

## Driving innovation through university collaboration - key elements for success



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**A**FTER a turbulent year in our industry, Australian manufacturers need to innovate now more than ever before. Creating a path for a thriving business and economic recovery after COVID-19 will depend on embracing the fourth industrial revolution and, crucially, purposeful and effective collaboration. At the Innovative Manufacturing CRC (IMCRC), we have reviewed and assessed hundreds of manufacturing project ideas to determine their suitability for IMCRC R&D project funding, research collaboration and commercialisation. With many businesses being clear on what they want to achieve, our focus has been on helping them understand the why and the how of their project objectives, and, most importantly, supporting them in finding the right collaboration partner.

As part of our project assessment, we reviewed their business' manufacturing merits, the research work to be conducted, the overall business model, the associated technical risks and long-term potential benefits and return on the investment. To date, we have funded more than 40 significant manufacturing research projects as part of an investment portfolio in excess of \$200million. Many of these innovative projects are already exceeding expectations and leading to much broader outcomes, largely due to the quality of the research collaboration – i.e. people working together respectfully, openly and with mutual intent and focus. As we have helped nurture these collaborations and watched them grow, we have seen patterns emerge, with six attributes in particular indicating which manufacturers are likely to have higher chances of success in collaborating with a university. These

six key attributes for success tend to be founded at the leadership level of a business, together with technical capability, maturity and an openness to collaborate.

**Key attributes that can help drive successful collaboration with universities**

**1. Project leads have the right technical skills and qualifications**

University research teams are typically engaged for their expertise and deep knowledge in a technical area such as additive manufacturing or robotics, yet their understanding of the technology or science alone is not a guarantee for success. There also needs to be a focus on the research findings and on translating those into a business context. A key element we look for within a research project is that those who oversee the project also understand

the technical and contextual aspects of the research. Ideally, project leads will be industry experts who have the right skills and knowledge to intersect and challenge the university's research approach throughout the lifecycle of the project.

**2. The business leadership has a foundation in STEM**

IMCRC's most innovative and best performing projects are supported by business leaders who have postgraduate science and engineering degrees, including at a PhD or Masters level, and display high levels of both scientific and business acumen. This level of understanding enables informed decisions to see the work being executed as planned and agreed. These leaders also ensure that the research and business objectives are aligned, encouraging a swift consolidation and successful

translation of research outcomes into the business' operations and broader ecosystem.

For companies looking to innovate and leverage cutting edge or complex research and technology, technical skills and qualifications should be an important consideration of the hiring policy and workforce development of the leadership team.

**3. The business is producing revenue to support the project**

How an industry partner raises its cash investment for a project – while important – is secondary to IMCRC's approval process. However, we have noticed projects in which companies strategically and routinely invest a proportion of their operational revenue, research and development (R&D) are more likely to succeed.

Businesses that re-invest cash and other resources into innovation and research tend to be more established in terms of service offerings, financial structure and business operation. In general, they are more ambitious, outcome oriented and have a clear path of project integration into the business, even if the research work is not in an area aligned to its legacy operation.

Interestingly, hundreds of manufacturing SMEs that participated in futuremap, our business diagnostic and industrial transformation platform, also indicated that meaningful investment in R&D enhances business capability, maturity and ambition.

**4. The future of the business does not depend on the research outcome**

This may seem counter intuitive. If a business' future is in fact dependent on the success of research, you may expect to see a high focus on the project outcomes and a desire to deliver those successfully in the shortest possible time. However, this pace can lead to a number of complicating factors as university research is generally of a higher risk and involves more exploratory tasks that cannot be solved in short timeframes.

As highlighted above, businesses that have established revenue streams

and existing operations are less likely to depend on the research outcomes for their future prosperity.

They approach the exploratory phases of a project with flexibility and are able to pivot if required. In the case of manufacturing research related to current their operations, these businesses know how and who will integrate the outcomes into the organisation and be responsible for converting development work into stable and repeatable production.

That said, we have largely supported transformational projects where businesses are strategically committed to the collaborative investment – even in times of COVID.

**5. The business has a proven working relationship with universities**

IMCRC projects can represent a significant investment for a business, with mainstream projects averaging close to \$1million per matched cash investment. So, it can be beneficial if the industry partner has 'tested the university collaboration water'.

This may be through working with universities via smaller grants or contracted work, which can provide an idea of what to expect when establishing agreements, conducting the research work, communications and agreeing on deliverables with the university.

From the outset of a project, IMCRC works closely with businesses to oversee project management, providing significant structure to

the various processes, including the ownership of intellectual property. We find this ensures a more streamlined and smoother project experience, particularly when a relationship between the university and business has already been established.

**6. The business has innovated before (and has experienced both success and failure)**

Businesses who embrace innovation or have experience in managing R&D initiatives aligned to their needs tend to be more comfortable at working through the development and innovation process with universities.

Previous innovation success (and failure) is usually accompanied by a structured collaboration approach. This results in a focus on deliverables and end goals, as well as a commercialisation plan and knowledge of the resources needed to bring the outcome or product to market.

Although at IMCRC we don't believe every business has to meet all of these attributes to establish a successful university partnership. When we look holistically at the patterns, however, our most innovative research projects have had, or have implemented, at least three or more of the above.

We believe these businesses are set up for successful collaboration because they are more likely to meet key project milestones and outcomes,

thanks to a dynamic leadership team that is flexible and open to pivoting during the course of the development, and remains respectful to the different skills, capabilities and approaches that each party brings to the project.

Collaborating with universities can be as challenging as it is rewarding. Genuinely innovative businesses know that innovation and failure go hand in hand, because they are working with the unknown on a journey of exploration. Thus, it is important that business leaders consider how they best prepare for the journey, including closing any potential gaps around collaborating, technical know-how and the ability to invest for the long term.

Of note is that the size of the business is not a critical factor – more than 80% of our projects are with small or medium Australian owned businesses. This proves it is indeed possible for SMEs to successfully collaborate with Australian universities and the CSIRO.

At IMCRC we believe the future of manufacturing in Australia depends on this kind of innovation and collaboration. We are determined to help forge as many partnerships of value as we can, and we encourage the businesses whose research projects we co-fund to set themselves up for success by thinking through how they can best partner, and what core skills, capabilities and resources are needed to deliver success and real-world outcomes. 



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