

Digital thinking is the way forward for manufacturers

Caroline Tung speaks to aerospace components manufacturer Quickstep and the Innovative Manufacturing Cooperative Research Centre (IMCRC) to find out more about the importance of digitisation.

AEROSPACE components manufacturer Quickstep was founded in Perth in 2001 as a research and development (R&D) company by the Graham family. From 2001, through until 2009, the company has continuously developed its manufacturing processes.

One of those is the patented “Qure” process for carbon fibre composite parts, where the curing system (using pressurised heat transfer liquid to cure advanced composite components) has removed the need for high-pressure ovens. The Quickstep method means parts can be made in a much shorter time frame and at a lower cost.

From developing its own processes as a technology-based business, the now publicly-listed company has become a supplier to global defence customers. More than 95 per cent of its work is for export markets.

In 2018, Quickstep participated in one of the IMCRC’s industry workshops and used their business diagnostic tool, futuremap, to assess and identify Industry 4.0 innovations for the company.

Since using the tool and the futuremap report as guidance to grow the business, Quickstep executive general manager of engineering and technology, David Doral, has seen good returns.

“We have a dedicated R&D team in Victoria, in Geelong, and that’s where we’re seeing the results,” he said.

“We’ve gone through the exercise of trying to analyse success; how good are we in terms of implementing all those innovation feats or practices. The aim is to make the best of our resources.

“At the same time, we are also trying to bring the wider internal

Quickstep executive general manager of engineering and technology David Doral.



capability that we have in-house to support those efforts.”

The company became ASX-listed in 2005 to provide more equity capital, and in 2009, Quickstep signed with Northrop Grumman and Lockheed Martin Corporation to manufacture parts for the F-35 Lightning II Joint Strike Fighter aircraft.

The large-scale defence project triggered a change for the company and necessitated the move from Perth to a facility that would accommodate volume production.

With support from the New South Wales state government, Quickstep relocated to the ex-Boeing site at Bankstown, where they became a volume manufacturer of aerospace parts.

The company also has a member office in Texas, USA.

Case study: Future proofing Australian manufacturers

Since its launch in 2018, futuremap has helped inspire hundreds of Australian companies to transition into the fourth industrial revolution (Industry 4.0) and become advanced manufacturers.

When completing futuremap, businesses map the state of their company and their future aspirations against 13 key areas of industrial and advanced manufacturing competitiveness, which are broadly divided into four sections: digital, market, leadership and innovation.

IMCRC director of industrial transformation, Simon Dawson, said it was important for manufacturers to keep building on areas that are considered critical to their businesses.

Having guided a variety of

manufacturing businesses through futuremap, Dawson said many companies recognise leadership as an important driver for innovation.

“One element of futuremap focuses on leadership, so we’re acknowledging that leadership remains fundamental to driving innovation forward,” he said. “What we want manufacturers to do is reflect on their strengths and weaknesses and continue to grow leadership capability.”

Although innovating throughout the pandemic has proven a challenge, Quickstep is halfway to reaching its target of creating 30 high-skilled jobs, a goal that was set as part of the company’s futuremap.

Doral said the futuremap platform also served as a tool for Quickstep to identify hurdles.

“My hope is that the experience that we have gone through and the practical information and the practical cases that we talk about can help people find some inspiration, but also see that initiatives like this are possible,” he said.

An important strategy assisted by futuremap was that the business can identify an application, understand opportunities and the needs, so that their breakout project can potentially become a pilot.

“Our approach to this, in this case, the particular sample that we talked about is something that’s a little bit separated from our production, so allowed us to do things differently,” he said. “The idea is to find those opportunities so we can produce and send positive results before we can bear wider impact in the broader company, and in a way, rapid prototype a test, and eventually escalate.”

Doral said it was important to articulate a clear vision and keep up innovation with strategic investments during challenging

economic times – where affordable.

“COVID is making things hard, but if anything, it’s proving that making things better and what technology can do for you, and how you can make the best of it, is going to be required when moving forward,” he said. “The worst mistake you can make is forget completely about investing in innovation. Be careful, be smarter and think through options more carefully.”

Helping manufacturers plan ahead

In a recent futuremap workshop held by IMCRC, supported by the Australian Industry Group (Ai Group) and the NSW Government, Ai Group NSW head Mark Goodsell encouraged manufacturers to plan towards a future that is increasingly

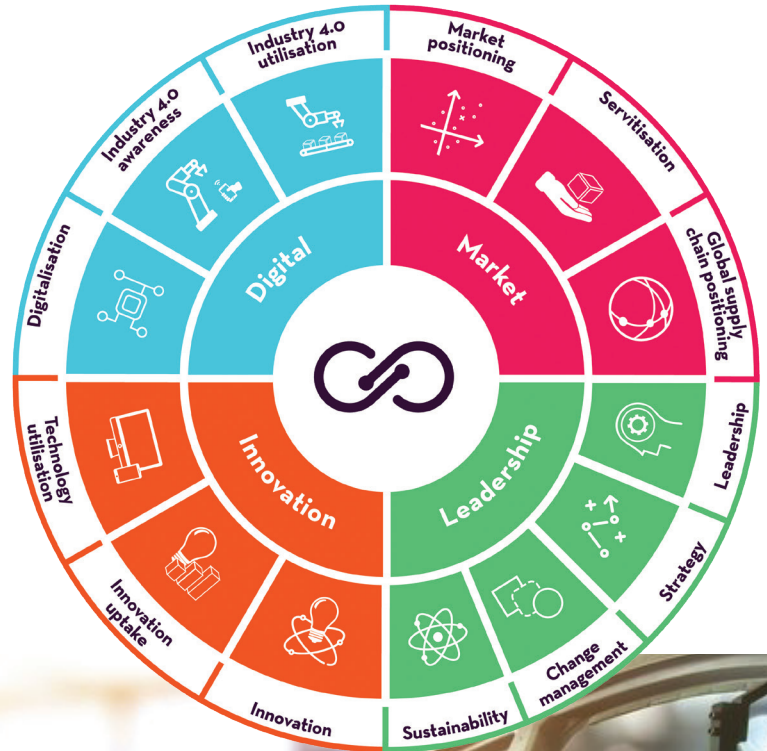
being driven by digitalisation and innovation.

“It’s very timely these workshops predate COVID,” he said. “COVID-19 has accelerated a lot of discussion about manufacturing, in particular, local manufacturing and the future of manufacturing.”

The Ai Group was actively involved in the formation and the successful application for funding for IMCRC.

“We were very conscious of the links between research institutions and industry, and that is very much the focus of IMCRC’s work,” Goodsell said. “Importantly, we built into their program, a big focus on innovation in business models, in business thinking around manufacturing, particular targeted at SMEs. futuremap is very much based on that stream of their work.”

The futuremap helps SME manufacturers map the current state of their business and future aspirations.



Decision making for how to react to market demands is important for manufacturers during COVID-19.

Issues & Insights

IMCRC has since been actively encouraging and helping manufacturers explore opportunities within the research community to foster creativity and draw strength from the country's university network.

"We know that Australia has one of the best university networks in the world. How do we bring that power to our SMEs and help them see that connection? The fact is you don't have to be big to connect with a university. IMCRC's \$200m investment portfolio has around two thirds of matched cash funding for projects coming from SMEs, proving that it is not just possible but a real opportunity for more SMEs to collaborate," Dawson said.

"For me, what's been exciting has been hearing the many

fantastic stories describing what manufacturers have done through COVID-19. The change of pace has been phenomenal."

Dawson said it is a now a question of how manufacturers keep this momentum going, looking at innovative business models, looking at their processes, and deciding how to respond and react to become a stronger manufacturer.

Although there are wide-ranging views in the current debate – whether the nation goes back to a "golden age" of almost making everything in Australia, or whether there will be a step back to the pre-COVID globalised structure for manufacturing – Goodsell

believes the last few months have changed thinking in both the community and in political

spheres about the sector's role in the economy.

"A lot of the fundamentals and the drivers predate COVID-19, so I don't think we will see a return to a 1970s type economic structure for Australia, but we will see some fundamental shifts in very important areas that will affect the future of manufacturing in this country, and indeed, globally," he said.

Goodsell said the pandemic has revealed a sense of risks that Australia had developed an industrial structure, where the country is exposed to thin supply chains, narrow supply chains, and fragile supply chains, which has brought to the fore, the need for sovereign capability.

"People in the government

were a bit alarmed at how thin our capability had become in the med-tech area, in the pharmaceutical area," he said.

An industry-led initiative towards digital thinking

Broadly, the recognition that advanced manufacturing changes the game globally and deals Australia back in – despite smaller markets and smaller capacities – the key, according to Goodsell, is to get the policy and industrial thinking within companies right.

"Government policy is one thing, but it really needs to be led by industry and the thinking that goes on within companies about what their future will look like," he said.

According to Goodsell, the trends that lie in productivity, particularly

Aerospace manufacturer Quickstep has seen good returns since implementing the futuremap.



in skills, energy costs, research, and links between industry and research institutions – all areas where Australia has not really coordinated its thinking to an optimum level – has been given a lot more attention in the policy area.

“It really comes back to how companies think, the mindset that they bring to their businesses, and the understanding they bring to knowing what the future holds in terms of opportunities and challenges,” he said.

Goodsell believes the limited opportunities for manufacturers to meet with their customers has been a driver for change.

“There’s no doubt within companies, the pandemic has accelerated thinking about digital transformation – whether it’s simply the fact that we’re doing so much interaction on digital platforms – but more fundamentally, how you keep an eye on, and how you manage supply chains, production and products,” he said.

Doral said the importance of having the right team to implement advanced technology is critical, not just from the point of view of having the right technical abilities.

“It’s the ability to innovate, to have curiosity, and to try change. That’s one of the skills or traits that we try to develop here,” he said. “We have a relatively autonomous team who are not only capable but have the inclination to innovate and to try new things.”

In the last 10 to 20 years, finding talent in the Australian market has been difficult.

“Finding talent is challenging because you need to compete with many other businesses,” Doral said. “Now, the situation is slightly different because the whole economy is slowing down. It’s something we need to constantly look for, not just the technical, hard skills, but also soft skills.”

The key to employing and retaining highly-skilled engineers during the economic downturn is to develop and sustain new processing lines.

“We’ve created a few highly

skilled jobs on the way, but we’re going to suffer a bit of a step back given the current circumstances before we can realise the full potential of that plant,” he said.

“While we focus on advanced manufacturing, there is still a very manual element, and even if we’re talking about hi-tech materials, some of those parts are sometimes very manually produced.”

Seeing the big picture

As mentioned, futuremap was launched in 2018 to help Australian manufacturers get an insight on the opportunities and challenges of digital and advanced manufacturing and act as a mirror for participants to analyse their own businesses.

Two years on, IMCRC is well on the way to achieving its objectives, according to Dawson.

“A simple measure of success is participation and we are well ahead of our initial targets. Perhaps more importantly, what we have seen is that participating organisations have catalysed their change and taken their business forward as a result of completing futuremap, a more rewarding result,” Dawson said.

futuremap asks companies to take a step back and assess their current business and then consider their relative ambitions. At the same time, the futuremap event educates and offers them some insights around what Industry 4.0 can do for them, to help enhance this ambition.

Dawson said using case studies within the session served as a demonstration of the art of the possible when it came to innovation.

“I think the success for us has been seeing the uptake of futuremap across Australia and the conversations about digital transformation that futuremap sparked within organisations,” he said.

With over 60 workshops held across Australia since launching, IMCRC has seen a strong participation rate across small-to medium-sized manufacturers.

Leadership has been identified as an important factor for innovation.



“There’s some really good aggregate data coming from that pool of manufacturers,” Dawson said. “It gives us a bit of confidence that people have been taking Industry 4.0 and the need to transition to digital and advanced manufacturing seriously.”

One of IMCRC’s latest collaborations is the Advanced Robotics for Manufacturing Hub (ARM Hub), a new not-for-profit company working with businesses in regional Queensland towards advanced manufacturing.

“Through the collaboration with the ARM Hub, we want to help organisations take action, tap into the ARM Hub’s skills and experience and kickstart their transformation journey,” Dawson said.

“We think it’s really important the country has facilities such as the ARM Hub that support manufacturing businesses locally,

where they can access equipment, take advantage of testing and exploring, and engage in research and development projects with universities such as QUT, CSIRO and others, and create pathways into the future.”

Ultimately, IMCRC hopes futuremap helps organisations reflect on their own ambitions and gets them to take the first step.

“We’re not testing organisations, but encouraging them to look at what they could be capable of, and hopefully inspire them to enter into the world of innovative manufacturing,” Dawson said.

“If through futuremap, we can increase your likelihood to go and talk to the ARM Hub about a potential project and get yourself onto that journey of exploring innovation, and how that could strengthen your organisation, then we think that has to be good for Australia.” **M**