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WELCOME TO SIEMENS DIGITAL INDUSTRY SOFTWARE

Software that's out of this world

What would it mean to your space business if you could develop it faster and reach your ambitions sooner with more certainty? There's a reason that the world's leading space projects choose Siemens hi-tech industrial software. In fact, the space industry is often used to illustrate Industry 4.0. If you can design, build and test in a fully digitalised environment then you can keep costs down, simulate conditions that can't be replicated in a lab, increase development cycles through rapid prototyping and simplify complex engineering collaboration.

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SOFTWARE – THE GREAT SPACE ENABLER

Advances in software have made space exploration and infrastructure significantly faster and less expensive. By **David Sanis**.

Earlier this year, David Sanis, the publisher of Australian Space OUTLOOK caught up with Samantha Murray who leads Siemens Digital Industries Software business in Australia and New Zealand to discover how Siemens hi-tech industrial software is making the space industry far more accessible to many companies of all sizes.

Technology giant Siemens is not new to the space industry. Its technology has been on board the Apollo 11 that landed on the moon, the Mariner IV space probe that took the first ever photos of Mars in 1965 to more recent

innovations such as the James Webb Space Telescope (successor to the Hubble Space Telescope), SpaceX rocket, Mars Curiosity and Perseverance rovers, United Launch Alliance's (ULA) vehicles and closer to home, New Zealand company Rocket Labs' satellites.

What's your take on the space industry right now?

There was more computing power in my high school calculator in the '80s than what NASA used to successfully launch Apollo 11. But the Apollo space program had 400,000 engineers, technicians and scientists over the 14-year program. Today's computing power and software means that space dreams and ambitions become accessible to almost anyone with a great idea, drive and talent.

We have some of the best research and brains trust here in this region. When we combine this with the most powerful industrial software, we'll see the Australian Space Agency's roadmap

to grow our space manufacturing become a reality.

Why is the space industry even more important today than it was in the '60s and '70s?

Many don't realise that space-based technology underpins a lot of the daily things we take for granted such as online banking, GPS in cars, forecasting the weather and more. There is tremendous potential for the space industry in many more areas of our lives — it's what we call at Siemens ... 'transforming the everyday'.

Also, as the country recovers from the impacts of COVID-19, investment into space infrastructure has significant 'trickle down' supply chain benefits that could impact the broader economy and help create more jobs.

How is Siemens involved and what's the connection to the German concept of Industry 4.0?

Siemens is the largest industrial software company in the world and our software is used by the space industry in a similar way to other industries where speed, reliability, flexible design, more efficient outcomes, better use of finite resources, collaborative platforms and, ultimately, competitive advantage is required. Everything from digital twins to engineering data management and even supply chain collaboration are just as critical to the space industry as other advanced manufacturing environments. However, the added complexity for the space industry is that it's generally not an option to test physical prototypes

because you usually can't recreate the conditions in a lab.

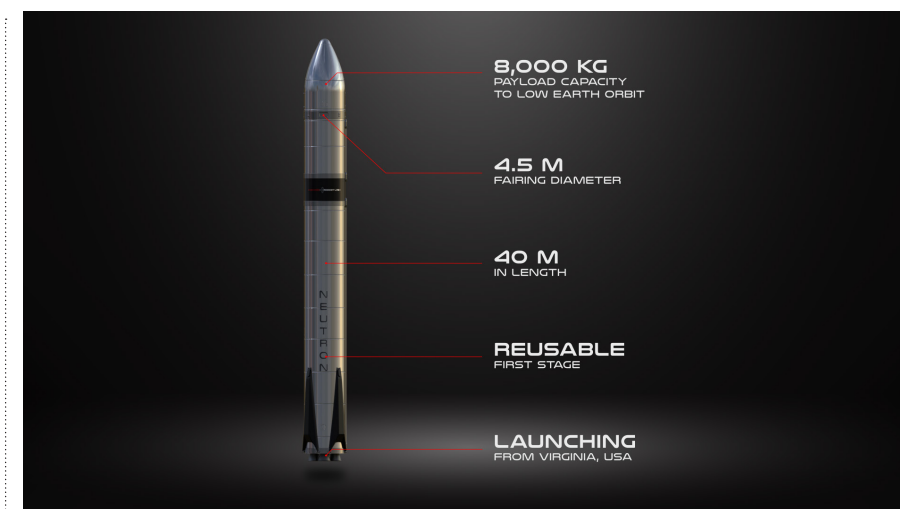
When it comes to Industry 4.0, some of the best examples and analogies come from space industries. Take NASA's Mars rover program including the recent rover Perseverance. Here you have one of the most complex engineering undertakings with a zero margin for error. The Perseverance rover is NASA's largest, most advanced vehicle and it leveraged Siemens software from design to simulation and assembly. This same approach is core to Industry 4.0. Its all about reducing risk, managing more complexity, and doing more and more in a digital environment.

Siemens have been doing a lot with universities in Australia — can you tell us about this and touch on how it's connected to space research and manufacturing?

We work closely with a number of universities and have provided significant software grants to a national network of universities with the intent of building a future workforce capability for Australia and the region in general. There are seven universities so far. This means that thousands of students at Australian universities now have access to the same software that's being used by NASA, Rocket Lab, SpaceX, ULA and others. And with the Industry 4.0 test laboratories now at each of these universities, Australia is also building research infrastructure which will assist industry to see how leading technologies can be applied to their circumstances.

Are there any great space examples closer to home?

One of my favourite examples is Rocket Lab in New Zealand. In 2006 they were a start up with founder, CEO and CFO, Peter Beck who wanted to provide open



access to space to improve life on Earth. Today, Rocket Lab employs more than 500 people with sites across the world and this year announced they intend to list on the Nasdaq and are building a brand-new rocket.

David Sanis then caught up with Bill Hughes, Director of Vehicle Engineering, Rocket Lab to find out more...

Congratulations on your announcement to build the Neutron rocket.

Thanks. The medium-lift Neutron rocket will be an advanced new generation reusable launch vehicle. It is designed to have an 8-ton payload lift capacity tailored for mega constellations, deep space missions and human spaceflight. Neutron is tailored to be able to lift more than 90% of all satellites forecast to launch through to 2029 with highly disruptive lower costs.

What's the role of software in supporting Rocket Lab's program?

We started working with Siemens software in late 2019, adopting Teamcenter and NX to allow us

to integrate all of our design and engineering data with the goal of establishing an end-to-end digital thread that enables increased transparency and efficiency across various offices. We've been able to combine various aspects of data related to the same part, assembly and system to maintain a single source of truth across the life cycle of the product. We are now looking at expanding this data integration into manufacturing as well. Having powerful software allows us to grow and with more flexibility and manage more complexity.

What are some of the industries being enabled by Rocket Lab?

We are the first company to deliver regular and reliable dedicated launch services for small satellites, and I'm proud that Rocket Lab has also played a leading role in catalysing the growth of the commercial small satellite industry. The satellites we launch are being used in areas such as national security, Earth observation, space debris mitigation, weather and climate monitoring, communications and scientific research.

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