

AUST-US SPACE TREATY: Extended by 25 years

ACMA LICENSING: Telstra, Defence warn of interference issues

SURVEY: Inmarsat looks at IOT in global mining industry

3.6GHZ

**ACMA identifies
four satellite
protection zones**

SPACE & SATELLITE AU

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Why it pays to keep hopes for space agency grounded

It's hard to pinpoint when the tipping point occurred, but it's safe to say that the space and satellite sector is officially sexy. Look no further than Adelaide for evidence, with more than 4500 paying punters attending last month's International Astronautical Congress and the government capitalising on the interest by announcing its support for a national space agency.

I was at the opening ceremony during the IAC when Liberal senator for South Australia Simon Birmingham made the announcement and was quite surprised by the spontaneous round of applause and cheering it drew. I mean, great to have an announcement but where have governments been for the past decade in terms of support for the space industry? In terms of publicity seeking, it was of Elon Musk proportions . . . but he/that was another IAC story.



By Editor
Geoff Long

If the government had really been serious about space it would have created a national agency when everyone was calling for one months and, in some cases, years ago. And if it wanted to really impress it would have announced the actual details of said space agency at IAC in Adelaide.

As it is, we have absolutely no detail. No funding details, no idea of what its role will be. When the government should have been announcing a space agency, what we got back in July was yet another long inquiry into Australia's space capabilities that won't be provided until March next year.

According to senator Birmingham, that review will also now provide the missing details on the space agency. Which is good because we didn't need another report into Australia's space capabilities - it's already been done. All 111 pages as commissioned by the federal government, produced by Asia Pacific Aerospace Consultants, and publicly presented last year.

As that review found, Australian firms have greatest capabilities in ground systems and related space enabled services and applications, driven by the extensive use of satellite communications and navigation in Australia. The annual revenue from the Australian space industry sector is estimated at \$3-\$4 billion: 92% domestic and 8% export activity. And employment in the sector is estimated to be between 9,500 and 11,500 full-time equivalent.

In other words, we have a strong and vibrant space and satellite sector and the government should be looking at ways it can make things easier for that commercial sector to compete and thrive. Gone are the days when government activity was dominant in space. As the report also noted, globally commercial space activities are continuing to outpace government activities, growing by 9.7% in 2014 and now representing 76% of the global space economy.

As well as having done a prior review of space capability, the government has also had a prior stab at a national space body. In 2013 it had moved to create a Space Advisory Council to generate advice and coordinate activity. Unfortunately four years later and that body has never held a meeting. You could go back even further and the path is littered with bodies of past space agencies, including the Australian Space Office and the Australian Space Council that were abolished back in 1996.

Let's face it, a lot of the current activity that is making space and satellite sexy is despite government activity not because of it. And as much as there is a case to argue for a national space agency, if all it does is create another layer of bureaucracy we have failed.

On a brighter note, welcome to the first edition of the weekly Space&Satellite Au. Hit me up with any news leads or comments at geoff@commsdaymail.com.

Four satellite protection zones identified in 3.6GHz carve-out

Lockheed Martin's earth station facility near Uralla in NSW could be given protection under new plans to re-allocate the 3.6GHz band for future 5G services. The Australian Communications and Media Authority is also considering three new regional areas – near the towns of Quirindi, Moree and Roma – as possible future earth satellite station protection zones.

However, in its draft spectrum reallocation recommendation the ACMA proposes to advise the Minister for Communications to reallocate the remainder of the 3.6 GHz band for the issue of spectrum licences in defined metropolitan and regional areas of Australia.

While Lockheed Martin was granted a reprieve, Inmarsat's earth station at Landsdale near Perth will still be impacted – although it has been given a longer timeframe to deal with changes. In most metropolitan areas, licence holders have been given just two years to migrate or relocate services, however Inmarsat has been given five years. It had previously told the ACMA that costs to relocate its earth station facilities, which includes antennas used by other C-band operators, may exceed \$50 million.



The ACMA said in its decision that five years was chosen as a balance of sufficient time for relocation, while minimising the impact protection of this facility would have on availability of new services in Perth. “The continued operation and protection of the facility beyond this time would severely affect the availability of wide-area broadband services in this spectrum in the Perth area,” it advised.

The protection zone near Uralla would support the ongoing use of Lockheed Martin’s earth station facility. It had earlier told the ACMA that the facility, set up in 1999, provided a critical role in a global network of earth station facilities used to control satellites through launch and transfer orbit to the satellites’ intended locations. It also noted that the Uralla facility was used to provide frequent support to satellite missions from commercial operators around the world.

The other two main licensed earth station operators were Telstra and Optus. However, the ACMA said that one of the primary developments learnt during feedback to the 3.6 GHz band consultation was the reduced level of apprehension from the two carriers regarding possible changes. This is because they are able to retune operations at their current earth stations in Sydney and Perth above 3700 MHz.

Meanwhile, the ACMA said it remains of the view that establishment of one or more east coast earth station protection zones is an appropriate mitigation strategy. However, it is still uncertain which of the sites will be suitable. It said that by identifying several of the most promising options now, it will provide more time for the ACMA and industry to investigate the suitability of these sites for potential recommendation as protection zones to the minister.

Geoff Long

Proposed treaty would extend space cooperation between Australia and the US by 25 years

The federal government is considering a new treaty between Australia and the United States that would extend cooperation in space-related activities for a further 25 years. The current agreement, which deals with space vehicle tracking and communication facilities, is due to expire in February next year.

Australia and the US have had some form of agreement in place since the 1950s with the establishment of facilities at Woomera in South Australia to track US satellites. The treaty arrangements have been updated numerous times over the years to allow for the establishment, operation and maintenance of National Aeronautics and Space Administration facilities in Australia to the benefit of both countries.

According to a briefing paper prepared by the Department of Industry, Innovation and Science, it is in Australia's national interest to extend the current agreement. It said it provided for collaboration between Australian and NASA scientists and direct employment for several hundred Australian engineering, scientific, technical and administrative staff, while indirectly providing a pool of trained personnel for high-end engineering, scientific and technical roles in the public and private sectors.

SPACE & SATELLITE AU



Space & Satellite **AU** is the new weekly newsletter from the people behind CommsDay and the Australasia Satellite Forum.

Australia and its surrounding Pacific region have long been an important market for global players such as Intelsat, Viasat and Eutelsat. Homegrown operations from NBN, Optus and Speedcast have also become central to the sector.

Now we see the rise of a local nanosat and space industry and increasing interest in the creation of an Australian space government agency.

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In turn, the Australian facilities are vital to NASA's operations that include radio contact with human and robotic missions, scientific satellites and deep space probes exploring the solar system. The facilities include the Canberra Deep Space Communication Complex at Tidbinbilla in the ACT, as well as tracking and data relay satellite facilities in Alice Springs, the Northern Territory and Dongara, Western Australia.

The ongoing collaboration between NASA and the Commonwealth Scientific and Industrial Research Organisation allows CSIRO scientists access to world class radio astronomy facilities at a reduced cost. In addition, the data gathered by NASA is freely available to Australian scientists and is used by organisations such as Geoscience Australia and the Australian Bureau of Meteorology.

The Australian facilities provide a two-way communications link for the guidance and control of spacecraft and the relay of data and images. It has provided support for several missions including: the Curiosity rover, which is exploring the surface of Mars, the Cassini mission to Saturn, and the Hubble space telescope.

The briefing paper also noted that the CDSCC is an integral component to NASA's Deep Space Network, billed as the largest and most sensitive scientific telecommunications system in the world.

Activities conducted in Australia under the agreement are managed to ensure that they are consistent with Australian interests. The CSIRO manages the facilities on behalf of NASA, with specific operational and maintenance activities contracted out as required. Management and operation of the CDSCC is conducted by CSIRO.

“The continued use of Australian facilities presents further opportunities for Australia to develop its highly skilled technical workforces, significantly enhance domestic scientific and technical capabilities, and providing opportunities for Australian industry,” the report noted. It added that NASA funds the total cost of the facilities, including the salaries and administrative costs of Australian government personnel involved in the management of activities under the agreement.

The proposed treaty has now been tabled in parliament. The government's treaties committee has called for submissions on the agreement by 23 November 2017.

Geoff Long

Telstra, Defence warn of interference issues under new licensing proposals

Both Telstra and the Department of Defence have called for proposed new licensing procedures for space-based communications to include tougher requirements to prevent interference with existing satellite systems.

The organisations made the call in response to an Australian Communications and Media Authority inquiry into an update to its business operation procedures around earth and space apparatus licences for fixed earth stations.

Telstra said that the operating procedures should require that any new licences include formal certification that a proposed new radio-frequency system is compatible

with existing licensed services. It said under the newly-proposed arrangements, there is no specific requirement for demonstrating technical compatibility with existing services.

“Consequently, we recommend that the requirement for formal technical certification be explicitly added to both BOPs, whereby a person formally accredited by the ACMA certifies that operation of the Space and Space Receive, or Earth and Earth Receive station will not only be consistent with the Australian Table of Allocations but will also be compatible with existing licensed radiocommunications systems in Australia and its territories, and that the new space object will neither cause interference nor claim protection from such licenced systems,” wrote Jane van Beelen, Telstra's executive director regulatory affairs.

Similarly, the Department of Defence has called on ACMA to ensure stronger safeguards. It said in its submission that it can provide a number of examples of cases where an incoming satellite operator could have caused significant interference to critical Defence networks, yet they have claimed that they were unaware of any networks that could be affected.

“Defence strongly recommends that the assessment procedure should require evidence that coordination agreements with key existing or planned Australian satellite networks and critical Defence satellite networks serving Australia are in place, prior to licensing operation in Australia,” it said.

Geoff Long

South Australia issues global call for firms to run space accelerator programs

The newly-formed South Australian Space Industry Centre has issued a global call for organisations to run its space accelerator and space incubator programs. The programs are backed by \$1 million a year in funding through the state's space innovation fund – the first step in establishing a new Space Innovation Hub in South Australia.

The Space Innovation Fund will support training scholarships, incubation services and an accelerator program to develop a space startup ecosystem, with the programs expected to be open for applications in February next year.

In the meantime, SASIC has given organisations until November 10 to submit proposals to run the program. Negotiations with short-listed applicants will then commence 22 November.

South Australia defence and space industries minister Martin Hamilton-Smith said the global call demonstrated how serious the state was about creating a thriving space sector. “This is a unique opportunity for suitably qualified organisations to play a key role in developing startup and early stage businesses and turning them into high growth commercial ventures,” he said.



In addition to the innovation fund, the South Australian government has recently

announced a partnership with more than 15 Australian and international space sector start-ups that will work with the State Government to establish Southern Hemisphere innovation facilities in the state for launch testing, technology development, stepped flight-proving programs and space-qualification missions.

The partnership is being coordinated by the state government and Fleet Space Technologies and discussions are already underway with businesses working across the sector, including in the fields of space launch, remote sensing analytics, robotics and rocketry. Companies in the discussion include Delta-V Newspace Alliance, Moonshot Space Company, Gilmour Space Technologies, Alauda Aeronautics, Flurosat, HE Robotics, Ozius Spatial, Australia Space Launch, Space Ops Australia, Eirobotix, Hypersonix, Next Aero, Additive Rocket Corporation, Southern Launch and Ripple.

Geoff Long

Northern Territory seeks launch capacity in 2018

Northern Territory chief minister Michael Gunner said he plans a launch facility in Arnhem Land within a year. He told a Darwin defence conference on Wednesday that his government is in talks to lease a site near Nhulunbuy.

“Being close to the equator means rockets need less fuel to break through the atmosphere. Being close to the ocean, in the case of Arnhem Land, means there are safe drop zones,” he said. “And, more generally, we have few built-up areas and comparatively modest air traffic.”

He said he is in talks with Equatorial Launch Australia, a company whose space base proposal is being considered by federal and NT infrastructure funds. Last month the NT also signed a MoU with South Australia and the ACT to pool their space industry developments.

“South Australia has the established Defence manufacturing industries. ACT has some of the world's finest astronomical minds. And the Northern Territory is where the magic will happen,” Gunner said.

NBN kicks off enterprise satellite consultation, releases mobility product agreement

NBN is moving ahead with plans to push its satellite service into new markets, kicking off a product consultation for enterprise satellite services this month as well as releasing its customer agreement for the satellite mobility product for large aircraft.

Commercial satellite operators have been critical of NBN's move into the enterprise space, arguing that it prevents new capacity coming on stream in Australia. The consultation was highlighted in NBN's integrated product roadmap for October. In the case of the satellite mobility product, a service has been in trial with ViaSat and Qantas since earlier this year and is expected to be extended. The agreement outlines how and on what terms the mobility service could also be provided to other airlines.

NBN highlights that the mobility product for aircraft operates in a shared band-

width pool with its regular fixed satellite service. However, where there is capacity contention or congestion NBN will prioritise its Ethernet-based end-user traffic over the mobility product.

It also warns that the mobility product operates in a shared bandwidth pool with mobility products supplied to other customers – which could adversely affect the capacity available depending on the number of customers located within the same mobility beam.

BROADBAND AWARD: Meanwhile, NBN's Sky Muster service has taken out the “Broadband Delivering Social Impact” award at the Broadband Awards 2017 in Berlin. It beat off competition from operators including China Unicom, Telkom Indonesia and Spanish giant Telefonica to win the award. NBN chief strategy officer JB Rousselot commented that the award showed that the global telecoms community is taking notice of what NBN is doing in providing the most remote parts of our country access to broadband.

Geoff Long

Bevan Slattery says 60s US space program most successful VC investment of century

Just weeks after the Australian federal government committed to creating its own space agency, renowned local telco entrepreneur Bevan Slattery has held up the US space program leading to the 1969 moon landing as the most successful example of venture capital investment in a hundred years.

Slattery has founded, developed and sold multiple large and successful Australian tech and telco ventures, ranging from a transcontinental subsea cable system to a pioneer high-grade datacentre company. Speaking at the annual Charles Todd oration in Sydney lauded the US government and president John F Kennedy, who set the national goal of landing a man on the moon, as having driven “the single most successful venture capital investment in, certainly, the last century” in terms of return on outlay.

“Kennedy said ‘we choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard, because that goal will serve to organize and measure the best of our energies and skills;’ and it absolutely did that,” noted Slattery. “It’s the original moonshot; it is the benchmark, and the standard of achieving excellence beyond measure. It was an impossibility – but it was inspiring.”

“I think the moonshot was the single most inspirational vision of the 20th Century, in terms of ‘here’s a target, we’re going to go for it’ – and it genuinely inspired the world, not just a nation.”



But Slattery also noted a myriad technological developments that had come out of, or been accelerated by, the space program. “Power tools, cordless drills... Teflon, structured software – there wasn’t really a structured software managing program that was in place at the time, they created that – the computerized axial tomography scan, magnetic resonance imaging. It accelerated silicon chips... memory foam, insulation, spatial GPS and satellite communications. All were created because of Kennedy’s vision to send a man to the moon,” he said.

“And what that also did was create knowledge powerhouses in the US; it was probably the most significant driver of STEM education in graduates, in particular in Stanford and the areas around Dallas and Houston in Texas... and Silicon Valley is absolutely a creation and an outcome of Kennedy’s vision, there would not be a Silicon Valley if it wasn’t for the moonshot,” he added. “Once the US government achieved that extraordinary outcome, there was an entire country of people that were inspired, [that believed they] could do anything.”

Petroc Wilton

SPECIAL FORCES COMMANDER JOINS EM BOARD

Brisbane’s EM Solutions has appointed as a director the highly decorated and recently retired Major General Jeff Sengelman DSC, AM, CSC. With nearly forty years of military service, most recently as the Special Operations Commander of Australia, he has been responsible for Special Forces units globally. Having worked as an advisor on Counter Terrorism and to the Chief of the Defence Force regarding security issues of national significance, Sengelman has worked in government and areas of national security nearly his entire life. On his new role Major General Sengelman said, “I want to continue serving Australia and its allies during this next phase of my career. By working on the board of a company that is growing and highly innovative, and contributing already to sovereign defence capability, I hope to help EM Solutions cement its position as a major exporter and go-to company for defence communications products and services”.



INTERNATIONAL

Indonesian space agency seeks \$61m budget, discusses satellite launch station potential

Indonesia’s space agency LAPAN has requested a US\$61 million budget for its aeronautical and space technology development program as well as administrative support. The agency has also thrown its weight behind the development of Indonesian satellite launch capability.

The space program is geared towards the country’s overall national plan for 2018, “Spurring Investment and Consolidating Infrastructure Development in order to Accel-

erate Quality Economic Growth”. To this end, LAPAN says its program will promote regional development and stimulate the maritime sector. The budget will also go towards improving connectivity throughout Indonesia as well as ensuring food and national security. In the future, LAPAN would like to also become involved in the energy, mineral resources, mining and tourism industries.

Yesterday LAPAN held a seminar in Jakarta titled “Policies and Regulations on Aviation and Space Toward National Independence” where the idea that Indonesia should develop independent space capability given it has such a large territory.

According to Thomas Djamaluddin, head of LAPAN, more detailed planning of satellite launch station capability is underway, with a view to cooperation with other countries. China and South Korea have showed interest in the endeavor but Indonesia will first explore options with Japan and India first

Trevis Cunningham

Cambodia developing satellite with Great Wall

A senior official at the Telecom Regulator of Cambodia said the country is hoping to launch its first communications satellite as early as 2021 at an estimated cost of US \$150 million.

Im Vutha, spokesman for TRC, said “the satellite is a very costly project, so we are seeking all the input we can get from relevant stakeholders, so that we may know how much demand there is and how much we should invest. I think it will cost around \$150 million to put the satellite into orbit, with the satellite having a lifespan of at least 15 years”.

Cambodia is developing its plans with the China Great Wall Corporation which has already launched a satellite in Laos. Prime Minister Hun Sen previously said that Cambodia should have its own satellite to make high-speed broadband available to all.

Trevis Cunningham

MYANMAR TO LAUNCH SATELLITE IN 2019

Myanmar will launch its own satellite system MyanmarSat-2 in June 2019, costing \$U155.7 million. Vice President U Myint Swe told a coordination meeting of a steering committee in Nay Pyi Taw that ministries will be encouraged to abandon Sat-1 in favour of the new satellite.

INTERNATIONAL

ESA satellite first to use P-Band

Thales Alenia Space has signed a contract with Airbus Defence and Space GmbH to develop the feed array system for the antenna on the European Space Agency’s Biomass spacecraft. Biomass’s mission is to measure the quantity of carbon stored in the world’s

forests and is the first in the world to use a P-band radar—at 435MHz.

Due for launch in 2021, it will generate maps of forest biomass and forest height at a resolution of 200 metres and measure deforestation at a resolution of 50 metres.

“In addition to the primary mission goals, the data generated will be used to monitor the ionosphere, glacier and ice sheets, while also mapping subsurface geology in deserts and the topography under dense vegetation,” Thales said in a statement.

Airbus Defence and Space UK is the prime contractor for the Biomass satellite. Airbus Defence and Space GmbH is in charge of the main instrument, a fully polarimetric synthetic aperture radar operating in P-band (435 MHz).

Thales Alenia Space will provide the SAR Antenna Feed Array which radiates onto a 12m deployable reflector to generate the SAR beam.

“Thales Alenia Space is proud to be selected as the supplier of this equipment, a key to the performance of this satellite, which will help protect our planet. It also illustrates our long-standing expertise in Earth observation satellites and instruments”, said Donato Amoroso, Deputy CEO of Thales Alenia Space.

Thales Alenia Space describes the satellite as being part of its “new space” strategy designed to meet “key societal objectives”: “observe and protect our planet, connect and guide people, deliver data that can influence decisions impacting climate change, guarantee people’s safety in today’s tense geopolitical climate, save lives during natural disasters, and even explore new worlds that may one day be home to humanity.”

Staff reporter

IRIDIUM TO LAUNCH 20 SATELLITES ON DEC 22

Iridium will launch its next 20 satellites on a pair of previously flown Falcon 9 boosters beginning December 22, 2017. Previously, Iridium planned to launch all its satellites on newly manufactured rockets, but kept open the option to change to previously flown boosters if it could achieve certain parameters. Iridium’s goal of completing its next-generation relay network, comprising up to 81 satellites, remains on schedule for completion mid-2018, according to Iridium’s CEO Matt Desch. This December 22 flight will mark the halfway point. Iridium has contracted with Thales Alenia Space and Orbital ATK to build 81 satellites to replace the company’s current spacecraft, providing uninterrupted global messaging and telephone service, and introducing new higher-bandwidth applications, such as video.

ANALYSIS

Inmarsat: Big appeal in satellite-based environmental monitoring for mining sector

A new survey from Inmarsat suggests that satellite-based environmental monitoring will be a major driver for the Internet of Things in the mining sector.

Earlier this year, market research specialist Vanson Bourne interviewed respondents from 100 large mining companies across the globe for Inmarsat’s ‘The Future of IoT in Enterprise 2017’ report, and found that 47 per cent of organisations identified moni-

toring environmental changes as their number one priority for their IoT deployments. In addition, 57% of respondents from the mining sector reported that the most exciting innovation that IoT will bring to the world is improved environmental monitoring.

The report says that by deploying connected smart sensors in a network, IoT makes it possible to “automatically pick up data from previously elusive locations and for this data to be communicated rapidly to other devices.”

“This will sow the seeds for a network of automated devices that adjusts to environmental conditions in real time, and will enable mines to take more workers out of dangerous locations and replace them with robotics. However, historically sluggish mining companies will need to develop new skill sets if they are to embrace digital technology’s promise,” the report warns.

Joe Carr, Director of Mining at Inmarsat Enterprise commented: “Improving environmental monitoring is an area where mining operators clearly see real value in IoT. The increasing pressure from strict government regulations focused on mining’s environmental impact is placing a heavy burden on businesses in the sector, so operators must embrace innovative technologies if they are to comply and continue to operate efficiently and sustainably.”

Inmarsat adds that mining businesses have a duty of care over the lifetime of a mine to ensure that they minimise their impact on the environment and rehabilitate the land to its natural state. When this is done by manually-operated processes, it can be expensive and prone to error, with sub-optimal data collection and analysis.



manually-operated processes, it can be expensive and prone to error, with sub-optimal data collection and analysis.

Inmarsat says it is currently working with several mining operators to achieve their corporate social responsibility objectives and comply with government regulations by deploying monitoring solutions made up of connected networks of sensors and devices.

“For example, a network of sensors across a tailings dam can constantly gather data on the levels and integrity of the dam, avoiding the expense of sending a staff member out to gather a single data point and removing the possibility of human error, while enabling staff to react instantly if readings breach minimum or maximum safety levels,” the firm says.

Carr says satellite is a natural fit for mining IOT. “The remote location of many mines means that terrestrial or cellular networks are often not available. Satellite communications can provide connectivity in deep, open pit mines and even underground, using repeaters. With up to 99.9% uptime, Inmarsat’s L-band services are enabling IoT

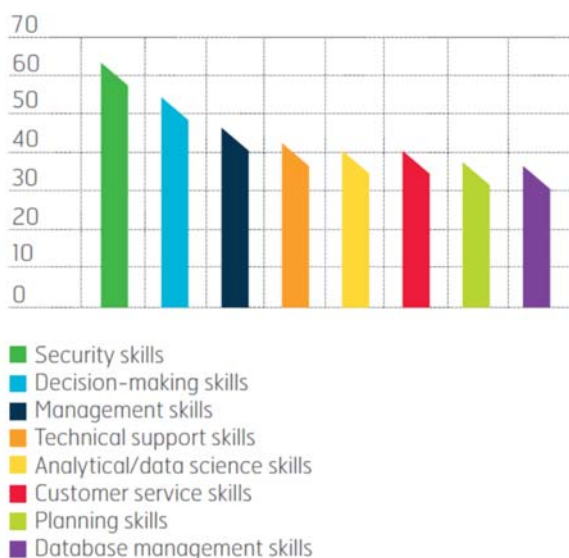
solutions in mines globally, even in the most remote and hostile environments.”

But the report warns that mining companies have some way to go in understanding the challenges and opportunities of IOT. “The mining industry has not yet put in place the secure and stable infrastructure or recruited the skills required to take advantage of the new gold, data. Without this, it will continue to lag behind other industries already embracing the exploitation of data for productivity and profit.”

“Mining faces additional challenges in attaining the relevant skills to make the most of its data – its workforce is ageing and while older workers possess more deep industry knowledge, they are also less comfortable with digital tools,” the report continues.

“With millennials often failing to look favourably at the mining industry and shunning more mechanical-physical careers, it is not surprising that the mining industry has a skills shortage when it comes to IoT. It is highly probable that this shortage is contributing to the delayed development of digital-first operations when compared to other sectors in this research project.”

What additional specific skills do you think your organisation needs to deliver IoT? (%)



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