Response to 'The Digital Economy: Opening up the Conversation'

The Pearcey Institute (PI) is pleased to make a submission in response to the Digital Economy Consultation Paper – 'The Digital Economy: Opening up the Conversation.' The PI submission is structured as follows. We begin with the policy context and a suggestion for a way forward, and a discussion of where the digital economy is key – healthcare, mining and social sectors.

We are not addressing all of the questions that have been raised in the consultation paper, choosing to focus on observations of the digital economy ecosystem in Australia and constructive steps on improving it.

Creating a Shared Vision for Australia

The vision of the Pearcey Institute (https://pearcey.org.au/pearcey-institute) is to create 'A thriving Australia empowered by technology innovation and entrepreneurship.' Its mission is to 'Create, facilitate, foster and sustain an innovative, entrepreneurial, fair and productive Australia through research, policy advice and active collaboration.' Thus, PI supports the Government in its policy to increase uptake of technology and expand the Digital Economy.

Just as we link technology and innovation, the Digital Economy strategy cannot be seen in isolation. For example, it should be linked to the Australian Innovation System Strategic Plan 2030 being developed by Innovation and Science Australia (ISA). Indeed, the Pearcey Institute organized a meeting earlier this year with ten IT thought leaders and John Howard who was conducting consultations for ISA. Our submission to that strategic plan can be made available.

The Government needs to ensure that the Digital Economy strategy is implemented across all sectors of the economy. There is a real danger of fragmentation. While it is widely accepted that 'digital underlies everything,' often each sector develops its own plan for digital in isolation to the rest of the economy. Likewise, all ranks of government need to coordinate efforts to ensure strategic and practical outcomes are achieved across the country at the state and local level.

Where are we now and how do we get to where we want to be?

There is a lot known in industry and academia about what works and what does not in the adoption of technology, its role in transforming industries and how new ways of working can be created through automation. There is a depth of knowledge, experience and engagement that Australia has through a rich and vibrant entrepreneurial community both within and across the world to draw from. There is a role for Australia to become an 'Entrepreneurial State' (Mazzucato, 2013) and leverage our political, technical and social capital.

A partnering and collaboration model needs to be developed that harnesses the breadth and depth of this knowledge and experience, and that we have the opportunity to engage. The model needs to feed the strategy and its execution for it to have the best opportunity to fast track our economy out of the current digital standing described in the Harvard Business Review as 'Stall Out – high levels of digital development but losing momentum.' To help with the development of the model, the PI is working on a collaboration platform where expertise can be viewed across sectors to develop new models of value creation.

The Government should ensure that it collects meaningful statistics. We note that in 2015, the Australian Bureau of Statistics undertook a review of ICT relevant statistics. The Pearcey Institute, under its earlier name of CIIER, prepared the submission for the Australian Computer Society to this review. A subsequent ABS report adopted most of the submission as its findings. However, PI continues to hold the view that the current statistical nomenclature related to ICT, and by extension, the digital economy is out-of-date, erroneous, and accordingly leads to less efficacious policies and programs.

The PI has initiated a project to develop an **Australian Digital Cities Index (ADCI**) under a MOU with Nesta UK. ADCI can be viewed as a meta study to assist government and industry to understand and monitor the growth of the digital economy at the city level in line with international standards. The indicators and use of multiple data sets to map the environment enabling Australia's digital economy would be a great resource for both industry and government at all levels. We are currently seeking support for the project.

Sector Profiles

Fellows of the Pearcey Institute have been involved over the past several years in organising forums for Australia 3.0 (http://www.australia30.com.au/), a thought leadership program run to analyse and stimulate sectors of the digital economy including mining and healthcare. We summarise some observations of a sample of the sectors.

Healthcare

Digital technology has played a very significant role in healthcare over the past forty years, particularly in clinical interventions and intensive care. Advances in healthcare have changed the landscape from one that saw chronic conditions as an end of life expectation where the tertiary hospital played a pivotal role to one where the ageing population now commonly survives and lives with a condition and comorbidities while trying to maintain their lifestyle.

However digital technology has an even more critical role to play in:

1. The evolving personal digital world where its impact could be felt throughout the system in condition forecasting, detection, early intervention, emergency assistance and monitoring of ones own wellbeing during the stages of life and chronic illness self-management.

2. Increasing efficiencies and productivity in the delivery of services to those diagnosed with, suffering from and managing loved ones with chronic conditions that now absorb the majority of our growing healthcare expenditure irrespective of their distance from a recognised tertiary facility and enabling more people to stay at home throughout their lives.

3. Improve the quality of care and the efficiencies of the tertiary hospital and also enabling the development of facilities closer to the community within a cost profile that is significantly lower than current expenditures.

Those developing technologies for the healthcare sector can do so in isolation of the other sectors. However, the principles, problem identification, solution development and product testing in a digital world should not be separated as the value of lessons learnt will transcend industries benefiting all.

We must therefore remove the barriers that have been established over the years to defend the domain of healthcare delivery when the model of care is in such a drastic need of renovation. Technology can be a facilitator but the agent of change has to come from within and be open to the growing pressure from the citizen and consumer of services. Education for the provider is becoming critical and must receive more support and engagement than currently.

Those in the healthcare sector community become armed with knowledge and awareness of what works and what doesn't, of the best facilities and clinical advisors and of the growing knowledge of how our bodies function and respond to a more holistic program of care. Technology is enabling the knowledge and is creating communities of common interest around conditions across the world. The key to the growth in knowledge is the accessibility that the digital channel has already opened up for those diagnosed with a chronic, life changing condition that impacts their families and communities. They and their carers seek information about their personal healthcare journey and they make up a very large proportion of the so-called Healthcare literacy that is about 40% of our population. There can be no greater motivation to develop health literacy than to experience a chronic condition diagnosis oneself, to a close friend or loved one.

Creating the motivation for citizens to engage in greater healthcare literacy, their self-awareness and management, is a critical lever to any adoption of technologies that impact the cost of healthcare for the remaining 60%. This alone is a key factor in the failure of the implementation of the government funded and developed personal healthcare record. Why is this important? Because there is a well understood relationship between, for example, obesity and conditions that consume healthcare resources and also negatively impact national productivity and value creation.

The Australian healthcare system needs to acknowledge and accept that a change in its service delivery model is under significant pressure from a growing digital community. This community can get second opinions and healthcare advice from outside of Australia without leaving the comfort of their own home. While this may seem to be available to only a few within our social network it is outpacing the knowledge that one clinician can retain or build while managing a time poor and growing patient load. This old system and some of its professional structure will be replaced by technology, professions may include: Dermatologists, Radiologists, Psychiatry, and aspects of GPs' services. Surgeons could be under threat from the development of robotics in certain sectors.

Research has demonstrated that change to the delivery of healthcare takes between 13-17 years to move from concept to acceptance, with evidence-based change averaging 15 years. These are timeframes that are outside the curve of digital adoption that we have seen over the past twenty years. It was stated in the 2017 Australia 3.0 health forum that: "*We must change our approach from the base of the 'Waterfall' to the top of it and adjust the flow from there.*"

We note the geographical challenges that Australia faces, that in the context of healthcare saw the creation of such great initiatives as the Royal Flying Doctor Service. However, we are not continuing to leverage this legacy and need to be a leader in the provision of services. We have fallen behind in the use of telemedicine for example to other countries that needed a solution to the same problem, but adopted a technology first approach.

Mining

Mining is an industry fundamental to the Australian economy. The Australian mining industry has been able to demonstrate that it is at the cutting edge of technology developments. The widespread adoption of disruptive ICT provides opportunities for the Australian mining industry to improve competitiveness in a global industry. These opportunities can also form the basis of growing a global services industry, usually called METS (Mining Equipment and Technology Services). There are significant efforts by many State Governments and the Federal Government to encourage the development of the METS sector.

These efforts for developing new METS capability need to be well informed of the impact of the technology enabled transformations in mining and the evolving global eco-system of suppliers, a situation common to many other industries. The lessons need to be shared. In addition, a trend in recent years has been for large international services companies to acquire local ICT suppliers in mining. Consequently, capability may not be retained within Australia over the medium to long term, and active efforts are needed to build and retain a vibrant local technology capability.

Another core issue for developing a healthy METS sector in Australia is that our pathways for developing a vibrant local ICT-in-mining industry have fundamentally changed. We believe that the traditional R&D mechanisms are no longer working very well and unlikely to improve even if we return to boom times in mining. These mechanisms include: the lone entrepreneur forming a start-up; the professional researchers (eg. CSIRO or mining company research lab) running a commercialisation process; the University research teams forming a spin-out; an existing technology supplier developing a new product or service offering; as well as the collaborative research done by groups such as the CRCs and AMIRA International. New approaches to

collaborative innovation are being tested and some of the large global mining companies are developing their own collaborative research networks. There are also new open innovation approaches to technology innovation that take advantage of ICT and entrepreneur networks to quickly develop ideas and build prototype solutions, such as ideation challenges and hackathons.

Not only are all parts of the METS sector active in technology-based innovation, but the METS sector itself is being impacted by disruptive technology. For example, there is an increasing trend of equipment and technology product suppliers developing a services business, often through partnerships. This trend towards a services model is being accelerated by the proliferation of intelligent sensors in the field, improved data analytics and ability of distributed teams to collaborate and share data and results in a virtual manner, anywhere in the world. This IoT "gold rush" is leading to many new start-ups attempting to sell remote analytics as a service, for example for equipment reliability.

These changes to the innovation landscape require economic research that informs all the players of the facts behind the trends in disruptive change, including informing the various Government investments in industry development. The research can be conducted from anywhere, by location and by sponsorship. There is no area in the world that is the natural home for this sort of research, and so is amenable to a virtual model. Many of the opportunities for collaboration are with other industries with similar challenges, such as petroleum, agriculture, infrastructure, automotive and aerospace. Going virtual in research and education will help overcome barriers of time and space as well as the knowledge silos based on industries and disciplines.
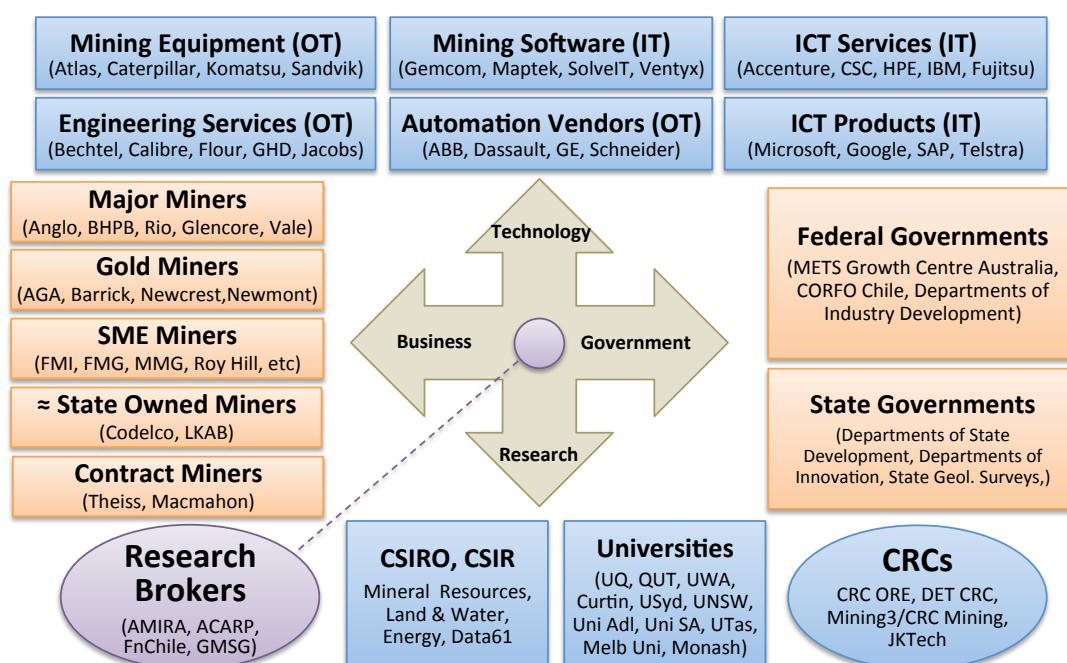
The interaction among investors and researchers is very complex. Innovation in technology-enabled transformation in mining is dominated by partnerships between mining companies and their technology product and service providers. Step change innovation strategy and planning is largely conducted in workshops managed by specialist consultancies. The involvement of the

government and research sectors, including industry based research brokers, is marginal. This interaction can be summarized in the above diagram.

Some key digital transformation issues facing the mining industry are:

- Many innovations in mining are simply recycled over time due to lack of uptake and sustainability.
- The boom and bust cycle in mining has led to a decreasing local capability in science and engineering.
- Geoscience and mining engineering degrees need curriculum upgrades to properly cover technology related topics but universities lack undergraduates and hence funding.
- Digital Mines of the Future will require workplace technology skills that do not yet exist in quantity and quality.
- Duplication of research is common and often simply due to ignorance of the research and commercial landscape.
- The diversity of the METS ecosystem globally will make it difficult for Australia to play anything other than a niche role in the major mining transformation initiatives.
- Other clusters are developing in Scandinavia, Canada and Chile that may play larger roles in mining transformation.
- Accelerators and incubators are proliferating and it remains unclear whether they have a net positive impact.
- Collaborative research structures seem to limit the potential for cross-industry and cross-discipline research.

Society

There is a recognition of the need for new solutions to complex policy challenges or 'wicked problems' Combined with the changing role of technology in society, is an interest in using digital solutions to improve policy outcomes and achieve a positive social impact. Innovative solutions to address complex problems such as such as homelessness, family violence and disaster management have drawn together different parties with diverse approaches to look at the issue anew.

Defining social innovation is a challenge but a populist and perhaps the simplest definition of social innovation is by Nesta CEO Geoff Mulgan as 'new ways to address old problems'. According to leading researchers Nicholls and Murdock consider "social innovation as the 'sixth wave' of macro-level change that has the potential to be as disruptive and influential as the technological-economic waves that came before". Further to this is how social change can be supported and spearheaded through technology. Pearcey Institute is examining the relationship between social and digital innovations with a PhD project through the Melbourne School of Government and Social Institute at the University of Melbourne. View the online directory of Australia's digital changemakers and their initiatives at www.digitalsocial.org.au.

The size and role of government is contestable and citizens are asked to accept that they no longer can rely on the government for some services. The gap between demand for (human) services and what government can provide is widening with an estimated gap by 2025 of Australia $54 billion by some sources. Trust in both government and financial institutions have been eroded since the 2008 Global Financial Crisis with less than half of Australians surveyed

trusting government according to the 2015 Edelman Trust Barometer. Within this context and to address systemic social issues such as an ageing population, entrenched indigenous inequality, youth unemployment and homelessness governments need new approaches. The World Economic Forum in 2015 noted that as "governments search for guidance and inspiration on how to scale cost-effective solutions to social problems, social innovation has taken centre stage". As such it timely for the digital economy strategy to ensure that the benefits of new technologies shared to all Australians and not entrench existing inequalities.

Technology has been increasingly adopted by the social sector and changing the dynamics of 'giving' for more than a decade. Consider the transformation brought about by social media in fundraising and awareness campaigns. Not-for-profits that are able to respond quickly to crises, embrace new technologies and connect with audiences are the most innovative according to the NFP Innovation Index by Australia Post and GiveEasy. One of the top innovators in 2015 was the Movember Foundation. As Nicholas Reece, Non-Executive Director member, notes, "digital disruption is central to the Movember success. Achieving a rare feat of two separate billion dollar ideas – moustache growing and using social media as a fundraising platform".

There is a history of technology corporates as funders of grants for social change through digital innovation. The Telstra Foundation, from 2002 to 2012, invested $43 million to more than 7,000 community projects across the themes of cyber safety, indigenous community development, health, wellbeing and social innovation. Importantly the issue of digital skills is on the agenda with GoDigi, a four-year national partnership of Infoxchange and Australia Post aimed at improving the digital literacy of over 300,000 Australian as part of the National Year of Digital Inclusion in 2016. It is unclear if it is the availability of funding or the need to deliver services via tools that people use every day, like their mobile phone, that is driving this digital direction. What is clear is that the appetite for digital is growing. These foundations provide an opportunity to explore the public policy dimensions of digital social innovation building on work in the European Union with a distinctly Australian flavor.

Major change programs require political will, a guiding coalition and resources to deliver so the right steps are in place. It should be noted that constant change or short-termism can also be counterproductive to delivering outcomes, whether just funding pilots and never scaling solutions. Innovation requires a longer-term view if it is to achieve lasting social change and inclusion need to be an integral part of the digital economy strategy. It is within this policy context that the PI advocates for Australia to embrace digital social innovation to share socio-economic benefits for all.

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