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Realising a cloud-enabled economy in Australia:

How cloud drives economic and societal impact through micro, small, and medium-sized businesses

2023

By 2030, MSMEs can deliver greater societal value in a cloud-enabled Australia

Across key sectors[i] this opportunity is expected to represent:

$9.3 billion combined annual productivity benefits unlocked through cloud-enabled MSMEs in healthcare, education, and agriculture

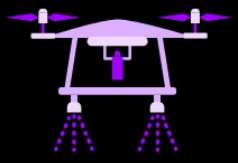
This represents a 16% increase on current levels

1.4 million people in Australia (10% of the workforce) employed by cloud-enabled MSMEs within healthcare, education, and agriculture

17 million virtual health consultations using cloud supported by MSMEs' services

2 million school students engaging in online learning via cloud-enabled MSMEs

1 in 3 farms using cloud-enabled precision agriculture technologies supported by MSMEs



MSMEs is the abbreviation of micro, small, and medium enterprises.
Current values are annual 2022-2023 values based on the latest available data.
i. Key societal sectors are healthcare, education, and agriculture.
Source: Accenture research (see global report appendix for methodology).

Overview

Micro, small, and medium enterprises (referred to as "MSMEs") are businesses and startups with between 1 and 250 employees and are a major driver of economic performance. In Australia, MSMEs collectively account for about 99% of all businesses, 41% of jobs, and about 30% of Gross Domestic Product (GDP).[1,2] MSMEs are also a major source for innovation and disruption in the economy, leveraging both old and new technologies to fill gaps in the current market and bring new products and services to bear.

By allowing users to procure on-demand, scalable IT products and services over the internet or a private network, cloud technology has driven economic and societal benefits by creating new business models, reducing costs, and supporting new opportunities for entrepreneurs and startups. According to the Organisation of Economic Cooperation and Development (OECD), 71% all businesses across Australia now utilise at least some basic form of cloud technology (such office software and email), although adoption rates of more advanced technologies, such as artificial intelligence (AI) and machine learning (ML) remain low, at approximately 15% of businesses.[3,4] Cloud technologies have most profoundly impacted MSMEs by allowing them to start, operate, and scale their operations more effectively.

The use of cloud technology by MSMEs is expected to become increasingly ubiquitous, advanced, and mature. With continuous advancements in technology and the decreasing costs of cloud services, MSMEs will have access to an even wider range of scalable and cost-effective technology solutions across functions, occupations, and industries. We refer to this potential future state as the "cloud-enabled economy," a future characterised by high levels of overall cloud adoption across Australian businesses. It is anticipated that under this scenario, 90% of all businesses would adopt at least a basic level of cloud technology.[5,6] For many businesses, however, this represents only the beginning of their cloud journey. The escalating sophistication in cloud technology beyond basic applications will be a pivotal driver for economic growth in the future. As MSMEs tap into advanced cloud functionalities, such as AI, data analytics, and serverless computing, they can foster innovation, streamline operations, and customise consumer experiences at scale. These advanced uses can unlock new revenue streams, encourage innovation and the creation of new business models, and enhance competitiveness, collectively underpinning the future of the digital economy.

By 2030, a cloud-enabled Australian economy is expected to deliver even greater societal impact by supporting MSMEs to produce innovative new products and solutions or augment their existing operations. Within the key societal sectors of health, education, and agriculture, this annual contribution is expected to reach $9.3 billion.[7] Furthermore, by 2030, cloud-enabled MSMEs are expected to support 17 million virtual health consultations, two million school students to access online education, and one in three farms to access more efficient and sustainable farming practices in Australia. Cloud-enabled MSMEs are also heavily involved with developing solutions to transition the economy towards a more sustainable future and designing digital finance solutions (through 'fintechs') that help to support better financial inclusion and wellbeing.

[1] Australian Small business and family enterprise ombudsman (2022) 'Contribution to Australian Business Numbers'
[2] Australian Small business and family enterprise ombudsman (2020) 'Small business counts – December 2020'
[3] OECD (2023), Share of businesses purchasing cloud services
[4] Advanced levels adoption derived from aggregated cloud usage types. See Section 1.2.1.
[5] Gartner (2022), The future of cloud computing in 2027: From technology to business innovation.
[6] Gartner (2021), Gartner says cloud will be the centerpiece of new digital experience.
[7] All monetary values are quoted in Australian (2023) dollars unless otherwise specified.

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Although these benefits are substantial, the opportunities of the future cloud-enabled economy will not eventuate without immediate action. To unlock this potential, Australian MSMEs, industry, and governments need to work together to foster the continued adoption and maturity of cloud usage. Businesses can help to achieve a cloud-enabled economy by:

- identifying how cloud technology can be embedded within their business and developing a strategy that is cloud-led to help them scale and deliver greater impact
- developing a plan for transitioning off legacy systems and training employees to leverage the benefits of cloud technology.

Australian state and federal governments can support businesses, address structural barriers to cloud adoption, and accelerate the path to a cloud-enabled economy by:

- prioritising cloud technology education and training as appropriate, both in tertiary education and in the workforce
- investing in digital infrastructure to ensure innovation can continue unimpeded; and
- leading by example through adopting cloud technology and promoting cloud-first policies across all public sector organisations.

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1 The cloud-enabled economy

Cloud technology has changed, and continues to change, the way many businesses operate, particularly for MSMEs who employ between 1 and 250 employees[8], by enabling them to scale quickly, reduce costs, and access a range of technology resources that were previously unattainable.

1.1 Cloud technology enables the digital economy

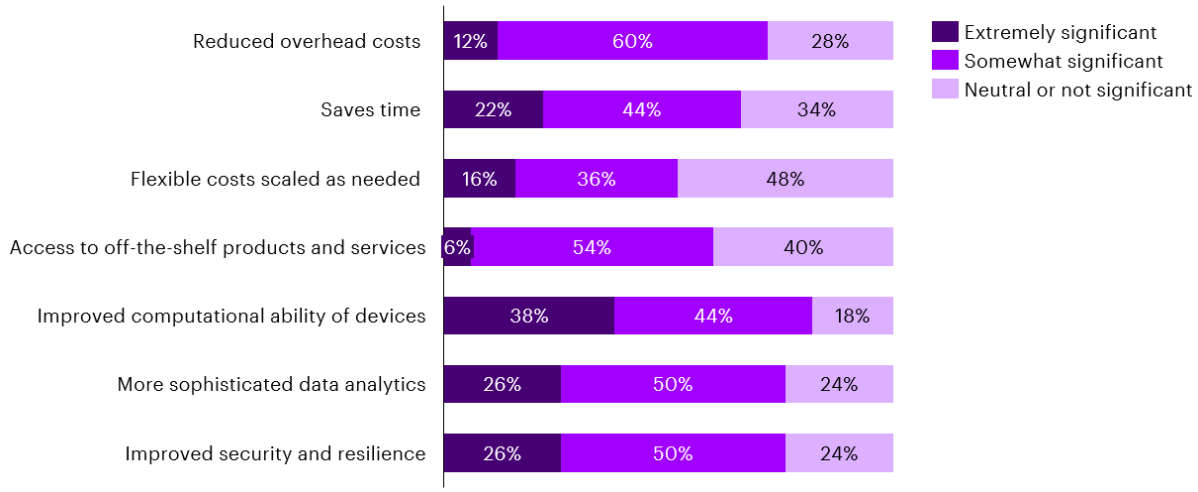
Cloud technology refers to the provision of on-demand IT products and services delivered over the internet.[9] This involves housing digital resources from centralised servers owned and operated by cloud service providers, reducing the need for individual businesses to procure and maintain physical hardware. Outsourced technology provides greater flexibility to support MSMEs through the early stages of the business lifecycle by:

- reducing overheads and time to market
- providing greater ability to scale up or down depending on business demands
- offering specialised technology solutions
- increasing computational power of ordinary devices; and
- enhancing security and resilience.

Cloud technology supports MSMEs and helps to enable the digital economy by providing a range of benefits highlighted in Figure 1. The Accenture societal impact survey of cloud-enabled MSMEs conducted for this report indicates that the ability to perform data analytics, enhanced computational power, and improved security and resilience are the features of cloud technology that are most impactful to MSMEs.

Figure 1: The most significant benefits of cloud technology for MSMEs

Average % of cloud-enabled MSMEs across industries in Australia that find cloud somewhat or extremely significant in providing a particular benefit



Source: Accenture societal impact survey (2023), n = 55. 'Neutral or not significant' includes responses of neutral, somewhat insignificant, and not significant at all.

[8] The definition of MSME is taken from the OECD (2023).
[9] AWS (2023), What is cloud computing.

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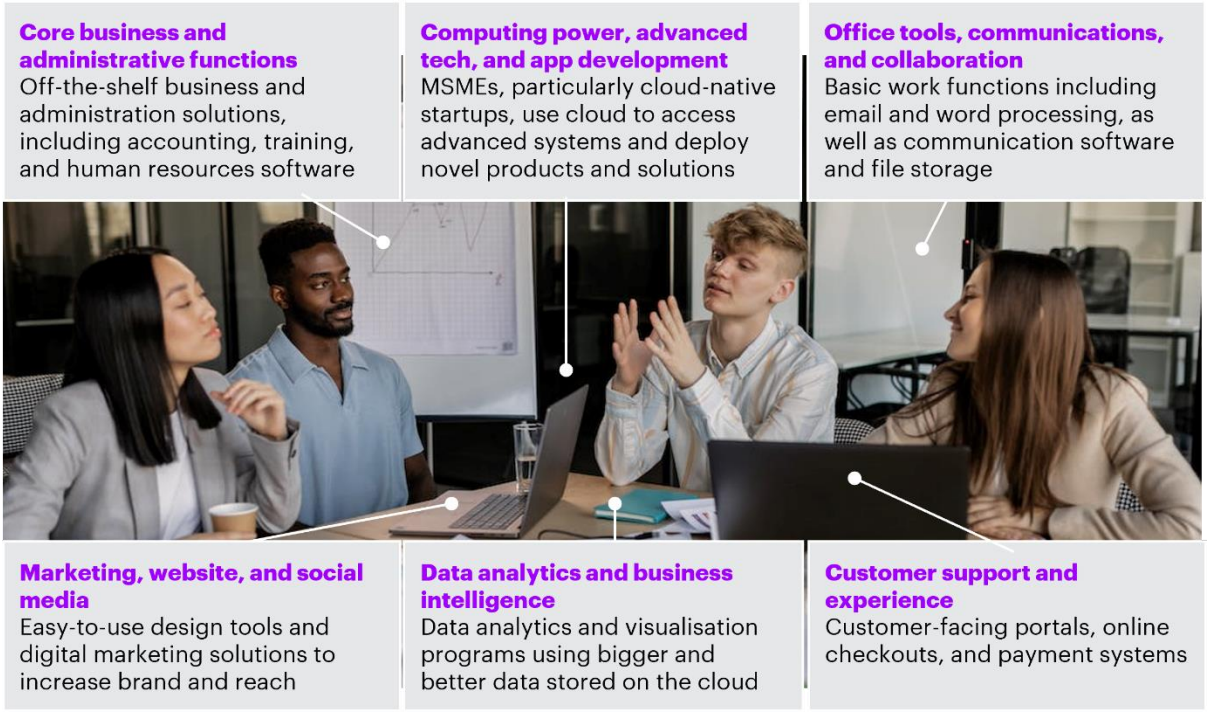
By promoting shared resources, cloud has fundamentally changed the way that individuals and businesses interact with technology, with the number of potential applications of cloud technology far eclipsing simple, remote data storage. Most applications, platforms, and smart products have some functionality facilitated by cloud technology as shown in Figure 2. Having access to on-demand functionalities supports MSMEs to start, operate, and scale their business more efficiently and effectively.

Figure 2: End-to-end cloud applications for MSMEs



Source: Accenture

1.2 Achieving a cloud-enabled economy can unlock significant societal and economic potential

With continuous advancements in technology and the decreasing costs of cloud services, economies will continue to experience a wave of digital disruption and productivity as businesses find more ways to produce novel, new products and solutions or augment their existing operations. We refer to this potential future state as the "cloud-enabled economy," a future characterised by high levels of cloud adoption; based on an assessment of cloud industry forecasts, this report expects 90% of all businesses will adopt at least a basic level of cloud technology in a cloud-enabled economy.[10,11] As cloud technology applications mature, a cloud-enabled economy would increasingly involve digital applications and services being cloud-based, high internet speed and connectivity, cloud-enabled data storage and processing, as well as a mobile workforce (see Figure 3).

[10] Gartner (2022), The future of cloud computing in 2027: From technology to business innovation.
[11] Gartner (2021), Gartner says cloud will be the centerpiece of new digital experience.

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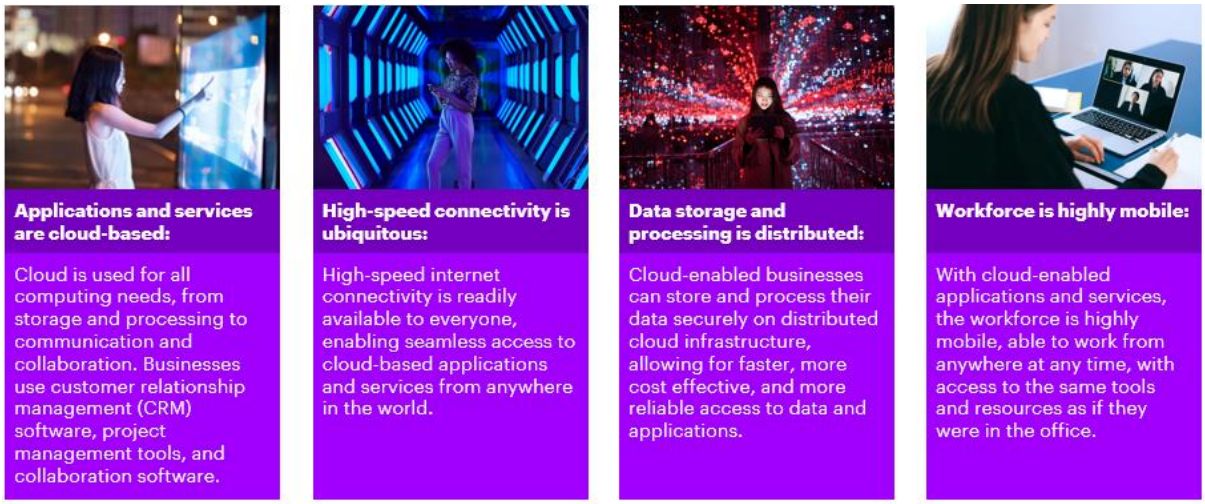
Figure 3: Characteristics of a cloud-enabled economy



Source: Accenture.

1.2.1 The spectrum of cloud adoption

The definition of cloud adoption used in this report is consistent with the OECD, and refers to the share of businesses that purchased cloud services[12] as a proportion of all businesses, across all levels of maturity.[13] However, cloud technologies have a range of applications across a suite of business functions that mean that the use of cloud technology can be considered on a spectrum of maturity or sophistication as shown by the figure below, which includes:

- **Basic adoption:** user-friendly solutions designed for everyday tasks. These solutions typically do not require specialised technical knowledge to operate and primarily serve to simplify and enhance common digital activities. These include simple cloud-based storage solutions, web-based email services, and collaborative office suites.
- **Intermediate adoption**: applications and platforms that cater to more specialised needs but still largely consist of off-the-shelf products with intuitive interfaces. Such tools include customer relationship management, enterprise resource planning, project management tools, developer platforms, and cloud-based databases.
- **Advanced adoption**: highly specialised cloud applications and cutting-edge technologies tailored for expert tasks. This category encapsulates machine learning and AI platforms, big data analytics tools, internet of things (IoT) platforms, serverless computing, container management systems, and advanced security and compliance tools.

As the global economy increasingly digitises, the need for MSMEs to increase their cloud maturity is becoming increasingly pertinent. MSMEs that fail to leverage the scalability of cloud solutions may not only forfeit the ability to compete more effectively with fewer fixed IT costs, but they may also pass up more sophisticated data analysis tools, more secure safeguards for digital assets, streamlined compliance with international regulations, and advanced technology applications (such as artificial intelligence, see Section 1.2.2). For many MSMEs to maintain their competitive edge in a dynamic, cloud-enabled economy, the

[12] Cloud computing as part of this definition includes information and communications technology (ICT) services that are provided over the internet or a private network to access servers, storage, network components and software applications.
[13] OECD (2023), OECD Going Digital Toolkit

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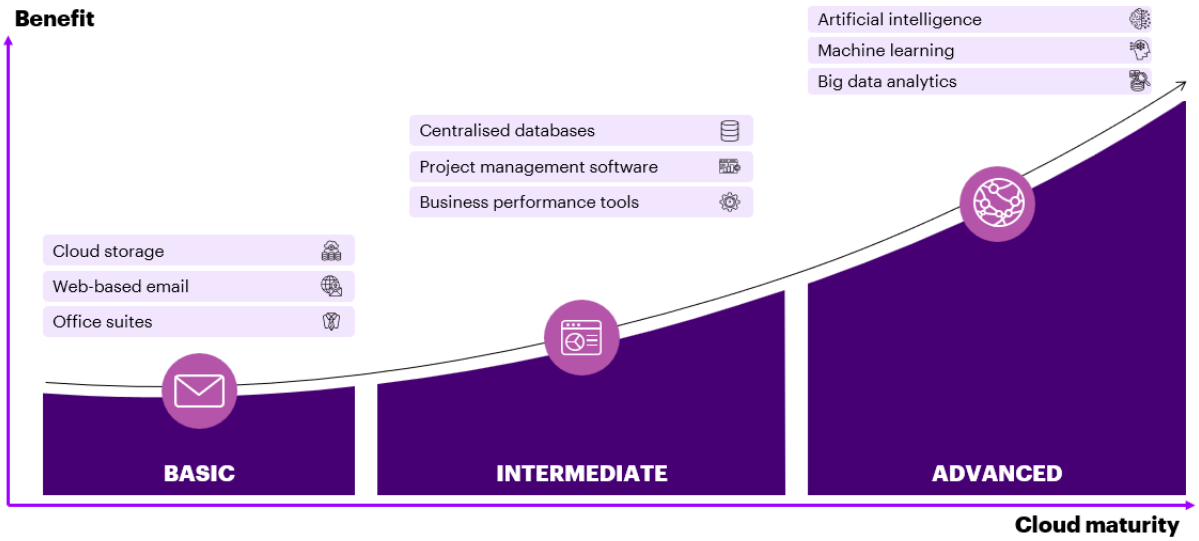
sophistication of their adoption will need to evolve and adapt with the technology according to their specific needs.

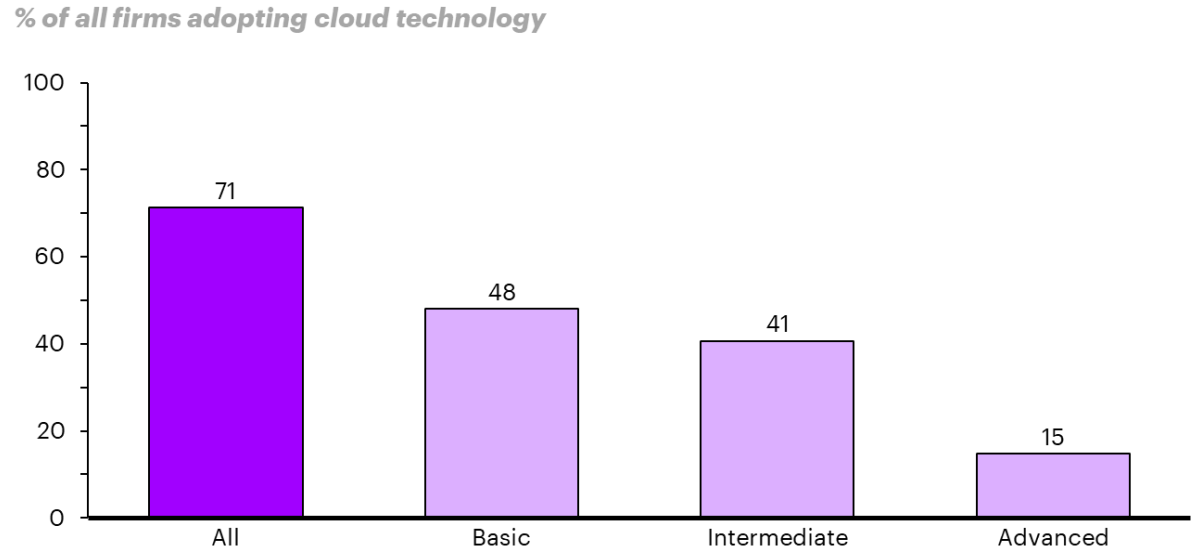
Figure 4: Spectrum of cloud maturity and example applications



Note: Applications above are examples of types of uses for each of the levels of maturity. The lists are not exhaustive.
Source: Accenture.

The rate of cloud adoption across Australia varies considerably depending on the technology types. The OECD reports that 71% of Australian businesses use at least a basic level of cloud technology in their business, although intermediate and advanced adoption rates are far lower with 41% and 15% of businesses, respectively (see Figure 5).

Figure 5: Cloud adoption by sophistication, all Australian businesses (2020)



Note: As a result of the COVID-19 pandemic, it is possible that cloud adoption has changed since 2020 (last reported).
Source: OECD (2023)

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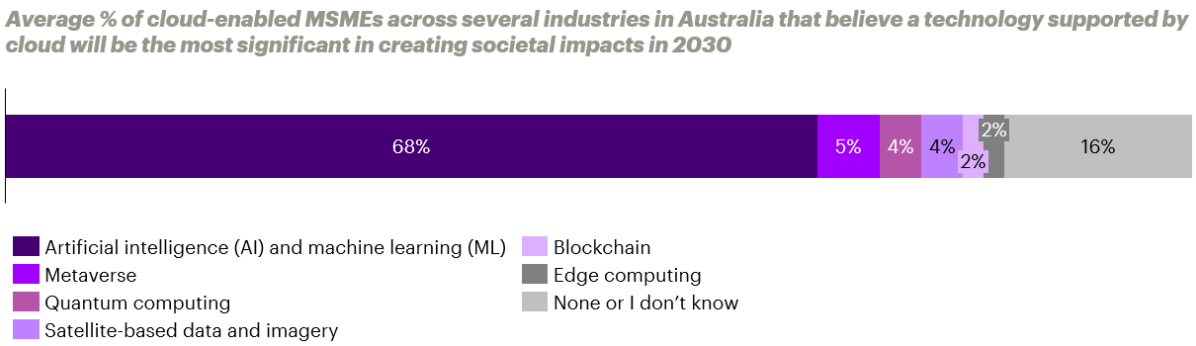
1.2.2 Advanced cloud usage unlocks the potential for emerging and innovative technologies

Embracing advanced cloud adoption also allows businesses to select from a variety of innovative and cutting-edge technologies to meet their unique business needs and secure a competitive edge in the market. Cloud has increased the viability and proliferation of a wide range of tools, business models, and technologies that, together with cloud, generate societal and economic impact. Advanced applications of cloud include:

- artificial intelligence (AI), encompassing generative AI
- machine learning (ML)
- internet of things (IoT)
- quantum computing; and
- edge computing.

These examples form a growing list of advanced technologies that have become accessible to a wider base of users though cloud technology (see Appendix D of the global report for a full description of each technology supported by cloud).[14] Of these technologies, generative AI is experiencing the most rapid and dramatic growth; over the next 10 years generative AI is expected to grow at an annual average rate of 27%.[15] Although the technology has only recently been adopted by the wider public, generative AI is already disrupting and enhancing businesses' processes, accelerating innovation, and facilitating greater speed and creativity across a variety of industries. Businesses and employees are already experimenting with generative AI to create content that supports a range of tasks from writing text and code to generating images.[16] As shown in Figure 6, 68% of Australian MSMEs across several industries identified AI (including generative AI and natural language processing (NLP)) and ML as the technologies likely to be most significant in creating societal impacts in 2030.[17,18] Generative AI could be used by cloud-enabled MSMEs for a wide variety of applications, such as helping medical professionals analyse patient data and testing results to inform decision making, or generating exam questions and instant feedback to support individualised learning pathways.

Figure 6: Technologies supported by cloud creating the most significant societal impacts in 2030



Source: Accenture societal impact survey (2023), n = 55. 'Artificial intelligence (AI) and machine learning (ML)' includes subsets generative AI and natural language processing (NLP).

[14] Damian Mazurek, (2023), Leveraging Cloud-based AI/ML Services to elevate your business.
[15] Precedence Research (2023), Generative AI Market size to hit USD 118 Bn by 2032
[16] AWS (2023), Generative AI on AWS.
[17] Accenture survey (2023), n = 55. 68% of Australian MSMEs is consistent with the 78% of MSMEs globally out of a sample of 562 who identified AI and ML as the technologies likely to be most significant in creating societal impacts by 2030.
[18] Survey responses were from MSMEs working in healthcare, education, agriculture, finance, and sustainability.

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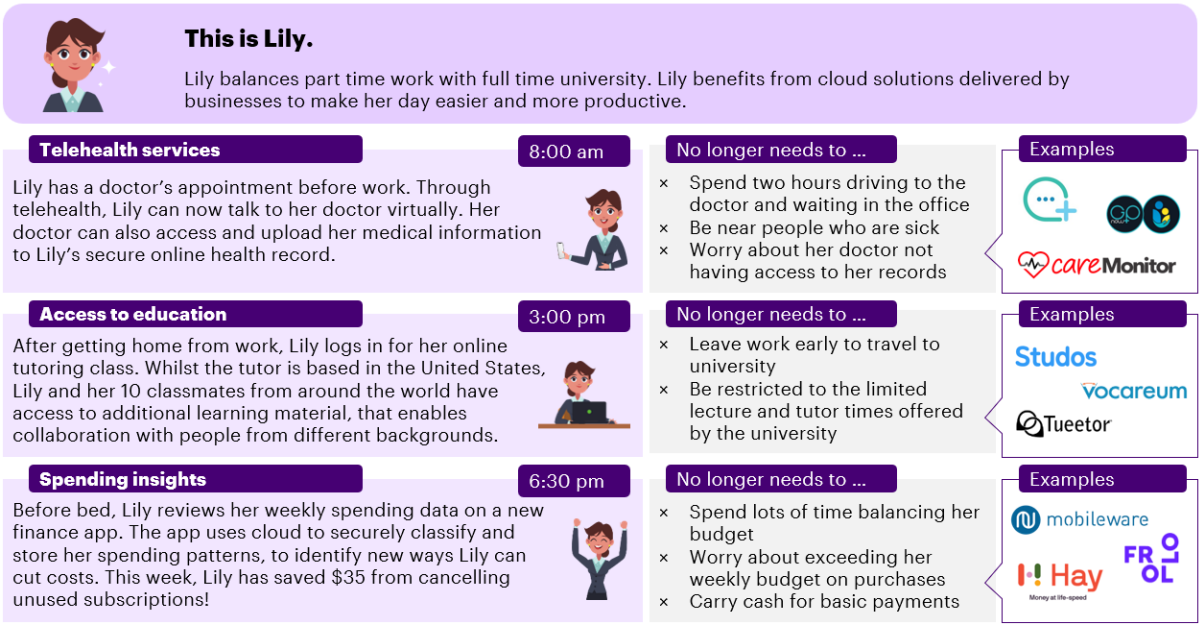
1.2.3 A more productive, cloud-enabled economy offers societal as well as economic benefits

While the opportunity to scale and grow businesses has a clear impact on economic activity (see Chapter 2), in many cases businesses can also create a positive societal impact. Cloud has opened up a range of emerging technologies that are underpinning a new wave of digitally-led innovation to address some of society's most pressing, global issues. Cloud offers MSMEs new ways to produce and commercialise technological solutions that generate positive societal benefits, in addition to economic benefits, across a range of industries. Although this list of industries is not exhaustive, the estimation of the societal impact of cloud technology is focused on the following industries:

- healthcare
- education
- agriculture
- finance; and
- sustainability and disaster response.[19]

While these industries are not the only ones that are impacted by cloud technology, these industries face increasingly complex challenges that could lead to less equitable societal outcomes if they do not adapt and harness the benefits offered by cloud technology. These industries are also directly linked to the United Nations Sustainable Development Goals (SDGs), particularly the overarching objectives of improved healthcare (Goal 3), education (Goal 4), and economic prosperity and equality (Goal 9 and 10).[20] Figure 7 demonstrates through a stylised cameo how cloud technology supports access to these industries for individuals through digitisation.

Figure 7: The impact of cloud-enabled MSMEs on individuals



Notes: Examples include MSMEs and startups using cloud solutions from AWS case studies
Source: AWS[21]

[19] The report chose to focus on these industries since most societal impact case studies reviewed fell into one or more of these industries. These labels also benefit from matching the economic modelling data as they are taken directly from the International Standard Industrial Classification (ISIC).
[20] United Nations (2023), Sustainable development goals.
[21] AWS (2023), Customer Success Stories.

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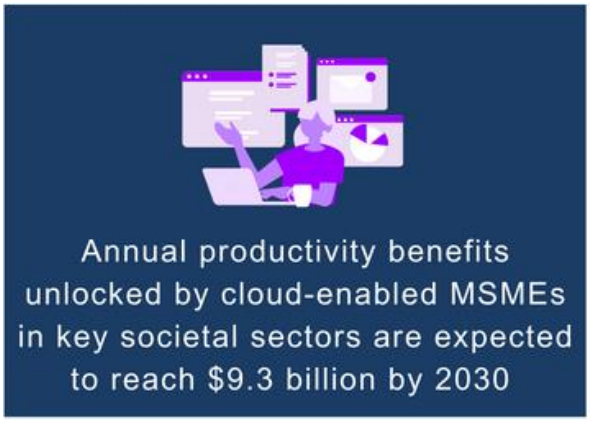
2 Unlocking a total $9.3 billion in productivity benefits within key societal sectors

MSMEs are a major driver of economic performance in Australia, accounting for about 99% of all businesses, 41% of jobs, and about 30% of Gross Domestic Product (GDP).[22,23] Cloud technology is helping to create and scale MSMEs (See Chapter 1), the impact of which can be identified in overall, aggregate economic performance. The impact of further cloud adoption and maturity on aggregate economic output is estimated with a novel economic model, based on analysing current data that captures the relationship between adoption and economic activity. In Chapter 3, this analysis is taken to the next level of granularity, assessing how much of this impact can be attributed to key societal sectors of healthcare, agriculture, and education.

Box 1: Modelling the economic potential of a cloud-enabled economy
This research estimates the impact of cloud on economic productivity at the country level using data from the OECD to capture the relationship between cloud adoption rates and GDP (controlling for capital and labour inputs). A full explanation of the modelling approach, data, and outputs can be found in Appendix A of the global report.

Australian organisations are global leaders in cloud adoption, making Australia well-positioned to transition to a cloud-enabled economy.[24] The OECD states that 71% of all Australian businesses use at least a basic level of cloud technology in their business operations, which has grown from 30% since 2014 and is one of the highest overall rates of adoption in the OECD.[25] As was the case in many other countries, cloud technology adoption in Australia increased significantly during the COVID-19 pandemic as businesses made resiliency plans during 2020 and 2021.[26]



[22] Australian Small business and family enterprise ombudsman (2022) 'Contribution to Australian Business Numbers'
[23] Australian Small business and family enterprise ombudsman (2020) 'Small business counts – December 2020'
[24] For consistency across modelling, we use adoption rates as reported by the OECD which refers to the share of all businesses purchasing cloud services. Adoption rates reported by the OECD may differ from those reported by local statistical agencies.
[25] Accenture analysis of OECD data. See global report for full methodology.
[26] Accenture analysis of OECD data.

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The productivity benefits of the cloud-enabled economy to Australian societal sectors would be significant. Through successful transition to a cloud-enabled economy, MSMEs in the healthcare, education, and agriculture industries within Australia are expected to unlock $9.3 billion in combined annual productivity benefits by 2030, increasing 16% from $8.0 billion today. Under this scenario, it is estimated that 1.4 million people would work at cloud-enabled MSMEs in these industries, which would be 10% of the total jobs in Australia, an increase from 8% currently. This reflects the increasing ubiquitousness of cloud technology in almost all forms of digital technology and occupations across the economy.

Although overall adoption is high and this opportunity is large, it represents only the beginning. Australia's usage of more sophisticated cloud technologies remains low at only 15% of businesses (see Section 1.2.1) and the increasing adoption of cloud technology beyond basic applications will be a pivotal driver for economic growth in the future. As MSMEs introduce more sophisticated cloud technologies, such as AI, big data analytics, and serverless computing into their business models they can foster even further innovation, enhanced and more efficient operations, and better outcomes for customers at scale. Cloud expenditure in Australia is expected to grow at an average compounding rate of 16% over the next four years to $22.4 million, as businesses develop their cloud usage.[27] These advanced uses will unlock new revenue streams, introduce new ways of solving problems, and create new market opportunities, collectively underpinning the future of the digital economy.

[27] Linus Lai and Louise Francis (2023), Public cloud services opportunities and dividends to the Australian and New Zealand economies

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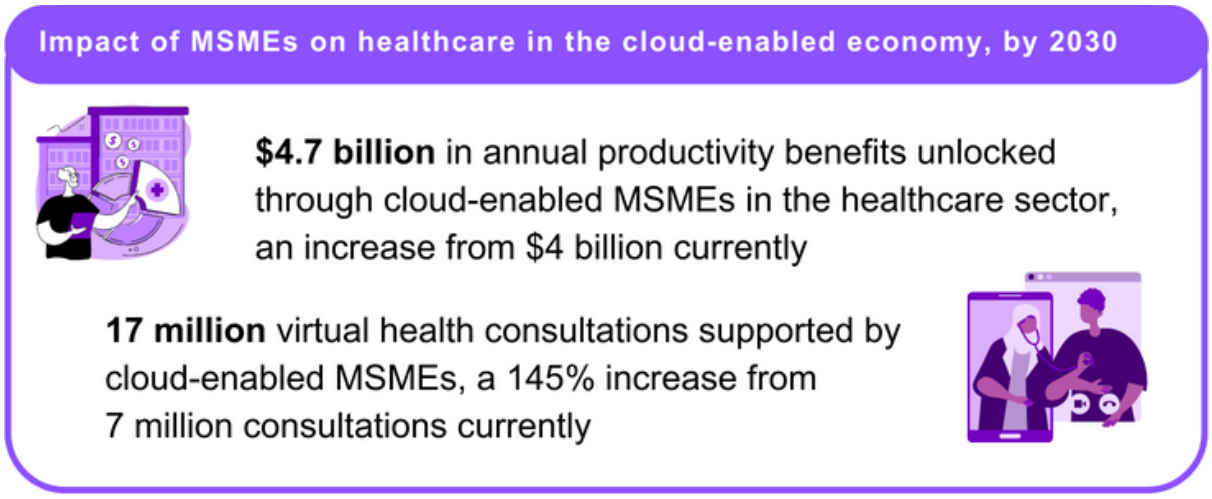
3 The societal impact of the cloud-enabled economy

MSMEs that harness cloud technology have the potential to create significant societal impact in Australia. We define "societal impact" in reference to the positive changes and improvements in outcomes facilitated by cloud technology in areas such as healthcare, education, and agriculture. By leveraging cloud technology, MSMEs can enhance the efficiency, affordability, and accessibility of services to customers and citizens, enabling advancements such as telemedicine, online education, precision agriculture, financial access and autonomy, and sustainable technology. These solutions will lead to improved social wellbeing and development Australia-wide.

3.1 Driving innovation and improving access to healthcare and life sciences

Cloud technology is supporting MSMEs to boost productivity and outcomes in healthcare, helping to make healthcare more data-driven, efficient, and accessible. Cloud-enabled MSMEs can help to overcome these barriers with virtual consultation and healthcare provision, along with improving collaboration between healthcare providers and enabling new modes of healthcare. Approximately 28% of Australians (seven million people) live in rural and remote areas, and increased provision of digital healthcare models can improve access to care. If Australia were to achieve a cloud-enabled economy, MSMEs in healthcare are expected to unlock $4.7 billion in annual productivity benefits by 2030. Cloud-enabled MSMEs are expected to support 17 million virtual health consultations per year by 2030.[28,29]



Note: Estimates for the number of virtual health consultations produced through market size estimates (see Appendix C of the global report) and are calculated separately to the GDP contribution. Current values are annual 2022-2023 values based on the latest available data.

Through harnessing emerging developments in technologies supported by cloud, MSMEs can stay at the forefront of healthcare innovation, helping to deliver positive societal outcomes into the future. Figure 8 outlines just some of the ways in which cloud technology is supporting MSMEs to deliver improved outcomes in healthcare.

[28] Virtual health consultations can also be supported by telephone or through large cloud-enabled businesses.
[29] Australian Institute of Health and Welfare (2023), Rural and remote health.

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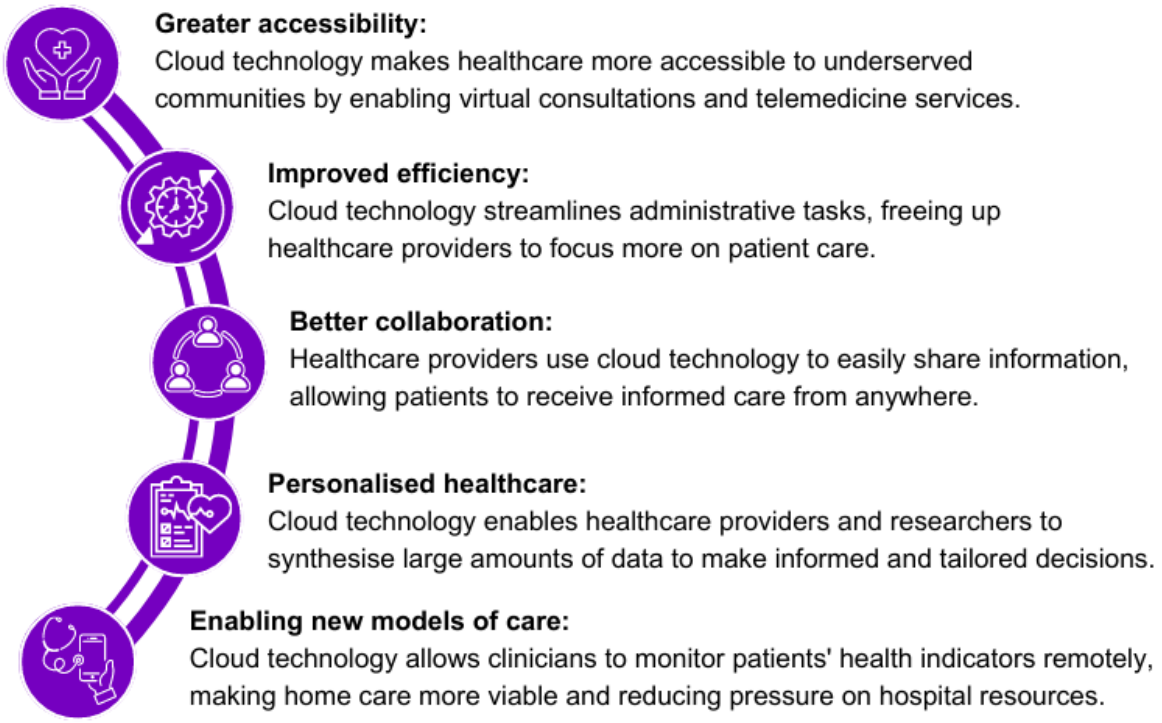
Figure 8: How cloud enables MSMEs to deliver improved outcomes in healthcare



Source: Accenture interviews and research[30,31,32,33,34]

Osara Health, an Australian cloud-based startup, provides virtual support to patients and caregivers during treatment phase, as well as connecting them to doctors who use the app to manage and monitor self-reported symptoms and side-effects, such as pain (see Case Study below).[35]

[30] Eze et al. (2020), Telemedicine in the OECD: An umbrella review of clinical and cost-effectiveness, patient experience and implementation.
[31] OECD (2021), Laying the foundations for artificial intelligence in health.
[32] OECD (2019), Health in the 21st Century: Putting Data to Work for Stronger Health Systems.
[33] OECD (2021), Empowering the health workforce to make the most of the digital revolution.
[34] OECD (2023), The COVID-19 Pandemic and the Future of Telemedicine.
[35] Osara Health (2023).

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Osara Health supports patients and caregivers through cancer treatment with a cloud-based app and dedicated Health Coach

OSARA HEALTH

Industry: Healthcare

Size: Small (<50 employees)

Locations: Australia, New Zealand, and the United States

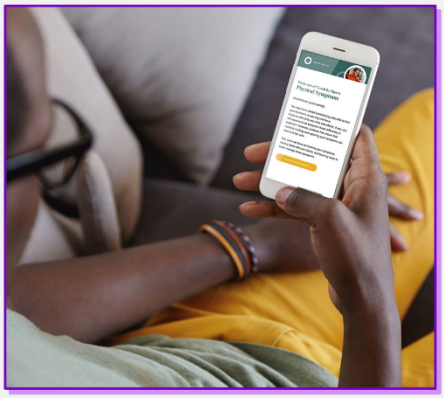
Osara Health is a digital health company founded in Australia in 2016 by oncologists determined to provide a smoother journey for cancer patients**. On average, one in three people will experience a cancer diagnosis and 40% of those diagnosed are of working age.** As a result, most people will be impacted by a cancer diagnosis in their lifetime. The founders identified a need to minimise the (often permanent) disruption that diagnosis has on these affected people's lives - 40% of cancer survivors do not return to work post diagnosis.

"Through our cloud-based app, Osara Health is providing equitable access to care, guiding patients through their cancer journey, and improving the care experience. We empower patients through treatment to better manage their diagnosis and help them return to their activities as quickly as possible."

Dr Raghav Murali-Ganesh, CEO and radiation oncologist

So far, Osara Health has **supported thousands of patients** through their cancer diagnosis. Osara Health has integrated into the employee wellbeing and support strategy at more than 50 large-scale organisations in Australia, New Zealand, and the United States, including Minter Ellison, Lendlease, and various departments of the Australian government.

Through an entirely cloud-based app, Osara Health connects patients to a dedicated Health Coach for personalised guidance, as well as access to digital tools such as evidence-based resources covering all aspects of treatment and behaviour change, verified articles and self-management tools.



Patients can also self-report **up to 18 symptoms**, such as pain and fatigue, straight to their doctor through secure records allowing self-management for better informed treatment plans and monitoring. As a result of this support, **33% of patients report an improvement in their pain, and are 73% more likely to return to work after treatment**.

Cloud is critical for Osara Health to provide coaching at scale and across even the most geographically isolated regions. Without cloud Osara Health indicated the company would not be able to scale its enhanced cancer care services effectively, being able to offer services to only a fraction of current patients and in an entirely different (likely face-to-face or over the phone) format. Cloud also offers data security credentials (ISO27001) necessary to provide secure and confidential digital support.

At time of writing, Osara Health has just announced their international expansion and relocation to the United States and has intentions to expand further in coming years.

Sources: Accenture consultations; CancerAid (2019), Return to Work After Cancer: A Key Health Outcome; Osara Health (2023).

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Cloud technology is also important for streamlining administrative tasks, creating efficiency for healthcare providers. Healthcare providers can use cloud technology to support informed patient healthcare decisions, helping providers to collaborate and easily share patient information, and assisting them to take insights from large amounts of data to make treatment personalised and tailored. Technologies supported by cloud, particularly generative AI, also have significant potential to change the healthcare industry, from the delivery of healthcare to administrative functions. MSMEs can use generative AI to support clinical decision making, helping medical professionals analyse data more accurately, along with supporting efficiency in research and development.[36]

3.2 Improving access to engaging and personalised education

Australia has a greater proportion of students completing later stages of high school than the OECD average, although according to NAPLAN, one in three Australian school students are not meeting expectations for numeracy and literacy.[37,38] Cloud-enabled MSMEs are increasingly active in education, helping to improve access to quality education for all. Adults in Australia are also pursuing opportunities to learn, with 68% of those aged 20-24 and 35% of those aged 25-74 participating in some form of education or training in the past 12 months.[39] Cloud technology can make education more equitable and accessible by providing new learning opportunities for a wider audience, including remote communities, people living with a disability, and for adults with limited time who are looking to boost or diversify their skills. Under a cloud-enabled economy, MSMEs in education are expected to unlock $2.9 billion in annual productivity benefits by 2030. Through supporting the education industry, cloud-enabled MSMEs are expected to facilitate two million school students and five million Australian adults to receive online learning by 2030.

[36] WE Forum (2023), How will generative AI impact healthcare?
[37] OECD (2022), Education at a Glance 2022.
[38] ABC (2023), One in three school students not meeting numeracy and literacy expectations, NAPLAN results show.
[39] ABS (2022), Work-Related Training and Adult Learning, Australia.

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Impact of MSMEs on education in the cloud-enabled economy, by 2030

$2.9 billion in annual productivity benefits unlocked through cloud-enabled MSMEs in the education sector, an increase from $2.5 billion currently

2 million primary to high school students using online education via cloud-enabled MSMEs

5 million adults accessing education via cloud-enabled MSMEs, a 65% increase from 3 million adults currently

Note: Estimates for the number of students and adults accessing cloud-based education produced through market size estimates (see Appendix C of the global report) and are calculated separately to the GDP contribution. Current values are annual 2022-2023 values based on the latest available data.

By helping to support teaching and learning, innovative MSMEs within a cloud-enabled economy can make the future of education more engaging and accessible (see Figure 9). Cloud-enabled MSMEs are introducing advanced analytics into the classroom, helping to personalise learning for each individual student, therefore creating a more meaningful, impactful educational experience for them. Personalised content and feedback can help students with different learning styles work at their own pace. AI and, in particular, generative AI could be especially useful in helping educators provide differentiated learning pathways by constructing learning materials based on past responses and comprehension on concepts.[40,41] Educators are also utilising cloud-based learning analytics to monitor the quality, safety, and security of online learning environments. Saasyan, an Australian startup, is already using AI to detect online bullying and alerting staff and parents to potential warning signs.[42] The software is currently being used across 600 schools (with 400,000 school students) to alert teachers to potential online incidents.[43]

[40] World Economic Forum (2023), Can AI improve education? Here are 4 potential use cases.
[41] Stanford University, Human-Centered Artificial Intelligence, (2023) AI Will Transform Teaching and Learning. Let's Get it Right.
[42] Saasyan (2023).
[43] Saasyan (2023).

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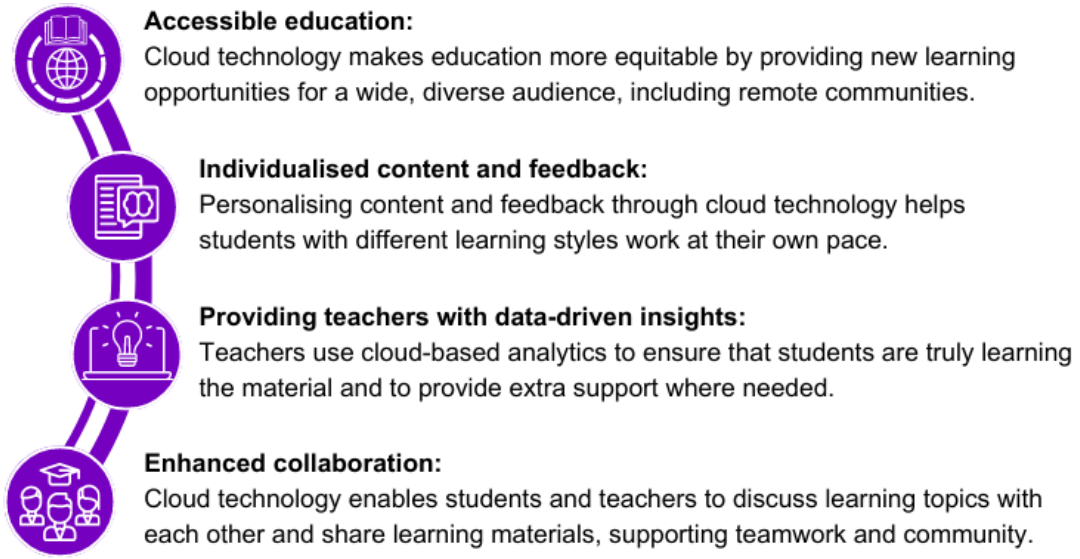
Figure 9: How cloud supports MSMEs to improved access to quality education



Source: Accenture interviews and research[44,45,46]

Cloud technology supports teachers to share content more readily, along with enabling students and adults to ask questions and share information in the learning environment. Cloud technology can also help reduce the administration workload for teachers and school staff, enabling them to spend more time on the more human aspects of their jobs such as interacting with students, planning effective lessons, and helping individual students. School Bytes, an Australian cloud-based startup, replaces legacy administration systems with a single-stop administration platform that helps schools to organise everything from school finances, parent communications, to school sport selection.[47]

3.3 Developing smarter and more sustainable farming practices

The agriculture sector is a significant contributor to the Australian economy, representing around 2.4% of GDP and 11.6% of total exports in goods and services.[48] MSME cloud services are being used by the agricultural industry in Australia to support smarter, more sustainable farming practices that can create increased output with a reduced impact on the environment. One of the more advanced ways that cloud technologies are impacting the agricultural sector by supporting "precision agriculture" – the practice of employing sophisticated monitoring devices that provide better, real-time data about crops, livestock health, and resource consumption.[49] For example, Australian-based MSME AgriDigital is helping farmers better manage their supply chains, support access to agriculture finance and help local producers connect with buyers.[50] Under a cloud-enabled economy, MSMEs in agriculture are expected to unlock $1.7 billion in annual productivity benefits by 2030.

[44] OECD (2021), OECD Digital Education Outlook 2021: Pushing the Frontiers with Artificial Intelligence, Blockchain and Robots.
[45] UNESCO, (2021), AI and education: guidance for policymakers.
[46] OECD (2021), OECD Digital Education Outlook 2021: Pushing the Frontiers with Artificial Intelligence, Blockchain and Robots.
[47] School Bytes (2023).
[48] Department of Agriculture Fisheries and Forestry (2023), Snapshot of Australian Agriculture
[49] FAO (2022), Leveraging automation and digitalization for precision agriculture: Evidence from the case studies.
[50] AgriDigital (2023).

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Precision agriculture technology supported by cloud-enabled MSMEs are expected to be in operation in one in three farms across Australia by 2030.

Impact of MSMEs on agriculture in the cloud-enabled economy, by 2030

$1.7 billion in annual productivity benefits unlocked through cloud-enabled MSMEs in the agriculture sector, an increase from $1.4 billion currently

1 in 3 farms using precision agriculture supported by cloud-enabled MSMEs, a 190% increase from 1 in 9 farms currently

Note: Estimates for the number of farms using precision agriculture produced through market size estimates (see Appendix C of the global report) and are calculated separately to the GDP contribution. Current values are annual 2022-2023 values based on the latest available data.

Beyond precision agriculture, cloud-enabled MSMEs can support agriculture in a number of ways from enabling automated vehicles and equipment to streamlining business administration B2B (business-to-business) and B2C (business-to-consumer) sales. Technologies such as AI and ML could enable the use of more accurate real-time data analytics for precision agriculture, including through analysing crop and satellite images, with generative AI conveying these insights to farmers for decision making.[51,52]

[51] World Economic Forum (March 2021), Artificial Intelligence for Agriculture Innovation.
[52] World Economic Forum (January 2021), How AI will solve agriculture's water efficiency problems.

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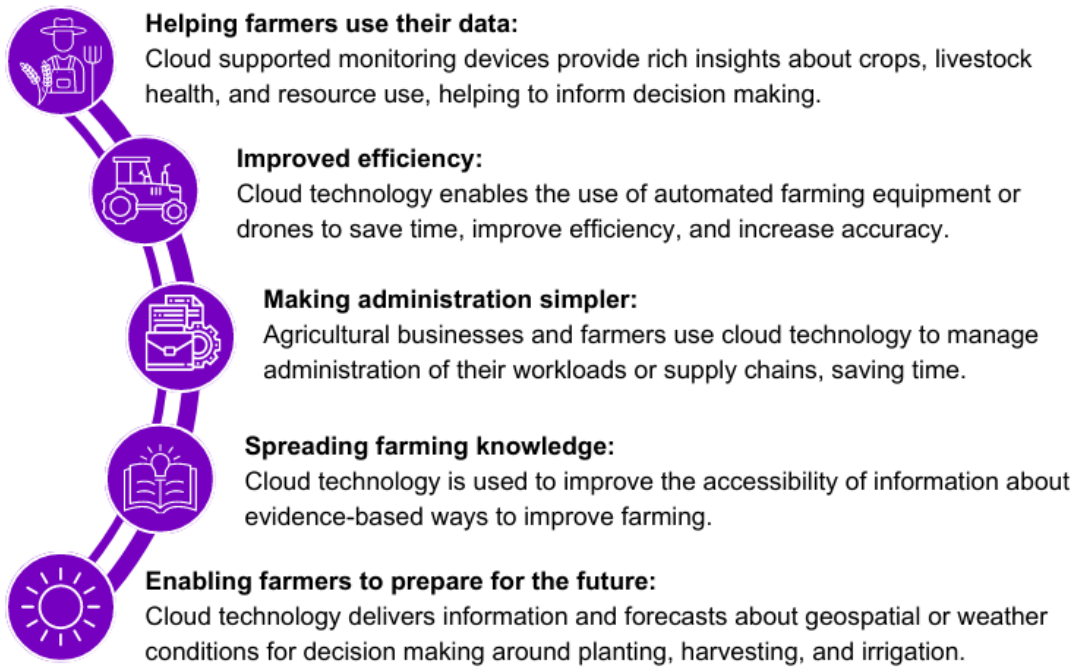
Figure 10: How cloud supports smarter, more sustainable agricultural practices



Source: Accenture interviews and research[53,54]

3.4 Improving financial access and wellbeing

Digitisation of the finance sector has led to wave of disruption, increased competition, and new types of products and services that better service customers.[55] Alongside the rapid adoption of smart devices, a critical part of the proliferation of digital finance options has been cloud technology that supports financial information to be transferred and accessed quickly and securely.[56] As such, cloud-native MSMEs in the finance industry (referred to as fintechs) represent one of the fastest growing markets in the world, expected to rise from US$134 billion in 2022 to US$557 billion globally by 2030 – more than a 400% increase.[57]

[53] OECD (2022), The digitalization of agriculture: A literature review and emerging policy issues.
[54] World Bank (2021), What's Cooking: Digital Transformation of the Agrifood System.
[55] OECD (2020), "Digital disruption in banking and its impact on competition".
[56] Ibid.
[57] Vantage market research (2023)

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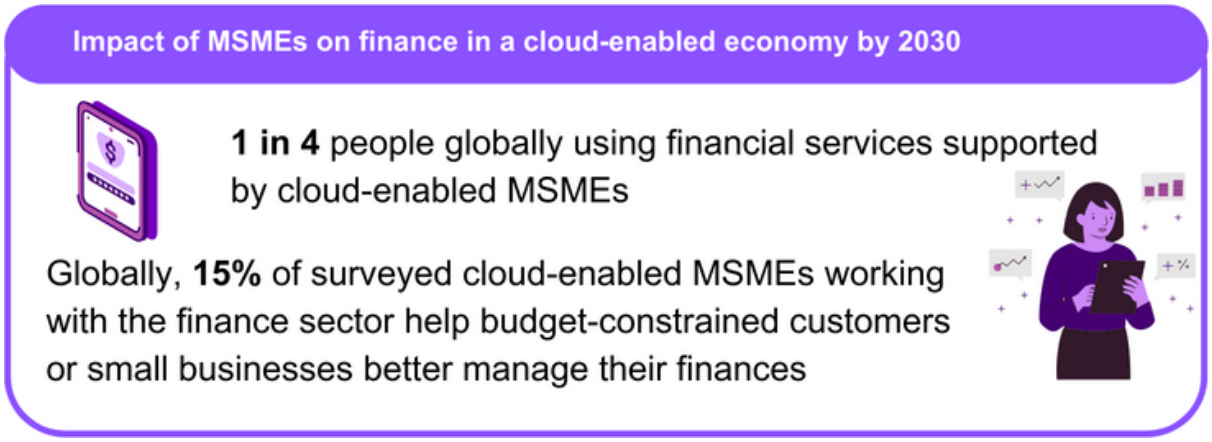
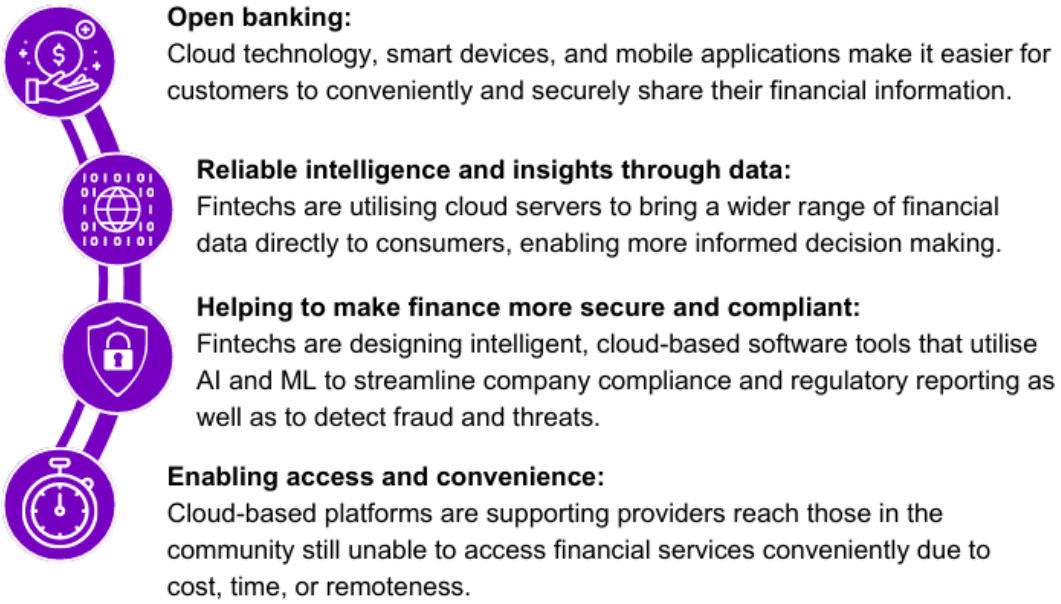


Source: Accenture societal impact survey (2023), n = 188. Based on global results across 12 countries.

The rise of fintech apps has not only been seen an increase in the number of financial services companies, but also a boost in convenience and access, individual autonomy over financial decisions, better access to information, and tighter security frameworks (see Figure 11). Payable is one such fintech company based in Australia, which provides a platform to help consumers better manage their regular bills by providing alerts and automating payments. According to the Accenture societal impact survey, by 2030, one in four people globally are expected to be using financial services supported specifically by cloud-enabled MSMEs.[58] Globally, 15% of cloud-enabled MSMEs working with the finance sector are expected to be helping budget-constrained customers or small businesses to better manage their finances.[59,60]

Figure 11: How cloud-enabled MSMEs support improved financial autonomy and access



Source: Accenture interviews and research.

For many countries, a cloud-enabled financial services sector is not far away, with many MSMEs already incorporating or exploring the use of cloud-supported technologies, such as AI and ML, to improve outcomes for consumers across a range of applications.[61] A sample of

[58] Accenture societal impact survey (2023), n = 188.
[59] Accenture societal impact survey (2023), n = 188.
[60] Based on the number of cloud-enabled MSMEs currently supporting this outcome.
[61] IMF (2021), Powering the Digital Economy: Opportunities and Risks of Artificial Intelligence in Finance.

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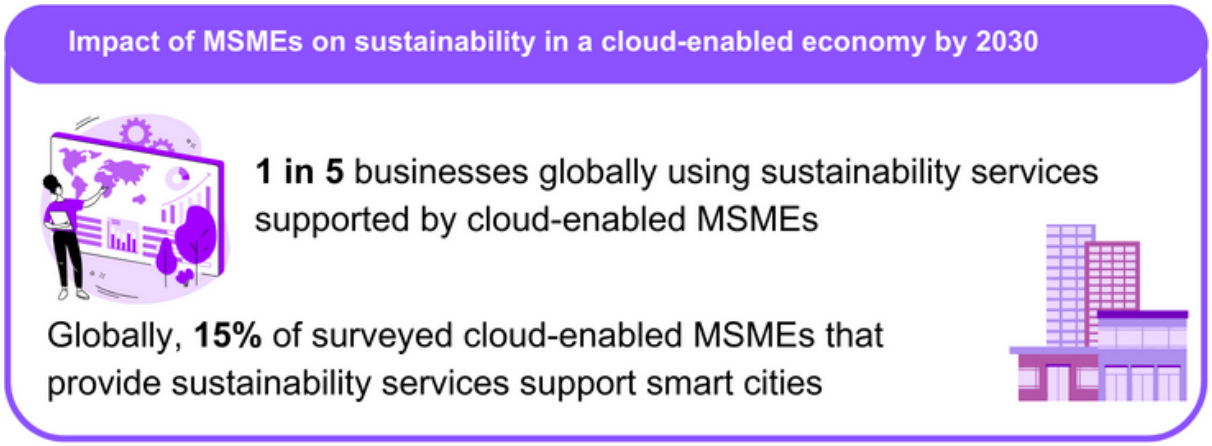
MSMEs operating in the global financial services space indicated that the most common areas for these MSMEs to be active were in providing digital banking and budgeting or financial management tools.[62,63] The improvements in societal outcomes most often attributed to these MSMEs were increased affordability of services, improved financial literacy and education, and fraud detection.[64,65]

3.5 Designing a sustainable future

Developing the tools and technologies that will support a sustainable future is one of the most pressing global challenges, but also one filled with enormous economic potential. MSMEs can use cloud-enabled technologies to directly reduce environmental impacts, with innovations such as more efficient resource usage and smarter waste management. According to the Accenture societal impact survey, by 2030, one in five businesses globally are expected to be using services provided by cloud-enabled MSMEs to directly address their climate and sustainability objectives, such as through energy or emissions monitoring and reduction.[66] And it's not only businesses using these services; across the world, cities and towns are increasingly turning to cloud-based technology solutions provided by MSMEs to achieve a range of sustainable outcomes.[67,68] Globally, 15% of cloud-enabled MSMEs providing services to achieve sustainability goals are expected to be supporting "smart cities", such as through optimising traffic flows or making waste removal more efficient, and enabling the tracking or reduction of electricity usage.[69,70,71,72]



Source: Accenture societal impact survey (2023), n = 66. Based on global results across 12 countries.

Although sustainability objectives cover a broad range of social issues from pollution and waste collection to traffic congestion and energy usage, the solutions supported by cloud-enabled MSMEs could help societies leave less of an impact on the environment. Some of the ways that MSMEs could support individuals and businesses to improve sustainability are shown in Figure 12.

[62] Accenture societal impact survey (2023), n = 188.
[63] Based on the services that cloud-enabled MSMEs are currently delivering.
[64] Accenture societal impact survey (2023), n = 188.
[65] Based on the number of cloud-enabled MSMEs currently supporting this outcome.
[66] Accenture societal impact survey (2023), n = 66.
[67] IDC (2023), Smart Cities.
[68] IDC (2021), The Next Frontier: AI and Digital Twins in Smart Cities.
[69] Accenture societal impact survey (2023), n = 66.
[70] Based on the number of cloud-enabled MSMEs currently supporting this outcome.
[71] AWS (2023), Building Smart Cities with AWS Cloud.
[72] OECD (2021), Measuring smart city performance in COVID-19 times: Lessons from Korea and OECD countries.

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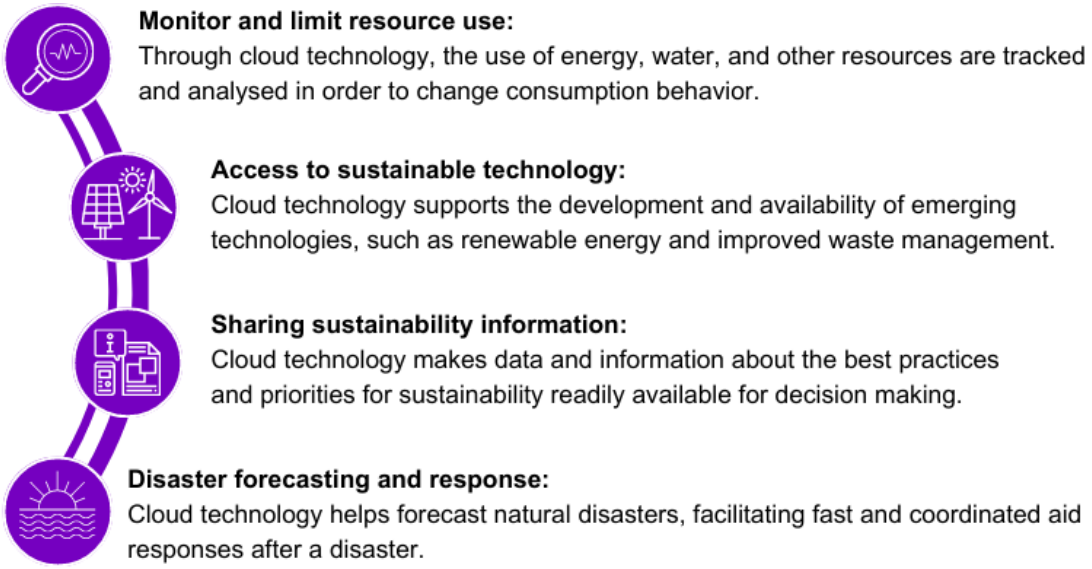
Figure 12: How cloud-enabled MSMEs support humanity to manage environmental impact



Source: Accenture interviews and research.

According to the Accenture societal impact survey of global MSMEs, cloud technologies have already enabled these businesses to provide smarter resource management and usage, access to sustainable and renewable technologies, carbon footprint monitoring, and sustainability information.[73] Through these sustainable solutions, global MSMEs are helping to support wider sustainability goals including more efficient use of energy and water, improving waste management, supporting better air quality, and increasing the availability of renewable energy.[74] One Australian MSME, Brighte, provides a cloud-based app that enables access finance for sustainable energy solutions such as solar installations for households. Through the app, households can apply and receive loan approvals, search and contact approved retailers and manage their account and repayments.[75] Brighte estimates that through enabling households to affordably access renewables, the company has helps to avoid one million metric tons of CO_2 emissions each year.[76,77]

[73] Accenture societal impact survey (2023), n = 66.
[74] Accenture societal impact survey (2023), n = 66.
[75] Brighte (2023).
[76] Brighte (2023).
[77] AWS (2022), Brighte.

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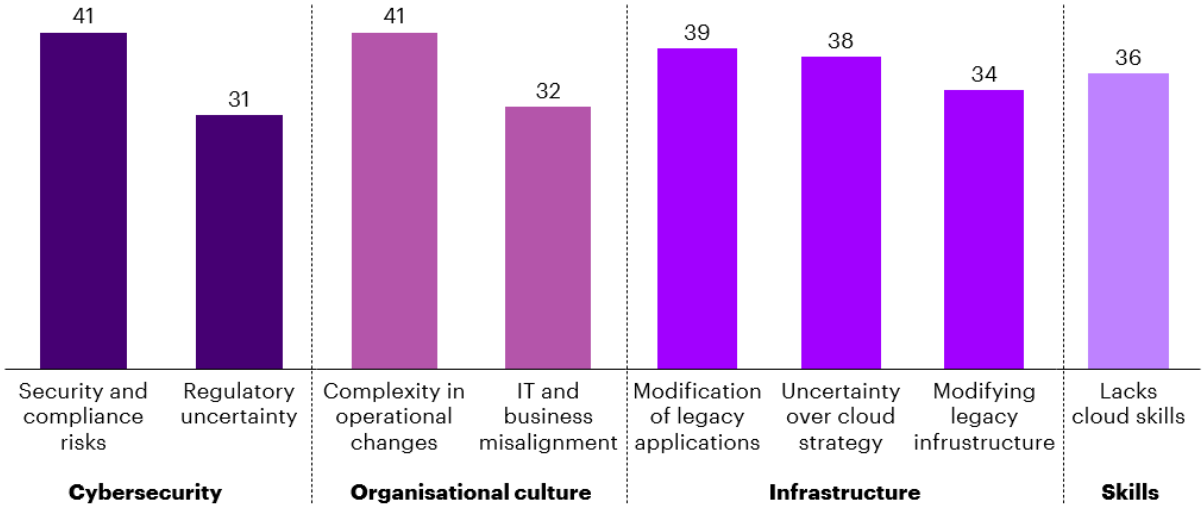
4 Achieving the cloud-enabled economy

With businesses across Australia at starkly different points along the adoption spectrum, Australia's path to a cloud-enabled economy involves a combination of increasing sophistication and further encouraging greater levels of overall adoption and cloud maturity. However, barriers to adoption remain despite the upside. A global survey of global business leaders, conducted by Accenture, shows that persistent barriers to adoption in developed countries, like Australia, continue to concern cybersecurity, reluctant organisational cultures, insufficient infrastructure (e.g., software and hardware) or difficulty transitioning, and digital cloud skills (see Figure 13). Unlocking these opportunities in Australia by 2030 requires continued coordinated action from businesses, wider industry stakeholders and state, local, and federal governments to address the barriers to cloud technology uptake.

Figure 13: Primary barriers to cloud technology uptake

% of respondents listing barrier in top three responses



Source: Accenture (2023). Global survey responses from 2022, n = 800.

To address each of these complex challenges MSMEs should evaluate barriers at the business level, to identify specific security, IT resources, organisational culture, and skills required to be successful. This will help MSMEs to develop holistic cloud solutions, optimised and scaled to improve performance, and reduce costs.

4.1 Holistic strategies to overcome business-specific barriers to cloud adoption

MSMEs can adopt a range of internal policies and actions to overcome these barriers to cloud adoption. Through the strategies highlighted in Figure 14, MSMEs can further integrate cloud solutions across all business functions, thereby maximising their efficiency and productivity.

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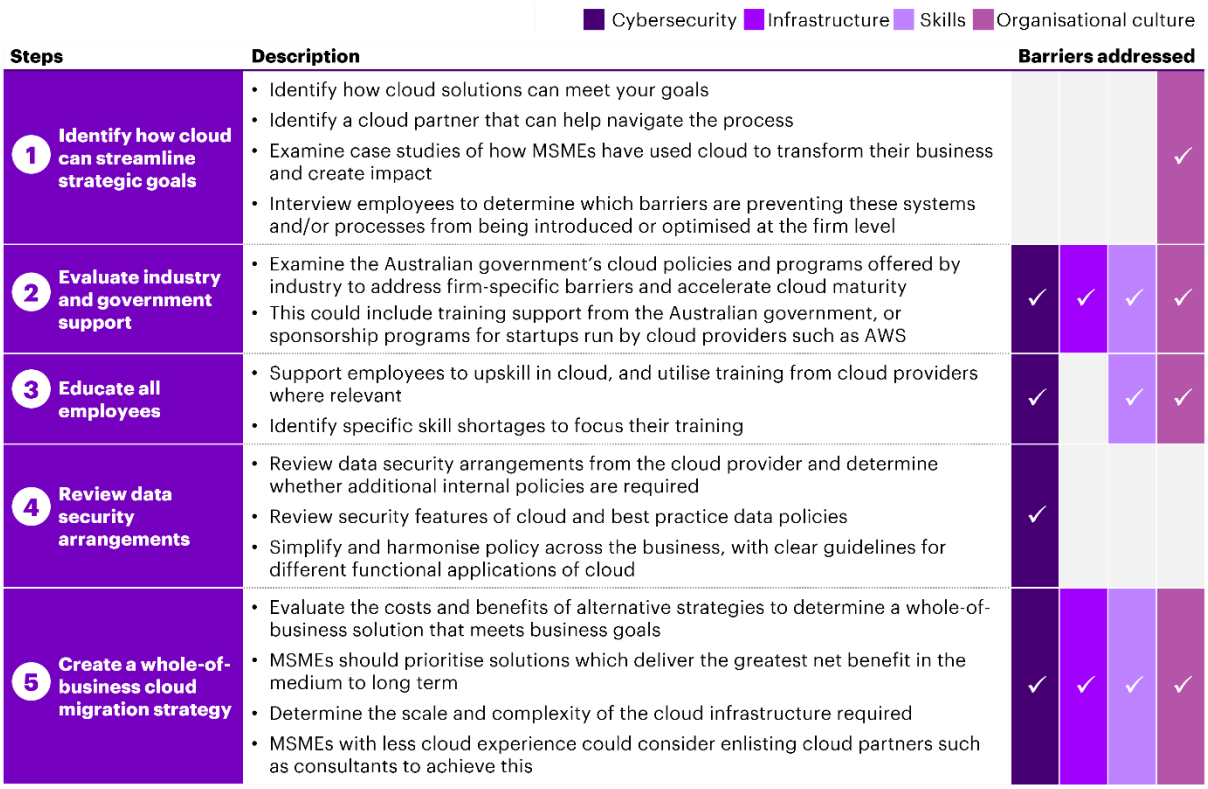
Figure 14: Steps for MSMEs to accelerate cloud maturity



Steps	Description	Barriers addressed
1 Identify how cloud can streamline strategic goals	• Identify how cloud solutions can meet your goals • Identify a cloud partner that can help navigate the process • Examine case studies of how MSMEs have used cloud to transform their business and create impact • Interview employees to determine which barriers are preventing these systems and/or processes from being introduced or optimised at the firm level	✓
2 Evaluate industry and government support	• Examine the Australian government's cloud policies and programs offered by industry to address firm-specific barriers and accelerate cloud maturity • This could include training support from the Australian government, or sponsorship programs for startups run by cloud providers such as AWS	✓ ✓ ✓ ✓
3 Educate all employees	• Support employees to upskill in cloud, and utilise training from cloud providers where relevant • Identify specific skill shortages to focus their training	✓ ✓ ✓
4 Review data security arrangements	• Review data security arrangements from the cloud provider and determine whether additional internal policies are required • Review security features of cloud and best practice data policies • Simplify and harmonise policy across the business, with clear guidelines for different functional applications of cloud	✓
5 Create a whole-of-business cloud migration strategy	• Evaluate the costs and benefits of alternative strategies to determine a whole-of-business solution that meets business goals • MSMEs should prioritise solutions which deliver the greatest net benefit in the medium to long term • Determine the scale and complexity of the cloud infrastructure required • MSMEs with less cloud experience could consider enlisting cloud partners such as consultants to achieve this	✓ ✓ ✓ ✓

Source: Accenture.

4.2 Strong policy support to address structural barriers and incentivise MSME cloud adoption

While Australia has some of the highest rates of cloud adoption in the world, international counterparts can still offer best practice solutions for further addressing these barriers to cloud adoption (see Figure 15).

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Figure 15: Global best-practice examples of cloud adoption policies

Cybersecurity | Infrastructure | Skills | Organisational culture

Policy	Key existing support	Future policy	International policy examples	Barriers addressed
Invest in digital infrastructure	The Australian government has invested ~$50B into the National Broadband Network, to connect 2.1m full optic fibre premises (24% of broadband connections). An additional $2.4B will be spent to connect 1.5m more to full optic fibre by 2025.	Continued investment into regional and rural areas and connecting more premises to full optic fibre connections would improve speeds to facilitate cloud.	**Singapore optic fibre** accounts for 93% of broadband connections **Thailand optic fibre** accounts for 94% of broadband connections **Canada optic fibre** accounts for 94% of broadband connections	✓
Invest in cloud skills and training	Australia has collaborated with industry and cloud experts to deliver cloud training, but Australia is estimated to require an additional 650,000 workers to reach a 1.2 million technology workforce by 2030. An increased focus on cloud training will be necessary, given that 70% of Australian workers require upskilling for tech jobs, and cloud is one of the top 10 skills they require.	Continued support for digital skills training, with a focus on emerging cloud skills.	**Singapore's digital skills training** is supported by strong performances in maths and engineering education, placing the country second in cloud talent affinity in 2022 **Brazil's Digital Transformation Strategy (E-Digital)** includes partnerships with industry and educators to provide cloud training and certifications	✓ ✓ ✓
Harmonise data privacy policy across regions	State regulation is accompanied by Australia's *Privacy Act 1998*. In a 2023 Inquiry, the Attorney General identified that the Act "has not kept pace with the changes in the digital world".	Continue to harmonise and update policy in line with global best practice to promote confidence in cloud, particularly as it relates to cross border flows.	**European Union's General Data Protection Regulation (GDPR, 2016)** improved clarity and consistency across the EU, promoting data flow within the EU	✓
Improve cloud-first policies	Australia was one of the first countries to establish a Cloud-First policy in 2014. As of the 2021 update, the policy is considered one of the best globally.	Further emphasis on public cloud-first policies to encourage saleability and create clear guidelines for industry.	**United Kingdom's Cloud-First policy (2013)** is a whole-of-government, public cloud-first approach that outlines clear guidelines and procurement policies for departments	✓ ✓ ✓ ✓

Source: Gregory, M. A.[78], Green, E.[79], Lim, S.[80], World Broadband Association[81], Government of Canada[82], Australian Government[83], AlphaBeta[84], MIT Technology Review[85], Australian Government[86], GDPR EU[87], Delphix[88], ATO[89], Mcguire Sponsel[90],Australian Government[91], UK Government[92], Tech Council of Australia[93]

[78] Gregory, M. A. (2022), What's next for the National Broadband Network? Labor and the Coalition's plans compared.
[79] Green, E. (2022), Huge plan to fix Australia's NBN to be announced in Albanese's federal budget.
[80] Lim, S. (2019), The city of the future: What will a full-fiber broadband city look like.
[81] World Broadband Association (2021), Global fiber development Index
[82] Government of Canada (2023), High-speed Internet for all Canadians.
[83] Australian Government (2013), The National Cloud Computing Strategy.
[84] AlphaBeta (2021), Unlocking APAC's Digital Potential: Changing Digital Skills Needs and Policy Approaches.
[85] MIT Technology Review (2022), Global Cloud Ecosystem Index 2022.
[86] Australian Government (2023), Rights and protections – Privacy.
[87] GDPR EU (n.d.), What is GDPR, the EU's new data protection law.
[88] Delphix (2020), The Japan Act on the Protection of Personal Information Explained.
[89] ATO (2022), Small Business Technology Investment Boost and Small Business Skills and Training Boost.
[90] Mcguire Sponsel (2020), Calculating cloud computing expenses.
[91] Australian Government (2021), Secure Cloud Strategy.
[92] UK Government (2022), Government Cloud First policy.
[93] Tech Council of Australia (2022), Getting to 1.2 million.

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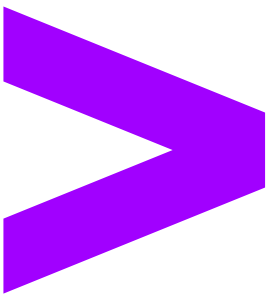

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