Comment

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How Australia can effectively commercialise collaborative research and innovation

THE future of many of Australia's industry sectors depends on innovation derived from the successful development and commercialisation of technology. A significant opportunity exists for industry to accelerate this is through collaboration with our world class universities and other scientific research organisations.

As a Cooperative Research Centre that connects industry with Australia's research sector, IMCRC's experience has been that whilst Australian universities comprise many excellent examples of industry research collaborations, only a small proportion of Australian industry knows and takes advantage of this.

Such examples include Urban Art Projects' collaboration with Queensland University of Technology (QUT) and Royal Melbourne Institute of Technology (RMIT University) to use innovative robotic vision systems and software user-interfaces to reduce the integration time between design and custom manufacturing. This has already led to significant onshoring of manufacturing from China into Australia as well as creating new business opportunities. Another is Corin Australia's collaboration with the University of South Australia to manufacture orthopaedic implants with novel surfaces in order to minimise risk of post-operative infection.

The challenge is to remove barriers to participation and increase the number and frequency of the examples of industry collaborations with research organisations.

In April this year it was a privilege to contribute IMCRC's submission to the Commonwealth Government's University Research Commercialisation Consultation Paper. In response to the Government's request for views on the development of a potential model for university research commercialisation, we outlined several recommendations for industry and university collaborations based on the learnings we have gained, and success we have achieved, at IMCRC, building on what has now been more than 230 CRCs since the CRC Program was established in 1991.

Fostering commercial outcomes through stage-gated research

Critical to the success of IMCRC's research and development (R&D) projects with Australian universities has been a well-considered program that, by design, ensures all parties – the industry lead, university and any other supporting collaborators - are aligned at each step of a project before proceeding onto the next.

With project milestones described in terms of manufacturing or technology readiness levels (MRLs/TRLs), as well as quarterly and annual reviews, we have established an R&D model that creates meaningful and transparent structures that are agreed to in advance and build trust and accountability among university and industry collaborators.

One of the key benefits of stage-gated research is that it allows industry to decide whether they will continue investing in a project at each stage gate, enabling only those projects with innovation and commercial potential to advance.

The successful development and commercialisation of technology will play an important role in the future of Australia's industry sectors.

Understanding incentives to drive participation

Increasing demand for transformative research outcomes will require incentivising industry to put forward ideas for scientific collaborations with universities. Universities must also look beyond purely scholarly objectives and towards partnering with industry in order to build capacity of Australia's research commercialisation ecosystem to generate more innovation.

Motivating factors for industry include access to relevant research capabilities (including trained professionals with skills to solve their problems) and infrastructure (which allows industry to de-risk innovation from a cost and operations perspective when compared to funding and completing the research in-house). Universities might look to participate in applied research that is recognised by government performance metrics, translates into social and economic impact, leads to staff development and advancement and results in academic outcomes such as scientific publications and research student graduates.

Further, in IMCRC's view, the commercialisation of research outcomes arising from collaboration with industry cannot rely heavily on government funding. Rather, this funding should be used to co-fund with industry to de-risk and catalyse investment in transformative R&D collaborations.

Universities should be incentivised to place more value on the income that comes with conducting the research and, in turn, focus on collaborations that create intellectual property (IP) that can be commercialised by industry and/or the partner university.

IMCRC's model provides a precedent for this; its commercially led approach looks for IP agreements favouring those who are funding the work and best able to commercially utilise the innovation within specific fields of use, without impeding further research and education outcomes central to the university's operational models. At the same time, any commercial returns can serve to fund new research and lead to the development of personnel, workforce pollination and more participation. Importantly, IMCRC owns none of the IP created through its projects.

Encouraging commercial exposure through cross pollination

In general, we encourage university researchers to gain commercial exposure by working hand in glove with their industry counterparts and being required to develop and agree to commercial objectives. Our partnership with APR.Intern is an example of the ways manufacturers can connect and collaborate with researchers, with IMCRC providing eligible SMEs and larger businesses with a project subsidy of $7,500 to help drive advancement by providing manufacturers with access to PhD-level research talent.

Similarly, there is a need to increase skills of industry to maximise the success of collaborations with universities. Since IMCRC's inception in 2016, we have reviewed and assessed hundreds of manufacturing project ideas to determine their suitability for project funding, research collaboration and commercialisation. Over the years patterns have emerged, indicating that business leaders with industry experience and an appreciation for research are most likely to succeed. In our experience, finding a combination of willing, ambitious and open-minded business leaders who can work with equally willing universities can lead to excellent outcomes.

Learning from others' experience and success

With close to $220 million in manufacturing research investment catalysed so far, IMCRC's industry-led R&D model has been effective in establishing successful collaborations between Australian research organisations and manufacturing businesses, in particular SMEs.

In IMCRC's view, Australia would benefit from a national, industry-led R&D framework that allows for multiple organisations, across the manufacturing innovation ecosystem, to work towards a common mission and set of challenges.

The industry-led CRC model could be scaled up nationally through the creation of a national network of technology, innovation, and R&D collaboration hubs with large, globally relevant, companies and SMEs working alongside research organisations. In manufacturing, there are precedents for this including the Manufacturing USA Institutes, the UK's High Value Manufacturing Catapult Centres and Germany's Fraunhofer Institutes to name a few. All have spearheaded long-term national industrial and manufacturing strategies, and incentivised significant R&D and investment well beyond the initial government support.

Such an overarching R&D framework would seek to customise and scale up established models that have proven successful, reduce duplication of effort and increase efficiency amongst universities and other scientific research organisations.

The Commonwealth Government should be commended on its prioritisation of the commercialisation of university research outcomes in Australia. We are fortunate to have gained rich learnings from IMCRC and others' success that can be applied nationally for the benefit of both Australian industry and research organisations. M