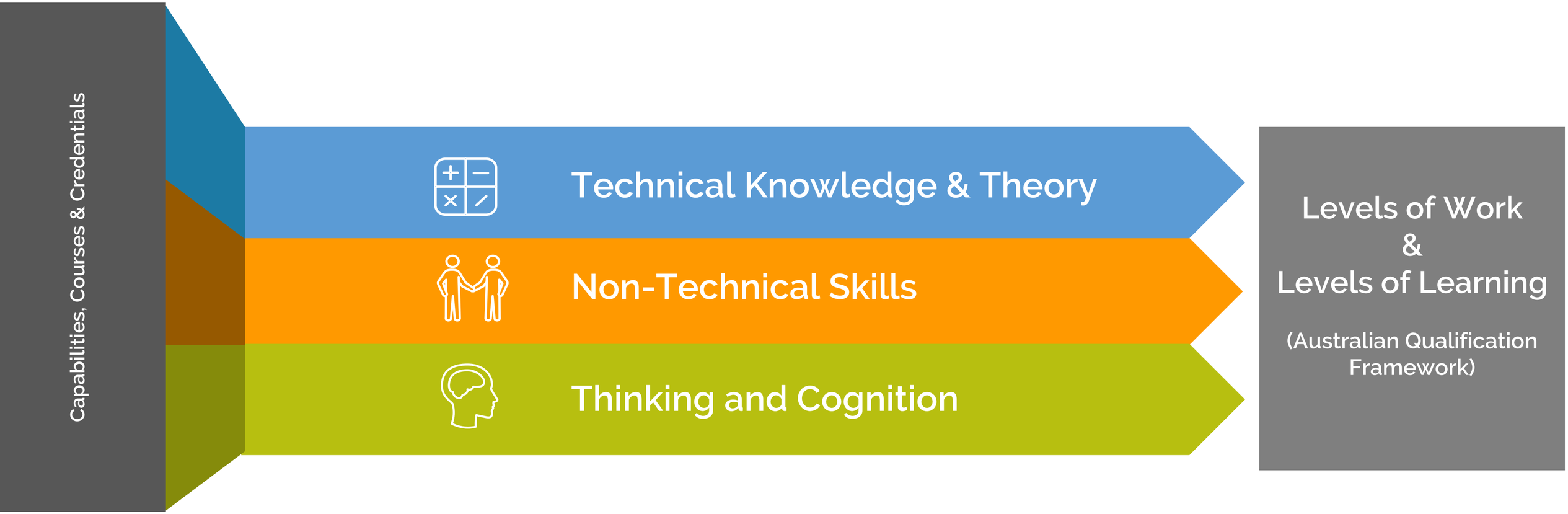
** Cambodia, Indonesia, the Philippines, Thailand and Vietnam estimates as at July 2017*

Future Capabilities
the view in late 2018

The following slides represent the latest research Working Futures™ is doing on future capability frameworks for professional, educational, and corporate clients. Most are works in progress and build off previous global research and findings. While leadership capabilities have also been a major area of research, generally the leadership capabilities have been distinct to the core future capability frameworks reported on the following pages.

Capabilities required for future work

The design logic for capabilities typically span three domains.



Future skills: Research based conclusions

There has been significant research undertaken across the globe on future skills or capabilities. Much of the research has focussed on the skills humans need that cannot be easily automated or provide careers in the future workforce. The research is well grounded, rigorous and starting to concentrate on a consistent set of core requirements both for work and for navigating the disrupted global labour markets. For instance, Deakin University undertook an 18-month, million dollar DeakinDigital project with IBM Watson that analysed 60,000 current and future global jobs to reach their conclusion.

Oxford Martin School (2016)	**DeakinCo. (2014)**	**OECD Global Workforce Core Competencies (2016)**	**Department of Education Foundations Skills (2015)**	**World Economic Forum Top 10 Future Skills Australia (2018)**
Sense-making	Self-management	Analytical thinking	Self-management	Creativity, originality & initiative
Social intelligence	Communication	Flexible Thinking	Communication	Analytical thinking & innovation
Novel and adaptive thinking	Teamwork	Strategic Thinking	Teamwork	Active learning & learning strategies
Cross-cultural competency	Problem Solving	Manage Resources	Problem Solving	Technology design & programming
Computational thinking	Critical Thinking	Achievement Focus	Technology	Complex problem-solving
New media Literacy	Digital Literacy	Diplomatic Sensitivity	Learning	Critical thinking & analysis
Transdisciplinarity (work across disciplines)	Global Citizenship	Teamwork & Team Leadership	Interactive & Enterprise Skills	Leadership and social influence
Design Mindset	Innovation	Organisational knowledge & alignment	Planning & Organising	Emotional intelligence
Cognitive Load Management	Professional Ethics	Negotiating and Influencing		Reasoning, problem-solving & ideation
Virtual Collaboration	Emotional Judgement			Resilience, stress tolerance & flexibility

CApable Draft Model

Example from initial research by Chartered Accountants ANZ:

Less is more. The CA model illustrates how a macro-level, trans-national workforce strategy relies on isolating the most important capabilities across four domains. This allows the framework to flex and evolve. It can maintain relevance while keeping an undiluted focus on the priority skills required to transition the existing profession or help those entering the workforce remain employable. The model will be validated and tested with stakeholders in early 2019.

Technical

Tax
Financial advisory & superannuation
Audit & assurance
Insolvency
Corporate finance
Reporting

Personal

Ethics & integrity
Self-management & learning
Critical thinking & judgement
Adaptive mindset
Global citizenship

Business

Communication
Collaboration & relationships
Problem solving & decision making
Customer focus
Digital acumen
Business and data analysis

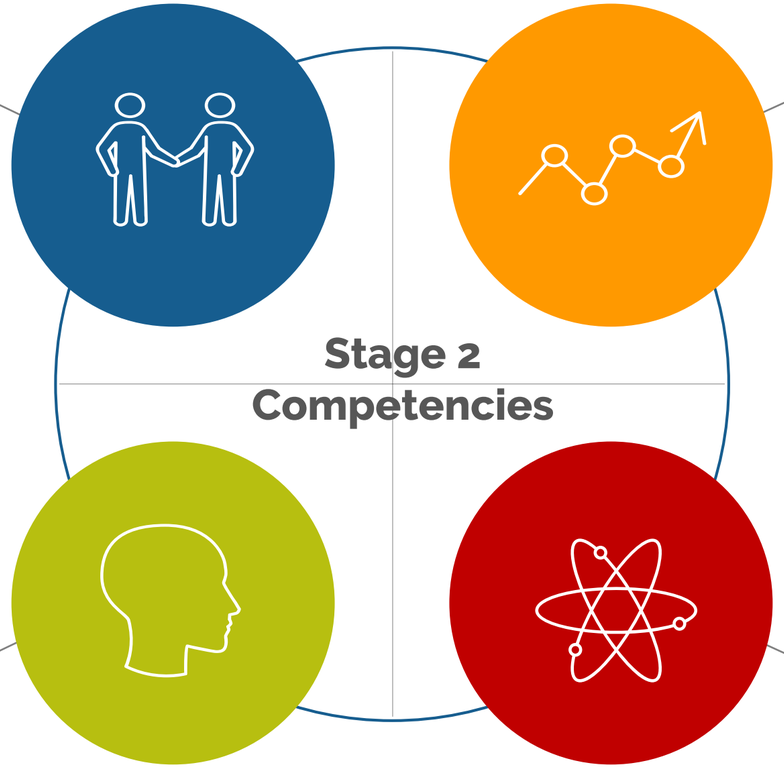
Leadership

Future focus
Drive for results
Leading & developing others
Agility & change
Innovation & creativity
Risk & Governance

Engineers Australia Model

Example from EA Professional Stage 2 Competency Model:

EA has a national competency model that aligns to international standards. For graduates EA propose the future engineer will require a mix of 16 elements across four competency domains.



Obligation to Community

4. Develop safe and sustainable solutions
5. Engage with the relevant community and stakeholders
6. Identify, assess and manage risks
7. Meet legal and regulatory requirements

Value in the Workplace

8. Communication
9. Performance
10. Taking action
11. Judgement

Personal Commitment

1. Deal with ethical issues
2. Practise competently
3. Responsibility for engineering activities

Technical Proficiency

12. Advanced engineering knowledge
13. Local engineering knowledge
14. Problem analysis
15. Creativity and innovation
16. Evaluation

QTAC Future Capabilities

Example from Queensland tertiary Admissions Centre Future Capability Dictionary:

The capabilities underpinning the badging, verification and credentialing regime by partner universities spans three domains and 14 core capabilities required by future workers seeking employment. They have been isolated as part of a review of global research. They will be stress tested with clients in early 2019. The capabilities have also been mapped against higher education graduate learning outcome/ attribute frameworks.

Personal

1. Personal Initiative and Drive
2. Personal Learning and Mastery
3. Adaptive Mindset
4. Cultural and Social Intelligence
5. Empathy
6. Entrepreneurial Thinking
7. Critical Thinking and Judgment

Non-Technical

8. Ethics and Integrity
9. Communication
10. Collaboration and Relationships
11. Creativity and Innovation
12. Problem Solving
13. Digital Acumen
14. Customer Focus

Technical

15. Technical/ Professional Skills and Knowledge

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