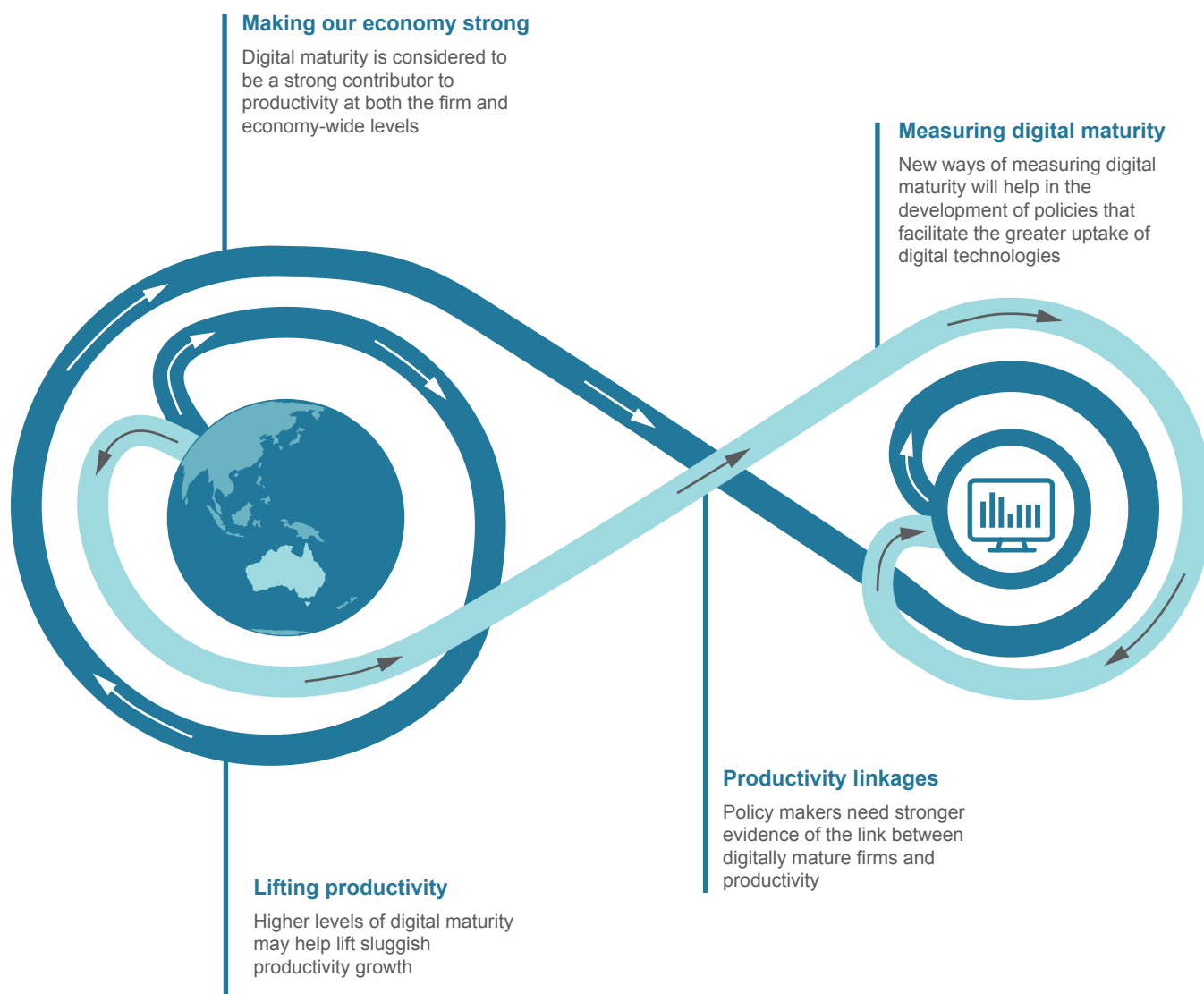


6

Australian business and digital maturity

Examining the role of digital maturity in driving higher business productivity and economic growth, and demonstrating the benefits of better measurement for both business and government.



Challenges

Many Australian businesses, particularly SMEs, are not tapping into the full potential of digital technologies



Opportunities

As a result, they may be missing out on the productivity benefits of digital maturity



Digital technologies have immense potential to drive competition, innovation and productivity. There are many types of digital technologies ranging in levels of sophistication. Examples include internet connections, websites, emails, cloud computing, social media, e-commerce, online platforms, automated supply chain management and digital assets. Applications for these technologies have included innovations such as driverless vehicles, 3D printing, drones and wearable technology.

Not all sectors and firms in Australia are making full use of the potential of digital technologies. As a result, these firms are not as productive or efficient as they could be. In contrast, “digitally mature” firms are using digital technologies in sophisticated and innovative ways to continually improve their performance and competitive advantage. Digitally mature firms are in a strong position to take advantage of the opportunities offered by an increasingly connected and globalised economy.

There is now strong evidence that at an economy-wide level, business investment in digital technologies results in higher productivity over the long term.⁸⁷ This suggests that at the firm level, digitally mature businesses are more productive and competitive compared to firms that use digital technology at a relatively basic level. It also points to a growing gap in the economy between digitally mature firms and less digitally mature firms, with the latter running the risk of being left behind in the highly competitive world of the 21st century.

This chapter discusses why digital maturity is important for Australia’s productivity growth and competitiveness, the challenges in measuring digital maturity, and how Australian businesses compare internationally. The department also outlines its plans to develop stronger evidence on digital maturity in Australia. Such evidence will allow policy makers and businesses to more accurately benchmark Australia’s performance against other advanced economies.

Understanding digital maturity

Digital maturity is the extent to which a business uses digital technologies to improve its performance and competitive advantage, and includes more than just a firm’s expenditure on computer equipment or software. To achieve digital maturity, a firm needs to adopt a strategic, integrated and holistic approach so it can make the most of its investment in digital technology.⁸⁸

Digitally mature businesses tend to be more productive and competitive than less digitally mature firms. This capability can be a significant source of growth at a time of slowing productivity in the Australian economy. Digital maturity enables a firm to transform its operations and create new ways to exchange and provide services.

⁸⁷ Shahiduzzaman M, Layton A and Alam K (2015), ‘On the Contribution of Information and Communication Technology to Productivity Growth in Australia’ *Economic Change and Restructuring* 48, p. 300

⁸⁸ Shahiduzzaman M, Kowalkiewicz M, Barret R and Briggs A (2015) Technology investment is not enough: Growing Australia’s Productive Digital Economy, *PwC Chair in Digital Economy based at Queensland University of Technology research paper*
http://www.chairdigitaleconomy.com.au/wp-content/uploads/2015/12/ITandDEPaper_vFINa.pdf

Elements of digital maturity

Digital maturity has two elements:

- the level of technology investment and usage (digital intensity) intended to improve a firm's operational activities
- the level of management capabilities needed to create digital transformation within an organisation.⁸⁹

Businesses can be at different stages of digital maturity according to how they use digital technologies and management capability. Figure 6.1 shows the four stages of digital maturity.

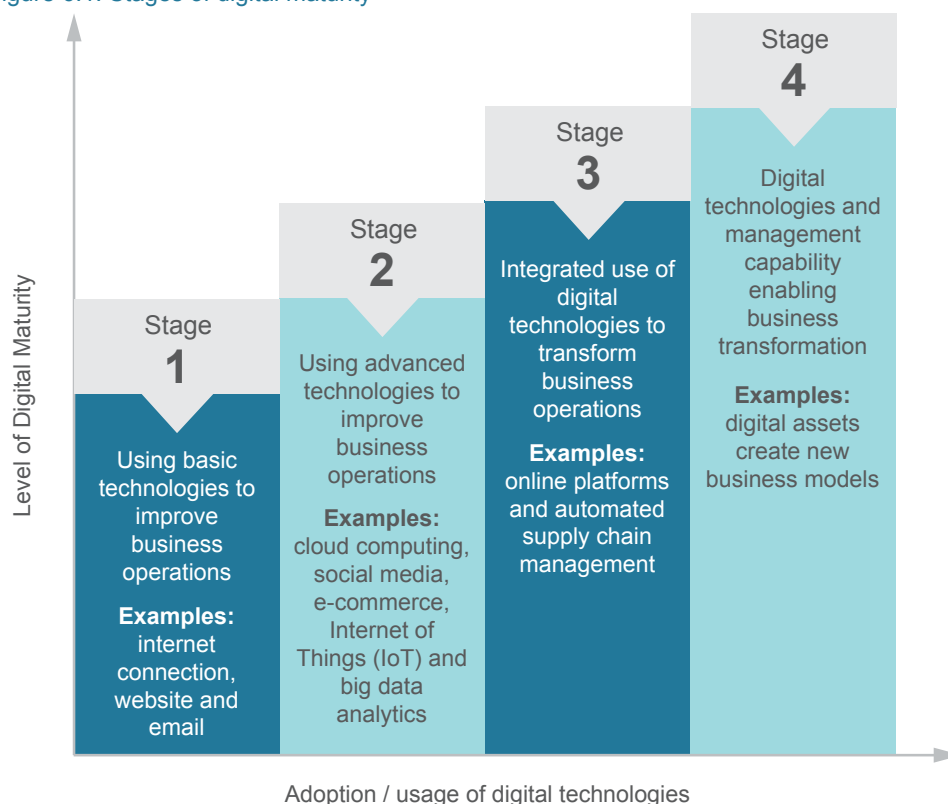
At the early stages of digital maturity, businesses use basic technologies such as connectivity to the internet, having a website, and using email to better communicate with suppliers and customers.

At the middle stages of digital maturity, businesses implement a more integrated, strategic approach to using digital technologies. For example, they may use advanced technology in sophisticated ways to improve their operations.

At the advanced stages of digital maturity, firms shift from simply digitising business operations to combining digital technologies in innovative and transformative ways. This often involves business leaders radically rethinking how their organisation operates and implementing a clear vision of the organisation's digital future.⁹⁰

Achieving digital maturity is a dynamic and evolving process. Firms will never reach a state of complete digital maturity. Instead they must constantly examine new ways to use technology to increase productivity and maintain their competitive edge.

Figure 6.1: Stages of digital maturity



Source: Department of Industry, Innovation and Science

⁸⁹ Westerman G, Bonnet D and McAfee A (2012) The advantages of digital maturity, *MIT Sloan Management Review* <http://sloanreview.mit.edu/article/the-advantages-of-digital-maturity/>

⁹⁰ Westerman G and Bonnet D (2015) Revamping your business through digital transformation, *MIT Sloan Management Review* <http://sloanreview.mit.edu/article/revamping-your-business-through-digital-transformation/>
Kane G et al (2015) Strategy, not technology, drives digital transformation, *MIT Sloan Management Review* <http://sloanreview.mit.edu/projects/strategy-drives-digital-transformation/>

Importance of digital maturity

Australia's productivity has been lagging. New sources of growth are needed to maintain a high-wage economy and high living standards. There is strong international evidence to suggest that digital technologies can drive innovation and, in turn, enhance productivity and competitiveness.⁹¹

Digital maturity drives productivity growth and competitiveness

The benefits of digital maturity are significant at both the firm and economy level.

At the firm level, digitally mature firms are agile, using innovative practices to transform their operations. This allows for lower cost structures through the use of more efficient processes, thereby increasing productivity. Small and medium-sized Australian businesses that have reached advanced levels of digital maturity generate more revenue, create more jobs, and are more likely to be exporting compared to less digitally mature businesses.⁹² By being more ready to experiment with new processes and technologies, they foster a more innovative and competitive marketplace. As a consequence, goods and services are produced at lower prices and higher quality. This ultimately leads to higher performing firms.

At a time of slowing demand for resources and softer commodity prices, Australia needs new sources of competitive advantage. Improving the uptake of digital technologies across all firms and industry sectors could make a significant contribution to economic growth. Digital maturity can generate new sources of income by allowing firms to access new and more geographically dispersed markets.⁹³

Digital maturity can also provide an opportunity for Australia to remain a productive economy characterised by high-income, high-quality jobs. New evidence from the OECD suggests the main source of the slowdown in multifactor productivity is not so much innovation slowing down (it is continuing apace in the most globally-advanced firms), but rather the slowdown in the spread of innovation throughout the economy.⁹⁴ Earlier research at the Productivity Commission showed that the accelerated use of computers brought substantial productivity gains throughout the 1990s.⁹⁵ More recent evidence suggests that digital technologies are now generating varying productivity effects across Australian industries.⁹⁶

Challenges in measuring digital maturity

Stronger evidence on how Australian firms use technologies will help both government and business to develop effective measures to seize the opportunities that digital technologies provide.

To better understand the links between digital maturity and higher productivity, new ways are needed to measure the use and impact of digital technologies on both firms and the wider economy. However, measuring the digital maturity of Australian businesses can prove challenging for three reasons:

1. There are continual changes and rapid advances in digital technologies.
2. Firms are combining digital technologies in a growing number of sophisticated ways.
3. The impacts from using digital technologies can be long-reaching and difficult to quantify.

These challenges are examined in further detail in this section.

⁹¹ OECD (June 2016), *Stimulating Digital Innovation for Growth and Inclusiveness*

⁹² Deloitte Access Economic Report commissioned by Google, *Connected Small Businesses 2016*

⁹³ Boston Consulting Group (2013) *Ahead of the Curve: Lessons on Technology and Growth from Small-Business Leaders*. http://www.bcg.com.cn/export/sites/default/en/files/publications/reports_pdf/BCG_Ahead_of_the_Curve_Oct_2013.pdf

⁹⁴ OECD (2015), *The Future of Productivity* p. 8

⁹⁵ Productivity Commission (2004), *ICT use and productivity — a synthesis from studies of Australian firms*

⁹⁶ Bureau of Communications Research (February 2016), *IT Use and Australia's productivity — Where are we now?*

Rapid advances and sophisticated combinations of digital technologies

Rapid advances in technology present a key challenge in measuring the extent to which Australian businesses use digital technologies. Over the past 10–15 years, developments in hardware, software and network technologies have made it easier for firms to access and use digital technologies in every business operation.

Businesses are also using combinations of new technologies and applications, such as cloud computing, the Internet of Things and data analytics in highly sophisticated ways. It is difficult to separate and measure how individual components contribute to a firm's digital maturity. Businesses are using complex combinations of digital intensity, transformation management approaches and other strategies to realise the benefits of digital technology. For example, manufacturing processes that were once standalone and analogue are becoming increasingly digitised. This facilitates the development of “smart factories” that are significantly more flexible, transparent and customisable.

These rapid changes in technology and market trends make it difficult to obtain accurate and up-to-date data on the extent that firms and sectors are adopting digital technologies.

National statistical organisations are also grappling with these challenges and are taking steps to improve data collection on business technology adoption. The Australian Bureau of Statistics (ABS) continues to refine its annual Business Characteristics Survey (BCS), which now includes questions on the use of more advanced technologies such as cloud computing, intelligent software, data analytics and the Internet of Things. However, the ABS does not measure the impact of digital technologies on the entire economy.

Measuring impacts of digital technologies is challenging

Assessing the impact of digital technologies on firm performance and the wider economy is challenging, since digital maturity involves more than just physical investment. Recent evidence shows that it takes more than technology investment alone to improve a firm's performance.⁹⁷ Therefore, any methodology used to measure the impact of digital technology needs to assess both changes in investment and management practices to better harness digital technology.

New research also indicates that digital technology may be having a much greater impact on economic growth than expected. A recent report commissioned by the UK government suggests that if the digital economy were fully captured by official statistics, it could add between one-third and two-thirds of a per cent to the UK economy's growth rate.⁹⁸ The report argues that traditional measurements of GDP, which were developed when the economy was dominated by goods and services, are struggling to account for the impact of digital technologies.

⁹⁷ *Technology Investment is not enough; Growing Australia's productive Digital Economy*
http://www.chairdigitaleconomy.com.au/wp-content/uploads/2015/12/ITandDEPaper_vFINa.pdf

⁹⁸ UK Government 2016 Press notice: 'Take economic statistics back to the future' says Charlie Bean,
<https://www.gov.uk/government/publications/independent-review-of-uk-economic-statistics-final-report/press-notice-take-economic-statistics-back-to-the-future-says-charlie-bean>

New approaches for measuring digital maturity

International organisations such as the OECD and the G20 are now looking to develop better measures of the contribution of digital technology to the economy. This is in response to concerns that GDP does not directly account for economic benefits such as time saved, increased choice, and lower costs of production. Therefore, new approaches are needed to better estimate GDP growth and labour productivity increases.

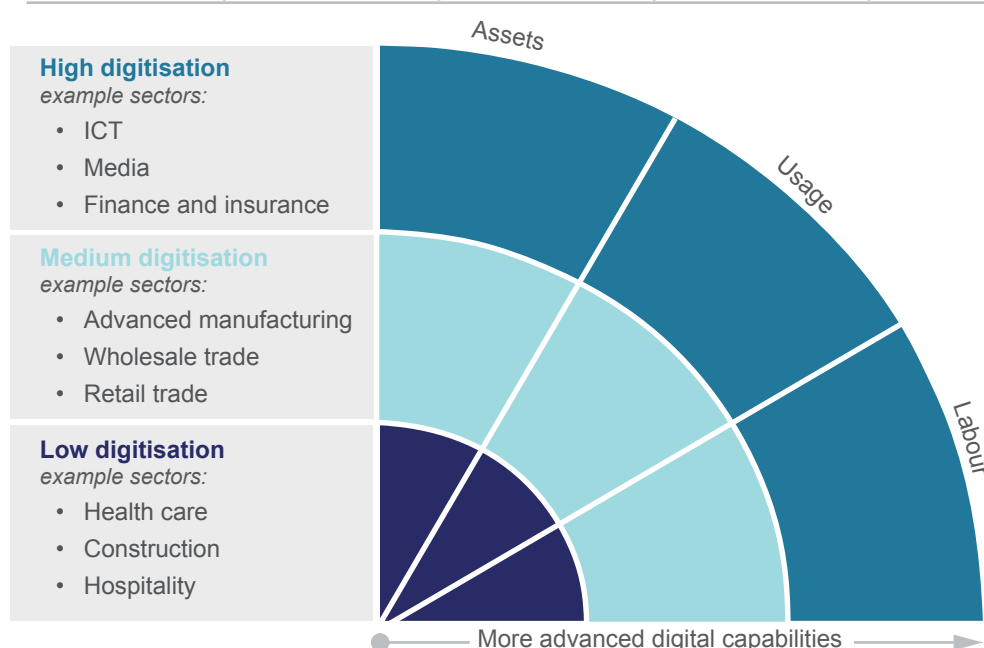
The McKinsey Global Institute (MGI) provides an example of a model that better measures the impacts of digital technologies on an economy (see Figure 6.2). The Industry Digitisation Index (MGI Index) provides insights on digital maturity in the US economy (and more recently in Europe) using three broad categories — digital usage, digital assets, and digital workers.⁹⁹ McKinsey estimates that greater levels of digitisation could add up to US\$2.2 trillion to US annual GDP by 2025.

Figure 6.2: McKinsey's Industry Digitisation Index

MGI's **Industry Digitisation Index** combines **27** indicators to measure the digital assets, digital usage and digital workers in each sector.

Across industries:

Digital assets create competitive advantage	New intermediaries emerge	Value chains break apart	Winners-take-all dynamic emerges	Industry boundaries blur
---------------------------------------------	---------------------------	--------------------------	----------------------------------	--------------------------



Source: McKinsey Global Institute

The challenge for business leaders and policy makers is to keep up to speed with the rapid changes brought about by digital technologies. Meeting this challenge requires a good understanding of what should be measured and how it should be measured, to ensure Australia is adopting and using the latest technologies and business models.

⁹⁹ McKinsey Global Institute (MGI) (December 2015), *Digital America. A tale of the haves and have-mores*



The department is developing stronger evidence on digital maturity in Australia. This evidence will help the government develop policies that facilitate business take-up of digital technologies. It will also help policy makers and business to accurately measure the impact of digital technologies on the economy. This work includes:

- Analysing the relationship between the adoption and usage of digital technologies, and the subsequent performance of Australian industries. To these ends, the department is investigating how it can leverage the Business Longitudinal Analysis Data Environment (BLADE) — a statistical asset that integrates financial and business characteristics data for more than two million active businesses in Australia.
- Working collaboratively with Data61 (the CSIRO's digital research unit¹⁰⁰) to identify and develop a research methodology for measuring digital maturity using non-traditional data sets (Open Data Signals). Data61 is already exploring the use of non-official data sources to investigate the relationship between the use of digital technologies and firm performance.
- Building a statistical dashboard that aggregates and visualises data on Australia's engagement and performance in the digital economy. The "digital economy dashboard" will provide up-to-date statistics and regular analysis of how Australia is performing on various measures of the digital economy, including digital maturity.

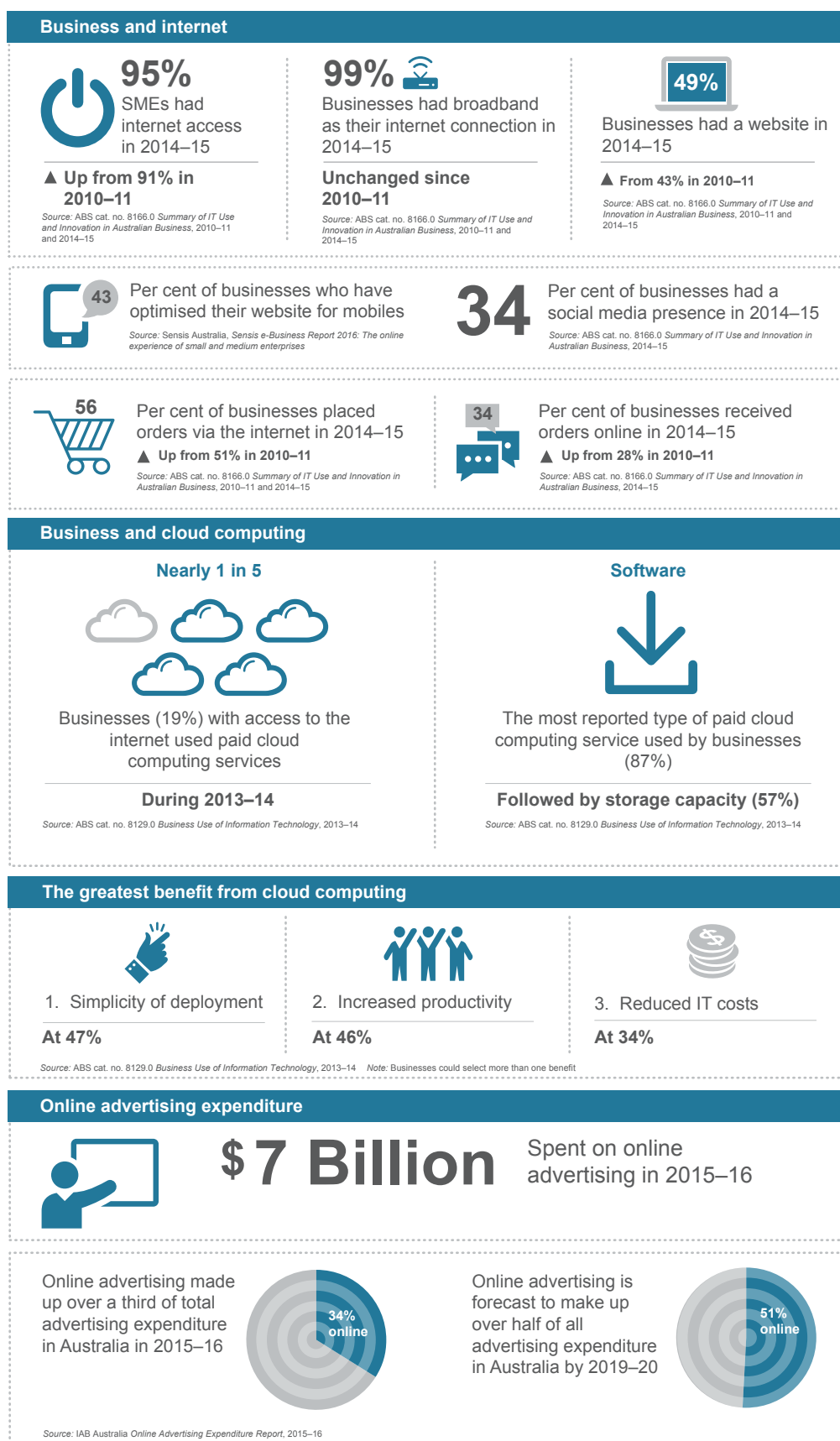
How are Australian firms performing?

Current measures of digital maturity indicate that many Australian businesses are lagging in the sophisticated use of digital technologies. Most businesses have internet access, about half have a website, and relatively few have a social media presence (see Figure 6.3).

Small and medium-sized enterprises (SMEs) tend to lag behind larger firms in their use of technology. For example, firms with four or fewer employees were the lowest users of cloud computing, compared to those with 200 or more employees.

¹⁰⁰ Data61's work includes making government data more accessible, improving industry cyber security, linking businesses with data researchers and training businesses in data analytics.

Figure 6.3: Business use of ICT



Source: Australian Bureau of Statistics, Australian Communications and Media Authority, Interactive Advertising Bureau Australia, Sensis, Price Waterhouse Coopers

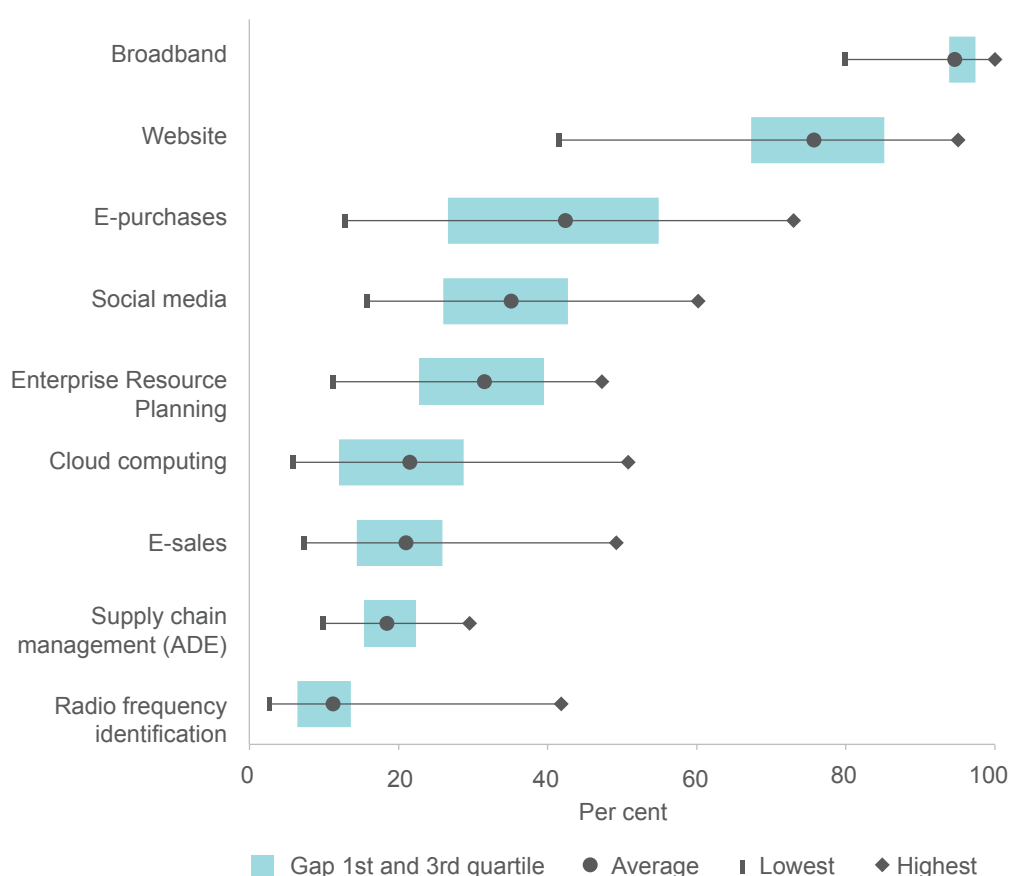
Australian businesses — especially SMEs — are missing out on the productivity benefits digital technology offers. Given the contribution of SMEs to the Australian economy, the data suggests many could be more productive if they were to increase adoption of digital technologies. There is also evidence that many businesses do not have a digital business strategy. The data show a growing gap in terms of growth and productivity between SMEs with a digital business strategy and those without one.

How does Australia compare internationally?

By international standards, Australian businesses are not fast adopters of technology. On a number of digital engagement indicators, Australia ranks in the middle of the pack of advanced economies, rather than at the forefront. For example, Australia is ranked 20th among OECD countries in terms of enterprises having a website — a cornerstone digital asset for any business to interact with customers and suppliers.¹⁰¹ Australia also ranks 12th for business IT investment as a proportion of total capital investment.¹⁰²

OECD studies show that many businesses, particularly SMEs that lag in productivity, also lag in digital maturity.¹⁰³ Despite the greater capacity for advanced ICTs (e.g. cloud computing, supply chain management, and enterprise resource planning software) to improve productivity, SME's adoption continues to be lower than their adoption of less advanced technologies such as broadband networks or websites (Figure 6.4).¹⁰⁴

Figure 6.4: Diffusion of selected ICT tools and activities in enterprises, 2014



Source: OECD Science, Technology and Industry Scoreboard, 2015

¹⁰¹ OECD *Digital Economy Outlook* (2015), p.133

¹⁰² OECD *Digital Economy Outlook* (2015), p.161

¹⁰³ OECD *Digital Economy Outlook*, (2015), p. 47

¹⁰⁴ OECD *Science Technology and Industry Scoreboard*, (2015)

The World Economic Forum (WEF) also ranks countries on their adoption and use of ICT using the Networked Readiness Index (NRI).¹⁰⁵ The NRI measures the capacity of countries to leverage ICT to improve competitiveness and wellbeing. It ranks each country's performance across four categories of indicators:

- the overall environment for technology use and creation (political, regulatory, business, and innovation)
- ICT infrastructure, affordability and skills
- the use of technology by government, the private sector and individuals
- the economic and social impact of new technologies.

According to the WEF, Australia ranks 18th overall on the NRI, having slipped two positions from previous years due to a decline in connectivity and affordability (see Table 6.1).¹⁰⁶ The report notes that business use of ICTs in Australia was lagging compared to other countries (ranked 24th). It suggests that an increasingly sophisticated and innovative use of ICT is the common element of countries experiencing greater economic and social benefits from technology.¹⁰⁷

Table 6.1: Where Australia ranks on key digital indicators¹⁰⁸

<i>Indicator</i>	<i>Ranking (out of 139 countries)</i>
Network Readiness Index	18
Overall business use of ICTs	24
Availability of latest technology	24
Firm-level absorption of new technology	22
Business capacity for innovation	25
ICT use for business-to-business transactions	26
Internet use for business-to-consumer transactions	25
Impact of ICTs on new services and products	41
Employment in knowledge-intensive activities	13

Source: World Economic Forum, *Global Information Technology Report 2016*
<http://reports.weforum.org/global-information-technology-report-2016>

¹⁰⁵ *The Global Information Technology Report 2016*

<https://www.weforum.org/reports/the-global-information-technology-report-2016>

¹⁰⁶ Affordability (57), fixed broadband subscriptions remain expensive (US\$46.7 per month adjusted for purchasing power parity, ranked 100th worldwide)

¹⁰⁷ *The Global Information Technology Report 2016*

<https://www.weforum.org/reports/the-global-information-technology-report-2016>

¹⁰⁸ Australia ranks higher on the overall NRI than on a number of digital indicators because it performs well on broader environmental indicators such as the political and regulatory environment and infrastructure.