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The Data Ready, Future Ready CIO

Chief Information Officers from Federal Government and cross-sector enterprises attended *The Data Ready, Future Ready* virtual roundtables to hear high-level insights from special Guest Speaker, internationally-renown astrophysicist and advisor to the Australian Space Agency, Professor Lisa Harvey-Smith. The robust discussion was moderated by sought-after speaker and math genius, Adam Spencer, with highlights including standout use-cases that are applying advanced data analytics; the spin-off space technologies that CIOs should watch; and the intelligent data analytics creating points of competitive differences for CIOs and their organisations.

CIOs and CXOs in attendance at *The Future Ready, Data Ready CIO* virtual roundtables below (from Federal Government): ASADA; Australian Bureau of Statistics; Australian National University; Australian Taxation Office; Civil Aviation Safety Authority; Commonwealth Ombudsman; CSIRO; Dept. of Veteran Affairs; Dept.of Home Affairs; Dept.of the Prime Minster and Cabinet; Geoscience Australia; Services Australia; Transport Canberra and City Services; (from enterprises): Allianz; Animal Logic; CIMIC; Coal Services; Gilbert + Tobin; Healius; Macquarie; Perpetual; PwC; QBE; SBS and Westpac.

A cross Australia, government agencies and cross-sector enterprises are putting data assets to good use by investing in advanced analytics capabilities to solve problems that would have been unfathomable only a handful of years prior.

From sifting through the terabytes of data generated by exploding stars to detecting cancer at the earliest stage, or helping to more effectively route traffic through cities, data is being brought to life through technologies such as artificial intelligence and machine learning.
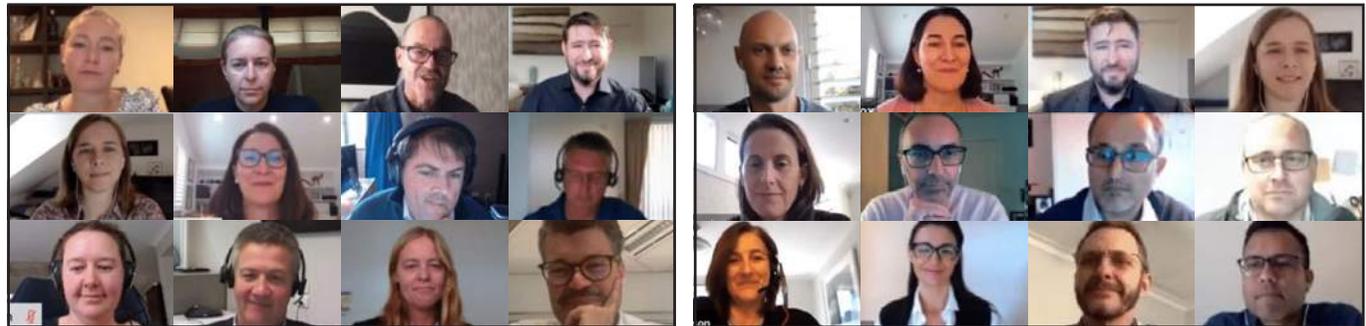
Due to these technologies' rapid evolution, tools designed to solve the most leading-edge problems such as managing interplanetary space missions is being rapidly repurposed and made accessible to all.

These were some of the topics discussed by a group of senior technology executives convened by Dell Technologies in Canberra and Sydney, and joined by special guest Professor Lisa Harvey-Smith, Professor of Practice and the Australian Government's first Women in STEM Ambassador and advisor to the Australian Space Agency.

Together they discussed the rapid evolution of advanced data technologies and examined how they might be applied to problems such as the exploration of space through to more pressing needs such as helping Australian organisations navigate their way through a post-pandemic recession.

Bringing Space-Based Intelligence Down to Earth

As an astronomer and advisor to the Australia Space Agency, Harvey-Smith described her long-term interest in radio astronomy and space exploration. She said all organisations should take encouragement from the emergence of new, agile commercial space organisations such as Space-X, which have decreased the cost of transporting people and equipment into space by a factor of 20. She said that would enable new space-based industries, including tourism and industrial manufacturing, but would also benefit terrestrial industries by bringing new capabilities in communications and highly accurate geo-positioning.

Harvey-Smith described how the deployment of constellations of low earth orbit communication satellites by companies such as Adelaide-based Fleet Space Technology would offer high-speed, low-latency connections to any corner of the earth, including rural and remote areas of countries such as Australia.

"Whether you are a customer in the resources industry running autonomous vehicles, or you're creating a smart farm where you're tracking your cattle across a station the size of NSW, this is very exciting," Harvey-Smith says.

"They have a sovereign capability to look at farms and monitor water use, soil moisture and the chemical constituents in the soil, or to look at vineyards and measure the lengths of lines. The bank is lending them money to remotely monitor all of these things. This can also be used by government to monitor the health of farming in Australia."

Harvey-Smith said this idea was exemplified by the Chinese automotive manufacturer Geely, which planned to launch its own network of low earth orbit satellites to provide centimetre-level precision global positioning for operating fleets of autonomous vehicles.

Space technology was also helping to advance analytics capabilities. Harvey-Smith described her own work analysing the data from thousands of individual radio telescopes, which currently generate 72 terabytes of data per second, to create an evolutionary map of the universe over the last few billion years.

Prof. Lisa Harvey-Smith with astronaut, Buzz Aldrin

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Adam Spencer, Moderator

Angela Fox, Dell Technologies

Arron Patterson, Dell Technologies

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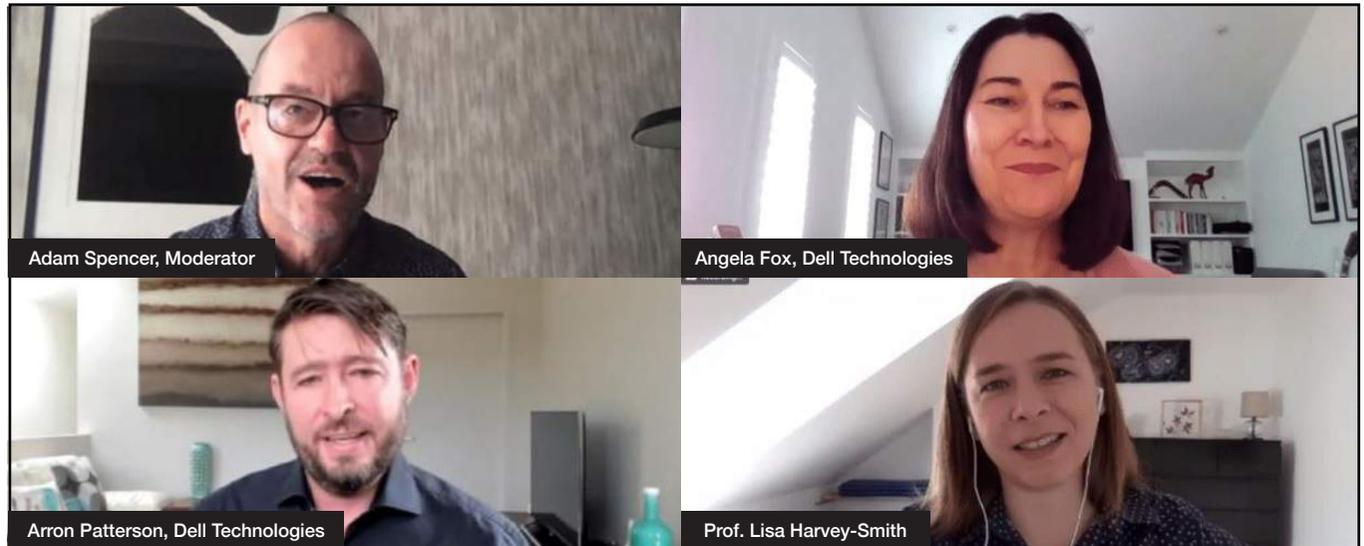
"It's actually too much now for us as human astronomers to deal with," she said. "We are trying to teach our computers to be astronomers, and a lot of work is being done to develop machine learning capabilities so that we can solve this Big Data problem by sifting through 72 trillion bits per second – in real time.

"Astronomy imaging has been used to make clear images of galaxies millions of light years away. You take pictures of the sky, and then you have to do complex analysis to create a clear image of the galaxy. This technology has spin offs and has been developed in various ways to improve detection of things like cancers and other abnormalities in medical imaging scans."

Harvey-Smith also told the story of another Australian company, Akin, which was working with the US-based Jet Propulsion Laboratory to create an AI system to help astronauts on interplanetary missions with complex tasks and maintain systems while also monitoring their health and safety.

"It's important psychologically to develop AI that is realistic as a human companion," Harvey-Smith said. "You can imagine the uses for this in industry on Earth for chatbots and virtual assistants for customer service. And if it's a realistic kind of a friend or a companion, it can actually converse and provide empathic conversation. You could imagine it having a really big impact for individuals who are isolated socially, such as the elderly."

Analytics in Action

Harvey-Smith also described numerous applications of advanced analytics capabilities that were much more down to earth, such as the Australian Government's MyGov service, which has now been used by 78 per cent of people over the age of 15.

"There are currently 15 million accounts on MyGov," Harvey-Smith said. "It's proven better for the public and creates less hassle for people that are trying to access money or pay their taxes or access healthcare information. It makes it safer and it also saves money."

She said this last point had been demonstrated by research from Deloitte which found the cost of service delivery per transaction through MyGov was 40 cents, verses $16.90 for face-to-face delivery. "It is not just the mega e-government systems that are being used in Australia," Harvey-Smith said. "A lot of work is being done within departments to engage these modern data analytics technologies to make government service delivery better, and to make the work of public servants more efficient and save money."

Harvey-Smith also cited ASIC's use of AI and machine learning to undertake activities such as trawling the internet for banking sector advertisements and then using natural language processing to read these ads and flag any potential misleading statements.

"They are also looking through product discloser statements and financial prospectuses to make sure companies are meeting their financial regulations," she said. "There is still a huge scope for organisations and institutions to adopt greater levels of data analytics and this technology is moving incredibly quickly."

From Data to Transformational Insights
Numerous examples of AI being used to solve intractable problems in the commercial sector were also discussed, including Dell Technologies' work with Mastercard for next-generation fraud detection analytics.

Dell Technologies' Chief Technology Officer Lead for Asia Pacific & Japan, Arron Patterson, said the new system went beyond using facial recognition at the point of purchase. He said it also analyses the way a user held their device, how hard they pushed buttons, and the speed in which they worked through the interface, which all created a unique digital biometric fingerprint of the user.

"They analyse not only what you know, but what you do and how you work, to make sure that they can very accurately identify who the user is," Patterson says. "At the back end, the machine learning systems they have built is

Arron Patterson, Dell Technologies

running through your payment history to try to understand if this is a transaction that fits within the profile of your behaviour. The decisions have to be actually made within the timeouts of the payment gateways themselves. The sort of infrastructure they've put in place we are starting to see become more common across a range of industries."

Patterson also discussed the increase in interest in AI-driven chatbot technology to help unlock complex information stores within organisations and spread expertise. "I've worked with financial institutions and in Malaysia and in Vietnam that have taken a kind of employee intranet, which is the storehouse of the business process and the practices, and built an AI engine on the top of that which helps to surface the right process at the right time to be able to take them through a workflow very quickly," Patterson says.

"Having an AI chatbot that actually surfaces the very latest process and allows them to be able to leverage that to delight your customers and leverage the capability can be a very powerful and simple way of doing a couple of things at once."

Leading the Tech Agenda
Patterson said those same capabilities were now being utilised to enhance decision-making within organisations. "We're starting to collect more and more information about the way our teams are interacting

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and working and having that surfaced and simple ways to be able to predict and drive the nature of decision making," Patterson says.

"The best CIOs are doing that in a collaborative and partnering manner. They're reaching out into the supply chain to people that are closer to the customer – and further up in the supply chain – to be able to provide an end-to-end view, share data, insights, and build API-driven methodologies that connect these pieces of data together to create a much richer and fuller understanding of challenges."

He said one of the key technologies in play was the use of Graphic Process Units (GPUs), which had dramatically increased the ability to build visual systems. "That machine learning function I talked about from MasterCard is largely accelerated by GPUs, but we're starting to see a panoply of other accelerators coming through into the marketplace," Patterson says.

"Neuromorphic processors and domain-specific architectures are extremely good at a particular type of AI machine learning and natural language processing algorithms, that take those types of workloads and make sure they can run faster, cheaper, with lower power and often very, very close to the edge of the network."

However, he added that getting the most out of these technology investments will also take a concerted effort to ensure that staff at all levels and functions could actually make use of them. That means upskilling the workforce to be not just digitally literate, but also confident with data as well.

An Analytics-Driven Recovery

While much of the discussion focused on high-end applications, Patterson and Harvey-Smith also stressed how these technologies were rapidly finding their way into more commonplace applications, and would prove essential in helping Australian government agencies and enterprises navigate their way through

disruptive global events. Patterson gave the example of robotic process automation (RPA), which held the potential of freeing up people to focus on higher value tasks. He suggested this would be especially beneficial as the economy moved into a recessionary period and organisations sought to make the best use of the resources they had.

"RPAs are very often one of the easier use cases to be able to put in place quickly, understand and accelerate time to market," Patterson says.

At the same time, he said organisations needed to invest in their analytics capability to better sense and respond to the world around them. "We have seen a trend the last couple of years moving design centres from reliability and predictability to agility," Patterson said.

"We are living in a time now where agility and the ability to respond to unforeseen environments is more critical than ever. We are seeing really successful CIOs looking hard at the data and assets they have available to them; and then look into the community and other agencies who can fill gaps and can give the information they need to make better decisions and delight both citizens and customers at the end of the process.

"Using all that information at your disposal, being open to partnering outside your organisation, and being very open to feedback tends to be one of the success criteria that we are seeing."

Whether it is for the delight of citizens or customers, both speakers agreed that the ultimate beneficiary of advanced analytics would be the humans that were impacted by the insights they generated.

Hence, Harvey-Smith said right now there was an opportunity for industries to understand the changes that recent disruptive global events have wrought on human behaviour and apply smart analytics to unravel new ways of engaging with customers.

About Dell Technologies

On September 7, 2016, Dell and EMC joined forces in the largest technology merger in history to become Dell Technologies. Dell Technologies unites seven technology leaders – Dell, Dell EMC, Pivotal, RSA, Secureworks, Virtustream and VMware – in one company with the power to drive digital transformation and generate real results every day for the customers and people who partner with us. Human progress is a journey, one we believe should be travelled together. Whether you know our journey well, or you're just beginning yours, we're honoured to embark upon it with you.

About 6 Degrees Media

6 Degrees Media was established by Angela Horvat, former Editor and Publisher of award-winning publications including *Computerworld, Information Age, My Business, The Who's Who of Financial Services* and Founder of FST Media; and Emma Charter, one of Australia's most connected and respected media and events strategists with more than 15 years' experience in delivering C-Level engagement strategies for clients in Australia and the UK. Together, they lead a team of Australia's most talented and driven conference producers, technology and business journalists and event managers to create content-driven experiences.