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Why the pandemic could produce the next global tech giant

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Jon Whittle, the new boss of CSIRO's Data61, the national science agency's data and digital specialist division, believes some serious innovation will emerge from the dark economic times induced by the coronavirus.

He believes technology will be at the core of Australia's economic revival on the way out of the pandemic. "History shows that economic recessions are a driver for innovation in the tech sector,'' he says.

The boss of the CSIRO's Data61 division, Jon Whittle. **Eamon Gallagher**

He points to a long list of tech giants established when the global economy was in a hole at various times over the past decades.

"Companies like IBM, HP, Microsoft, WhatsApp, Instagram and Uber all started business during a recession,'' he says.

"The digital economy is booming and it has the potential to bring companies out of the greatest financial crisis many of them have ever faced. We've already seen this in certain sectors like telework, telehealth, online retail, online education, online entertainment,'' he said.

"Online services in general have been booming during COVID-19, and we've seen 10 years' worth of digital transformation in the space of a few months,'' he said.

Virus research

Some of the specific sectors in which Data61 researchers are working have a direct link to the COVID-19 pandemic.

They are using 3D computational modelling and virtual reality to explore the molecular structures of the COVID-19 virus to better understand how it behaves.

"By creating an accurate replica of COVID-19 our researchers can identify the regions of its proteins that could be good targets for vaccines,'' Dr Whittle says.

"Experimental science can be very expensive as is developing new drugs, which means accurate modelling can help to save time and money in finding a solution.

"The virtual reality part of the work, made possible by our partner Nanome, helps researchers interact with the structures, collaborate together and get a more comprehensive view of them."

On a general level, companies which keep investing in research and development in the current downturn will also be ahead of rivals on the road out, he adds.

Dr Whittle has a deep and diverse background. He was previously the dean of the faculty of information technology at Monash University prior to taking the helm of CSIRO's data science division in July, and has broad experience both offshore and within Australia.

He spent six years in Silicon Valley working as a senior research scientist with the NASA Ames Research Centre, leading artificial intelligence research for civil engineering and space technology development.

He was also the founding co-director of the Monash Data Futures Institute and is a big believer in pursuing the practical. Collaboration with industry is crucial, and commercialising smart research is a lofty end goal.

Data61 was formed in 2015 after the National Information Communications Technology Australia group (NICTA) lost its federal funding and merged with CSIRO to cut costs and survive.

Improving in the area of commercialising research has been a major focus of CSIRO boss Larry Marshall, who created the ON accelerator program to help scientists think commercially. It also underpinned CSIRO's Strategy 2020.

Some of the spin-outs from Data61 thus far have included drone start-up Propeller Aero, AI decision-making software company **Opturion** and healthcare video conferencing company Coivu.

Dr Whittle says Microsoft and LinkedIn estimate that due to digital acceleration post-COVID, the world economy will create 149 million new jobs with 98 million in software development, 23 million in cloud analytics, 20 million in data science, 6 million in cyber security and 1 million in privacy and trust.

Golden age ahead

Australians involved in professional services such as architects and lawyers stand at the edge of a golden period if they are able to fully harness the power of digital technology. That will be a big plus for Australian exports, ushering in a new segment for a country reliant on iron ore, beef, wheat and wine.

"Digitally enabled exports are helping supplement the incomes of many Australian workers impacted by COVID-19,'' he says.

" There’s lots of architects, lawyers, doctors, counsellors, artists and countless other professions using digital technology to sell their services within Australia and globally,'' he says.

"The COVID-19 situation is likely to see a big jump in these numbers. This isn’t just good for workers. This is good for our exports, our GDP and our overall economic health.''

The spill-over into other industries is also immense.

''Digital innovation can create substantial benefits for an economy by improving output and productivity of existing industries and spurring the growth of new ones,'' he says.

"A manufacturer could install a new automated production line, or a farmer could use sensors to better monitor crops to improve yield. Both of these investments in technology allow organisations to produce more things, faster,'' he says.

Businesses can also experience productivity improvements when they adapt their business models to make better use of digital technology.

"The manufacturer might also change their product development and marketing strategy to better capture the benefits of automation. There’s no doubt that the pandemic has caused organisations to digitise their operations to adapt to the change in consumer behaviour,'' he says.

Dr Whittle says exporting digital products and services is going to be of increasing importance to drive economic value for Australia in the post- pandemic world.

The next wave is coming.

He says the digital innovation in a post-COVID-19 world will be driven by technologies that collect, manage, analyse and optimise increasingly large and complex datasets.

"It is now more important than ever for organisations to be thinking about whether they have the right data in place, and the right analytical capabilities, cyber security systems and digital cultures, to future-proof their organisations,'' he said.

Scrimping on research and development in a downturn is a false economy and it shows.

"The digital technology sector companies that are doing well during COVID-19 on the ASX, NASDAQ and other stock markets worldwide tend to be the ones that invest most heavily in R&D,'' he says.

Firing up the R&D

Dr Whittle points out that some of Australia’s top performing digital technology sector companies are spending over 20 per cent of their revenue on R&D. He points to ASX-listed software giant Wisetech being a standout.

He says Australia's home-grown tech sector has opportunities in cyber-physical systems, supply chain integrity, data-driven government, legal informatics and smart exploration and production.

"These opportunities present pathways to success for our home-grown tech sector across different industry domains," he says.

"Yes, the platform companies are growing and accelerating at such a rate that it is causing inequalities for others that will be unsustainable in the future."

This means that Australian businesses need to become more data-driven to compete.

Dr Whittle is also enthusiastic about a technology called PaidRight.

It was developed by Data61 in collaboration with PwC, and uses advanced analytics to ensure workers are paid fairly. It can also autonomously audit the accuracy of payrolls, saving businesses time and money during times of volatility.

The technology is based on over a decade of research in legal informatics and natural language processing, he says.

With an estimated cost of $250 billion per year, compliance has become Australia's fastest growing sector, he says.

Uni Fallout

Dr Whittle is also carefully watching the impacts on Australia's universities from the pandemic fallout.

Might the career trajectory change for younger researchers – who might now think twice about heading offshore to further their post-tertiary studies?

"The pandemic has brought the greatest financial crisis that Australian universities have ever faced. In the blink of an eye, they have gone from a booming industry to one that will be severely fiscally constrained over the coming years,'' he says.

He adds this will fundamentally change the career options for young researchers. PhD graduates will find it much more difficult to secure academic positions at universities.

"On the flip side, this means that large numbers of smart minds will be looking for other opportunities, which may lead to bolstering our innovation ecosystem as these young researchers are forced to head down a more entrepreneurial pathway,'' he says.

Australia needs to also look over the horizon to ensure its economy is robust enough to withstand the next economic downturn after the current one triggered by COVID-19.

"We need to be looking not just at recovering from the current crisis but making ourselves resilient for the next one,'' Dr Whittle says.

"Next generation technologies are needed to set ourselves up now''.

Artificial intelligence

He says artificial intelligence and cyber security are good examples, and he looks at them from two perspectives.

"First, the use of AI to provide better protection against cyber attacks. Second, the flip side, is that adoption of AI brings new cyber security challenges,'' he says.

The lack of transparency about how AI actually works means it’s harder to know where cyber attacks will come from, he says.

Australia also needs to be smart and recognise that as a relatively small country it can't become a winner in every part of technology.

"Australia can compete on a global scale with digital innovation by focusing its research attention to develop scale in strategic areas where we are globally competitive,'' he says.

"As well as ensuring there is the right combination of investment by government and industry, the investments should be co-ordinated so these aren’t spread too thin as this can make it difficult to achieve scale."