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Realizing a cloud-enabled economy in the United States:

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 United States

Across key sectorsⁱ this opportunity is expected to represent:

\$79.8 billion combined annual productivity benefits unlocked through cloud-enabled MSMEs in healthcare, education, and agriculture

This represents a 26% increase on current



8.5 million people in the United States (5% of the workforce) employed by cloud-enabled MSMEs within healthcare, education, and agriculture

23 million telehealth consultations using cloud supported by MSMEs' services



19 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.

Overview

Micro, small, and medium enterprises (MSMEs, businesses with between 1 and 250 employees) are a major driver of economic performance. In the United States, MSMEs collectively account for about 99% of all firms and 67% of jobs.¹ 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), 64% of all businesses across the United States now utilize at least some basic form of cloud technology such as office tools and storage, although usage of more intermediate and advanced tools, such as artificial intelligence and big data analytics, is expected to be far lower based on adoption data observed in other developed economies. Cloud technology has most profoundly impacted MSMEs by allowing them to start, operate, and scale their organization 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,” which would be characterized by high levels of overall cloud technology adoption across businesses in the United States. It is anticipated that under this scenario, 90% of all businesses would adopt at least a basic level of cloud technology.^{2,3} For many businesses, however, this represents only the beginning of their cloud journey. As businesses increase their sophistication and adopt more advanced applications of cloud technology, such as AI and ML, countries with already high rates of overall adoption can expect to derive even greater benefits.

By 2030, a cloud-enabled United States economy is expected to deliver societal impact by supporting MSMEs to produce innovative products and solutions or augment their existing operations. In health, education, and agriculture, this annual productivity benefit is expected to reach \$79.8 billion. By 2030, cloud-enabled MSMEs are expected to support 23 million remote health consultations, 19 million school students to access online education, and one in three farms access more efficient and sustainable farming practices in the United States. Cloud-enabled MSMEs are heavily involved with developing solutions to transition the economy towards a more sustainable future and designing digital finance solutions (through ‘fintechs’) that are helping to support better financial inclusion and wellbeing.

¹ United States Census Bureau (2021), Table CB2100CBP.

² Gartner (2022), The future of cloud computing in 2027: From technology to business innovation.

³ Gartner (2021), Gartner says cloud will be the centerpiece of new digital experience.

Although these benefits are substantial, the opportunities of the cloud-enabled economy will not eventuate without action. To unlock this potential, United States businesses and governments will need to collaborate to foster the continued adoption and maturity of cloud usage. Businesses can achieve this by:

- identifying how cloud technology can help them scale and deliver global impact
- investing in embedding cloud technology into their strategy; and
- developing a migration plan and training employees to leverage the benefits of cloud technology.

United States governments can support businesses in achieving a cloud-enabled economy by:

- prioritizing cloud technology education and talent development across all levels and roles, both technical and non-technical; and
- investing in digital infrastructure to ensure innovation can continue unimpeded and leading by example through promoting cloud technology adoption across all levels and divisions of government, along with ensuring the right legislation is in place to promote innovation and the adoption of new technologies.

1 The cloud-enabled economy

Cloud technology has changed the way businesses operate, particularly for MSMEs (businesses with between 1 and 250 employees)⁴, by enabling them to scale quickly, reduce costs, reach global markets, and access a range of technology resources that were previously unattainable.

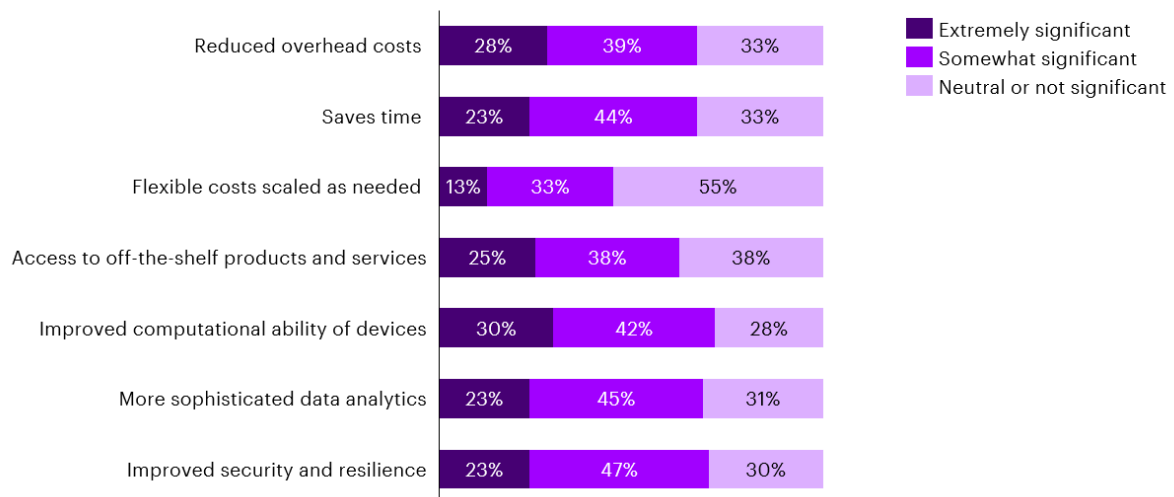
1.1 Cloud technology enables the digital economy

Cloud technology refers to the provision of on-demand IT products and services delivered over the internet or a private network.⁵ This involves housing digital resources from centralized 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 specialized technology solutions
- increasing computational power of ordinary devices; and
- enhancing security and resilience.⁶

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

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



Source: Accenture societal impact survey (2023), n = 70. 'Neutral or not significant' includes responses of neutral, somewhat insignificant, and not significant at all.

By promoting shared resources, the 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

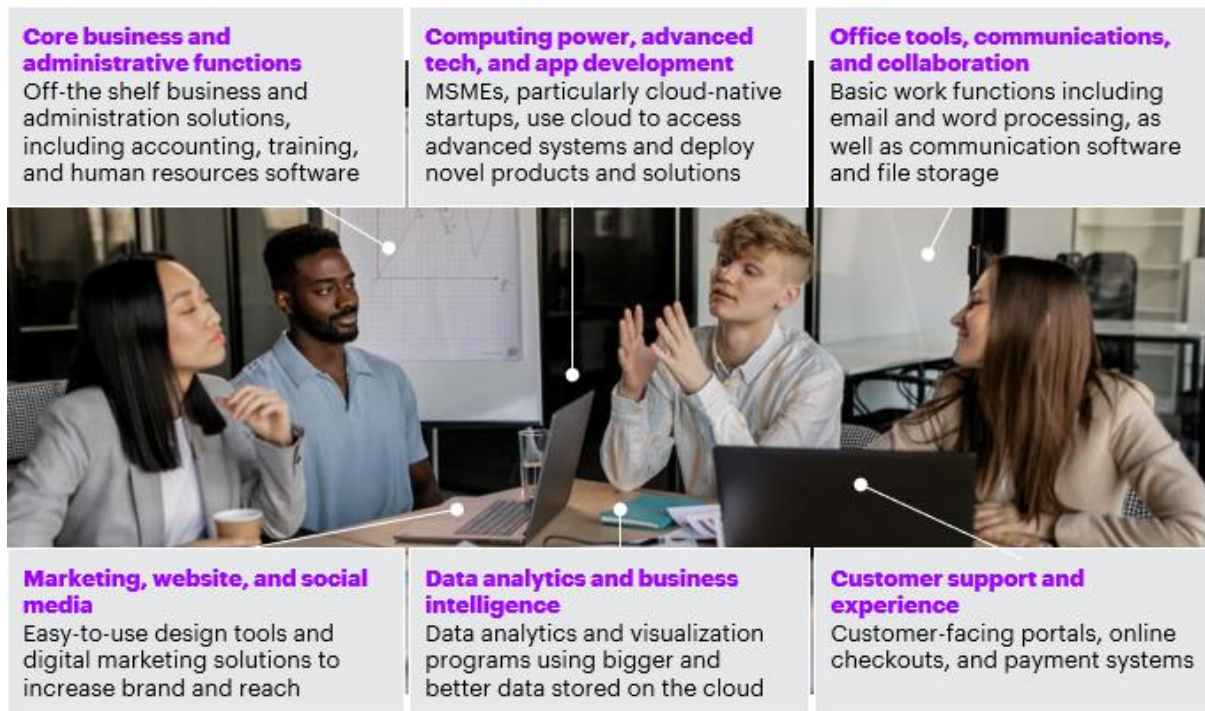
⁴ The definition of MSME used in this report is taken from the OECD (2023) and covers enterprises with businesses between 1-250 employees.

⁵ AWS (2023), What is cloud computing?

⁶ Accenture societal impact survey (2023), n = 562.

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 technology applications for MSMEs

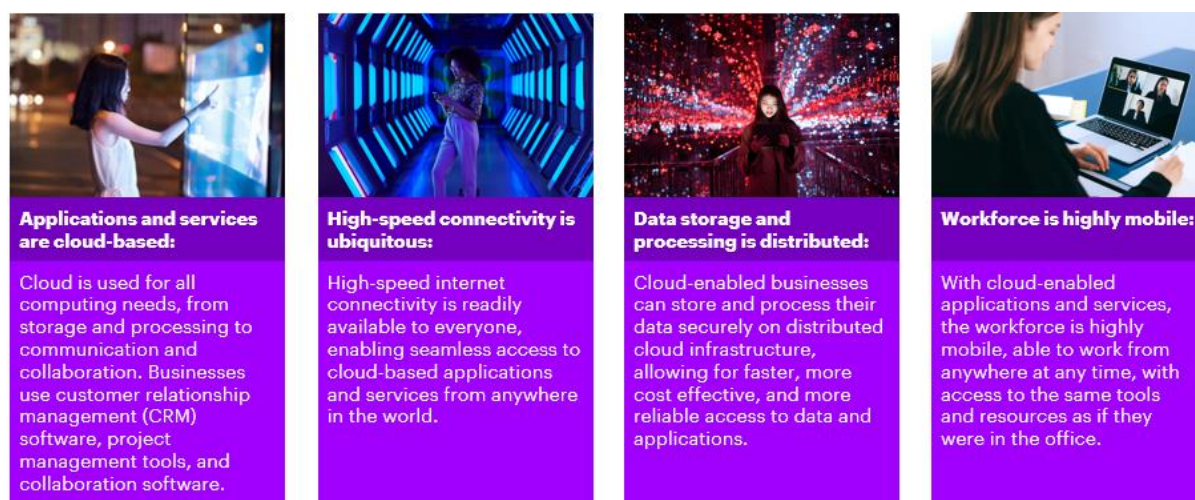


Source: Accenture

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 characterized by high levels of cloud technology adoption; based on an assessment of cloud industry forecasts, it is expected that 90% of all businesses will adopt at least a basic level of cloud technology in a cloud-enabled economy. 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).

Figure 3: Characteristics of a cloud-enabled economy



Source: Accenture.

1.2.1 The spectrum of cloud technology adoption

The definition of cloud technology adoption used in this report is consistent with the OECD, and refers to the share of businesses that purchased cloud services⁷ as a proportion of all businesses, across all levels of maturity.⁸ 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 specialized 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 specialized 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 specialized cloud technology 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.

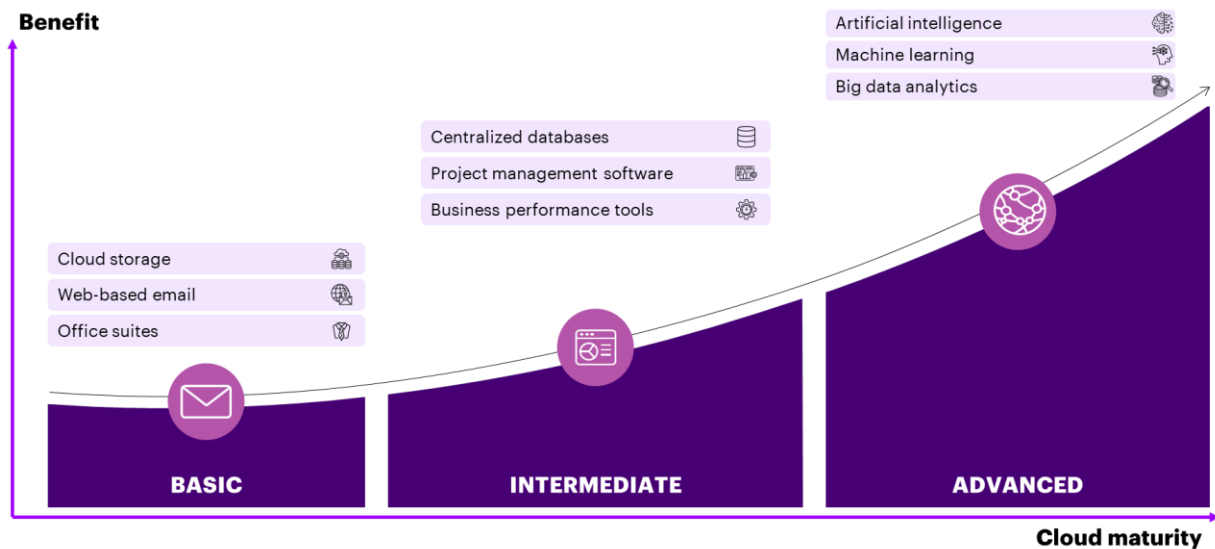
As the global economy increasingly digitizes, the need for MSMEs to increase their cloud technology maturity is becoming increasingly pertinent. MSMEs that fail to leverage the scalability of cloud solutions may not only forfeit the ability to compete more effectively with fewer fixed IT costs, but may 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

⁷ Cloud computing as part of this definition includes information and communications technology (ICT) services that are provided over the internet or private network to access servers, storage, network components and software applications

⁸ OECD (2023), OECD Going Digital Toolkit

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

Figure 4: Spectrum of cloud technology 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.

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

Embracing advanced cloud adoption 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. The 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 technology 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 through the cloud (see Appendix D of the global report for a full description of each technology supported by the cloud).⁹ 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%.¹⁰ 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.¹¹ As shown in Figure 5, 79% of United States MSMEs across several

⁹ Damian Mazurek, (2023), Leveraging Cloud-based AI/ML Services to elevate your business.

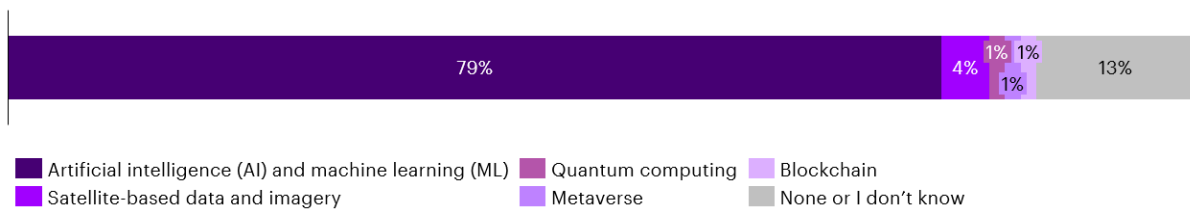
¹⁰ Precedence Research (2023), Generative AI Market size to hit USD 118 Bn by 2032

¹¹ AWS (2023), Generative AI on AWS.

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.^{12,13} Generative AI could be used by cloud-enabled MSMEs for a wide variety of applications, such as helping medical professionals analyze patient data and testing results to inform decision making, supporting pharmaceutical drug development, or generating practice exam questions and content with instant feedback available to support individualized learning pathways.

Figure 5: Technologies supported by the cloud creating the most significant societal impacts in 2030

Average % of cloud-enabled MSMEs across several industries in the United States that believe a technology supported by cloud will be the most significant in creating societal impacts in 2030



Source: Accenture societal impact survey (2023), n = 70. ‘Artificial intelligence (AI) and machine learning (ML)’ includes subsets generative AI and natural language processing (NLP).

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 technology offers MSMEs new ways to produce and commercialize 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.¹⁴

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 UN Sustainable Development Goals (SDGs), particularly the overarching objectives of improved healthcare (Goal 3), education (Goal 4),

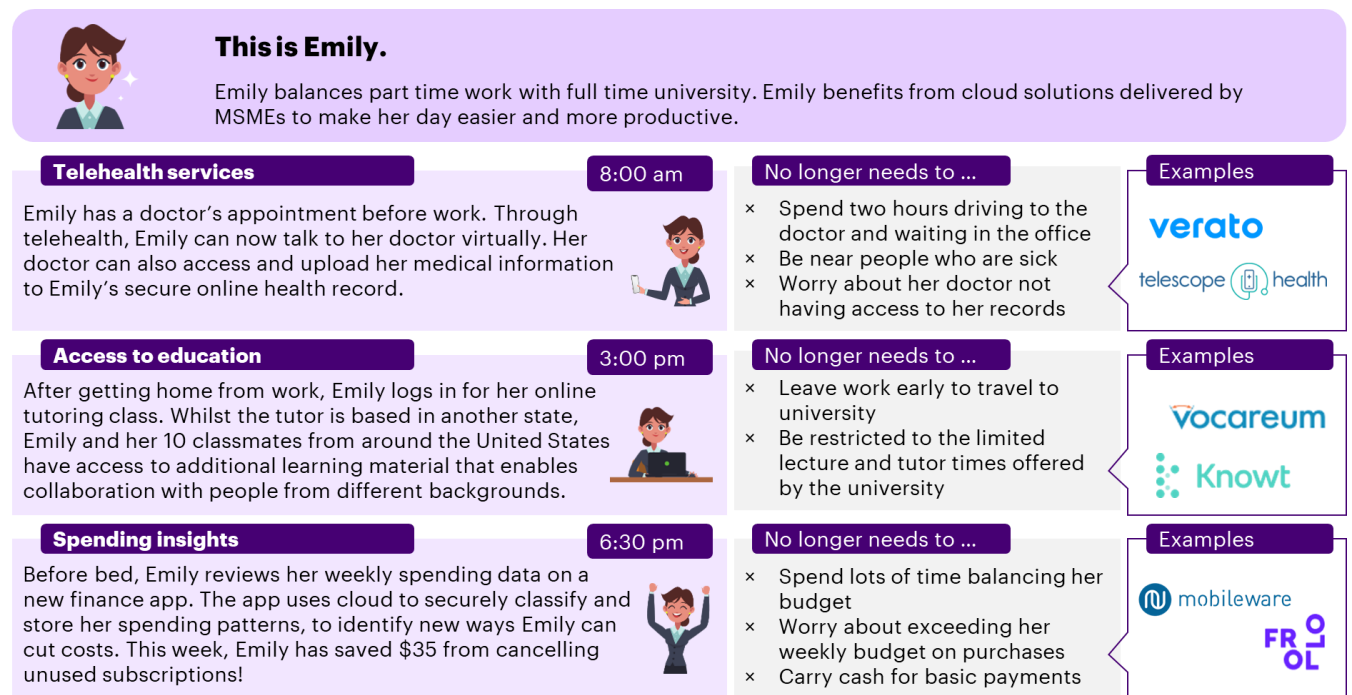
¹² Accenture societal impact survey (2023), n = 70. 79% of United States MSMEs is consistent with the 78% of MSMEs globally out of a sample of 562 who identified AI and ML as the technologies likely to be most significant in creating societal impacts by 2030.

¹³ Survey responses were from MSMEs working in healthcare, education, agriculture, finance, and sustainability.

¹⁴ 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).

and economic prosperity and equality (Goal 9 and 10).¹⁵ Figure 6 demonstrates through a stylized cameo how cloud technology supports access to these industries for individuals through digitization.

Figure 6: The impact of cloud-enabled MSMEs on individuals



2 Unlocking \$79.8 billion in productivity benefits within key societal sectors

MSMEs are a major driver of economic performance in the United States, accounting for about 99% of all firms and 67% of jobs.¹⁷ 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 technology adoption and maturity on aggregate economic output is estimated with a novel economic model, based on analyzing 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 labor inputs). A full explanation of the modelling approach, data, and outputs can be found in Appendix A of the global report.

The United States is a global cloud technology leader, home to the world's largest cloud market segment valued at around \$258 billion¹⁸ in revenue, and is well positioned to transition to a cloud-enabled economy with already high levels of cloud technology adoption.¹⁹ The share of all businesses using at least some basic level of cloud technology in their business operations is 64%, above average for the OECD (44%), although the rate of adoption for intermediate or advanced technology is expected to be far lower, based on an assessment of other developed OECD economies.²⁰ On average across the OECD, overall adoption rates sit at 44%, although adoption of intermediate and advanced applications are 19% and 13% respectively.²¹

The range of new technologies underpinned by the cloud is accelerating, with advances in technologies such as generative AI, that also offer significant economic and societal potential. Continued investment from industries and governments in the United States is required to continue realizing the benefits of the cloud-enabled economy. Cloud technology expenditure in the United States is expected to grow at an average compounding rate of 11% over the next five years to \$394 billion in revenue as cloud usage maintains pace with technological change.²²

¹⁷ United States Census Bureau (2021), Table CB2100CBP.

¹⁸ All monetary values are quoted in United States (2023) dollars.

¹⁹ Statista (2023).

²⁰ Accenture analysis of OECD data. See global report for full methodology.

²¹ OECD (2023)

²² Statista (2023).



Annual productivity benefits unlocked by cloud-enabled MSMEs in key societal sectors are expected to reach \$79.8 billion by 2030



8.5 million people in the United States are expected to be employed by cloud-enabled MSMEs in key societal sectors by 2030

The productivity benefits of the cloud-enabled economy to United States societal sectors would be significant. Through successful transition to a cloud-enabled economy, MSMEs in the healthcare, education, and agriculture industries within the United States are expected to unlock \$79.8 billion in combined annual productivity benefits by 2030, an increase of 26% from \$63.2 billion in 2023. Under this scenario, it is estimated that 8.5 million people would work at cloud-enabled MSMEs in these industries, which would be 5% of the total jobs in the United States. This reflects the increasing ubiquitousness of cloud technology in almost all forms of digital technology and occupations across the economy.


3 The societal impact of the cloud-enabled economy

MSMEs that harness cloud technology have the potential to create significant societal impact in the United States. 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 in these industries, enabling advancements such as telemedicine, online education, precision agriculture, financial access and autonomy, and sustainability technology. These solutions will lead to improved social wellbeing and development.

3.1 Driving innovation and improving access to healthcare and life sciences


Cloud technology is enabling MSMEs to make healthcare more accessible for individuals while also improving efficiency in healthcare delivery and supporting data-driven decisions and diagnosis. With such a large landmass and population, accessibility of healthcare is particularly important in the United States where approximately 17% of the population live in rural areas and outside the healthcare catchments of metropolitan areas.²³ Through remote consultations and monitoring of health indicators, cloud technology can help make healthcare more accessible to underserved communities throughout the United States. If the United States were to achieve a cloud-enabled economy, MSMEs in healthcare are expected to unlock \$45.3 billion in annual productivity benefits by 2030. Cloud-enabled MSMEs are expected to support 23 million virtual health consultations per year by 2030.²⁴

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



\$45.3 billion in annual productivity benefits unlocked through cloud-enabled MSMEs in the healthcare sector, an increase from \$35.9 billion

23 million virtual consultations supported by cloud-enabled MSMEs



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

MSMEs are already supporting remote healthcare, helping to make healthcare more accessible for communities throughout the United States. Telescope Health, an MSME based in the United States, uses cloud technology to provide virtual care through telehealth (see Case Study below).²⁵

²³ OECD (2022), Rural population.

²⁴ Remote health consultations can also be supported by telephone or through large cloud-enabled firms.

²⁵ Telescope Health (2023).

Telescope Health introduces access and navigation for patients, employers, and health systems to reduce the burden on emergency departments and cost



Industry:
Healthcare



Size: Small
(<50 employees)



Locations: the United States

Telescope Health, founded in 2018, is a small business based and operating in the United States. The company was founded by two emergency doctors who found that the emergency rooms (ER) were unnecessarily dealing with people with non-urgent needs because patients didn't know how to engage with the healthcare system effectively for their needs. It is estimated that up to **30% of emergency department visits each year in the United States are preventable** and could be handled by general practitioners (GPs) or other forms of care. These types of visits cost US\$4.4 billion each year and congest the system for patients with acute needs.

"In the US, emergency departments act as a catch-all for patients unable to access other resources or unaware they exist. Absence of transportation, lack of awareness, poverty, and no immediate alternative solutions are common drivers. ERs are flooded with minor and preventable care, such as filling prescriptions and upper respiratory illness. Telescope Health aims to break down these barriers to care by using technology to connect patients with care navigators and physicians. This access and guidance will improve access to long term care and decongest ERs in the process."

**Dr. Matthew Thompson, MD
CEO and Co-founder**

Telescope Health uses cloud-based software to provide employees and consumers with convenient access to physicians and a care navigation team at any time of the day to help patients with more routine care, follow up appointments, and price transparency. Importantly, Telescope Health is integrated into the electronic medical records (EMR) system and their subscription care plan partner, Accesa. These workflows provide frictionless access for employees and continuity of care for providers. Telescope's care team can ensure that all records are shared with primary care providers and specialists.



Telescope Health's use in care facilities, like nursing homes, for clinical support is reducing hospital readmissions for minor issues like elevated blood pressure or minor falls. In these instances, a short virtual consultation **saves the hospital system approximately \$10,000** for each patient that avoids ER transport and hospitalization.

Through digital innovation, Telescope Health is already a part of the movement towards a more preventative, rather than reactive, healthcare model. Beyond employee benefits, Telescope extends complimentary services to patients without insurance or facing health equity disparities in collaboration with chosen organizations. By offering preventative and on-demand visits, as well as complete care navigation and concierge level support, Telescope Health is removing longstanding barriers. This helps patients receive care more regularly, reduce healthcare costs, and continue a long-term care plan with clinics and specialists nearby.

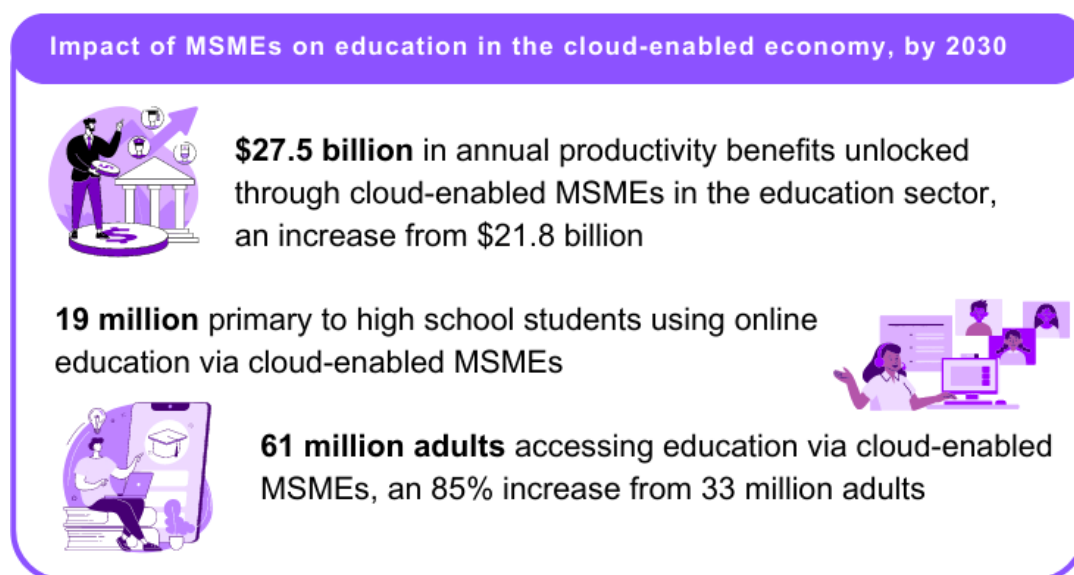
Cloud technology has been essential for the growth of Telescope Health, enabling seamless connectivity with EMRs, while also providing the secure environment for patient data. A cloud-based solution has allowed Telescope to scale rapidly across all 50 states and seamlessly onboard new and sizeable clients without hardware expansion.

Source: Accenture consultation, Telescope Health (2023).

Cloud technology is also important for streamlining administrative tasks, creating efficiency for healthcare providers. Verato is an MSME in the United States using cloud technology to provide an identity management solution for over 70 healthcare organizations, helping connect unique patient data across electronic health records, software systems, and other datasets to provide a single source of truth for patient identity.^{26,27} 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 personalized and tailored. Technologies supported by the cloud, particularly generative AI, also have significant potential to change the healthcare industry from delivery of healthcare to administrative functions. While generative AI is still a nascent technology, MSMEs can use it to support clinical decision making, helping medical professionals analyze data more accurately, along with supporting efficiency in research and development.²⁸ One company supporting research and development is Aizon, which utilizes AI and ML to enable pharmaceutical manufacturing organizations to manage their data and optimize manufacturing processes.^{29,30}

3.2 Improving access to engaging and personalized education

Cloud technology can make education more equitable and accessible by providing new learning opportunities for a wider audience, including remote communities or 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 \$27.5 billion in annual productivity benefits by 2030. Through supporting the education industry, cloud-enabled MSMEs are expected to facilitate 19 million school students and 61 million adult learners in the United States to receive online learning by 2030.



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 from the GDP contribution. Current values are annual 2022-2023 values based on the latest available data.

²⁶ AWS (2022), Verato Creates More Connected Care with Lyniate Rhapsody on AWS.

²⁷ Verato (2023).

²⁸ WE Forum (2023), How will generative AI impact healthcare?

²⁹ AWS (2022), Aizon Improves Pharmaceutical Manufacturing With Artificial Intelligence Using AWS.

³⁰ Aizon (2023).

Students and adult learners will be able to learn in a more collaborative environment, as cloud technology supports them to interact and share content more readily. Vocareum is an MSME based in the United States which utilizes cloud technology to support bringing digital skills labs to 2.4 million people, including through universities and corporate training programs, with virtual learning support, assignment management for educators, and other features.^{31,32} Cloud technology can also help reduce the administration workload for teachers, enabling them to spend more time educating students.

Cloud-enabled MSMEs are also introducing advanced analytics into the classroom, helping to personalize learning. Personalized content and feedback can help students with different learning styles work at their own pace, not to mention reduce the administration burden on teaching staff. Educators are also utilizing cloud-based learning analytics to monitor the quality, safety, and security of online learning environments. KnKowt is a United States cloud-based MSME enabling over 500,000 students to access AI-supported quizzes and flash cards.^{33,34} Generative AI has the potential to be particularly useful in helping educators provide differentiated learning pathways based on the needs of individual students.^{35,36}

3.3 Developing smarter and more sustainable farming practices

MSME cloud services are being used by the agricultural industry in the United States to support smarter, more sustainable farming practices. These technologies can assist agricultural decision making by employing sophisticated monitoring devices that provide better, real-time data about crops, livestock health, and resource consumption (referred to as precision agriculture).³⁷ TeralKytic is an MSME in the United States using cloud technology to gather insights from soil sensors, enabling users to see their real-time and predictive soil data and manage inputs such as fertilizer.³⁸ In addition to supporting the use of data or supply chain tools, cloud technology is also enabling automated vehicles and equipment which helps to improve the efficiency of agriculture. Under a cloud-enabled economy, MSMEs in agriculture are expected to unlock \$7.0 billion in annual productivity benefits by 2030. Precision agriculture technology supported by cloud-enabled MSMEs are expected to be in operation in one in three farms across the United States by 2030.

³¹ Vocareum (2020), Vocareum Delivers Virtual Labs to One Million Learners with the Help of AWS EdStart.

³² Vocareum (2023).

³³ AWS (2021), Knowt Builds Online Education App on AWS to Help Students and Teachers.

³⁴ Knowt (2023).

³⁵ World Economic Forum (2023), Can AI improve education? Here are 4 potential use cases.

³⁶ Stanford University, Human-Centered Artificial Intelligence, (2023) AI Will Transform Teaching and Learning. Let's Get it Right.

³⁷ FAO (2022), Leveraging automation and digitalization for precision agriculture: Evidence from the case studies.

³⁸ Teralytic (2023).

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



\$7.0 billion in annual productivity benefits unlocked through cloud-enabled MSMEs in the agriculture sector, an increase from \$5.5 billion

1 in 3 farms using precision agriculture supported by cloud-enabled MSMEs, a 100% increase from 1 in 6 farms



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 from the GDP contribution. Current values are annual 2022-2023 values based on the latest available data.

3.4 Improving financial access and wellbeing

Digitization of the finance sector has led to a wave of disruption, increased competition, and new types of products and services that better service customers.³⁹ Alongside the rapid adoption of smart devices, a critical part of the proliferation of digital finance options has been cloud technology that supports fast and secure methods of transferring financial information and better access to information.⁴⁰ In the United States, cloud technology is already widely used, at least in basic applications, across the financial services sector. A sample of cloud-enabled MSMEs operating in the financial services space globally indicated that the most common areas for these MSMEs to be active were in providing digital banking and financial management tools through cloud-based platforms.^{41,42} These MSMEs indicate that they are supporting increased affordability of services, improved financial literacy and education, and fraud detection.^{43,44}

However, there is an opportunity for more broader adoption and even more advanced applications, such as AI and ML, to improve outcomes for consumers across a range of applications.⁴⁵ These applications have the potential to unlock even greater individual financial wellbeing in a cloud-enabled economy by allowing customers to automate more elements of personal finances.⁴⁶ 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 \$134 billion in 2022 to \$557 billion globally by 2030 – more than a 400% increase.⁴⁷

³⁹ OECD (2020), “Digital disruption in banking and its impact on competition”.

⁴⁰ Ibid.

⁴¹ Accenture societal impact survey (2023), n = 188.

⁴² Based on the services that cloud-enabled MSMEs are currently delivering.

⁴³ Accenture societal impact survey (2023), n = 188.

⁴⁴ Based on the number of cloud-enabled MSMEs currently supporting this outcome.

⁴⁵ IMF (2021), Powering the Digital Economy: Opportunities and Risks of Artificial Intelligence in Finance.

⁴⁶ Crunchbase (2023) How the future of personal finance is self-driving money

⁴⁷ Vantage market research (2023)

Impact of MSMEs on finance in a cloud-enabled economy by 2030



1 in 4 people globally using financial services supported by cloud-enabled MSMEs

Globally, **15%** of surveyed cloud-enabled MSMEs working with the finance sector help budget-constrained customers or small businesses better manage their finances



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. Plaid is one such fintech company based in the United States seeking to democratize finance by offering an open banking platform that seamlessly connects financial apps and bank accounts, allowing consumers to be more engaged and in charge of their finance. 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.⁴⁸ 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.^{49,50}

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. Cloud-enabled MSMEs can employ technology and digitization to directly reduce environmental impact through innovation, such as enabling more efficient resource usage and smarter waste management. According to the Accenture societal impact survey of cloud-enabled MSMEs providing sustainability services, by 2030 one in five businesses globally are estimated to be using sustainability services supported by cloud-enabled MSMEs.⁵¹ 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.^{52,53} "Smart cities" are using a wide range of technologies supported by cloud-enabled MSMEs, including AI, to create societal impact and deploy more capabilities that support sustainable practices, such as through environmental monitoring and data-driven

⁴⁸ Accenture societal impact survey (2023), n = 188.

⁴⁹ Accenture societal impact survey (2023), n = 188.

⁵⁰ Based on the number of cloud-enabled MSMEs currently supporting this outcome.


⁵¹ Accenture societal impact survey (2023), n = 188.

⁵² AWS (2023), Building Smart Cities with AWS Cloud.

⁵³ IDC (2023), Smart Cities.


urban planning.^{54,55,56,57} Globally, 15% of cloud-enabled MSMEs providing services to achieve sustainability goals are expected to be supporting “smart cities”.^{58,59}

Impact of MSMEs on sustainability in a cloud-enabled economy by 2030



1 in 5 businesses globally using sustainability services supported by cloud-enabled MSMEs

Globally, 15% of surveyed cloud-enabled MSMEs that provide sustainability services support smart cities



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

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.⁶⁰ 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.⁶¹

⁵⁴ “Smart cities” use technology to meet people’s needs and improve social, financial, and environmental outcomes, which can involve better transport networks, more efficient resource use, improved city administration, along with a variety of other use cases.

⁵⁵ IDC (2021), Building Digital Resiliency in Smart Cities and Communities.

⁵⁶ World Economic Forum (2021), What is a ‘smart city’?

⁵⁷ IDC (2021), The Next Frontier: AI and Digital Twins in Smart Cities.

⁵⁸ Accenture societal impact survey (2023), n = 66.

⁵⁹ Based on the number of cloud-enabled MSMEs currently supporting this outcome.

⁶⁰ Accenture societal impact survey (2023), n = 66.

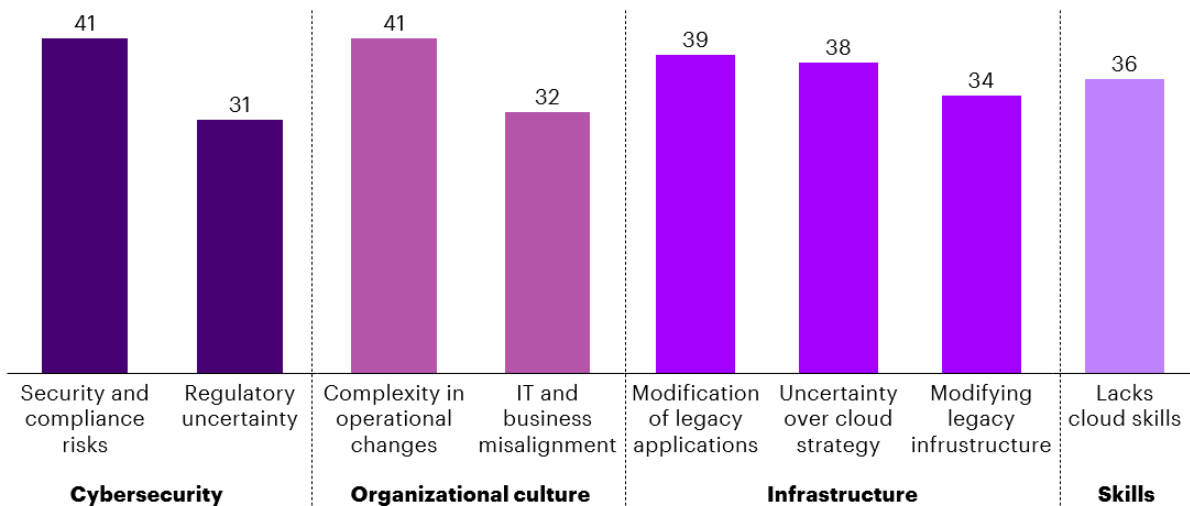
⁶¹ Accenture societal impact survey (2023), n = 66.

4 Achieving the cloud-enabled economy

With businesses across the United States at starkly different points along the adoption spectrum, the United States’ path to a cloud-enabled economy involves a combination of increasing sophistication and further encouraging greater levels of overall adoption. However, barriers to adoption remain despite the potential upside. A survey of global business leaders, conducted by Accenture, shows that persistent barriers to adoption in developed countries, like United States, continue to concern cybersecurity, reluctant organizational cultures, insufficient infrastructure (such as software and hardware) or difficulty transitioning, and digital cloud skills (see Figure 7).

Figure 7: Primary barriers to cloud technology uptake

% of respondents listing barrier in top three responses



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

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

4.1 Holistic strategies to overcome firm-specific barriers to cloud technology adoption

MSMEs can adopt a range of internal policies and actions to further integrate more complex cloud solutions across all business functions, thereby maximizing their productivity dividend overtime (see Figure 8).

Figure 8: Steps for MSMEs to accelerate cloud technology maturity

■ Cybersecurity
 ■ Infrastructure
 ■ Skills
 ■ Organizational culture

Steps	Description	Barriers addressed			
1 Identify how cloud can streamline strategic goals	<ul style="list-style-type: none"> 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 optimized at the firm level 				✓
2 Evaluate industry and government support	<ul style="list-style-type: none"> Examine the United States government’s cloud policies and programs offered by industry to address firm-specific barriers and accelerate cloud maturity This could include R&D tax credits from the United States government 	✓	✓	✓	✓
3 Educate all employees	<ul style="list-style-type: none"> Support employees to upskill in cloud, and utilize training from cloud providers where relevant Identify specific skill shortages to focus their training 	✓		✓	✓
4 Review data security arrangements	<ul style="list-style-type: none"> 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 harmonize policy across the business, with clear guidelines for different functional applications of cloud 	✓			
5 Create a whole-of-business cloud migration strategy	<ul style="list-style-type: none"> Evaluate the costs and benefits of alternative strategies to determine a whole-of-business solution that meets business goals MSMEs should prioritize 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 incentivize MSME cloud technology adoption

The status of the US as the world’s largest cloud technology market is partly attributable to strong policy support at all levels of government since cloud technology first emerged. This has included a variety of policies addressing the barriers discussed above in Section 4.1. Beginning with the establishment of the world’s earliest cloud-first policy, the United States government also has a strong history of investing in high-speed broadband, data centers and cloud training. However, there is an opportunity to further harmonize data security policies across states and with other countries to promote the cross-border flow of data. While the United States currently stands as a market leader in cloud adoption, international examples can still offer best practice solutions for addressing these barriers further (see Figure 9).

Figure 9: Global examples of best-practices for cloud adoption policies

■ Cybersecurity ■ Infrastructure ■ Skills ■ Organizational culture

Policy	Key existing support	Future policy	International policy examples	Barriers addressed
Invest in digital infrastructure	43% of households have optic fiber connections, with \$65 billion dedicated to further expansion. The US also has more data centers than any other country.	Continued investment into regional and rural areas and connecting more premises to full optic fiber connections would improve speeds to facilitate cloud.	 Singapore optic fiber accounts for 93% of broadband connections  Thailand optic fiber accounts for 94% of broadband connections  Canada optic fiber accounts for 94% of broadband connections	Cybersecurity: No Infrastructure: Yes Skills: No Organizational culture: No
Invest in cloud skills and training	The United States has collaborated with industry and training providers on multiple training initiatives to improve awareness and develop cloud skills.	Continued collaboration with industry to develop cloud skills. Improved maths scores and engineering graduates would also support cloud training.	 Australia's National Cloud Computing Strategy includes cooperation with industry and educators to enhance cloud training  Brazil's Digital Transformation Strategy (E-Digital) includes partnerships with industry and educators to provide cloud training and certifications	Cybersecurity: Yes Infrastructure: No Skills: Yes Organizational culture: Yes
Harmonize data privacy policy across regions	The United States has multiple data protection laws at the federal and state level, with varying restrictions, guidelines and penalties.	Work with state governments and world leaders to harmonize in line with global best practices, while promoting 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	Cybersecurity: Yes Infrastructure: No Skills: No Organizational culture: No
Create clear guidelines for industry	Some governments have guidelines for industry on data privacy laws, including the Health Insurance Portability and Accountability Act (HIPAA) and Gramm-Leach-Bliley Act (GLBA) for financial institutions.	Work with states and experts to develop clear industry guidelines on federal and state policies to promote confidence in cloud solutions.	 Japan's Data Protection Laws include clear guidelines for the finance, healthcare and telecommunications sectors	Cybersecurity: Yes Infrastructure: No Skills: No Organizational culture: Yes
Incentivize cloud adoption and maturity	Cloud technology is fully tax deductible in the United States and tax credits are available for multiple cloud-related investments	Continued ongoing support for MSMEs to reduce the cost of transitioning to cloud.	 Australia's Small Business Technology Investment Boost and Small Business Skills and Training Boost has a temporary 120% tax deduction on cloud training and systems costs for small businesses in 2023	Cybersecurity: No Infrastructure: Yes Skills: Yes Organizational culture: Yes
Improve cloud-first policies	The US was the first country to introduce a Cloud-First policy in 2011, instilling public confidence in cloud technology. The 2018 Cloud Smart strategy provided further guidelines for implementation.	Consider a public cloud-first policy and how complex cloud-dependent technologies could be integrated into government functions.	 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	Cybersecurity: Yes Infrastructure: Yes Skills: Yes Organizational culture: Yes

Source: OECD,⁶² Petrova, M.,⁶³ Lim, S.,⁶⁴ Australian Government,⁶⁵ Federal Government of Brazil,⁶⁶ Harrington, D.,⁶⁷ GDPR EU,⁶⁸ Delphix,⁶⁹ Mcguire Sponsel,⁷⁰ ATO,⁷¹ U.S. Department of the Interior,⁷² UK Government⁷³

⁶² OECD (2023), OECD broadband statistics update

⁶³ Petrova, M. (2022), Why the U.S. is seeing a fiber optic boom

⁶⁴ Lim, S. (2019), The city of the future: What will a full-fiber broadband city look like

⁶⁵ Australian Government (2013), The National Cloud Computing Strategy

⁶⁶ Federal Government of Brazil (2018), Brazilian Digital Transformation Strategy

⁶⁷ Harrington, D. (2023), U.S. Privacy Laws: The Complete Guide

⁶⁸ GDPR EU (n.d.), What is GDPR, the EU's new data protection law

⁶⁹ Delphix (2020), The Japan Act on the Protection of Personal Information Explained

⁷⁰ Mcguire Sponsel (2020), Calculating cloud computing expenses

⁷¹ ATO (2022), Small Business Technology Investment Boost and Small Business Skills and Training Boost

⁷² U.S. Department of the Interior (2018), Cloud Smart Strategy

⁷³ UK Government (2022), Government Cloud First policy

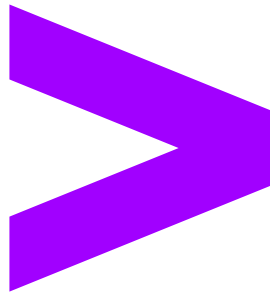
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