

The Australian Technical Industrial University Network (ATIUN)

An “idea” whose time has come

Chris Moran (chris.moran@curtin.edu.au)
Deputy Vice-Chancellor, Research
Curtin University

11 April 2023

1	Summary	1
2	Background – Australian Universities.....	2
3	Introducing the ATIUN (The Australian Technical and Industrial University Network)	3
4	Network Development	6
5	The Australian National Technology and Industry University (ANTIU).....	6

1 Summary

The Accord provides an opportunity to reconsider Australian universities as an ecosystem within which different groupings of universities perform different functions by emphasising and evolving their strengths to meet national needs.

This submission proposes that conventional universities are needed to maintain the underlying stability of the Australian university system. Some gigantic conventional universities are an acceptable part of that support. Regional universities are needed to provide opportunities for regional and remote people, to represent the Australian rural culture and provide opportunities for those who do not see their future in metropolitan environments.

This stability and regional opportunity lens provides an opening to envisage and realise a new differentiated force in the Australian university sector. This new force can be thought of as an elaboration and mobilisation of the existing Australian Technology Network. However, it can also be significantly more than that. This submission outlines some features of what this could be and presents a summary development trajectory for it. The Australian Technology and Industrial University Network should be tasked and resourced to fulfil specific and pressing needs for Australia whilst the conventional and regional universities maintain underlying stability and contribute to the pressing needs as and when their strategies and resourcing permits.

This is not a vision of a separated sector but rather an ecosystem where overlaps are accepted as necessary for proper functioning, but intentional and supported differentiation is a must for overall system resilience and timely and effective delivery of national priorities.

2 Background – Australian Universities

Conventional and gigantic universities

Australian Higher Education needs to be anchored by conventional universities into the foreseeable future. These universities will evolve gradually over the next 10, 20 and 30 years. Australia has ~8-10 of these universities. This is probably sufficient. Conventional universities have demonstrated clearly by their massive growth and development of financial resilience under extreme pressure, that they need no further elaborated government support. Incremental changes to policies and programs suit the gradual evolution of conventional universities. There are 5 universities that have reached a scale not likely imagined 15 years ago. In industry, this rate of growth has been coined gigantism and has reached physical limits in some cases, e.g., some mines and their associated machinery have become so large it is not physically possible to put more trucks on the roads and thus extraction rates are limited by gigantism – diseconomies of scale have arrived. Without specific policy or funding intervention there appears little reason for Australia's 5 gigantic universities to halt their growth. There is essentially nothing to break the virtuous cycle of increasing international student numbers to increase research strength to increase international student numbers. South Australia and possibly Western Australia are looking carefully at mergers with an envious eye on the perceived advantages of university gigantism.

Regional and Rural universities

Australian Higher Education needs universities embedded into their local communities in rural and remote locations. These universities need to develop sustainable business models that balance online, offshore and local focus. They will need varying government support over time because local rural and remote communities are unable to sustain them through the volatilities that define Australian rural and remote communities.

Indeterminate universities

Australia has a number of universities that fall into a class that is difficult to define other than in terms of resembling conventional universities but without their scale or consequent resilience. Their future should be closely examined under the Accord. Either they should provide models for significant increases in their intake and successful graduation of less-privileged students or merge with other universities to gain the scale needed for resilience.

Private universities

Australia is sufficiently large to sustain a small number of private universities. The market will determine their form at any time over the 10-, 20- and 30-year time horizon. Currently Bon and Torrens appear to have sustainable business models). Private universities should not require government assistance.

Our missing indigenous university

Australia has no indigenous university. This is a gap in our system. The Accord is an opportunity to consider how (not if) such a university (likely a network) should be initiated

and sustained. Its 10-, 20- and 30-year future is perhaps the most exciting opportunity for creativity, imagination and breakthrough under the Accord.

Technical and Translation Universities

The group of universities that have thrived as a result of previous policy changes of the potential magnitude of the Accord, are the technical and translation universities. The most evident examples are the members of the Australian Technology Network (ATN). These universities have grown strong over the last 15 or so years. They have found a differentiated role in the ecosystem. They are balancing and evolving the conventional student needs and marginalised access to fundamental research funding via ARC and NHMRC (longitudinal analysis suggests that the GO8 dominance will unlikely change), by establishing high quality industry partnerships and developing an experience for students that differs from the conventional universities. The future development of these universities is the subject of this submission.

3 Introducing the ATIUN (The Australian Technical and Industrial University Network)

In recent years, the Australian community, industry leadership and politicians have called with increasing volume for greater interaction between universities and the Australian economy, particularly companies. All Australian universities have responded to these calls to a greater or lesser degree. Conventional universities have responded but struggle with the challenge that the culture change associated with the emerging opportunity only marginally aligns with existing culture, university strategies and overwhelming success in ARC and NHMRC. Consequently, while there are examples of good practices and partnerships, this comes with an uneasy tension and potential loss of identity and effectiveness of the conventional universities. However, a group of universities exist that have embraced the call. I argue that one can envision how they can develop rapidly and could be ready to take significant forward and further differentiating steps over the next 10-, 20- and 30-years.

Currently, some of the technical universities cluster in a formal group - The Australian Technology Network (ATN). The others operate unaligned.

Under the Accord the opportunity exists to incentivise these universities to align to an overarching vision and mature processes and initiatives in a new differentiated Australian Higher Education System. The Australian Technical Industrial University Network (ATIUN) is one obvious evolution of ATN but with a far stronger intent and commitment to capitalise on synergies and realise opportunities.

The current separate or more-or-less loosely connected technical industrial universities are: The original ATN (Curtin University, Royal Melbourne Institute of Technology (RMIT), University of Technology Sydney (UTS), Queensland University of Technology (QUT) and University of South Australia (UniSA)), Newcastle, Deakin, Swinburne.

There are very significant advantages to a formalise network that a loose arrangement fails to realise. These opportunities include (but are not limited to):

- Strategic planning of workforce to optimise between local geographic opportunities and network-wide synergies.
- Sharing internal team capabilities to provide opportunities across the network.
- Incentive for mobility of students across all campuses between a wide range of strategically organised, planned and delivered courses.
- Sharing on company partnerships and multi-party collaborations to provide critical mass and rapid multi-market deployments and the formal Agreements and contracts that support them.
- Development of off-shore scale through joint marketing and combinations of complementary courses and research supervision opportunities.
- A significantly increased internal market purchasing potential for new products, combined with a massive market reach for scale -up of their commercialisation.

The ATIUN will have a seamless interface to companies. The more industry focussed the academics are the more involved and embedded in industry they will be. I envisage that there will be a non-trivial magnitude of a cohort who work almost entirely in companies and rarely visit campuses. These people will provide new at-scale opportunities for companies to involve multiple types of students in their businesses without compromising their business outcomes. Indeed, they will augment the business outcomes and business growth. These companies will define a *new era in Australian companies and our economy* because they will be driven, led and supported by a workforce that has been incrementally involved in the innovation of the companies.

This will result in (require) development of a large national cohort of “Industrial Academics” where industry activity is combined seamlessly with Teaching (Teaching and Industrial Academics), Research (Industrial Research Academics) and Industrial Focused academics. Through these new categories, whole new pathways are opened up for students. The ATIUN will draw in students looking for a very different experience that leads to industry careers by design.

The ATIUN should not only focus on incumbent companies. There is a real opportunity to become an engine room of entrepreneurship and formation of new companies. The deal flow scaling that would come from a more intentional and committed network would provide a magnet for capital. The network itself would provide an immense initial market for new companies to test first products. This will accelerate the nascent capacity of technology campuses to become a network of productization laboratories to rival any in the world – because of scale and intent. No single university can reach this level of entrepreneurial opportunity. Students will be attracted to the ATIUN for the very reason that they will be encouraged to create businesses from day 1 of their learning experiences.

The potential synergies between existing companies and new enterprises is what is needed in Australia to meet the pressing needs of sovereign capability being sought with urgency by the Australian defence forces and their supporting research and policy branches. The ATIUN should be resourced to accelerate Australia’s response to this need and to focus on it as a main component of activities. Their success should, in significant measure, be assessed against their delivery of sovereign capability in the economy.

Undergraduate research is being increasingly practiced globally. However, this is mostly an add-on option to the mainstream conventional student experiences which remain dominated by information loading and learning assessed by information retrieval. Two important linked forces exist that require a response from universities.

1. The first is Artificial Intelligence. The relatively recent arrival of large language models is being treated as an unexpected revolution. It should have been expected and universities should have been ready to capitalise upon its arrival. Search engines were adapted within weeks of the purchase of the capability as a contrasting example to our relative somnolence.
2. The second force is corporatisation of the global knowledge base. Google and a small number of other technology companies (and so-named publishers) have captured more-or-less everything that has been published and hold society to ransom to secure its release piece-by-piece. Meanwhile, these companies have the opportunity to combine AI and this knowledge base for their own private benefit. The world's knowledge is currently held hostage.

It is debated whether these are existential threats to universities or not. However, this argument is a distraction. Whether it is existential or not is irrelevant to the need to respond. I argue that the conventional universities should be supported to protect and evolve our current pedagogies to ensure society maintain the ability to transition to a different future without further (potentially catastrophic) loss of our human intellectual capital. However, there is an opportunity, if not a need, to create a capability in our university ecosystem to mobilise and respond to these two forces in a different and urgent manner. The ATIUN should rapidly develop and widely apply "discovery as pedagogy". Those students and workers who wish to participate can join a system wherein discovery rather than information loading is their learning paradigm. Research and discovery pedagogy has to explode from the confines of university boundaries and sit seamlessly across (and inside) companies and universities. The ATIUN should develop this as its dominant pedagogy and extend the learning environment into companies in an organised, well-ordered, and evaluable manner.

The clear starting point is the Higher Degree Research pathway, which is already exploring this interface with great success. The PhD degree, in particular, will require modifications to ensure that the advancement of knowledge assessment can be adapted to meet the new working paradigm. This is likely to involve more work in place solving "halfway to the horizon" challenges and opportunities for companies in a project-by-project approach as opposed to the traditional deep focussed dive of the PhD. Many PhD's today are operating at this edge without the redefinition thinking to support their success. The MPhil (Master of Research) needs to be emphasised and grown to develop a greater respect for the capabilities of those who undertake it in terms of their potential to transform companies. The traditional view of many people in companies that research degrees represent a focus on smaller and smaller matters of less and less relevance to companies needs to be changed.

A new leading role for the humanities is envisaged. The key to changing our industrial systems and solving the global and regional challenges posed by human development is to comprehend that change will only occur at the rates needed by taking an approach that

comprehends the human systems and institutions and their dynamic and evolving nature. Consequently, as the ATIUN matures it will become increasingly successful as it learns how to be led by humanities people rather than led by the possibilities for technological innovations.

4 Network Development

An overview schematic of a potential development pathway for the ATIUN over the Accord timeframes of 10, 20 and 30 years is provided below (Figure 1). This graphic is provided as a quick scan of the features to complement the text above and avoid this submission turning into a book.

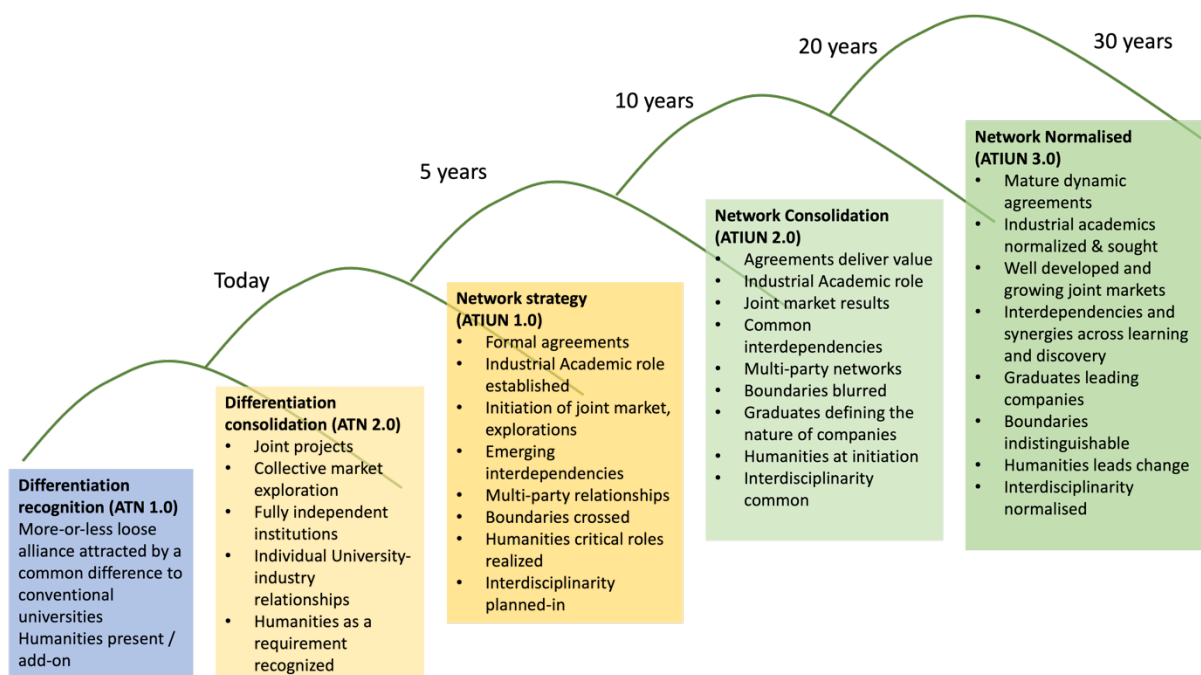


Figure 1. The development of the Australian Technological and Industrial University Network (ATIUN).

5 The Australian National Technology and Industry University (ANTIU)

It is a simple mental step to shift thinking from a university network to a university. If a network was able to function and gain the synergies on offer there would be little reason to propose amalgamation. It is a very challenging proposition for leadership of existing independent universities to agree to disappear. However, whilst it may seem inordinately long, a 15 to 20-year transition will be less threatening and could provide the basis for a new way to think about merging for the greater national good.