



Queensland University of Technology

Response to the University Research Commercialisation Consultation Paper

Queensland University of Technology (QUT) strenuously maintains that Australia needs a comprehensive University Research Commercialisation (URC) system that recognises and builds on fundamental discovery as the basis for innovative applied research outcomes. It will be important that any new measures supplement, rather than supplant, support for the rest of the innovation ecosystem. Specific URC schemes must complement existing programs and bodies, i.e., Australian Research Council (ARC), National Health and Medical Research Council (NHMRC) and Cooperative Research Centre (CRC) programs. To replicate the success of Backing Australia's Ability, an Australian URC Scheme must enjoy similar stable, long-term, bipartisan support for higher risk, higher reward research, leveraging existing strengths and achievements.

1. Mission-driven research

a) Are Missions the appropriate priority-setting mechanism? Should they be accompanied by smaller, targeted Challenges?

Missions may be an appropriate mechanism to address priorities provided they are grounded in an appropriate base of reliable, sustainable funding for long-term research capability. Top-down mechanisms rarely succeed unless they encourage the best researchers, working alongside stakeholders, to define and address problems within the context of an appropriate level of challenging research questions.

QUT supports a commercialisation model that builds on existing collaborations and that incentivises and supports researchers and industry to form long-term partnerships affording the time to take risks to address current and future national and international challenges.

Mission-driven research models are most effective when they achieve a balance between addressing specific societal challenges (e.g., future mobility, material challenges, circular economy or clean energy) and developing platform-based technologies applicable to multiple industry sectors (i.e., artificial intelligence and big data). To succeed, Missions need to be ambitious and proportionately enabled by significant financial and time commitment.

It is perhaps counterintuitive, but experience shows that in general the shorter the time-frame and the greater the management overlay imposed on a project, the less risk will be taken. This is the recipe for worthy incrementalism, not breakthrough innovation. The success of truly ground-breaking programs lies in the design of the program to ensure the selection process aligns to the objective of the scheme.

Using smaller challenges could be akin to trying to de-risk the construction of a multi-storey structure by building a floor at a time and pausing for review before proceeding with the next floor. Instead, QUT advocates reducing the risk by selecting the right architect, design and construction firm at the outset that are fit for the purpose.

Investment in the careful design and selection front-ends some of the labour and expense but pays off handsomely in confidence, risk mitigation and the quality of the outcome.

b) What criteria should be used to select Missions?

Missions should be:

- Determined in a process that is transparent to all stakeholders.
- Informed by data and robust information on Australian research capability to address the mission.
- Sufficiently broad to ensure they are ambitious and innovative (again, perhaps counter-intuitively, the more narrowly these are defined, the less de facto scope exists for innovation and opportunities).
- Guided by socio-political, economic and cultural strategies at national, state, and local levels with reference to global imperatives, international standing, national wellbeing, and advancement of public and private sectors.

c) Is Australian research sufficiently linked to demand? Where are the opportunities to link supply to demand?

d) How can university researchers identify this demand?

The extent to which Australian research is linked to demand varies between and within institutions, disciplines, and industry sectors. To increase the linkages between researchers and industry there needs to be greater awareness in both directions. While researchers may lack an awareness of the needs and concerns of industry and private investors, including what they might find attractive in university-based research; the corollary is also true, with an uneven apprehension among industry and investors of what university researchers do and how their work might benefit their businesses. The skillsets required to be either a world-class university researcher or a leading industry innovator or investor do not inherently overlap with the skillset required to work the interface between these worlds.

Universities that do engage well with industry have achieved that in part by investing in professional staff who serve to link academics and potential commercial partners, provide project management for the partnership activities and/or create commercialisation pathways. These dedicated commercialisation staff support commercialisation and industry engagement and contribute a complementary skillset to Australia's existing research excellence. They provide critical support to university-industry linkages and build capacity among academics. Such investment has proven successful and should continue with dedicated, sustainable funding.

2. Stage-gated Scheme design

a) Is a stage-gated model suited for the purpose of the Scheme?

It is not clear whether a stage-gated model is suitable until the purpose of the scheme is better defined, and in any case we would caution against such an approach, particularly if its design rationale is to de-risk the investment. Such de-risking could be achieved with less likelihood of creating a damping effect on innovation by adding additional criteria such as a previous (verifiable) successful partnership, or beneficial outcomes from another collaborative scheme (ARC Linkage, Industrial Transformation, CRC, RDCs).

b) What is the appetite from industry and private investors to participate in such a Scheme?

The appetite will vary but the best predictor of future investment will be a previous successful partnership.

c) How should any stage-gating process be defined to ensure any additional incentive is maximised?

As noted above we don't necessarily agree with the premise in respect to stage-gating, but at the very least the expectations of the partnership and evidence of effectiveness of IP and other arrangements should be a starting point.

Effective funding programs leave an element of freedom in the research going forward: adaptability and flexibility in milestone adjustment between partners is an important element.

d) How should projects be selected?

The aims of the scheme need to be absolutely clear at the outset and investment in the design at the front end is critical; selection should then follow from that early clarity of definition. To the extent to which this might involve stages there must be separation between the selection of the problem or mission areas (e.g. using broad consultation across stakeholders) and the projects designed to address these. Attempts to combine these stages and stakeholders will produce only average results.

e) How should the success of projects be measured?

QUT cautions against using the WIPO Global Innovation Index as a measure of national innovation, as the framework is informed by data not fit for this purpose. Instead, project success should be judged using HERDC data, international collaboration, and other existing tracking R&D metrics.

3. Incentives for participation

Incentive shifts should be approached with caution – this is the move that most risks introducing undesirable unintended consequences. Equally, the identification and removal or mitigation of existing disincentives will be at least as effective as the introduction of novel incentives.

While some areas of research lend themselves readily to applied impact (e.g., drug development), there are other forms of impact (both scholarly and applied) that are important to recognise and incentivise. In psychology, for instance, this could include generating foundational knowledge that may not be directly commercialised, to applied knowledge that may have a value beyond commercialisation (i.e. improving mental health services for diverse Australians). Incentivising university commercialisation is important to improve overall commercialisation outcomes, but this should not come at the expense of incentivising the many other ways university-generated knowledge improves society.

The incorporation of appropriate and accurate recognition of activity associated with commercialisation in workload and performance metrics is critical to motivating this activity in the context of a sustainable and productive academic worklife. Research commercialisation should be allowed for, supported, measured and rewarded.

a) What broader incentives influencing the business and university sectors may influence their participation in a Scheme?

b) What would motivate businesses, universities or private investors to invest in this Scheme?

Long-term funding would enable universities to develop explicit career pathways for industry-engaged researchers that enable, encourage and reward both collaboration and translational outcomes. QUT academics' report that previous stage-gated project schemes have offered a funding amount too low to support initial stages, which has impeded sufficient progress and precluded tangible outcomes from these early stages.

Incentives must be sufficiently strong to affect both the individual university researcher and the university sector as a whole. This is not a trivial task given that in 2018 the university sector expended more discretionary income (\$6.2 billion, principally from fee revenues) supporting research than they obtained from all external sources combined. Error! Bookmark not defined.

On the demand side, by far the most effective incentive for industry would be the introduction into the R&D tax incentive scheme of the premium rate for collaboration with public universities and publicly funded research agencies, as recommended by Bill Ferris, Alan Finkel and John Fraser when reporting on their review of the scheme commissioned in 2016 by the current federal government.¹

c) Aside from co-funding, should universities or businesses have any additional requirements for participation?

Fundamentally, universities and businesses need to share a clear and solid understanding of what is required to commercialise innovation and to be able to clearly articulate the risks involved in developing a commercialisation pathway to overcome the “valley of death” between initial capital contribution and revenue generation.

Standard, transparent, accessible and fair collaborative agreements are also vital, especially in relation to IP ownership and usage.

4. Industry-university collaboration

a) How may the Scheme incentivise or support better industry-university collaboration?

Internationally, there is a long history of successful schemes supporting industry-university collaboration. The UK has benefited from third stream funding since 1999 through deliberate calibration of Higher Education Innovation Funding (HEIF).² New Zealand’s funding for the Commercialisation Partner Network (CPN), which acts like a “third stream” funder to develop the skills and capabilities of the people that negotiate and execute the commercial transactions, is an example of best practice that Australia would do well to emulate.

Australian universities would benefit from an initiative in the vein of the UK’s Knowledge Exchange Concordat.³ Signed by 126 UK Higher Education providers, the Concordat establishes eight high-level principles that facilitate effective knowledge exchange and subsequent economic, social and cultural growth.

Another compelling model is the German Research Council’s transfer projects, which kick in after the conclusion of a Discovery type grant: thus supporting fundamental research first, then the application of that research in two separate, staged grants.⁴

Financial incentives from government agencies of sufficient scale to achieve realistic effect will greatly improve positive outcomes of commercialisation initiatives.

¹Ferris, B., Finkel, A. and Fraser, J. Review of the R&D Tax Incentive. Commonwealth Department of Industry, Innovation and Science, April 2016. https://consult.industry.gov.au/r-d-tax/r-d-tax-incentive-review/supporting_documents/Researchanddevelopmenttaxincentivereviewreport.pdf

² *University knowledge exchange at the heart of the Industrial Strategy*. Research England. <https://webarchive.nationalarchives.gov.uk/20200923114537/https://re.ukri.org/news-opinions-events/news/university-knowledge-exchange-at-the-heart-of-the-industrial-strategy/>.

³ <https://www.keconcordat.ac.uk/>

⁴ https://www.dfg.de/en/research_funding/principles_dfg_funding/knowledge_transfer/index.html

Schemes that incentivise industry-university collaboration must explicitly encourage and enable researcher movement in both directions between the university and industry sectors – empowering the hybrid careers of serial innovators.

b) Would an Industry PhD program help improve collaboration outcomes?

The Australian research ecosystem already features strong programs supporting industry-linked PhDs. The CRC program and the ARC Linkage Scheme have both supported industry-orientated research to very positive effect for decades. The Graduate Outcomes Survey shows that currently half of Australia's HDR graduates are employed outside on the university sector and more than half engage with industry during candidature.⁵ The ARC Industrial Training Scheme evolved from an approach where the ARC supported individual or small numbers of PhDs in collaboration with industry to one that provided the infrastructure needed for success. Further investment built upon these robust successful extant programs would benefit the university research commercialisation agenda.

Structural limitations include overly specific PhD topics (inhibiting recruitment of appropriate candidates) and timeframe mismatch between industry and universities.

c) Are there skills gaps in academia or business that inhibit collaboration or commercialisation?

As discussed, existing skills and knowledge gaps in academia and business with regard to commercialisation are being filled through ongoing investment in commercialisation and engagement personnel who seek to both improve industry engagement capacity and intermediate between industry and academics. This needs to be dramatically scaled up to achieve consistent and sustainable outcomes.

d) How can we increase collaboration between university researchers and industry, particularly amongst SMEs?

Physical centres located neither in industry nor university could provide a collaborative “third space” – physically separated from the day-to-day priorities of the ongoing business and providing time, resources and an environment to focus on the mission. The UK Newton Institute⁶ is one such example. These physical resources and infrastructure would be especially useful for SMEs including start-ups and may also be an important component to enabling researchers to transition their careers more readily between university and industry.

The UK Catapult Network⁷ provides businesses with access to their expertise and facilities, enabling them to test, demonstrate and improve their ideas. By fostering collaborations between industry, government, research organisations, academia and many others, Catapults are helping to create the best environments for innovation. Catapults work with small, medium and large businesses, to understand the challenges they face and support them in the development of solutions that will help improve their business performance.

In addition, increasing collaboration depends on:

- Ensuring that appropriate and realistic resources (personnel, funding, technical support) are provided at suitable points throughout the commercialisation process;
- Clarity and transparency for all parties involved;

⁵ QILT. (2021). *2020 Graduate Outcomes Survey*, 30. <https://www.qilt.edu.au/qilt-surveys/graduate-employment>.

⁶ <https://www.newton.ac.uk>

⁷ <https://catapult.org.uk/>

- Realistic and mutually understood expectations of the process; and
- Suitable workload allocations.

5. Governance arrangements

a) What stakeholders should be involved, and where, in the governance arrangement?

It is not entirely clear as to whether the Department is asking about governance of the Scheme as a whole, or of the individual projects or programs, but either way it should be designed to ensure the selection criteria and selection decisions are informed by international-best practice, and that selection decisions are made by professionals with an understanding of research in universities and in the relevant disciplines, and not subject to the influence of interest groups and political interference. To this end a statutory agency or board would be best placed to oversee the governance.

b) What type of Governance arrangement is best suited for the Scheme?

The Scheme should avoid the tendency and cost involved in establishing independent entities for each project, instead leveraging the capacity of institutions or an industry partner to lead and take responsibility for management and reporting on projects.

c) How should projects be selected and managed?

As noted above this depends on scale and the selection criteria but there needs to be independent and expert advice involved in the selection, without political interference, capture by short-term agendas or sectional interests, or undue regard to expediency rather than genuine discovery and application.

d) How can the Governance arrangement minimise administrative burden whilst also minimising risk?

This can be achieved through the use of existing accountability measures, structures and administrative processes already in place for universities and developing a scheme that leverages existing activities and partnerships.