

Tomorrow's Digitally Enabled Workforce – megatrends and scenarios for jobs and employment in Australia over the next twenty years

This report examines plausible futures for jobs and employment markets in Australia over the coming twenty years, towards 2035.

Megatrends:

Megatrends are gradual and deep-set trajectories of change that will at some point reshape the business and policy environment. The megatrends most relevant to labour market change are:

1. Steep growth in computing power, device connectivity, data volumes and artificial intelligence
2. Changing employment markets and organisational structures
3. The era of the entrepreneur
4. Divergent Demographics
5. Continued growth of the service sector

The megatrends are examined in the context of four different possible future scenarios:

1. Despite linear advance in technology, penetration is bumpy and uneven. There is little change to business structure or process. The workforce is similar to today.
2. The promises of artificial intelligence and automation systems have been fully realised. While technological advances have replaced many jobs, there are few changes to employment models.
3. Exponential technology growth and innovation, socially inclusive employment models, many opportunities for individuals and society.
4. Technology has advanced more slowly and task automation hasn't had much impact on the bulk of people's jobs. Organisational structure, culture and practices have changed substantially.

Policy Implications

The megatrends and scenarios hold implications for the ways in which individuals manage their careers (and those of their children), the ways via which companies manage their workforce and the ways via which government regulates and manages the labour market.

- 1. Education and training are becoming ever more important.**
There will be fewer and fewer jobs within the service sector of the economy – within which the bulk of Australians are currently employed – which do not require skills and/or training qualifications.
- 2. New capabilities are needed for new jobs of the future.**
Lifelong education and training for all Australians needs to prepare both young and old for new and different jobs and employment models.
- 3. Digital literacy is needed alongside numeracy and literacy.**
To enter the labour market of the future, Australians will need to be literate, numerate and digitally literate. These capabilities will be threshold requirements for most jobs.
- 4. The importance of Science, Technology, Engineering, and Mathematics (STEM) will change.**
STEM skills are likely to be needed in many of the better paid jobs of the future. In general STEM participation is in decline. There are good reasons to believe it will be increasingly important for getting a good job in the future

5. **New aptitudes and mindsets will be needed to handle a dynamic labour market.**
In tomorrow's job market adaptability, resilience, buoyancy and entrepreneurial capabilities will be of increasing importance.
6. **Improving workforce participation in vulnerable demographics will be important.**
Finding positive ways to improve workforce participation rates for vulnerable demographics, such as low skilled male workers, is an increasingly important national priority. The number of working aged men not in the labour force has more than doubled since the late 1970s.
7. **Tapered retirement models will become more common.**
There is a need to develop tapered (and other new) retirement models that productively harness the skills of an aged population and ensure positions are available for younger labour market entrants.
8. **Perceptions and norms about job types will be challenged.**
Gender, age and cultural imbalances sometimes occur in certain professions as a result of perceptions by employees and employers about the 'right person' for the job. Challenging these perceptions will be increasingly important for maintaining Australia's workforce in the more dynamic and rapidly changing employment market of the future.
9. **New models to forecast job transition requirements will emerge.**
Individual career choices in the fast-changing digital economy will require more real-time and fine-grained modelling, drawing upon holistic and dynamic data. Decision models are needed by companies, industries, government agencies, regions, State/territories and nations which can:
 - a. Predict existing jobs (and tasks) likely to be automated;
 - b. Identify new jobs likely to be created; and
 - c. Identify transition pathways via which individuals, organisations, industries and societies can make the switch as smoothly as possible.
10. **Improved understanding of the peer-to-peer (and freelancer) economy.**
There are, as yet, unanswered questions about how private and public sector organisations and individual employees connect with the newly arriving peer-to-peer labour markets:
 - a. For what types of jobs, tasks and industries does a freelancer model work well and where does it not work?
 - b. Should (and how should) companies transition from current arrangements to a more freelance workforce?
 - c. How is fairness (for both employers and employees) ensured by government regulators within a freelancer workforce which may be delivering a large volume of micro-transactions across jurisdictional borders?
 - d. What is the demand for offices and workspaces and what is the impact on the design and functioning of cities with a more agile, networked and connected population of portfolio workers?

An historic level of change

There are several factors creating unique conditions, or "*a perfect storm*", at this point in history:

- The first relates to rapid advances in, and adoption of, digital technology.
- The full impact of exponential and/or steep growth in computing power, device connectivity, data volumes and artificial intelligence is yet to be felt within Australia's labour market.
- The internet of things is at the early stages of growth. In 2006 there were 2 billion smart connected devices, in 2015 there were 15 billion devices and by 2020 there will be 200 billion devices. Major growth is predicted in healthcare devices and manufacturing.
- Australia has high rates of internet access and mobile connectedness. This is likely to increase in regional areas.

- Internet access is growing globally. There will be increased competition for jobs that can be performed online.
- Rapid advances are being made in artificial intelligence.
- Cloud computing has arrived, enabling lean start-ups connecting diverse groups of workers.

The second is a shift in the institutional landscape associated with the rise of digital technologies:

- Tech companies are achieving marketing capitalisation rates higher than historical patterns and with fewer employees.
- Peer-to-peer business models are emerging and there is a growing population of portfolio workers.
- Organisational structures are becoming flatter.
- Australia offers an environment conducive to entrepreneurship; however, Australian venture capital funding is declining.

The third factor creating the perfect storm is demographic change:

- In the next decade Australia's workforce will be older and more culturally diversified. Nearly every fifth Australian is expected to be over 65 years old in 2035 compared to one-sixth of the population today.
- Chronic and lifestyle diseases are on the rise. Nearly two thirds of Australian employees are overweight or obese. This rate may exceed 70 per cent by 2025.
- Over 80 per cent of annually arriving migrants are of working age, while only 54 per cent of the residents are of working age.
- Mental ill-health is highly prevalent in the Australian population including in employees.
- Higher education enrolments are increasing and so are the costs.
- Online education is likely to complement university (already does). Free learning opportunities are increasing and more widely available.

New Jobs

Looking forward, workers with a mix of technical skills and interpersonal aptitudes will have the best prospects for meaningful work. Jobs involving creativity, complex judgement, advanced reasoning, social interaction and emotional intelligence are likely to grow in the decades ahead, and are less likely to be affected by advances in automation and artificial intelligence.

The report puts forward six examples of new jobs that may be created in the coming years based on the megatrends and scenarios:

- Big data analysts
- Complex Decision Support Analysts
- Remote Controlled Vehicle Operators
- Customer Experience Experts
- Personalised Preventative Health Helpers
- Online Chaperones (managing risks with identity theft, reputational damage, social media bullying and internet fraud)