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Lifestyle
NEW COGS IN WHEELS OF FABRICATION

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Cutting-edge innovators are behind a re-emergence of manufacturing as a viable proposition in Queensland once again thanks to technology and niche products Wearing a pair of virtual reality glasses, the young employee of Northgate-based UAP works on a 3D sculpture that may one day grace an office lobby in China or a public square in the Middle East.

On the factory floor outside, the finishing touches to a decorative façade of a hotel are being made after earlier being fashioned using a robotic arm. Companies like UAP are at the local vanguard of a manufacturing revolution not seen since the first Model T Ford rolled off the production line in the early 20th century.

The first industrial revolution began in Britain in the late 18th century, with the mechanisation of the textile industry with the second coming when Henry Ford mastered the moving assembly line.

But unlike previous revolutions that were fuelled by large pools of labour, the third manufacturing revolution will increasingly rely on artificial intelligence and cloud computing. Australia, which over the last three decades has lost much of its manufacturing base to cheap factories in Asia, is well placed to take advantage of a sector increasingly dominated by 3D printing, robots and web services.

Manufacturing as a percentage of Australian gross domestic product has fallen from 12.9 per cent in 1979 to 6.2 per cent currently.

Founded in the early 1990s by art school graduates Matthew and Daniel Tobin, UAP (which stands for Urban Arts Projects) now employs 180 people, and has offices in New York and Shanghai. Its main factory at Northgate, which used to house a nail manufacturer and railway engineering works, now produces public art works for projects around the globe.

Matthew Tobin says the changing nature of manufacturing means that more work can now be done in Brisbane rather than outsourced to China.

Tobin says one example of that is the ability of robots to produce precise patterns for dies and moulds that are used to cast the original sculpture or artwork.

“Previously it required a worker to produce that die or mould,” Tobin says. “Now we can basically skip a step in the process. Ten years ago we thought we needed to manufacture in China to stay competitive. Now it is no longer as cheap to manufacture in China and we can onshore work.” Australian Industry Group (AiG) Queensland head Shane Rodgers says manufacturing in Queensland is undergoing a quiet revolution driven by new technology. “Queensland’s manufacturing niche tends to be in high quality bespoke product that can’t be easily churned out in low-cost labour countries,” says Rodgers. “As we become smarter at tapping global markets, this niche will become increasingly lucrative.” UAP’s Matthew Tobin and his brother started out at a small foundry that produced bronze statues for Brisbane’s Expo 88.

When that business went broke, they purchased a small welding company that made skip bins. Increasing demand for large public art works opened doors for the Tobin brothers, who combined artistic ability with entrepreneurialism to found UAP.

Their projects include the Wintergarden facade in Brisbane, the Wahat Al Karama monument in the UAE and Suzhou Sports Centre in China.

“The size of the projects has increased over the years,” Tobin says. “When we started, we thought a $10,000 commission was a big project. Last year, we did a memorial in the Middle East worth $15 million.” He says technology will continue to transform manufacturing, especially in the area of robotics. UAP was working with the Australian Centre for Robotic Vision at QUT on developing robots that will be able to do more advanced manufacturing work.

“A robot is good at doing one thing over and over again but not good at doing the work we do in mass customisation. The idea is to make the robot ‘see’ better so they can do more detailed work.”

Queensland Manufacturing Minister Cameron Dick concedes that Australian manufacturing has been hit by competition from low wage countries. But the sector remains of vital importance to the economy.

“The manufacturing sector is still the third-largest source of full-time employment, with 86 per cent of jobs being full time positions,” Dick says. “These are fair-dinkum jobs. We should not be in a race to the bottom on wages. A country like Germany shows us that high wages and advanced manufacturing jobs can go together.” Victor Vicario, who runs Arc, Australia’s first hardware incubator, says more support is needed for local manufacturers to get their ideas off the ground. Arc is a space set up in a former Fortitude Valley pub that allows startups, inventors and SMEs to build product prototypes, pitch them to investors and market them.

“Australia has an edge in advanced manufacturing because our high labour costs are less of a barrier now given the rise of new technologies,” says Vicario, pointing to a row of 3D printers set up on what had been the public bar of the hotel. “But there are still lots of barriers, including capital, resources and knowledge. The aim of Arc is to build an eco-system for manufacturing, an area which has been neglected in the past. There has been a lot of support for software but nothing for hardware.” Manufacturing used to rely on producing millions of identical products from a factory that could be located in another country from the customer. Now the trend is towards smaller batches of customised products made closer to the customer.

Armed with nothing more than a laptop, David Inderias is one manufacturer aiming to build a business empire from a shared workspace at Arc. Inderias, chief commercial officer of Tech Print Industries, produces 3D printed spectacle frames for 15 stores in the Netherlands and has an agreement to stock them in Costco stores across Australia.

Rather than mass producing and stockpiling glasses in a factory in China, Inderias says they are made to order using 3D printers in Melbourne. This on-demand approach to manufacturing means a customer walks into an optometrist and is shown various designs on a computer.

The customer’s head is then scanned into the computer where a particular design and size can be chosen and the order sent to Melbourne for printing.

“This reduces the need for optometrists to have large stocks of frames,” he says. “I make what I need when I need it. Manufacturing is being democratised. These glasses would have previously been made in China but now can be manufactured in Australia,” he says.

Alex Moss, a former fashion model and now head of tech startup Canaria, is busy at Arc building a prototype of a wearable personal safety device for workers in the mining and construction industry.

The stylish device, which is worn as a cuff on the ear, monitors the heart beat, oxygen levels and other vital signs of workers to ascertain whether they are getting too fatigued to continue with their work. “People in the mining and gas sectors work with heavy equipment at odd hours,” Moss says. “They can be afflicted by something called cognitive fatigue, which causes two thirds of all accidents.” Moss has won a NASA prize for the device, which may now be destined to be used by astronauts working for the European Space Agency.

In 2015-16, Queensland manufacturing contributed about $9.7 billion to the state’s real output, or 6.3 per cent of gross state product. The state’s manufacturers employ 172,900 people although most of these remain in traditional sectors such as metal fabrication, food production and transport equipment.

AiG’s Rodgers says an increasing number of manufacturers were making significant investments in research and development to give their businesses an edge. “Many are making smart investments in technology and versatile capital equipment,” he says.

Third-generation plastic manufacturers Mark and Rob Trenchard, founders of Brisbane-based Hydrox Technologies, recently won a prestigious international award for their plastic mulch that is used by small crop farmers to preserve soil moisture and warmth.

Arriving in Australia from South Africa as teenagers in the 1990s, the brothers studied business at the University of Queensland before going into the family plastics business. The brothers later set out on their own, making plastic bags for the aquarium business to transport tropical fish. “We designed a round bottomed bag that did not squash the fish when they were transported,” Mark Trenchard says.

The company later moved into agricultural related products, including plastic wrap for cucumbers. Disaster struck when the 2011 floods ripped through their Sumner factory destroying machinery. Looking around for cheap machinery after the flood they chanced upon an old plastic extrusion machine.

Through trial and error and adaption of the machinery they produced a plastic mulch cover that not only used 24 per cent less plastic than other mulch, but shrank when exposed to sunlight. That not only makes it easier to lay on the ground but preserves ground warmth and moisture, improving crop yields. The company now sells 800 tonnes each year of the plastic, which in February was named one of the best new products at the World Ag Expo in California.

“We were going up against big companies like John Deere and for a little startup from Australia to win was unheard of,” Trenchard says. He says the main challenges in manufacturing in Australia were access to capital and costs.

Hydrox would have to move out of its cramped factory at Sumner if it gets the expected big orders from the US. Plastic mulch for agriculture is a $4 billion industry globally and markets such as India could be lucrative for the company in the future.

“We are doing alright for a startup but we know we will have to invest more,” Trenchard says, adding the company was talking to venture capitalists about an investment. “So far it has all been our own money.” Trenchard says a grant from the State Government’s Ignite Ideas Fund did help cover some of the costs of overseas travel.

Manufacturing Minister Dick says there is a place for government assistance to help manufacturers, pointing to his Government’s Made in Queensland, Advance Queensland and Ignite programs.

“Some people say governments need to get out of the road in order to help manufacturers, but I think we need to pave the road in providing support either financially or strategically,” Dick says. He says that despite the effects of automation, manufacturing will continue to be a big source of jobs.

FAST FACTS -— $9.7b Manufacturing contribution to Qld’s real output 6.3% Percentage of gross state product 172,900 Number of people employed in sector in Qld 16,388 Manufacturers in QldSource: Ai Group

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