

## Demystifying data 2021

Unlocking the benefits of data maturity  
and machine learning in Australia and New Zealand

Commissioned by Amazon Web Services  
2021

**Deloitte**  
Access **Economics**

Despite rapid digital adoption driven by COVID-19, data maturity levels in organisations have not improved over the past year. **Three in five organisations in Australia and New Zealand** still have basic or beginner data maturity levels.

Data analytics has the potential to unlock significant value for organisations in this context. Economic modelling for this report finds every step of higher data maturity can lead to **6.7% growth in revenue every year**.

So what is stopping organisations from developing their data maturity and what actions can they take to succeed?

## THE BENEFITS



Productivity



Customer experience



Sales and revenue

## WHY DATA

The most common use of data among organisations was to **drive operational efficiencies** (61%).

Nearly all organisations (97%) have reported benefits from adopting machine learning.

## THE BARRIERS

**Data quality** remains the most common barrier to improving data maturity.

**33%**

A third of organisations reported the biggest impact of not embracing data was **delays in decision making**.

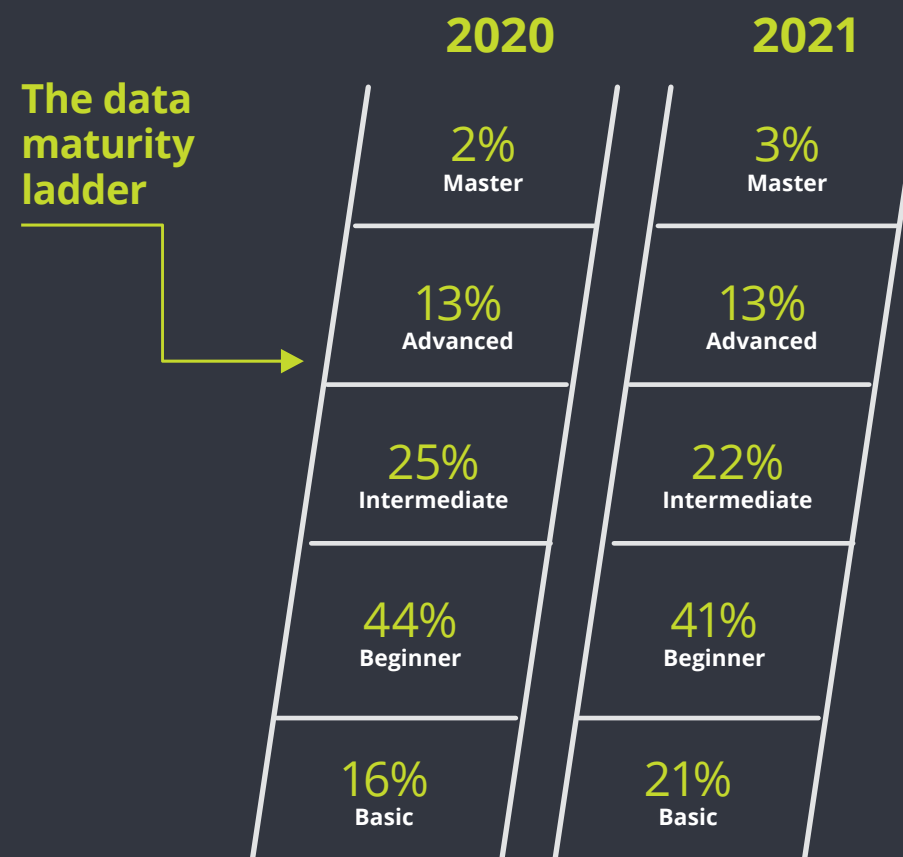
## WHAT NEXT?

- Engage leadership to drive data and analytics strategy
- Upskill staff through training
- Invest in **foundational data**
- Invest in **cloud solutions**
- Develop a realistic understanding of **current capabilities**



For organisations employing more than 200 staff, this uplift is equivalent to an additional **\$27 million (\$AUD)** and **\$17 million (\$NZD)** for organisations in Australia and New Zealand respectively.

## The data maturity ladder



Note: In 2021, organisations were also scored against their machine learning capabilities (not included in 2020). Findings based on a survey of 500 organisations in Australia and New Zealand. 2020 results are drawn from Deloitte Access Economics, 'Demystifying data' (2020).

# Executive summary

Data can be used in all sorts of ways to improve an organisation's performance. Customer data can be used to help target the market better, financial data can be used to improve investment decisions, human resources decisions can be informed by employee data, and capital assets by Internet of Things (IoT) data.

So it is no surprise that for several years data has been called the 'new oil' – that critical resource for success. But for all this commentary and potential, how are Australian and New Zealand organisations performing?

Demystifying Data 2021 is the second edition of a report (after Demystifying Data 2020) for Amazon Web Services (AWS) that analyses the data maturity of 500 large and medium organisations across Australia and New Zealand. It finds what one might expect of data use during an unprecedented year of change and digitisation: a dramatic increase in interest levels in data and analytics and consideration of machine learning (ML) and artificial intelligence (AI). Almost 90% of organisations have made some investment in data collection or analytical tools or software in the past 12 months and nearly two thirds of organisations generate meaningful insights from data at least weekly.

## How do Australian and New Zealand organisations rate in data maturity?

While overall interest and investment in data has grown, organisations are still struggling to improve data maturity. Using a six-pillar model that ranks organisations as having either a basic, beginner, intermediate, advanced or master level of maturity, we find:

- there has been **no systematic improvement in data maturity in the past twelve months**, with three in five still only having a basic or beginner level of data maturity
- organisations overstate their level of data maturity: two in five (41%) overreported their data maturity levels compared to results from the model.
- only one third of organisations expect to up their level of data maturity in the next five years

## Who is leading the data maturity race?

While overall data maturity has been stable, many organisations are setting the pace.

At the industry level, **finance & insurance** organisations have the highest levels of advanced or master maturity (48%), followed by professional services and technology & media.

By contrast, organisations in non-market industries where government plays a bigger role such as education and training and healthcare have the lowest relative levels of data maturity.

Organisations with **senior executive buy-in** had higher levels of data maturity – when the c-suite were the strongest advocates of data, they were 20% more likely to invest in data and analytics and 50% more likely to invest in machine learning in the past financial year.

Organisations with good **foundational data analytics are able to unlock the power of artificial intelligence and machine learning**. For those businesses with machine learning capabilities, 97% observed at least one benefit. The most beneficial use case of machine learning was identified as cyber security and fraud detection, followed by financial services and intelligent document processing.

Firms that **upskill current employees** have higher levels of data maturity on average. Over a third (36%) of organisations that upskill staff have advanced or master levels of data maturity on average, compared to just 14% across all surveyed organisations.

### What's holding back data maturity?

**Data quality** remains the most common barrier to improving maturity levels for organisations. Poor quality data could cost organisations as much as 15% to 25% of revenue. These costs are the result of correcting errors, seeking confirmation in other sources and dealing with mistakes that follow.

The next most commonly cited barrier for organisations to improve data maturity is a **lack of funding** (46% of organisations). This suggests that data may not be considered a priority for many organisations. While most have a data strategy, **half of organisations don't track progress in their data strategy** or have firm-wide belief in its value.

**Data security and risk** is another cited barrier to improving data maturity (45%). Cyber security is a key enabler for organisations to have confidence in collecting and using their data. But it is also about making the most of analytical tools. In fact, improving cyber security and fraud detection is actually the number one cited use case of organisations considering investments in machine learning.

### Can Australia and New Zealand reach its data potential?

Already, 30% of employees who undertake analysis for work reported their skills are inadequate or outdated. By 2025, the average worker in the Asia Pacific (APAC) region will need to learn seven new digital skills.<sup>1</sup>

While many organisations have ambitious goals for being more data-driven over time and improving their data maturity, this will exacerbate Australia and New Zealand's **data skills gap**.

Most organisations plan to address their own skills gap by hiring skilled staff from elsewhere (54%), outsourcing or partnering with others. Only a quarter (27%) plan to upskill existing staff themselves. Australia and New Zealand will need more actions to address the emerging skills gap.

### The prize for climbing the ladder

The majority of organisations report that data can lead to improvements in productivity (58% of organisations), customer experience (53%) and sales and revenue (53%).

The **financial benefits** from improving their data maturity are significant. Modelling in this report finds that each one point increase in data maturity score leads to a 6.7% growth in revenue each year. For the average organisation surveyed in Australia, this is approximately \$850,000 (\$AUD) and \$870,000 (\$NZD) for New Zealand organisations.

If all organisations with over 200 employees were able to achieve the one-point increase in data maturity, the 6.7% uplift in revenue would be worth an additional \$27 million (\$AUD) in Australia and \$17 million (\$NZD) in New Zealand.

Embracing data and analytics also helps avoid **delayed decision making**, with a third of organisations reporting this impact. These decision delays can cause organisations to lose valuable time in achieving its objectives, including developing new products and entering new markets.

1. AlphaBeta, 2021. 'Unlocking APAC's Digital Potential: Changing digital skill needs and policy approaches.'

# What are the next steps organisations can take to succeed?

This report identifies five key opportunities to help organisations identify areas of focus to achieve this objective.



**Engage leadership.** Senior leaders need to drive data and analytics to ensure organisations are able to reach their goals. This is critical to achieving an organisation-wide data strategy.



**Skills development.** Getting the right skills to develop and execute data strategies is important – but where will the skills come from? Each organisation will need to weigh up the options across hiring new talent, partnering with others, outsourcing their needs, and upskilling existing employees. Our tip, in a market with a significant skills gap, consider strongly the case for investing more in internal employee training and upskilling current staff, precisely because others are relying less on this.



**Investment in foundational data quality.** Investing in high quality data is critical for organisations to be data-driven. It will also unlock opportunities to utilise emerging technologies such as machine learning and artificial intelligence. Nearly three quarters of organisations surveyed had invested in artificial intelligence and machine learning in FY2021. Meanwhile, a quarter of organisations (25%) did not invest these technologies and risk missing out on the benefits.



**Moving towards the cloud.** Investing in cloud solutions will allow organisations to accelerate their data maturity levels and achieve data driven insights as the volume of data increases. A case study on Intellihub, a leading ANZ smart energy provider, reveals that the rapid growth of the business was enabled through the use of cloud technology to facilitate a six-fold increase in data reporting requirements.



**Understand current maturity level.** Developing a realistic understanding of current capabilities within an organisation and identifying opportunities for improvement, will allow organisations to make informed decision making. It will also help access the benefits from being data driven that are identified in this report.

## LEADERSHIP

Bring in senior leaders to champion growth in data and analytics



## SKILLS

Invest in upskilling current staff as emerging technologies are implemented



## DATA

Identify opportunities to improve data management to ensure high quality data



## CLOUD

Invest in cloud solutions to accelerate growth and achieve data-driven insights



## MATURITY LEVEL

Understand current capabilities and opportunities for growth



# Why data?

The growing importance of data has led to the transformation of existing organisations with new data analytics teams and emerging occupations such as data engineers and data scientists.

In fact, in Australia **seven out of 25 emerging in-demand occupations identified by the National Skills Commission (NSC) are centred around data analytics**. Employment for these roles has grown threefold between 2015 and 2019.<sup>1</sup> In New Zealand, employment in technology occupations has increased by 30% over the last decade.<sup>2</sup> A survey of New Zealand businesses found demand for data scientists would increase by 80% in the next two years.<sup>3</sup> Growth in these roles is expected to continue as organisations look to take advantage of data and analytics.

While many may consider these roles for only tech organisations, **every organisation can gain valuable insights from data it generates**.

This report was commissioned by AWS to understand the data maturity levels of medium and large organisations across Australia and New Zealand.

The insights generated from this report are based on a survey of organisations and case studies. Unless stated otherwise, all results presented are for both Australian and New Zealand organisations.\*

Further detail about the methodology for this report is available in Appendix A.

Data is not just about numbers in a spreadsheet or pivot tables. Data can be broadly defined as information that is collected through observation. Data can be both qualitative or quantitative and can come in a number of forms such as text, number, picture, video or sound.

Individuals and organisations generate data daily through communications (email, phone calls), finance (sales, share prices), social media and marketing (Facebook, website views), and logistics (inventory, freight movement).

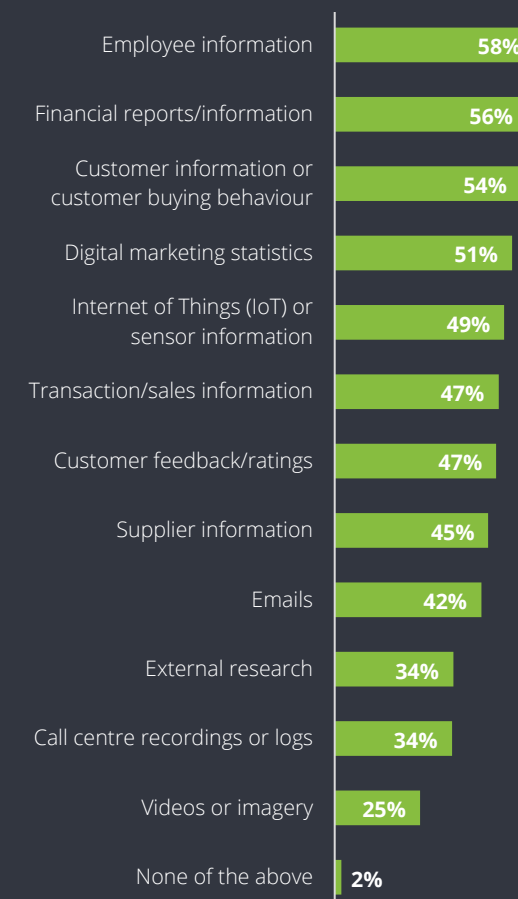
To benefit from data, organisations need to recognise the data that's available – both internally and externally.

Yet, **our results show that the number of organisations that recognise data for what it is has declined**.

For example, in 2020, 57% of organisations said digital marketing statistics was data, compared to 51% this year. Similarly, less than half (47%) of organisations said transaction or sales information was data in this year's survey, compared to 55% in 2020 (an eight percentage point difference).

Failing to recognise data for what it is may mean organisations aren't making the most of what they have.

## Proportion of organisations that identified the following as organisational data:



Source: Deloitte Access Economics and Dynata

\*Some breakdowns for Australia and New Zealand are available in Appendix B.

1. National Skills Commission, 2020. 'Emerging Occupations: How new skills are changing Australian Jobs.' <https://www.nationalskillscommission.gov.au/emerging-occupations>

2. NZtech, 2020. 'Overview of the New Zealand technology sector'

3. NZ Tech (2020), Digital skills for our digital future, <https://nztech.org.nz/reports/digital-skills-for-our-digital-future/>

# How can data be used?

Just like the variety of forms of data, its use can also vary. For example, financial information such as revenue and costs can be used to forecast future performance or identify trends. Cloud computing and advanced technologies like artificial intelligence and machine learning can help organisations leverage the growing volumes of data available.

Our survey found the majority of organisations are using data to understand their current organisation's situation and market. Three in five organisations (61%) said they were using data to drive **process improvements** such as operational efficiencies, while 60% said they were currently using data to **improve the customer experience**.

## Proportion of organisations that are using data to...

- 61%** drive operational efficiencies
- 60%** improve the customer experience
- 55%** inform company strategy
- 53%** drive innovation

However, around two in five organisations are yet to use data for these functions. Organisations need to get the full value of their data or they might risk falling behind their competitors.

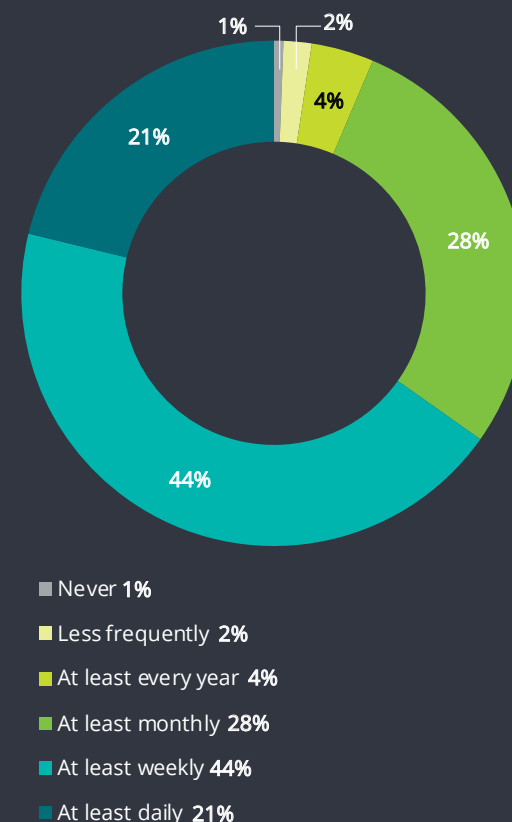
A smaller share of organisations are using data to help **innovate the goods and services** they provide (53%) and to **inform their strategy** (55%).

When it comes to analysing data, 45% of organisations use spreadsheet analysis software (e.g. excel), and 44% of organisations use analytic functions within their current applications (e.g. CRM). A third (36%) of organisations report using advanced analytics software (e.g. SAS, SPSS).

**Most organisations (65%) get insights at least weekly**, enabling them to make informed decisions and respond to emerging trends in their organisation and market. **This is similar to the share of organisations getting insights this frequently in 2020 (71%), suggesting many still aren't getting the most out of their data.**

Investing in improving their capabilities could help many organisations extract meaningful insights from their data daily, improving performance.

## Frequency at which organisations get meaningful insights from their data:

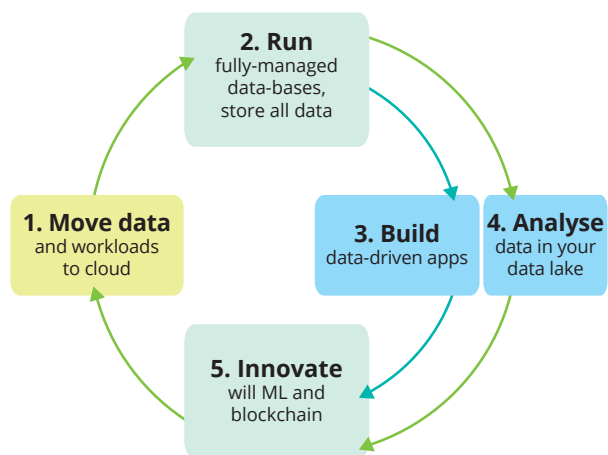


Source: Deloitte Access Economics and Dynata.

# Unlocking artificial intelligence and machine learning

High quality data and analytics capabilities are necessary to unlock more advanced data use cases such as artificial intelligence and machine learning. This is reflected in the AWS Data Flywheel, which illustrates how organisations can get the most value from their data.<sup>1</sup>

Our survey also found that organisations with higher levels of reported cloud and data maturity levels, also had higher self-reported levels of machine learning maturity.



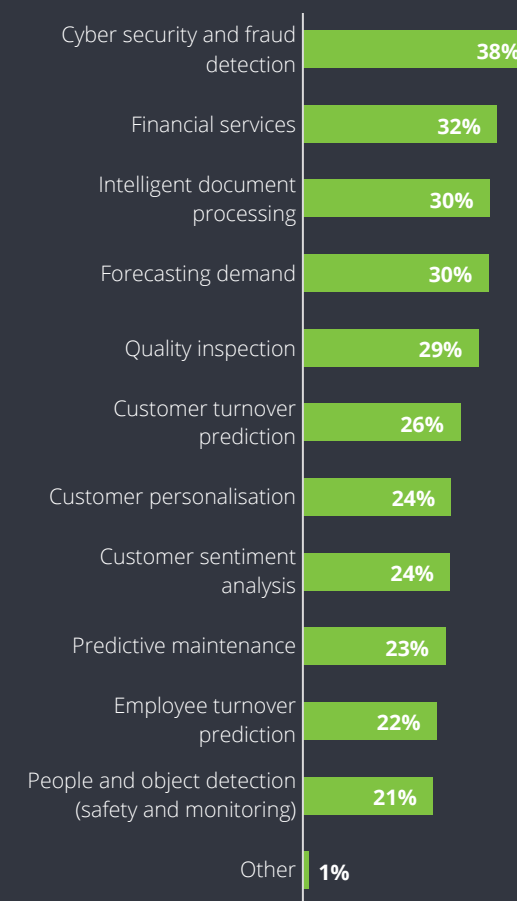
Two in five (40%) organisations surveyed had invested in, and had a budget for, artificial intelligence and machine learning. A quarter of organisations (25%) did not invest in FY2021 and risk missing out on the benefits of these technologies.

For organisations with machine learning capabilities, **97% have observed at least one benefit**. The most beneficial use case of machine learning was identified as cyber security and fraud detection, followed by financial services and intelligent document processing.

Looking forward, half of organisations expect to have higher levels of artificial intelligence and machine learning in the next five years.

To achieve this objective, getting senior executive buy-in will be key. Our survey found that organisations were twice as likely to invest in artificial and machine learning in FY2021 when C-suite executives were the biggest advocates of data, compared to organisations when the data team/professionals were the biggest advocate. This could be a result of data teams seeing these technologies as solutions to technical problems rather than seeing their full potential. The importance of C-suite in AI outcomes is supported by Deloitte's latest State of AI in Enterprise report, which indicates that organisations with an enterprise wide strategy are **1.7 times more likely to achieve AI outcomes to a high degree**.<sup>2</sup>

**Proportion of organisations that ranked the following as top three most beneficial use cases of machine learning to their organisation:**



Source: Deloitte Access Economics and Dynata

1. Amazon Web Services. 'AWS Data Flywheel.' [https://pages.awscloud.com/EMEA-Data-Flywheel.html?nc1=f\\_ls](https://pages.awscloud.com/EMEA-Data-Flywheel.html?nc1=f_ls)

2. Deloitte, 2021. 'Becoming an AI-fueled organization: Deloitte's State of AI in the Enterprise, 4th Edition.' <https://www2.deloitte.com/us/en/pages/about-deloitte/articles/press-releases/deloitte-state-of-ai-fourth-edition-report.html>





# Case study: TPG Telecom

As one of the major telecommunications providers in Australia, TPG Telecom has sought to scale up the strategic insights from the data collected by its operations. A year ago, TPG Telecom embarked on a journey to create a unified data lakehouse platform to serve all the brands under TPG Telecom (Vodafone, TPG, iinet, Lebara, internode, AAPT and felix), to help unlock the possibilities from machine learning and artificial intelligence.

Bobby Shaik, Head of Business Intelligence – Data and Analytics, TPG Telecom explains that the platform contains close to 100 external and internal models. The single platform has multiple use cases such as providing customer analytics, insights into TPG Telecom's network operations, and developing new revenue streams.

**"We believe data is an asset, so having a single platform hosted on AWS has allowed us to collect, process, and analyse datasets quickly, and develop richer insights that were previously not possible to attain when data was being siloed."**

TPG Telecom has sought to use the single platform to analyse individual level customer data aggregated at 15-minute intervals. The insights generated from this analysis help TPG Telecom to optimise investments in the network and develop solutions to enhance their customer experience journey.

TPG Telecom's data analytics team was designed to provide strategic insights across the organisation from its inception. Insights generated by the data analytics team are focused on tangible actions and insights for various teams within TPG Telecom. To enable this collaboration, the analytics team use data lakes for their modelling, as well as a 'TPG Telecom knowledge lake' on top. This knowledge lake is accessible to all teams and ensures the data is used in the best way possible to add value to the business.

**"Our team is all about impacting the data value. Being a partner and enabler for all business units is crucial and can influence business conversations by bringing data and value together."**

AWS has not only helped TPG Telecom with building the new lakehouse platform and data management practices, but also supported their data journey on projects such as a smart-farming trial. This trial, which received grant funding by the Australian Government's 5G Innovation Initiative, will use 5G technologies to deliver benefits and efficiencies to the agricultural sector by helping farmers count sheep at a livestock exchange.

**"We wanted to have our platform operational within a year, and we were able to achieve it in 7 months. Without collaborating with AWS, we wouldn't have been up and running as quickly as we are now."**

# A model for assessing data maturity

Consistent with 2020, to measure data maturity organisations are scored against a number of pillars. However, in addition to analysing organisations on their data, strategy, people, technology and process, this year's report **includes an additional pillar of machine learning** (last row in the table below).

The scores from each pillar are then summed together and grouped based on cut-off scores, to determine the overall data maturity. This ranges from basic to master (shown in the first row below). Further detail on the methodology is provided in Appendix B.

	Basic	Beginner	Intermediate	Advanced	Master
<b>Data</b>	Narrow understanding, data not captured	Limited understanding, data captured	Some understanding, data captured	Detailed understanding, data captured	Complete understanding, data captured from multiple sources
<b>Strategy</b>	None	Implemented in silos	Some investment in data and analytics	Firm wide strategy, ongoing investment in data and analytics	Firm wide strategy, dedicated analytics budget
<b>People</b>	No data culture or capability	Some data capability but lack of data culture	Emerging data team with capability and growing culture	Data team with good capability and culture	Data-driven culture, dedicated data team with high capability
<b>Technology</b>	Unable to draw insights from data	Limited ability to draw insights from data	Analytics informs solutions	Analytics informs decision-making	Analytics is embedded into strategic decision-making
<b>Process</b>	Data is not analysed, no data governance	Data is not analysed	Data is analysed on an ad-hoc basis, some data governance	Data is routinely analysed, some data governance policies	Data is analysed frequently, strong data governance policies
<b>Machine Learning</b>	No investment or use	Plans to implement	Some investment and implementation	Currently using a number of use cases across various areas in the organisation	Firm wide use of machine learning use cases

## The self-assessment

Organisations were also asked to rate their own data maturity, based on Amazon Web Services' data maturity index (see Appendix E).

The self-assessment included five data maturity categories; basic, opportunistic, systematic, differentiating and transformational.

The self-assessment is not directly comparable to the data maturity model shown in the table. However, it does incorporate elements of the data maturity model, such as strategy.

# Data maturity levels have remained the same despite digital acceleration during COVID-19

COVID-19 has led to a digital acceleration in the workplace, with research finding that one-third of Australian organisations expanded their online presence in the first three weeks of the pandemic, while 90% adopted new technology to support continuity of the organisation.<sup>1</sup> While in New Zealand, eight out of ten CEOs plan to increase investment in digital transformation over the next 3 years.<sup>2</sup>

This digital acceleration has impacted organisations in every industry as it transformed the way we work – from telehealth appointments and online teaching, to widespread adoption of cloud and video conferencing software to enable working from home.

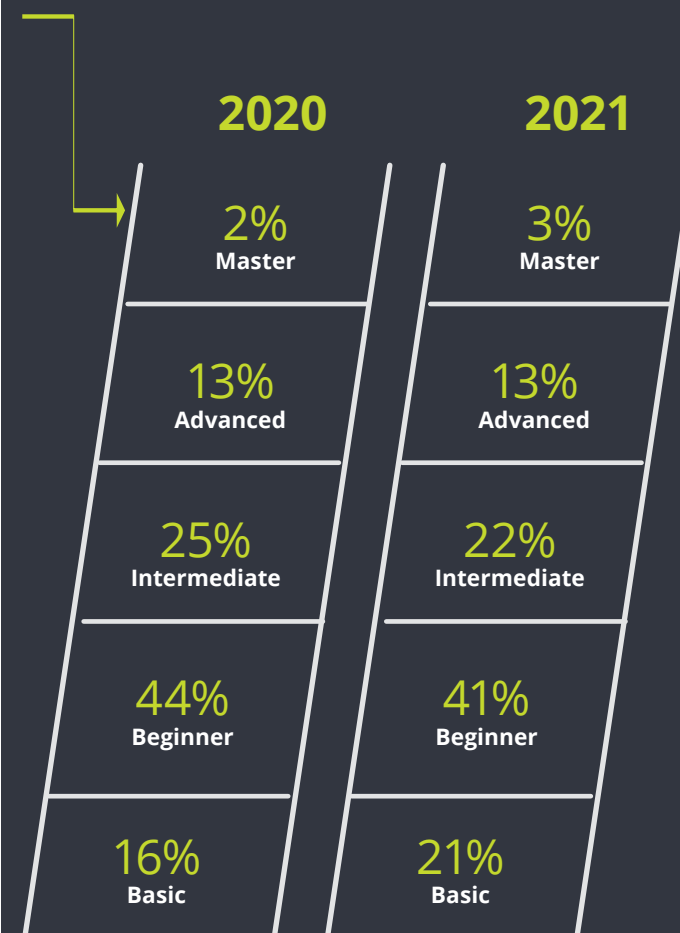
Despite the increasing importance of data for businesses in a COVID-19 environment, **our data maturity model finds that organisations have not improved overall in the past year.** In fact, three in five organisations still have basic or beginner data maturity levels, roughly equivalent to 2020 levels.

It's worth noting that the methodology has changed between 2020-21 with the addition of the machine learning pillar. However, even without machine learning, there are still 61% of organisations in the basic and beginner levels in 2021.

Even more surprising is that **just one-third of organisations** expect to move up the ladder in the next five years.

Nearly all organisations experience at least one benefit from data maturity for their performance and over half experience improvements to their productivity, customer experience and sales and revenue. This suggests that barriers may be preventing organisations from improving their data analytics capabilities.

## The data maturity ladder



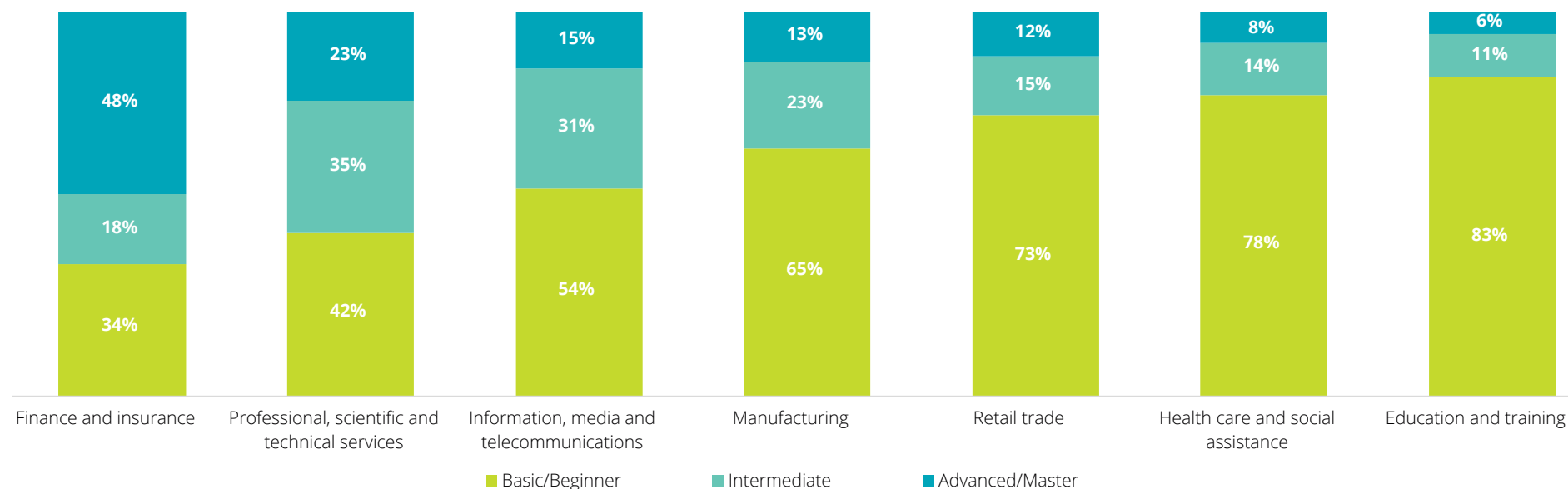
Source: Deloitte Access Economics and Dynata.

1. Australian Government, 'Technology is changing how we do business, Australia's Digital Economy', <https://digitaleconomy.pmc.gov.au/strategy/australia/changing-how-we-do-business>.
2. PWC, 2021. 'Reinventing New Zealand: Key findings for New Zealand from the 24th CEO Survey', <https://www.pwc.co.nz/insights-and-publications/ceo-survey/reinventing-new-zealand/digital-transformation-can-unlock-productivity-gains.html>

# Data maturity varies by industry

Data maturity can vary significantly by industry. **Organisations in finance and insurance lead the way**, with close to half (48%) with advanced or master levels of data maturity, compared to 23% in professional services on average. Meanwhile, just 15% of organisations in information, media and telecommunications have advanced or master levels of data maturity, however, as well as including digital organisations, this industry also includes more traditional media outlets and information services (e.g. print publications and library service) which may bring down the industry average. It should be noted though that the share of advanced and master levels is similar to the levels in organisations more generally (at 16%).

**Organisations in education and healthcare tend to have lower levels of data maturity** on average. While organisations in education and healthcare tended to score highly on certain pillars of the data maturity model (such as data), they scored relatively lower in other pillars (including process and technology) relative to their peers. This suggests that organisations looking to advance to the next step to access the associated benefits will need a high level of maturity across all pillars in the maturity model.



Note: Figures may not add up to 100% due to rounding.  
Source: Deloitte Access Economics and Dynata.

# Overconfidence in data maturity?

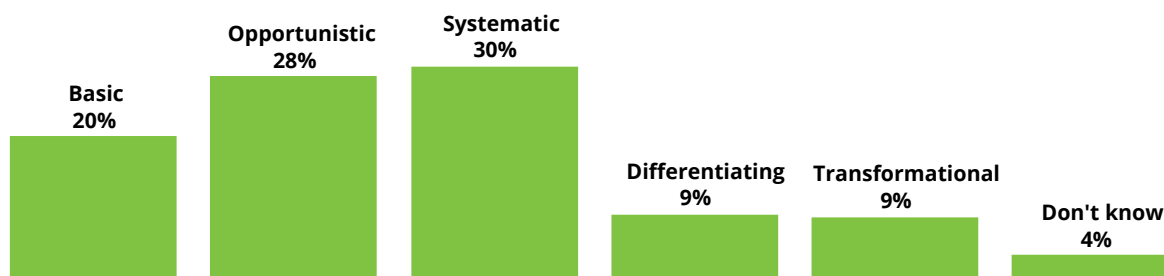
Organisations rated their own data maturity score, based on AWS's maturity index (see Appendix E). The majority of organisations reported to be in their early stages of data maturity (20% in the basic levels and 28% opportunistic).

However, compared to their actual data maturity score, **two out of five (41%) organisations overreported their data maturity levels.** Although the self-assessed maturity framework and our maturity model are based on different measures, this broadly indicates that organisations have the tendency to be overconfident in their data and analytics capabilities. Overconfidence may put organisations at risk of not taking action to move up in the data maturity ladder, or not realise opportunities for improvement.

Cyber security is a key enabler for organisations to have confidence in collecting and using their data.

This is supported in Deloitte's report on The Future of Cyber Survey 2019, which states that the most concerning cyber threat by organisations was data integrity.<sup>1</sup> Organisations reported high levels of cyber security readiness, where **four out of five (81%) ranked their cyber security readiness as 'good' or 'excellent'**.

However, the number of cyber threats continue to increase. Data from the Australia Cyber Security Centre found that self-reported losses due to cybercrime in Australia exceeded \$33 billion in 2020-21. In fact, cyber-attack incidents increased by 13% compared to the 2019-2020.<sup>2</sup> Similarly, cyber crime incidents reported to Cert NZ had a financial loss of \$16.9 million in 2020, an increase from \$16.7 million in 2019 and \$14.1 million in 2018.<sup>3</sup> These findings suggest that organisations need to remain vigilant to cyber-attacks as they continue to rise and threats change.



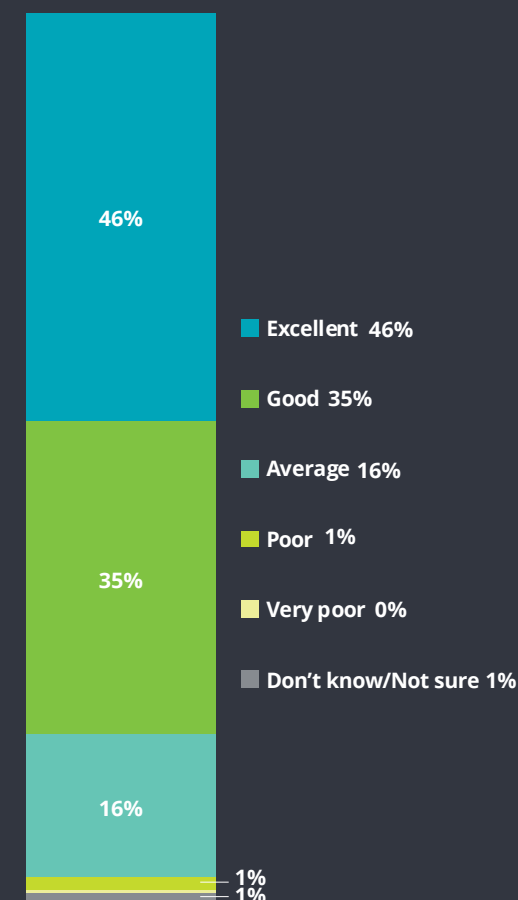
Source: Deloitte Access Economics and Dynata.

1. Deloitte, 2020, 'The future of cyber survey 2019'.

2. Australian Signals Directorate, 2021, 'ACSC Annual Cyber Threat Report, 1 July 2020 to 30 June 2021'.

3. CertNZ, 2020, '2020 Report Summary'.

## Self-reported rating of cyber security readiness:



Source: Deloitte Access Economics and Dynata.

Note: Figures may not add up to 100% due to rounding.



# Case study: Loyalty NZ

Loyalty NZ operates Flybuys, the longest-running and leading loyalty and rewards program in New Zealand, serving 80% of the country's households and working with partners like New World, BNZ, State Insurance (IAG), Z, and Caltex to drive more than 100 million customer contacts a year.

To engage members with relevant partner offers, Loyalty NZ needed to modernise its technology systems and develop a customer engagement platform capable of leveraging the full potential of the company's enormous data set, accumulated over its 25-year history.

Loyalty NZ manages 55 terabytes of customer data for its members, with 2 gigabytes added daily from 400 different data sources, including retail transaction data from its Flybuys online store.

According to Brian Ferris, Loyalty NZ Chief Technology Officer, the company's two legacy on-premises data centres were no longer able to process and analyse data fast and deep enough, prompting a move to migrate all its systems to AWS, including its transaction engine, data platform, and its rewards store, automating the entire data management process on AWS<sup>1</sup>.

**"By using AWS's cloud capabilities, including data analytics and machine learning, we gain the agility and speed we need to use our member data set to deliver relevant and valuable campaigns that help our partners thrive and our members to get value from Flybuys every day."**

Loyalty NZ stores customer data on Amazon Simple Storage Service (Amazon S3) with Amazon Managed Workflows for Apache Airflow (Amazon MWAA), a managed orchestration service for Apache Airflow (<https://airflow.apache.org/>) that makes it easier to set up and operate end-to-end data pipelines in the cloud at scale.<sup>1</sup> This makes Loyalty NZ's online sales channels more reliable, ensuring business continuity during spikes of up to six times the usual demand during sales and promotions like Black Friday and Boxing Day.

Using Amazon Athena, an interactive query service, and AWS Glue, a serverless data integration service, Loyalty NZ ingests, catalogues, and analyses partner data, including member shopping preferences and purchase history to ensure only the most relevant offers reach its members. This automation accelerated the Loyalty NZ's daily data intake from 27 hours to four hours, with some analysis tasks reduced from six hours to minutes.

The saved time enables data scientists to improve their customer targeting and Loyalty NZ to deliver more relevant and valuable offers to members.

1. Apache, Apache Airflow, and Airflow are either registered trademarks or trademarks of the Apache Software Foundation in the United States and/or other countries.

# Benefits of using data and analytics

Organisations understand the value of data and analytics and report a large range benefits of its use. Almost all organisations were currently using data across different areas of the organisation or planning to do so in the future. Nearly all (99%) reported experiencing at least one benefit to their organisation from data and analytics while **over half of organisations reported that data and analytics can improve productivity, customer experience and sales and revenue.**

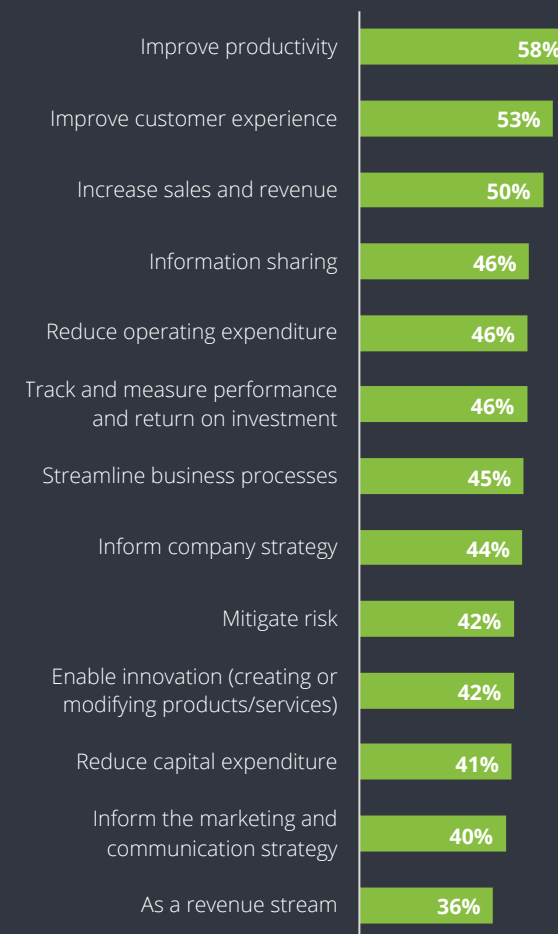
Data and analytics can also play an important role in strategic decision making. Two in five organisations report informing company strategy (44%), and informing marketing and communication strategy (40%) as a key benefit.

Organisations also see data playing an important role as a revenue stream and adding value to their customers. A third (36%) of organisations indicated data and analytics benefits as a revenue stream.

There are some differences in the perceived benefits of data and analytics across Australia and New Zealand. In general, New Zealand organisations report a larger range of benefits from data and analytics.

More than half (57%) of New Zealand organisations indicated that benefits to data and analytics was to **inform company strategy**, compared to two fifths (41%) of Australian organisations. Similarly, a greater proportion of New Zealand organisations see **increase in sales and revenue** as a benefit (59% for New Zealand and 48% for Australian organisations). Half (50%) of New Zealand organisations reported mitigating risk as a key benefit compared to 40% of Australian organisations.

## Proportion of organisations that ranked the following as benefits to data and analytics:



Source: Deloitte Access Economics and Dynata.

# Benefits of using data and analytics

Most organisations understand the benefits of using data and analytics, although it can often be difficult to measure the impact.

To assess the impact of being data-driven, Deloitte Access Economics has modelled the relationship between performance with data maturity scores.

The results show a **one-point increase in data maturity scores is associated with a 6.7% increase in revenue**. For the average Australian organisation in our sample, this is equivalent to approximately \$850,000 (\$AUD) in additional revenue and an increase of approximately \$870,000 (\$NZD) for New Zealand organisations.\*

These results align with the findings of last year's edition of Demystifying data, that improving digital performance can have significant financial dividends.

Seeing the return on investment is important to gain support from senior leaders and the wider organisation.

Further detail on the methodology used for these modelling results are available in Appendix C and Appendix D.

Previous research has shown that data driven organisations are three times more likely to report significant improvements in decision-making, compared to those that rely less on data.<sup>1</sup> Similarly, businesses using customer analytics are 23 times more likely to acquire customers, and nine times as likely to retain them.<sup>2</sup>

## Benefits for larger organisations

For large organisations with 200 or more employees, the average revenue in FY2020 was \$401 million (\$AUD) and \$259 million (\$NZD).<sup>3,4</sup> A one-point increase in data maturity based on our modelling would be worth an additional **\$27 million (\$AUD) and \$17 million (\$NZD) respectively per year**.

On average, for organisations with 100+ employees, a one-point increase in data maturity scores is associated with approximately:

**6.7%** in additional revenue

or

**\$850,000 (\$AUD)**  
in additional revenue  
for surveyed Australian  
organisations



**\$870,000 (\$NZD)**  
in additional revenue  
for surveyed New  
Zealand organisations



\*Average revenue reported by organisations in the survey was \$12.7 million (\$AUD) and \$13.0 million (\$NZD).

1. PwC cited in Stobierski, T. 'The advantages of data-driven decision making' Harvard Business School <https://online.hbs.edu/blog/post/data-driven-decision-making>.
2. McKinsey, 2014. 'Five facts: How customer analytics boosts corporate performance'. <https://www.mckinsey.com/business-functions/marketing-and-sales/our-insights/five-facts-how-customer-analytics-boosts-corporate-performance>.
3. Australian Bureau of Statistics, 2021. 'Australian Industry 2019-20' (Catalogue no 8155.0)
4. Stats NZ, 2021. 'Annual Enterprise Survey: 2020 Financial Year'







# Case study: Intellihub

Real time data analytics is increasingly important in providing timely and quality services to customers in highly regulated energy markets across Australia and New Zealand.

Strict rules require growing quantities of energy data to be delivered by metering providers to electricity retailers within a small window each day. In Australia the challenge is even greater with the introduction of five-minute settlements, which has led to increases of up to six times in the volume of data being managed. Legacy systems are increasingly challenged to effectively and efficiently scale up to meet these increases.

Intellihub provides smart metering services and data analysis for energy retailers and networks across Australia and New Zealand. Vivek Beri, Chief Information Officer at Intellihub, said its customers required metering partners that could scale up and provide secure and reliable data services, delivered on time each day.

**“The collection, crunching, and delivery of data needs to happen within certain timeframe every day. Strict rules set by the regulator, and market expectations and SLAs must be met, and even small delays can have a big impact.”**

Through an AWS Data Lab engagement, Intellihub investigated how it could build a secure, cost-effective, and scalable solution to deal with these growing data requirements and compliance, without requiring the company to continually invest in more infrastructure. The result is a cloud-based data processing platform hosted on AWS called Oncor.

Oncor is a platform that securely manages millions of sets of data flowing each day across the energy market. It collects and processes data such as energy usage from meter data management systems, and securely transports it so it can be settled in the market.

Beri explains that Oncor is not just about managing more data but making the most of the data that was collected. It's new data framework is now helping to provide better fault detection and data insights and compliance to its retail customers.

Importantly, it is translating into a more cost effective and efficient service for its customers.

**“The Build Lab sessions offered under AWS Data Lab typically run for two-to-five days, and the teams are very involved on both sides. We end up with something that is functioning—it might be only a small prototype, but it is a working thing. And then it's a matter of scaling it as our data needs grow”**

Intellihub also needed internal capabilities to develop its new products and applications. It engaged a new team of software engineers equipped with suitable skills and technology and created an internal Centre of Excellence in 2019.

The Oncor platform was the initial focus, but the team continues to focus on developing the next generation of products for Intellihub and its customers.

# Barriers to using data and analytics

Clearly, many organisations see the value of engaging with data for driving performance, improving customer experience, and a wide range of other benefits. So why do so many organisations still only have basic or beginner levels of data maturity?

The main barrier cited by organisations to using data and analytics was **data quality**, consistent with our findings from last year's report. Data quality can cover various aspects of data including accuracy, completeness, organisation, consistency and whether or not the data is up to date.

Poor data quality can impose substantial costs on an organisation. In fact, **previous research estimates that the cost of bad data could be as high as 15% to 25% of revenue.**<sup>1</sup> These costs occur through correcting errors, seeking confirmation in other sources and dealing with mistakes that follow.

Outside of data quality, other barriers nominated by organisations include **lack of funding** (nominated by 46% of organisations) and **tools and technology** (46%).



Source: Deloitte Access Economics and Dynata.

1. Redman, T., 2017. 'Seizing Opportunity in Data Quality', MIT Sloan Management Review, <https://sloanreview.mit.edu/article/seizing-opportunity-in-data-quality/>.

## Delayed decision making

A third of organisations reported the biggest impact of not embracing data was **delays in decision making**.

This can have knock-on effects for performance. Decision delays can cause organisations to lose valuable time across its pursuits, including developing new products and entering new markets.

The cost of delayed decision making depends heavily on the decision in question, and as such can be difficult to quantify. However, a study ran by the Harvard Business Review found that **decision effectiveness and financial results correlated at a 95% confidence level.**<sup>1</sup>

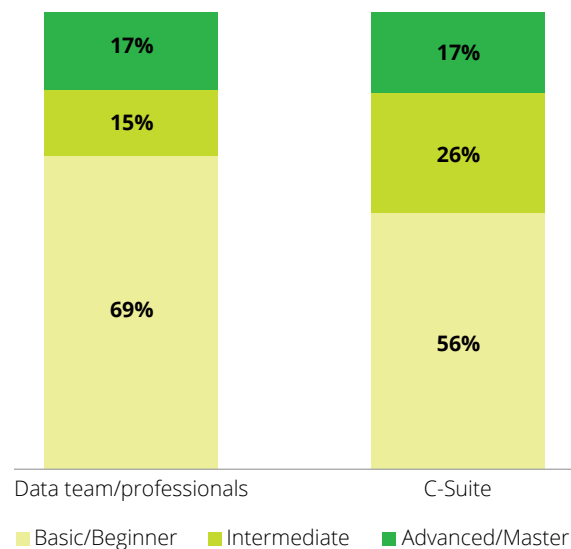


# The need for a roadmap to improving data maturity

A well-developed data strategy is critical to ensure there is a clear vision and direction for an organisation. Organisations with a well-defined, firm-wide strategy for leveraging data are more likely to invest in their data and analytic capabilities. For instance, these organisations **are 20% more likely to invest in data collection or analytic tools, 40% more likely to train existing staff in data and analytics, and 50% more likely to have invested in artificial intelligence or machine learning capabilities**, compared to organisations who do not have firm-wide data strategy.

But while three quarters (77%) of organisations have a firm-wide strategy for leveraging data, **half don't track their progress or see its value**. Buy-in at the leadership level is an important factor to drive a data and analytics culture across the organisation and track progress on achieving their goals. While data teams are able to provide technical solutions and support roll out on the ground, C-suite leaders are needed to develop a clearly defined, firm-wide strategy and drive strategic investment into new opportunities to make the most of analytic capabilities.

Our survey found that who is driving data and analytics in the organisation has impacts on data maturity levels. Almost seven in ten (69%) organisations who were being lead by data teams were at the basic or beginner stages of their data maturity journey, compared to 56% of organisations being led by C-suite executives.



Note: Figures may not add up to 100% due to rounding.

Organisations with a firm-wide strategy, which is clearly defined and involves tracking progress are:

20%

More likely to invest in **data collection or analytics tools or software**

40%

More likely to invest in **training existing staff in data and analytics**

50%

More likely to invest in **artificial intelligence or machine learning capabilities**

compared to organisations where only **some teams** have their own strategy



Source: Deloitte Access Economics and Dynata.

# Looking within for talent

Organisations have two options to develop their analytics capabilities – build or buy talent. That is, they can either ‘build’ the skills they need with the team they have, for example, through on-the-job training. Alternatively, they can ‘buy’ skills through recruitment drives, targeting current skills gaps.

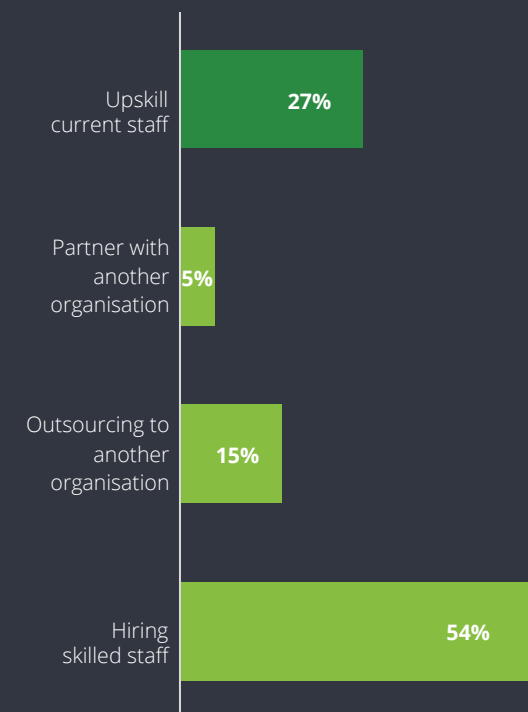
For most organisations in Australia and New Zealand, their preference is the latter. In fact, **54% of organisations plan to hire skilled staff to grow their machine learning and data analytics capabilities.**

This is a problem if there is not enough supply of skilled data professionals. Previous research by Deloitte Access Economics found that the biggest skills gap for Australian workers is data analysis. For those that need to undertake analysis for work, 30% of employees reported their skills were not at the level required, or they were outdated.<sup>1</sup> Furthermore, by 2025, it’s predicted that the average worker will need to learn seven new digital skills.<sup>2</sup>

This means that continuing to upskill by going to market is not going to solve the problem in the long-run. In fact, these skills will likely become more and more expensive to acquire as demand grows and supply bottoms out.

What’s more, our research suggests that **firms that do upskill current employees have higher levels of data maturity on average.** Over a third (36%) of organisations that upskill their staff have advanced or master levels of data maturity on average, compared to just 14% across all surveyed organisations.

Where organisations expect to find skills to grow data analytics, and machine learning capabilities:



Source: Deloitte Access Economics and Dynata.

Note: Rank 1 only.

Figures may not add up to 100% due to rounding.

1. RMIT Online, 2021. 'Ready, set, upskill: Effective training for the jobs of tomorrow' Report prepared with Deloitte Access Economics.

2. AlphaBeta, 2021. 'Unlocking APAC's Digital Potential: Changing digital skill needs and policy approaches.'

# Case study: Officeworks

Officeworks recognised that personalising communication with customers through the use of data analytics is critical to achieving higher levels of engagement. This has involved a mindset shift from being product centric to customer centric.

According to Revital Rosenberg, Head of Data, Analytics and Insights at Officeworks, this data journey began 3 years ago and now informs strategic business decisions made at Officeworks.

Officeworks engaged Deloitte to build a cloud-based product recommendation platform leveraging Amazon SageMaker, a fully managed service that helps data scientists and developers to prepare, build, train, and deploy high-quality machine learning (ML) models quickly by bringing together a broad set of capabilities purpose-built for ML.

**“The ability to understand the shifting needs of our customers and then tailor our offerings builds more trust, particularly during times of uncertainty.”**

The platform leverages Amazon SageMaker to analyse data, such as previous purchasing history, product preferences, and product characteristics, and then provide relevant recommendations to customers when they shop online.

Developing better capabilities to identify customers and using data-generated insights has produced tangible benefits for Officeworks. Personalizing their customer journey has resulted in a 70% improvement in email open rates, a 20% increase in online conversion rates, and a 20% increase revenue in the last 12 months.



To drive this personalization journey, Officeworks focused on building the right skills and capabilities in both its technical and nontechnical teams. The organization also hired new talent and provided existing employees opportunities to develop their data capabilities.

**“Our goal is to help technical teams hone their skills, while building cloud capabilities across the business to deliver a better experience for our customers,” said Rosenberg. “Over the last 12 months, we ran a comprehensive formal and informal training program, which included lunch-and-learn sessions and hands-on workshops with AWS.”**

As flexible working options increase, personalised online customer engagement will continue to be a focus for Officeworks.

**“We want to continue being customer focused and quickly responding to customer needs, even as their lives have changed in the past 18 months.”**

# Next steps

Improving data and analytic capabilities for many organisations may not require significant changes to their ways of working or extensive funding. Based on our report findings, the list below identifies some key steps that organisations can take to reach their data and analytic goals.



**Engage leadership:** senior leaders need to drive data and analytics to ensure organisations are able to reach their goals. This is critical to achieving a strategically developed organisational-wide data strategy.



**Cloud:** investing in cloud solutions will allow organisations to accelerate their data maturity levels and achieve data driven insights.



**Skills development:** organisations with a well-defined strategy and higher levels of data maturity are looking to upskill their current staff, despite the majority who are looking to hire or outsource their data analytic skills to grow their capabilities.



**Understand current maturity level:** developing a realistic understanding of current capabilities within an organisation and identifying opportunities for improvement, will allow organisations to make informed decision making.



**Investment in foundational data quality:** investing in high quality data is critical for organisations to be data-driven. It will also unlock opportunities to utilise emerging technologies such as machine learning and artificial intelligence.

## LEADERSHIP

Bring in senior leaders to champion growth in data and analytics



## SKILLS

Invest in upskilling current staff as emerging technologies are implemented



## DATA

Identify opportunities to improve data management to ensure high quality data



## CLOUD

Invest in cloud solutions to accelerate growth and achieve data-driven insights



## MATURITY LEVEL

Understand current capabilities and opportunities for growth



# Appendices

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# Appendix A: This report

Deloitte Access economics was commissioned by Amazon Web Services to understand the data maturity levels of medium and large organisations across Australia and New Zealand. The report highlights the benefits and barriers to these organisations from being data driven.

This report builds on the *Demystifying Data* report released in 2020. The analysis draws on an expanded survey of Australian and New Zealand organisations, as well as three new case studies by TPG Telecom, Loyalty NZ, Officeworks and Intellihub to provide real life examples of how organisations are leveraging data and machine learning.

## The survey

This report is informed by a survey fielded by Dynata in September 2021.

This year, a new sample of organisations were asked to participate in the study. Survey respondents were involved in marketing or finance decision making in their organisation. A total of 500 organisations participated in the survey, including 100 from New Zealand and 400 from Australia.

The size of organisations surveyed included both with 100-499 employees (54% of surveyed organisations) and those with 500+ employees (46%).

Figures contained in the report relate to surveyed organisations only, unless otherwise specified. As such, results will only be representative of organisations with 100 or more employees, rather than smaller businesses.



# Appendix B: Australia and New Zealand comparison

	AU (n=400)	NZ (n=100)
<b>Deloitte Calculations: Data maturity level</b>		
Basic	19%	28%
Beginner	39%	48%
Intermediate	26%	8%
Advanced	13%	15%
Master	4%	1%
<b>Q24 How frequently do you get meaningful insights from data?</b>		
At least daily	21%	23%
At least weekly	46%	38%
At least monthly	29%	25%
At least every year	3%	10%
Less frequently	1%	4%
Never	1%	0%
Don't know/Not sure	1%	0%
<b>Q33 Please rank where your organisation would expect to find the skills needed to use machine learning and grow its data analytics capabilities?</b>		
Upskill current staff	27%	25%
Outsourcing to another organisation	15%	13%
Partner with another organisation	5%	4%
Hiring skilled staff	53%	57%

	AU (n=400)	NZ (n=100)
<b>Q29 Please rank the top three machine learning use cases that would be more beneficial to your business, starting with 1 = 'most beneficial'.</b>		
Customer turnover prediction	25%	28%
Employee turnover prediction	21%	25%
Forecasting demand (products or workforce)	31%	28%
People and object detection (safety and monitoring)	22%	18%
Intelligent document processing	32%	26%
Predictive maintenance	22%	27%
Quality Inspection	29%	26%
Financial services	29%	42%
Customer personalisation	25%	23%
Customer sentiment analysis	25%	22%
Cyber security and fraud detection	40%	32%

Any comparisons between Australia and New Zealand results should be made with caution because the sample size is lower in New Zealand relative to Australia and the mix of respondents by organisation size and industry is different.

Note: Figures may not add up to 100% due to rounding.

## Appendix B: Australia and New Zealand comparison

	AU (n=400)	NZ (n=100)
<b>Q17 Has your organisation invested in the following in the past financial year (2020-21)? Training existing staff in data and analytics</b>		
Yes, the organisation has invested and there is a set budget for this type of expense	49%	38%
Yes, the organisation has invested but there is no specific budget for this type of expense	38%	42%
No, the organisation has not invested	11%	16%
Don't know/Not sure	2%	4%
<b>Q17 Has your organisation invested in the following in the past financial year (2020-21)? Data collection or analytics tools or software</b>		
Yes, the organisation has invested and there is a set budget for this type of expense	51%	43%
Yes, the organisation has invested but there is no specific budget for this type of expense	39%	38%
No, the organisation has not invested	8%	13%
Don't know/Not sure	3%	6%

	AU (n=400)	NZ (n=100)
<b>Q17 Has your organisation invested in the following in the past financial year (2020-21)? Artificial intelligence or machine learning capabilities</b>		
Yes, the organisation has invested and there is a set budget for this type of expense	43%	32%
Yes, the organisation has invested but there is no specific budget for this type of expense	34%	37%
No, the organisation has not invested	19%	19%
Don't know/Not sure	5%	12%

Note: Figures may not add up to 100% due to rounding.

## Appendix B: Australia and New Zealand comparison

	AU (n=400)	NZ (n=100)
<b>Q16 How is your organisation currently using data or planning to use data?</b>		
<b>Currently using this</b>		
Operations: Identifying business process improvements	62%	59%
Customer: Understanding and improving customer experience	60%	63%
Strategy: Guiding company strategy	56%	54%
Measurement of financial performance	62%	54%
Marketing: Informing marketing and communication strategies	59%	57%
Innovation: Creating or modifying products and services	54%	53%
Sales: Monetise data (e.g. selling data-based products to generate revenue)	58%	55%
Workforce Planning, Optimisation and Retention	58%	60%
Health and Safety: Analysis of incidence, improvement of workplace design	58%	53%
Environmental Impact: Tracking carbon footprint and emissions	43%	45%
Risk management and fraud detection	56%	52%
Other	12%	9%

	AU (n=400)	NZ (n=100)
<b>Q37 In general, what do you think are the most significant benefits from using data and analytics in an organisation?</b>		
Streamline business processes (operational efficiency, automation, supply chain optimisation)	43%	51%
Improve customer experience	52%	57%
Inform company strategy	41%	57%
Track and measure performance and return on investment	44%	53%
Inform the marketing and communication strategy	40%	40%
Enable innovation (creating or modifying products/ services)	40%	49%
As a revenue stream	35%	43%
Increase sales and revenue	48%	59%
Improve productivity	59%	57%
Mitigate risk	40%	51%
Reduce operating expenditure	46%	47%
Reduce capital expenditure	40%	47%
Information sharing	46%	47%
Data and analytics is not beneficial	1%	1%

## Appendix B: Australia and New Zealand comparison

	AU (n=400)	NZ (n=100)
<b>Q34 Which of these prevent your organisation from achieving data driven insights?</b>		
Data quality	49%	58%
Tools and technology	46%	50%
Access to skilled resources	41%	56%
Lack of funding	44%	55%
Short funding cycles	35%	39%
Workplace culture and politics	42%	57%
Data access	42%	46%
C-suite sponsorship/leadership	33%	42%
Fragmented ownership	32%	40%
Data security and risk	43%	51%
Strategy	42%	42%
Government regulation and legislation	37%	45%
Access to skilled partners in the ecosystem	34%	41%
Other priorities	19%	26%

# Appendix B: Data maturity

## Methodology

To calculate data maturity, the following steps were undertaken.

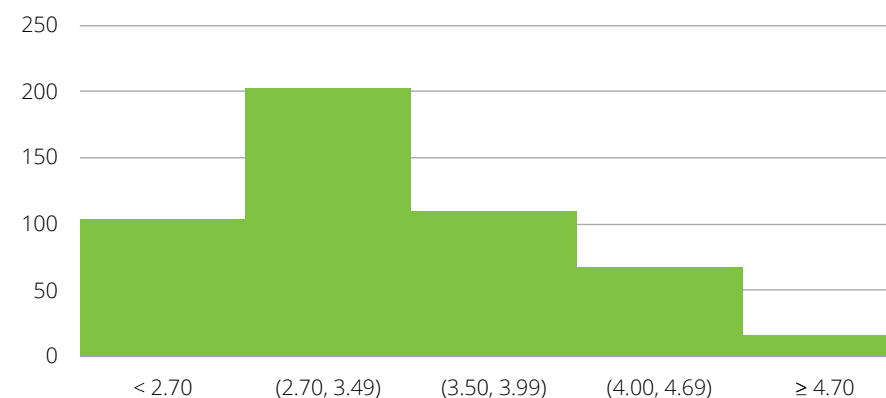
1. Survey questions were divided among the five data maturity pillars: data, strategy, people, technology and process. The number of questions in each pillar varied.
2. Each response within each question was allocated a score, based on the within-question level of data maturity. The maximum possible score in each question varied.
3. Responses were scored then summed together within each pillar based on the scoring adopted in step 2, then normalised to one.
4. The scores across the pillars were then summed to yield a total score ranging from zero to six. In the sample, the average score was 3.3. The lowest score was 0.7 and the highest 5.6.
5. Respondents were then grouped into five data maturity categories based on the cut-off scores shown in the table to the right.

The 'basic' category was defined as scores less than 2.7. This would be the score an organisation would receive if their data was not exploited, managed in silos, analysis was ad hoc, largely transactional and have not implemented machine learning. Likewise, organisations in the 'master' category were defined as scores greater than 4.7. This would be the score an organisation would receive if data and analytics was central to strategy, with use of advanced tools, strong investment, a well developed data culture and machine learning embedded firm wide.

*Data maturity level cut-offs, based on respondents' data score*

Data maturity level	Lower bound	Upper bound
Basic	0	2.69
Beginner	2.70	3.49
Intermediate	3.50	3.99
Advanced	4.00	4.69
Master	4.70	6

*Distribution of responses based on cut-off scores*



Source: Deloitte Access Economics and Dynata.

# Appendix C: Benefits modelling

## Methodology

Data maturity score ranges from zero to six. In the sample, the average score is 3.3, the lowest score is 0.7 and the highest score is 5.6.

A standard linear regression model was used to determine the impact of a one-point increase in respondents' data scores on growth in revenue and profit. Results controlled for industry, country, organisation type (for example, unlisted company or public sector) and number of employees. Including number of employees ensures that the results account for the size of organisation.

$$\text{Growth in revenue (\%)} = \beta_0 + \beta_1 \text{data\_score} + \beta_2 \text{industry} + \beta_3 \text{country} + \beta_4 \text{organisation\_type} + \beta_5 \text{no\_employees} + \varepsilon$$

$$\text{Growth in profit (\%)} = \beta_0 + \beta_1 \text{data\_score} + \beta_2 \text{industry} + \beta_3 \text{country} + \beta_4 \text{organisation\_type} + \beta_5 \text{no\_employees} + \varepsilon$$

The results are presented on the next page. Some caveats apply, as detailed below:

- There is likely a degree of reverse causality, with higher growth in revenue or profit allowing firms to achieve higher levels of data maturity.
- There is evidence of revenue and profit increasing along the data maturity 'steps' (i.e. from basic to beginner, intermediate, advanced and mastery), however these results are based on data scores in bins rather than using the full amount of variation available in the data score.
- There may be omitted variable bias. For example, data maturity would be correlated with digital maturity, which includes data maturity as well as other elements of digital engagement. Other work by Deloitte Access Economics indicates that digital maturity is positively associated with firm financial performance.<sup>1</sup>

Sources:

1. Deloitte Access Economics, 2019. 'Benefits of small business digital engagement'.

# Appendix D: Results

## Results

A one-point increase in the data score is associated with a 6.7% increase in revenue between FY20 and FY21. This is statistically significant at the 5% level.

This is equivalent to an **\$852,689 (\$AUD) revenue increase for Australian organisations** and **\$873,561 (\$NZD) for New Zealand organisations**. The analysis accounts for the effects of organisation size, industry, country of operation, and organisation type.

There was no statistically significant relationship between data maturity and percentage profit growth. However, it was found that data maturity has a statistically significant affect on profit growth in absolute terms.

This combination of results may suggest that data maturity is an important determinant of revenue for organisations of all sizes and of profit for larger organisations in particular.

Dependent variable	Revenue	Profit
Intercept	-0.592** (0.240)	-0.186 (0.184)
Data score	0.067** (0.032)	0.018 (0.067)
Mining	0.088	-0.286**
Manufacturing	0.373	0.380
Electricity, gas and water supply	0.788**	1.907
Construction	0.187	-0.177
Wholesale trade	0.347	0.061
Retail trade	0.394	0.103
Accommodation, cafes and restaurants	0.178	-0.138
Transport, postal and warehousing	0.296	0.025
Information, media and telecommunications	0.483**	0.183
Finance and insurance	0.359	0.086
Rental, hiring and real estate services	1.771*	1.498
Professional, scientific and technical services	0.400	0.227
Administrative and support services	0.544**	0.118
Public administration and safety	0.426*	0.033
Education and training	0.540	0.276
Health care and social assistance	0.483***	0.173
Arts and recreation services	0.376	-0.339
New Zealand	0.185*	0.266*
Unlisted company	0.161	0.199
Partnership	0.308*	0.170
Trust	-0.140	-0.185
Public sector	-0.037	0.030
Not-for-profit	-0.126	0.046
# of employees	0.000	-0.000

Source: Deloitte Access Economics

Note: Dummy base categories: Agriculture, forestry, fishing and hunting (industry), Listed company (organisation type), Australia (country). Note: \*\*\* Significant at 1% level \*\* Significant at 5% level \* Significant at 10% level. Standard errors are shown in parentheses for intercept and the independent variable of interest.

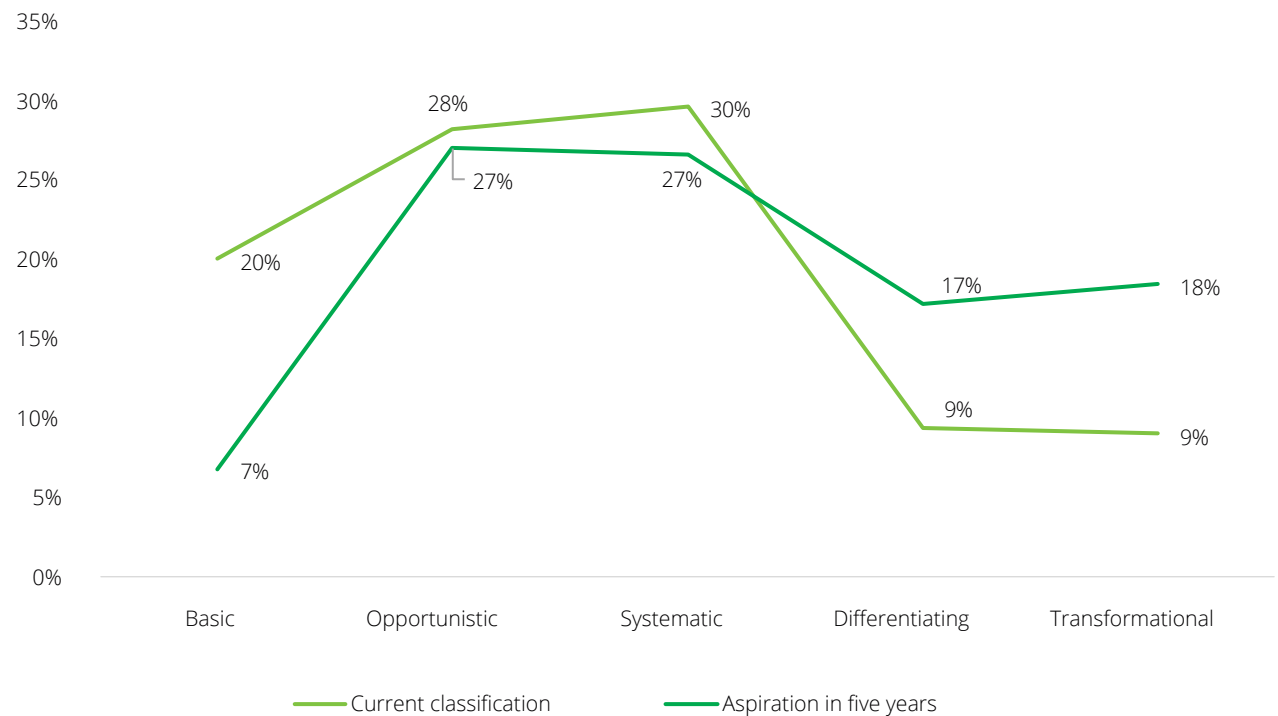
# Appendix E: Self-assessed data maturity

Respondents were asked to assess their data maturity based on the categories shown to the left.

It is noted these categories are based on Amazon Web Services' data maturity scale and are therefore not directly comparable to the data maturity scoring presented in this report.

## Categories

- **Basic:** Data is not exploited, managed in silos, analysis is ad hoc, largely transactional in nature
- **Opportunistic:** IT attempts to formalise information requirements, hampered by culture, strategy is not business relevant, data quality and insight efforts in silos
- **Systematic:** Strategy and vision forming, agile emerging, data sources starting to integrate, business championing data and analytics initiatives
- **Differentiating:** Business led, CDO function emerging, linked to innovation and performance, data driven ROI
- **Transformational:** Data and analytics is central to business strategy, data driven investments, strategy is continually evolved, CDO is a strategic function



Source: Deloitte Access Economics and Dynata, n=500

Notes: When thinking about your organisation's data maturity, at what stage would you classify your organisation?

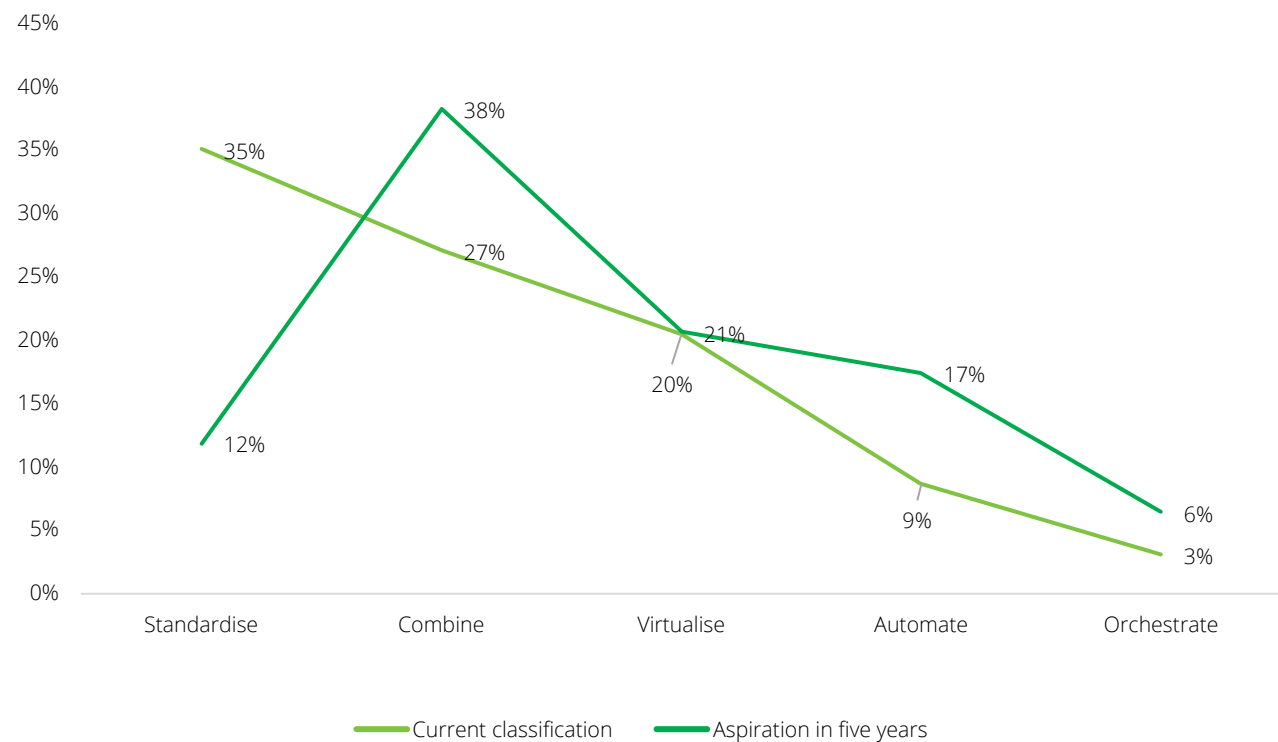
'Don't know/Not sure' not shown



# Appendix E: Self-assessed cloud maturity

## Categories

- **Standardise:** Focused on lower cost, consistent use of technology, enhanced performance and reduced complexity
- **Combine:** Increased efficiency, improved management, and improved governance
- **Virtualise:** Moving to centralised control, initial use of cloud services, improved resource management and utilisation
- **Automate:** Self-provisioning, automated governance, adaptable security, improved user experience, service oriented
- **Orchestrate:** Dynamically aligned to the business, self-adapting, enhanced business agility



Source: Deloitte Access Economics and Dynata, n=500

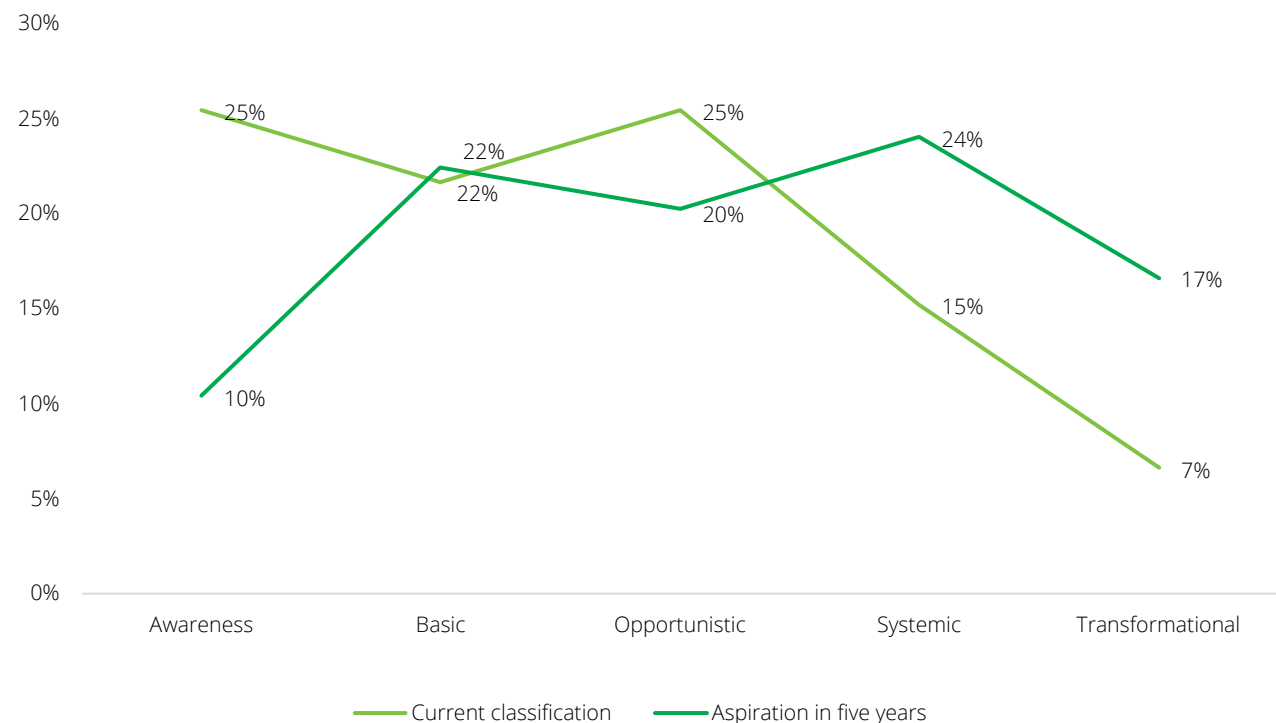
Notes: When thinking about your organisation's cloud maturity, at what stage would you classify your organisation?

'Don't know/Not sure' not shown

# Appendix E: Self-assessed machine learning maturity

## Categories

- **Awareness:** Machine learning is known but has not been implemented.
- **Basic:** Machine learning is used for individual or experimental use cases or by a single business department to address discrete issues
- **Opportunistic:** Strategy and vision forming across the business and business championing machine learning initiatives to drive initiatives in some core business processes
- **Systemic:** Business led machine learning adoption across the business for driving strategic value through increased efficiency and scale, supported through introduction of Machine Learning operations (MLOps) capabilities.
- **Transformational:** Machine Learning is central to business strategy, driving investments, strategic value and developing new AI powered products and services, continuously enhanced and maintained with robust MLOps capabilities



Source: Deloitte Access Economics and Dynata, n=500

Notes: When thinking about your organisation's machine learning maturity, at what stage would you classify your organisation?

'Don't know/Not sure' not shown

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