SAMSUNG

Whitepaper

5G for Business in Australia

The Early Years – Intent, Adoption, Use Cases

Introduction & Executive Summary

This is not a 5G report about Connected Cars and Autonomous Vehicles.

Nor does it cover Smart Cities.

This report provides insight into how 5G services will bring benefit to Australian businesses in the short and medium term.

Without doubt 5G mobile technology and solutions will radically alter the way we work and play.
What is also without doubt are the high levels of industry marketing as telecom providers progress 5G network deployments.

At Mobile World 2019 in Barcelona earlier this year the GSMA observed that whilst the US is the early leader in 5G network deployments, Asian countries, especially Australia, China and South Korea are expected to emerge as market leaders by the end of 2019.

How do businesses find the balance between the realities of the emerging market for business 5G services and enthusiastic industry excitement? Our answer was to ask businesses what they think.

What did we find?

Awareness of 5G is high

85%

of all respondents know 5G is coming for their business and this in turn is creating a significant thirst for knowledge about solutions, availability, devices, networks and functionality.

1 in 4

organisations intend to adopt business 5G services in the coming 18 months

with another 55% planning to adopt specific services in a 19-36 month timeframe.

Business cite several concerns regarding the adoption of 5G:

Pricing

Device Availability

Network Coverage

yet these will dissipate over time. Once these three are addressed, businesses want to understand why 5G is superior to 4G, what use cases exist and are specifically available for their sector. In other words, issues that are common to almost every new technology deployment.

There's a two-wave 5G deployment and adoption curve.

The first wave is predominantly 5G fixed wireless access or 'FWA', mostly in fixed site/campus style environments. The second will be a longer, more sustained wave that moves in synch with the rolling deployment of 5G mobile network coverage across Australia.

Speed or not speed? That is the question.

The benefit most identified with 5G services is the significantly higher bandwidth available to deliver services. However our research also shows that there is also relatively high awareness of additional solutions built around other 5G network capabilities including edge computing, low latency, multi-device connectivity and prioritisation of different levels of service performance over the same network connection.

Use cases are (rightfully) tightly linked to business outcomes.

Whilst that is a very obvious statement, we have provided various examples of where we have already seen activity and planning around 5G solutions by Australian organisations.

Lastly, 5G is a powerful enabler of other technology solutions including reality tech, AI and intelligent workplaces.

In short, 5G will be both the enabler of massive changes to our current way of working as well as a creator of the fuel (data) that will power new services, solutions, AI and big data analysis.

However, we're ahead of ourselves. Let's delve into the report and discuss the findings. We have split the report into 5 sections: 5G awareness, adoption issues, adoption plans and use cases. To finish we have provided a checklist that provides steps to support the creation of your company's 5G strategy.

5G Awareness & Understanding

Awareness is high, understanding of what 5G brings is fair and concerns are evidenced on networks, pricing and handsets.

Think 5G is simply a continuation of the evolution businesses have witnessed 'across the Gs' (2 to 3 to 4)? Long term, you may wish to rethink that view.

Recent launch activity (networks, phones and FWA hubs) has undoubtedly contributed to a very high level of awareness that 5G services for business are becoming available in the Australian market: When asked 'Are you aware 5G network solutions for your business will become available in 2019?' 85% of those surveyed answered 'yes'. Digging a little deeper into respondents' views of 5G also revealed a couple of interesting snippets:

Businesses see need for 5G

60%
of business

felt there was a need for 5G services to meet business needs above current 4G connectivity. It was also acknowledged that not everything needs to run over 5G. However for specific use cases including low-latency, high computational needs, multi-device connectivity, etc, then 5G was seen as a superior option.

5G is for more than just consumers

58%
of business

recognised that 5G is more than just consumer connectivity. As one CXO observed "...our eyes work with 15 millisecond latency – we can't watch a video faster than we already watch it. For us, 5G is about how we can optimise and drive our business. Not watch stuff more quickly."

Only 3% of organisations felt that 5G was 'just hype' and our respondents also indicated a good level of awareness regarding the key aspects of 5G technology, citing the top 5 key attributes as:

Missing from this top 5 list is the recognition that end to end 5G networks allow telecom service providers to 'slice' their network and create different classes of service for different workloads. In turn business users can also build different levels of service quality into their own customer solutions and products. Whilst respondents recognised this as a benefit it was ranked relatively lowly at 8th place overall.

Significantly higher connectivity speeds compared to 4G

Edge computing capabilities (by way of example consider an augmented or virtual reality training programme that requires significant compute, rendering and performance capabilities that are difficult to cost effectively incorporate into a lightweight, battery friendly device. Edge computing enables the intensive activity to be undertaken in the cloud and delivered in lightweight form to the device over a low latency, high speed connection, ie. a 5G network).

Ability to connect multiple devices (such as IoT arrays)

Create localised 'site' networks through FWA

Lower network latency which supports greater 'real-time' needs

Same same but different:

New tech, old issues

Broadly, the concerns and issues raised by our research are no different to those that typically arise when any new technology is coming to market, namely: what, why, how much, when, etc.

What follows are the most significant top of mind issues that business raised with us and are seeking clarification on to help develop their own 5G strategies and initiatives. Our respondents told us that they look to the following top 5 sources for information and guidance:

1   Telecom service providers, especially Telstra and Optus

2   Infrastructure vendors such as Ericsson and Samsung

3   Industry analyst firms

4   Consulting and advisory groups

5   Device manufacturers

"No question. We need to see what Telstra and Optus are doing. They sit in the middle of it all. The networks, pricing, phones. All of it. If we don't get clarity from them then we're not going to move (to 5G) in a hurry."

CDO Australian Retail & Hospitality Group

Build it and they will come...as long as the prices are reasonable...and there's devices, don't forget the devices...

The top 3 issues in this category identified by respondents are:

1   **5G pricing**: many organisations cited a concern that telcos will impose a 5G premium to help recoup significant network build costs. Many plans are still in development, yet early indicators from consumer plans suggest there will be incremental increases faced by some business users.

Interviews with various business executives suggested a degree of resignation to mooted price increases, in turn suggesting that incremental rises may have only slight negative impact on 5G adoption in the business market.

2 **5G device availability**: By end June 2019 three device manufacturers including Samsung had smartphones available for the Australian market. Other vendors are also expected to bring their own 5G-capable smartphones to market in the next 12 months. We expect that the coming year will see all major manufacturers bring multiple 5G-capable smartphones and other devices (such as tablets and 5G-SIM equipped laptops) to market across various price ranges, accelerating device adoption throughout 2020. Both Telstra and Optus are also offering 5G 'hubs' to support their FWA 5G solutions deployment.

3 **5G network coverage.** Unsurprisingly, network coverage is a major consideration for many businesses. Both Telstra and Optus are targeting metro and regional coverage with a slightly different 'unit of progress' for early deployment plans. Optus is on track to have 1,200 5G sites live by March 2020. Telstra by comparison already has 200 live sites in 10 Australian cities and plans to reach at least 35 cities by June 2020.

As network coverage expands and device availability grows these issues outlined in the three points will, mostly, dissipate over time.

Common questions around 5G adoption

Stop me if you've heard these before…

The following issues could be applied to almost any new technology that is considered by business for adoption, not just 5G. Readers will be familiar with the top concerns:

1 **What's the business case and why do I need 5G instead of 4G?**

It should be acknowledged that for current mobile services, 4G is a very capable technology platform and this is evidenced in the data: 1 in 2 organisations stated that they required additional information to determine why 5G is a better solution than current 4G.

Discussions with CXOs suggested that 'basic' mobility functions (e.g content streaming, current collaboration tools, access to cloud-based information sources) were supported by 4G services. As organisations adopt greater 'innovation' technologies (e.g reality tech

headsets, AI-supported decision making tools, real-time data or biometric services, etc) then increased network demands (latency, security, speed, compute, etc), will essentially mandate an uptake of 5G where available.

> **"I get in most cases for us 4G is perfectly fine right now. What compels me to look at 5G is the potential for truly dynamic services that use all those aspects (ultra-low latency, edge computing, etc) in ways we haven't quite fully envisaged but I know 4G won't be enough."**
>
> CXO Australian Utilities Provider

2 **What proof of concepts are already around that I can consider?**

Hypothetical examples of 5G are great and they do command interest from the business sector but there is no substitute for clear business cases: 4 in 10 are seeking clear business cases and proof of concept examples to help them develop their 5G strategies.

> **"It (adopting 5G) is a tricky one for us. We see several immediate uses for us but we need mobile coverage. Until that happens we're thinking more about what we could do with some sort of specific 5G fixed solution for one of our sites."**
>
> CTO Australian Manufacturing Group

3 **What solutions are available specifically for my industry?**

The last of the top issues focuses on what exactly will 5G bring for me and my business? 1 in 3 organisations cited a need to see 5G solutions that are specifically tailored to their industry sector and not generic examples. While there are examples emerging, these are initially within the expected high growth/fast adoption sectors.

5G Adoption Plans

Adoption will follow two complementary and intertwined 5G paths – FWA and cellular (our current mobile phone networks). FWA adoption will gain early traction due to 'easier' deployment, whereas cellular adoption is obviously more dependent on network coverage.

Our research indicates that overall adoption will see 24% of businesses adopt 5G services in the coming 18 months, with early mover verticals including mining, manufacturing, logistics, health and utilities.

Of this first 18 months, our expectation is that in the period between now and end of 2019, the majority of the adopted 5G services will be FWA.

As cellular network coverage continues to expand we will start to see adoption in this space gather pace, most rapidly from early 2020 onwards.

Between one and a half and three years from now we estimate that another 55% of organisations will have adopted 5G bringing the total to 79% of the business market in 3 years (assuming network deployment plans are met).

We believe over this cumulative 3 year period we will see different adoption drivers that we have determined as:

- Aggressive – utilising 5G services as rapidly as possible to achieve competitive advantage (12% of all respondents);

- Opportunistic – quick adoption based on suitability of business case (12%);

- Considered – waiting for the hype to settle and business cases to emerge before even considering 5G (37%);

- Gradual – adoption in line with network deployments (18%);

- Ubiquitous – no specific strategy or action taken until 5G is widely available across metro and regional areas (16%); and

- Deliberation – uncertain regarding 5G benefits and needing to determine the actual benefits and availability of 5G (4%)
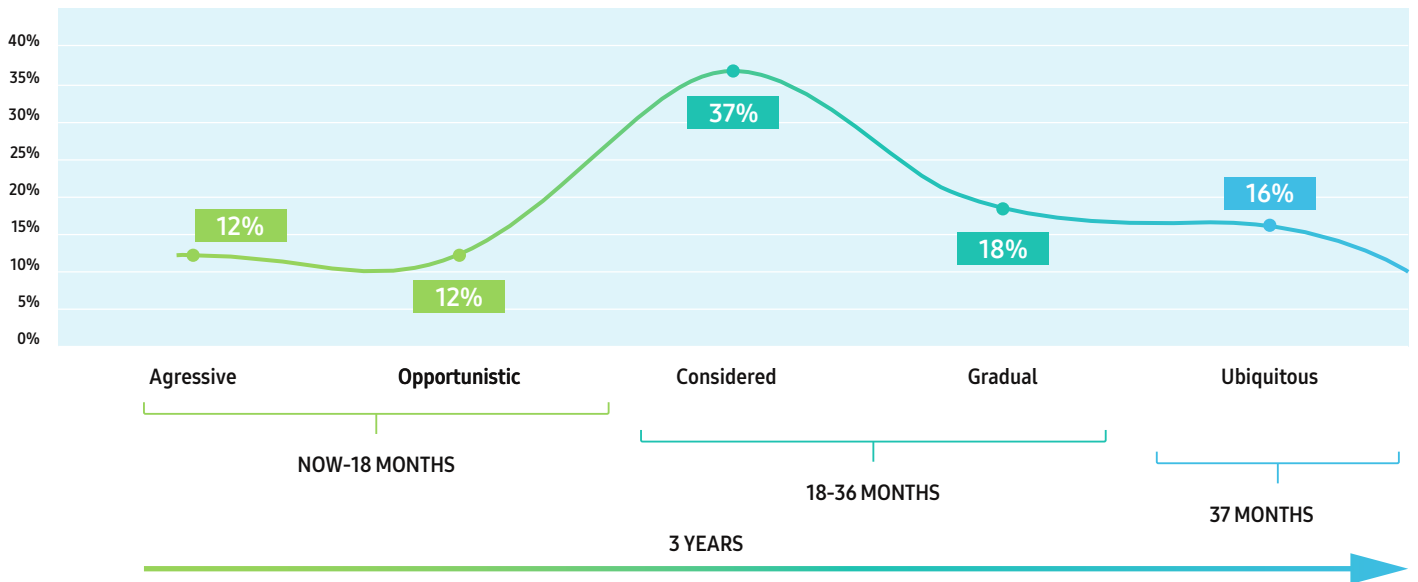
Source: Samsung & TRA 5G research report "5G for Business in Australia: The Early Years – Intent, Adoption, Use Cases" August 2019

Different 5G network capabilities will also have a direct impact on both adoption and use cases. Early solutions will focus on the more bandwidth-centric approaches before developing and integrating higher value added solutions that incorporate other 5G network attributes such as slicing and edge computing.

Our research highlighted that the major network attributes business see supporting their initiatives are:

- Speed/bandwidth
- Multi-device/IoT focused solutions
- Ultra-low latency
- Edge-compute capabilities, and
- Network slicing or classes of service

Based on these attributes, adoption intention and publicly available telco service provider network plans we have modelled what we believe to be a representative timeline of adoption for 5G business services.

5G Business Market Maturity - Early Vertical Adoptors & Solutions Availability
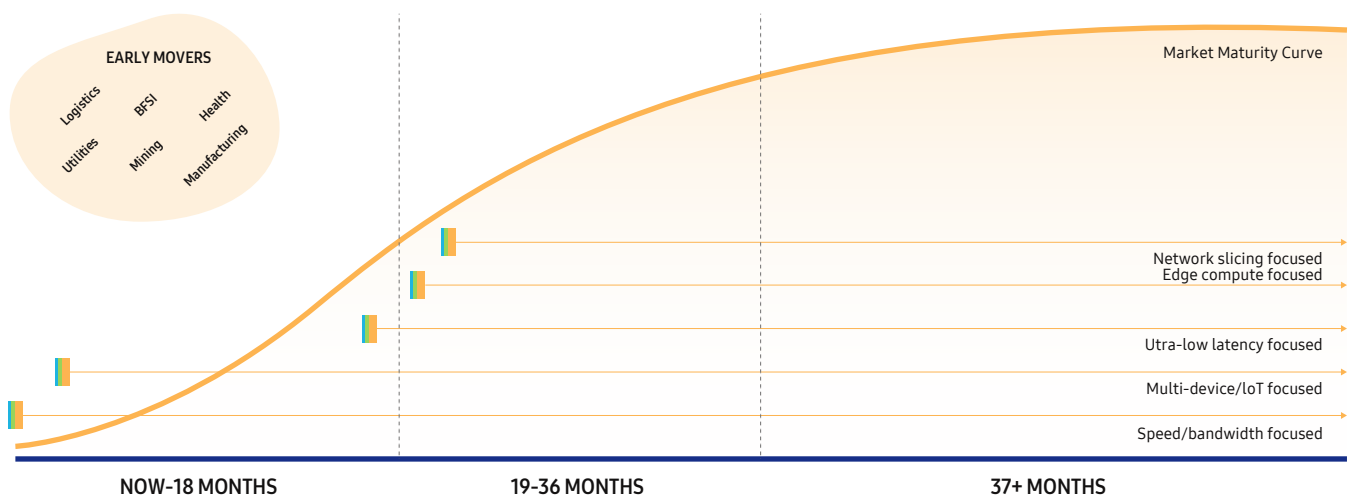
Source: Samsung & TRA 5G research report "5G for Business in Australia: The Early Years – Intent, Adoption, Use Cases" August 2019

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5G Use Cases

Before we delve into actual examples our respondents told us that they see 5G supporting the following business outcomes for their current and future operations:

- Increased Customer care, service and engagement

- Faster and more effective information access to support decision making, training, analysis, etc

- Enabling the adoption of Intelligent office/future workstyles

- Data management including creation, securing, ingestion, exfiltration, analysis and

- Supporting cloud services consumption and removing the 'bandwidth' tax many organisations experience in their day to day operations.

"In transport the low latency aspects alone mean it's ground breaking. We're actively trying to activate anything around IoT and analytics and then bring that through to 5G. The concept of IoT onto buses for example to monitor potholes and provide real time information is compelling. The ability to predict and anticipate what will happen on our transport network is critical to our customers and our service performance."

Executive Director, State Transport provider

We asked respondents if they believed there was a compelling use case for 5G in their business environment – 60% said 'yes'. What did our research specifically reveal?

5G Examples

We heard multiple use cases that organisations are currently developing to support these and other business goals including:

Improved customer service and engagement in the consumer banking sector: A big four Australian bank trialling 5G branch connectivity linked to smartphones and Samsung's DeX solution to ensure seamless connectivity and information access for its mobile customer service and banking employees.

Intelligent workstyles, costs reductions and efficiencies in the manufacturing sector: A production site connecting multiple device sensors combined with AI analytics to a smart device dashboard app that provides real-time information on manufacturing performance and quality to reduce defects and materials costs.

Intelligent workstyles, employee health and safety in the mining and exploration sector: The use of CCTV video analytics linked to small site 5G networks combined with AI biometric analysis to identify appropriately authorised employees in high risk areas and determine if they're wearing appropriate safety clothing and equipment. If not, an alert is sent to their smartphone to vacate the area.

Cost reduction/customer engagement in field services: An Australian reality technology hardware company equipping headsets with 5G connectivity to support augmented reality solutions for service personnel to reduce service time and provide real-time access to 'how to' videos/tutorials when undertaking more complex servicing requirements.

Data management, information access, health and safety/asset protection for government and emergency services: An Australian AI company that has created 5G connected drones to undertake aerial surveillance of areas under bush fire threat equipped with AI to identify issues and assets on the ground in real-time to assist emergency service and fire crews.

Data management, cost reduction, operational efficiencies in the utilities sector: The potential of using 5G to upload data to 3D modelling engines in real-time rather than 'batch-process' multi-terabyte transfers physically transferred to data storage at end of each working day.

Customer service, real-time augmented reality in the retail sector: Assessing the potential of using AR headsets to allow shoppers to 'try' clothing, linked to analytics engines drawing from cloud-located shopping data to make recommendations on similar or complementary products.

Patient services, cost efficiencies in health sector: Assessing the deployment of small site FWA 5G connectivity and smart devices to provide more efficient access to patient data and information with a longer term goal of supplementing with AI-assistance, remote surgery, asset management and connected IoT health devices.

Alongside these examples there are also two broader scenarios where 5G was identified as having potential and we have briefly summarised them here:

Intelligent Office and Future Workstyles.

From previous TRA research[1] we know that Australian organisations are moving towards more dynamic work styles and that:

50%	**of businesses** provide flexible working hours to employees
60%	**of employees** use more than one work space on any given day
1 in 3	**employees** use more than three different kinds of spaces in an average day
1 in 2	**employees** employees utilise a remote working option some or all of the time

Our 5G research also highlighted that network connectivity is retarding workplace productivity. 68% of businesses told us that their business operations are constrained by their network speeds and performance (67% for mobile and 69% for fixed networks). And it's impacting where it hurts. Business told us it has the most detrimental impact when

1. employees are mobile away from the office,

2. engaging with clients, and

3. even working in the office.

1: TRA Top 10 Trends for 2020 at Work, 2018

In other words, businesses are functioning under a 'bandwidth tax' that curtails their ability to work effectively and productively. 5G can help alleviate this problem from both a connectivity and security perspective.

Discussions with leading virtual desktop office vendors such as Citrix and VMware revealed a very clear belief and strategy to utilise 5G connectivity to help support client services and solutions within the office environment.

Yet it's more than that.

For VMware there is also a clearly articulated strategy that sees 5G embedded across the core to the edge of the network to support VMware's 'any device, any application, any cloud' vision. 5G has the potential to supercharge intelligent office and workplace environments far beyond their current capabilities.

5G and AI

There is a clearly emerging view that 5G is both the fuel for AI as well as the enabler of its delivery. Let us briefly expand.

In a 5G connected world, the amount of data created through massive IoT/machine to machine networks will be, to use a non-analyst term, 'huge'. The ability to rapidly move, ingest, exfiltrate and access this data will be critical to feeding the learning requirements of AI-supported tools and analysis.

Likewise, AI, or more accurately, machine learning will enable the service providers to better manage their 5G networks and support planning, management and operational needs. The sheer complexity of the network environment delivering all those services we've already mentioned almost dictates a high degree of machine learning to optimise network performance.

Getting Ready for 5G:

A checklist for your business

TRA offers the following considerations as your organisation begins developing its 5G business strategy. They are not intended to be exhaustively comprehensive or act as a silver bullet. Every organisation is different and these considerations should not replace proper due diligence. However, we trust they stimulate new thinking for informing your approach and strategy.

Let's start with a couple of obvious needs: **network deployment and handset availability**. In public, the telecom service providers are currently a little coy about deployment locations beyond high level motherhood statements. Going private, closing the door and pushing hard should ensure the private discussion is much more illuminating.

Likewise **device availability – what's the strategy?** Is it smartphones only? 5G hub only? Tablets? Mixture? ie. Determine your company's device need and match that to the service provider's product suite. Again, close the doors and get your provider of choice to detail their 5G device options and form factors with emphasis on availability of devices across all usage and value spectrums.

Determine your service provider's **5G network strategy and the timings of functionality enhancements** – what is the timing for the first phase of integrating 5G towers with the existing 4G infrastructure? What about the additional phase for bringing in network virtualisation and automation to support latency, multi-device, etc services? Does your organisation view 5G solutions as the equivalent of mobile network solutions that have preceded it – ie. 4G,

3G, etc? Has your organisation explored where 5G solutions can fit within the **company's overall digital strategy?**

What are your **possible business cases?** Are there specific **customer, cost and/or efficiency projects** in place where 5G could be leveraged for a positive outcome? What is your **current cloud environment** (if at all)? How do you currently **collect, store, manage and secure data?**

What consideration have you given **to how your future data needs will change** and impact your current strategy for data management, storage and security? 5G will dramatically increase both the amount of data created as well as consumed. What do you need to do to e**volve your data security, governance and compliance** capabilities to help future proof your **organisation, employees, third parties and customers?**

Many higher-value 5G solutions will require multiple partners. What is the **strength and depth of your technology partners' ecosystems?** How effectively do your primary providers work with additional partners to bring solutions to life?

How critical to your **future workplace strategy** is mobility? Where do desktop productivity solutions sit within the workplace strategy? What is the **5G strategy for your workplace providers?** Do they have a clear vision for services and value add or is 5G just another 'pipe' for connection only?

To help visualise possible use cases, the ITU (International Telecommunication Union) has a useful graphic to help understand the various 5G usage scenarios triangulated between three aspects:

Enhanced mobile broadband

Gigabytes in a second

3D video, UHD screens

Work and play in the cloud

Smart home/building

Voice

Augmented reality

Smart city

Industry automation

Future IMT

Massive machine type communications

Ultra-reliable and low latency communications

Self driving car

Mission critical application

Source: "ITU"

The definitions for each point of the triangle are as follows:

Enhanced mobile broadband

ie. faster data to handsets; theoretically up to 100 times faster than current 4G technology.

Massive machine type communications

As the IEEE defines it "fully automatic data generation, exchange, processing, and actuation among intelligent machines, without or with low intervention of humans" or as we think of it – large numbers of machines intelligently networking and communicating with large numbers of other machines.

Ultra-reliable and low latency communications

As it sounds, services that require very low latency (in some cases < 1ms with very high reliability of error rates less than 1 in 1 billion blocks.

How can your organisation map potential use cases against the same or similar framework?

To help with formulation, use the table below. It simply lays out various business functions such as data ingestion or collaboration and communication needs that can be mapped against their importance to your organisations future strategy. We have provided a number of functions and additional space to add your own.

The further to the right of the table, the more potential exists for considering 5G solutions for your business.

Business functions / Business importance	Low	Moderate	HIgh
Mobilised workforces			
Data ingestion			
Data management			
Data exfiltration			
Cloud services consumption			
Connected devices environment			
Workload and application prioritisation needs			
Collaboration & communication needs			
Wires-free workplaces			
Multi-device connectivity			
Data analytics, machine learning and AI			
Adoption of reality technologies such as VR/AR/MR			
Genuine real-time network performance			
Network performance demands			
5G POTENTIAL	Poor	Moderate	Strong

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Research methodology and demographics

TRA undertook a blended research methodology that encompassed:

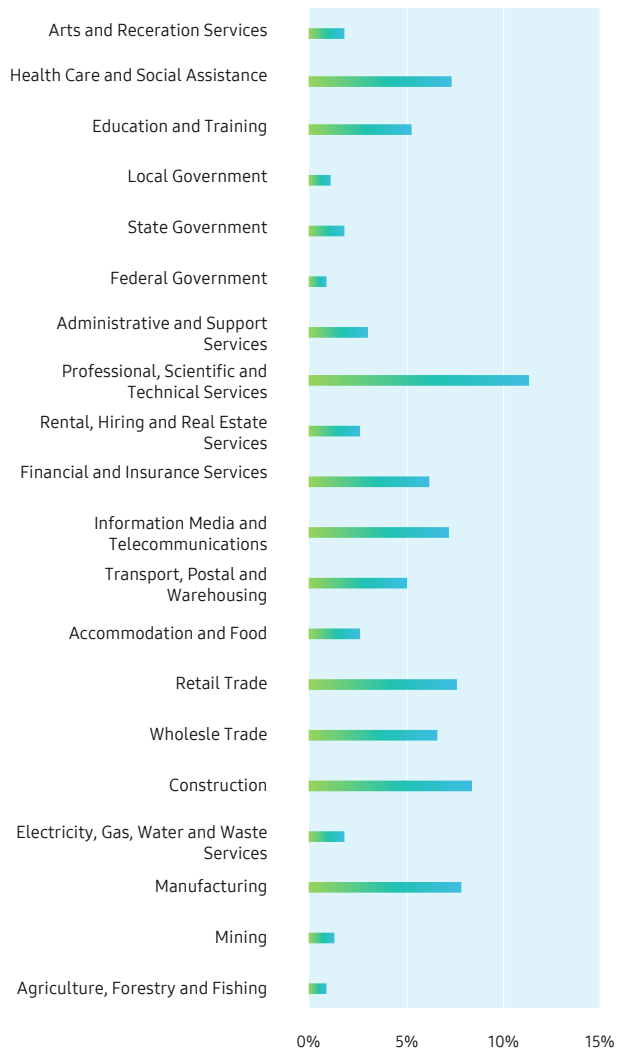A quantitative survey of 813 IT and Line of Business decision markets in Australian organisations

RESPONDENTS BY COMPANY SIZE
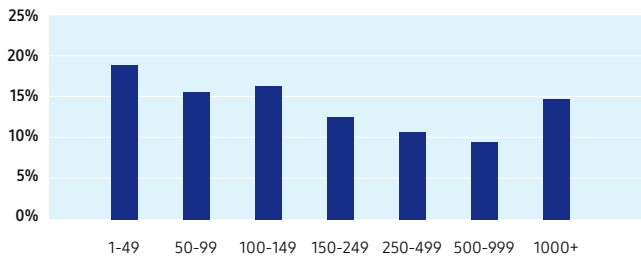
RESPONDENTS BY ROLE
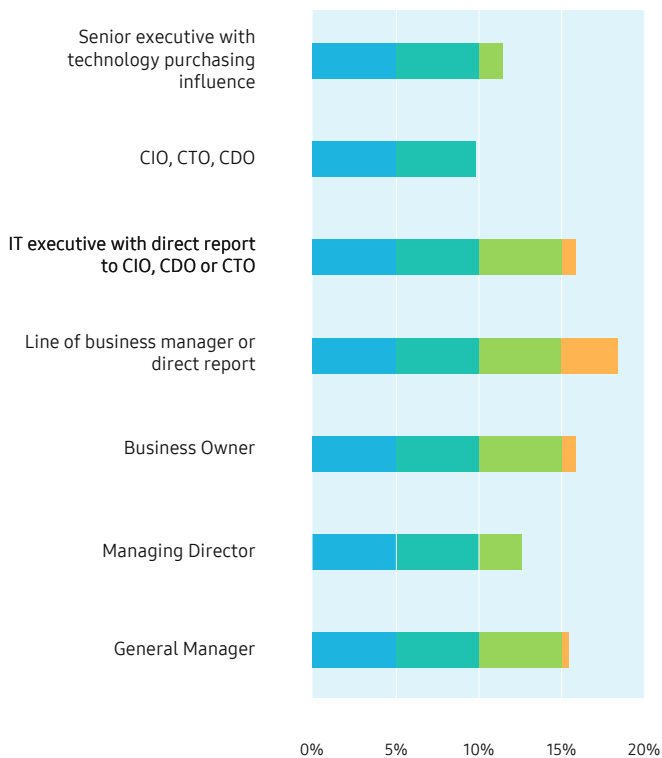
RESPONDENTS BY VERTICAL

Total survey size, n = 813
Conducted May 2019

In addition we interviewed CXO-level representatives from 25 Australian and international organisations to understand their view of 5G, goals, business focus and activities.

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