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By Email: digital.territory@nt.gov.au

**NT ICT Strategy (Towards a Digital Strategy for the Northern Territory)
Submission on behalf of HECG and Global Access Project**

We note that ICT matters were not ultimately considered in the NT Economic Development Framework (coming out of the Economic Summit), pending the development of the ICT Strategy (which we understand is intended to support the EDF, as well as other key policy agendas). As such, on release of the *Towards a Digital Strategy for the Northern Territory* discussion paper, please find below our submission on the discussion points contained in the earlier *ICT Issues Paper - working draft*, which we believe are also of relevance to the current discussion paper.

About us

Higher Education Consulting Group Pty Limited (HECG) is a strategy design and execution firm focussed entirely on higher education and research with particular experience in addressing opportunities for great innovation and collaboration between universities, government, community and industries.

Our practice leaders have senior executive experience working inside higher education institutions and in industry, and bring a unique capability to co-deliver successful new futures through this collaboration. As a result we act for many of Australia's largest universities, research organisations and education-focussed private equity firms.

HECG has also founded the social venture Global Access Project (GAP) and actively promotes its endeavours to fundamentally improve the accessibility of higher education globally. GAP collaborates widely with industry partners and universities including IBM, Quantum technologies UMass (Boston), University of Toronto, the Centre for Volunteering, UNE, Murdoch University, Curtin University and many others.

We will not seek to address all discussion points in detail, only those closely related to our fields of practice, and will respond with a focus on innovation/ higher education-related elements of this topic.

Discussion points

- What digital capabilities and ICT services will NT citizens and businesses need in the future to succeed in new and emerging markets and advance northern Australia? What niche opportunities can be identified, capitalised on and solidified? How can NT best play to its strengths?

HECG Comment: ICT capabilities need to solve digital accessibility for remote students and citizens - particularly those that are within the NT, but also noting growth opportunities to service others nationally and globally. Building excellence in this domain could and should create a unique competitive advantage for the NT, with an array of specialist products and services, that could for example have been initially designed for the NT education/ research sector, that are then exported beyond the NT.

For example, regional universities such as Charles Darwin University face a future of many new challenges and opportunities. While on-campus communities will continue to be a focus, with the increase in blended and online offerings, programs that provide both physical and digital access will become increasingly important. Organisations such as ODLAA.org that are promoting open access to information and learning are a valuable resource in this space. Some international counterparts to the ODLAA are even more matured in their insights and offerings.

For every modern university, today's on-campus environment has become increasingly reliant on ICT infrastructure to meet student and employer expectations. As universities move away from the large lecture model, students will seek to access and collaborate with their universities and other students online.

In terms of potential investment, for the campus environment this means far greater bandwidth and quality demands for services such as WiFi. Clearly, greater bandwidth, reliability and quality (including download and upload speeds) will assist and should be a priority. However, even in the absence of major new investments, significant improvement can occur through better use of current infrastructure.

If the NT sets itself a mission for leading the way in accessibility, there are multiple dimensions that will offer impact and benefit. For example, taking such an approach will ameliorate the barriers created by both remoteness and learning challenges.

Remoteness: becomes a barrier to education with resultant economic impact in numerous ways. For the Northern Territory, we understand that challenges exist not only in access to the internet and quality of connection, but also in individual utility - often as a result of shared access and travel required to obtain access. Technical access is beyond the scope of our expertise, however, as a design problem, much could be done to better utilise access that is currently available. For example, simple broadcast of materials often results in many potential users missing out because they are not available at the relevant time.

The use of living lectures (such as those enabled by learning management and meeting systems such as Zeetings and Moodle) would allow students asynchronous access to their learning materials, empowering them to download and access materials at any time and interact collaboratively with colleagues. Further, the use of cloud computing platforms such as Google Cloud has the potential to enable students to operate effectively in both online and

offline environments through having the capacity to save and access large files such as audio and video to the cloud.

Work previously undertaken by our team in the NT aimed to address some of the challenges brought about by remoteness through delivering learning materials in accessible ebook format. This work was funded by the Commonwealth Government through an Office of Learning and Teaching Grant, as well as industry support being provided by Microsoft. (A short video of this project can be viewed here:

<https://www.youtube.com/watch?v=zDyKrZIVwNw>)

Critically, design of solutions as undertaken above, highlighted the barrier created by reliable access to internet, and indeed in some cases, electricity sources. Poor socio-economic status is also a key consideration, with due attention needed to be given to access for participants to mobile technology, including being in credit with a telco service provider.

Due to the uniqueness of the challenges created through the issue of remoteness, it is our recommendation that introduction of any strategy be done so in close consultation with the Australian Centre for Indigenous Knowledges at Charles Darwin University.

<http://www.cdu.edu.au/acike>

Learning Challenges: Students with learning challenges are part of every community including students with difficulty accessing learning materials as a result of limited educational development, disabilities or environmental factors. However, most regional and remote areas of Australia have high instances of such challenges. For one client of ours, a challenge is the very low school participation rates beyond early high school. ICT-enabled capability can deliver enormous positive change to address such challenges.

Two examples of how ICT can bring these benefits are:

- in inspiration - opening up students to the possibilities for them in a connected world and
- Universal Digital Design - designing digital services (education or otherwise) in a manner that is accessible to the majority of the possibility, even for those with learning challenges. By way of example materials that are developed using universal design principles can be listened to with the use of text to speech technologies. This has the potential to open up access to information and learning to end users who have low or no English literacy.

The principles of universal design are well established and proven to be effective. Most government agencies in Australia are aware of standards such as WC3 for website accessibility but few are aware of the application of the principles to other services.

By building the necessary skills and rolling out collaborative platforms in conjunction, universal design can have great benefit to NT. As noted above, leadership in wider markets would also be possible, bringing further benefits to NT.

- In looking ahead, what are the emerging technology trends that could radically shift or disrupt how NT industries work? How can these trends be positively harnessed?

HECG Comment: In the near future most transactions and many services will be geographically anonymous. What is important is that the goods and services accessed via this online marketplace must be much more widely competitive or otherwise differentiated, and the participants must have the capability and technology to collaborate in this marketplace irrespective of their geography. Trends around collaborative technologies, cloud computing, IOT, social media retail, ethical trading, digital mobility will grow in popularity.

In this connected world, participants need new skills to access markets, market and promote effectively in a much larger market. While challenging to achieve, developing these skills will have much more relative benefit to regional and remote communities than in urban areas, where many businesses still rely on physical proximity to the market. Furthermore, markets that were never previously accessible, are now accessible; for e.g. a provider of creative design products can meet the needs of customers from New York to New Zealand.

We are aware from a review of relevant research that of particular interest to indigenous communities will be the ability to address markets utilising and benefiting from indigenous Intellectual Property (IP). This is currently dominated by operators with no relationship to the indigenous owners of the IP. By combining social media retail, ethical trading, digital commerce, co-operative marketing and rights management many new levers can be utilised to change how these markets operate.

Further opportunities exist for the NT to partner with projects such as Loon that have a mission of delivering remote and universal access to the internet: <https://x.company/loon/technology/>

- How can local ICT businesses partner with others to create synergies, leverage skills and grow their capabilities to succeed and reach well beyond the NT's borders?

HECG Comment: Historically, ICT has been seen as enabler of enterprise, particularly in physically remote transactions. This role is even more important today. However, ICT can take this role much further as a partner to local industries, to bring global connectivity, competitiveness and efficiency to NT businesses.

Further, this involvement should also focus on the development of SMEs, not just on the servicing of existing larger businesses. For example, utilising tools like Wix combined with online marketing and promotion tools (such as those in the Google suite) can provide very low cost access to global markets, and, as these businesses “scale-up”, their ICT needs increase. ICT businesses should then also be primed and able to specifically partner for this growth.

- What opportunities are there to build partnerships with emerging sectors of the NT economy, such as renewable energy, creative businesses and international education?

HECG Comment: Creative business and international education are already mature international markets that NT should be able to access today. Importantly though, these markets are difficult to succeed in without their own creativity and competitive differentiation.

Skills are required to assist in matching such creative and differentiated goods and services with global segments that will be particularly attracted to those goods and services. Quality, if defined by the proximity to overall perfection (for the majority of large markets), is less important in the new global marketplace than quality (as defined as meeting new needs or providing alternatives to existing products).

New needs can include ethical desires, connection with suppliers, or many other parameters. Too often do regional communities invest in ICT that at best provides average standard offerings to the marketplace - sometimes known as 'infrastructure strategies'. Partnerships must be created that actively look for differentiation and excellent offerings in more targeted markets, particularly those where high margins are available. Examples of such practices in remote areas of New Zealand have been extremely successful.

The NT is at the gateway to our North and the globe beyond. Referencing comments above about the possibility for the NT to carve a niche as accessibility specialists, we feel it worth also noting, in relation to international education that, when education materials are in a format that adheres to universal design, then they can be far more readily accessed by translation software. The potential presented, for example, by accurate translations of material into Indonesian, is exciting.

- How can ICT help the NT to foster innovation and sustain an innovative approach across industry sectors?

HECG Comment: Innovation exists in ICT and ICT can be used to underpin and enable innovation in other areas. Innovation is commonly seen as the combination of invention and commercialisation. ICT can be very effectively applied to both elements, making such activities easier, safer and more effective. Further, the ICT industry can be an exemplar (itself containing many innovative businesses) and an educator providing training and education in the use of ICT and experiential learning in the development of ICT businesses.

A great combination that achieves such objectives is the Global Scope Program run by the NSW Government in partnership with ICT edutech company *Intersective*. In this case a online collaborative learning environment, 'Practera', enables mentors from government and industry to provide experiential learning environments where students address genuine and current industry and government problems while at the same time developing design thinking, problem solving and online social collaboration skills. Student and mentor participants can reside anywhere in the world and participate intensely. The outcomes in terms of mentor organisation value and student learning outcomes are outstanding and demonstrate what impact ICT can have in bringing the actors together.

- How can the 'digital divide' in the NT be bridged effectively? How can affordable and reliable ICT services be delivered across the NT to enable all parts of the NT community to have the opportunity for economic growth and wealth creation?

HECG Comment:

The NT Government can invest for impact by engaging 'boundary spanners', and in supporting the assembly of multidisciplinary teams to bridge the digital divide. It is our belief that a multi pronged approach needs to be taken, incorporating professionals with experience in one or more of the following:

- strong business skills with the ability and track record to negotiate profitable deals for the NT with industry giants such as IBM, Microsoft and Google,
- strong IT skills, to meet the challenges unique to the NT environment and communities,
- interpersonal and communication skills to work closely with communities and grassroots users.

Bringing together these unique but critical skills into a single team, all working together in a spirit of respect and service for the NT citizenry, will be an essential element to addressing the digital divide.

It is worth noting that it is additionally critical that a pipeline of talent is invested in along the same lines- design of school and higher education offerings should have, at their foundation, the hallmarks of multidisciplinary approaches and integrated learning approaches that allow people from ICT fields to understand community, for business skills to connect with the power of industry 4.0 and other foundational ICT etc.

- What role can the NT Government play in increasing the economic benefits of ICT available to the broader NT economy? How can the economic value of government purchasing be planned and leveraged for downstream benefits?

HECG Comment: The NT Government can have an incredible role in establishing the conditions (or environment) for success in achieving these economic benefits. These conditions include skills development, investment in development activities (such as the Global Scope Program in NSW or the Scale-Up activities in the UK) and promoting brand values.

Skills development is often seen as the role of post-secondary education (via the TAFE, university or private education markets) however, this view has resulted in consistent and considerable declines in students entering STEM careers or establishing STEM related businesses. Further investment can enable business to be aware of the opportunities they have, to collaborate on challenges, and provide launchpad capabilities for smaller businesses.

Investing in 'boundary spanners' as addressed above is also critical.

Finally, there is huge potential in harnessing the procurement power of the NT towards further embedding innovation in ICT, and through that procurement process, demanding flow-on benefits to the research and training sectors. Innovate UK, through their policies and programs, offers strong and successful blueprints for how this can be achieved, disaggregated down to quite specific economic sectors and local geographies.

- What value and leverage can be realised from existing and emerging NT Government digital assets (ie data)? How can an open data policy benefit industry and opportunity?

HECG Comment: Data, as a form of information to assist in analysis and research, is critical, and any government's digital (data) assets are both vast and valuable. Contingent upon the data being gathered and stored in appropriate ways (machine readable formats, up-to-date and regularly refreshed, with relevant metadata etc), there are myriad ways in which data can be accessed to generate value. The following online article provides helpful insights and references on the issue:

<http://www.govtech.com/data/How-Government-Can-Unlock-Economic-Benefits-from-Open-Data-Part-I.html>

The following webpage gives access to many existing Australian government public data sets/ data portals, with the NT notably not featured:

https://toolkit.data.gov.au/index.php?title=Publishing_your_data

It is further noted that the higher education sector can provide a great partner to help government and companies unlock the latent value in government data. Advanced students can access data as part of their studies, with entire courses or units designed around data-driven analytics and learning across an array of disciplines- business, commerce, ICT, engineering, statistics and mathematics and more. The NT Government would be well advised to consider partnering with NT higher education providers to this end.

- How can the public and private sectors in the NT work together effectively to jointly solve problems, explore ideas and develop innovative solutions?

HECG Comment: Note comments above in relation to boundary spanners and multidisciplinary teams.

Further, partnerships that involve the private sector and higher education sector offer huge scope to tackle and solve problems, and generate new innovations. Areas harnessing ICT and of particular interest to a region such as the NT, such as robotics, offer great scope for such partnerships. Investing in specialist professionals, such as those in HECG, who have successfully scoped and developed such partnerships elsewhere will be essential, as will engaging with experts in the unique elements of the NT, to ensure design of such partnerships is fit for purpose.

- How can the ICT skills gap be reduced? What academic programs, vocational education and training courses, education in schools can be progressed and sustained to improve

take up of STEM subjects and increase the numbers of trained and qualified people working in the ICT industry? How can STEM programs and resources be better coordinated and targeted to avoid duplication and achieve results through relevant and contemporary skills development?

HECG Comment: ICT and STEM more broadly need to become foundational from the earliest levels of education. Engaging with companies who can deliver 'lifetime of learning' products, offering individuals multiple touch-points across their education and training journey will be important. Individuals and their families and educators need to be able to access such systems, to give them the confidence of (maturationally-relevant) ever-increasing levels of STEM and/or ICT attainment, and clarity about pathway options with in-built flexibility.

Carefully designed, such 'product offerings' can give individual groups, companies and educational institutions the ability to have their own badging and ownership of a program, whilst avoiding duplication of resources invested in design and administration. Critically, if data sharing in relation to participation in such programs can be agreed, there is much potential intelligence to be gleaned from analysing participation statistics and impact measures. HECG works regularly with providers who offer such approaches.

Furthermore, connecting with our great Australian research and innovation organisations such as CSIRO, offer opportunities at scale that are closely oriented to areas of national priority, and which can also be achieved through the auspices of program offerings such as those described immediately above.

- How can career pathways for entry-level ICT knowledge workers be improved? In this context, student internships, more constructive employment options for international students and encouraging ICT professionals to reside in the NT deserve consideration.

HECG Comment: Work Integrated Learning (WIL) is a critical element here. Edutech companies such as Intersective can support the generation, monitoring and evaluation of WIL placements at scale. Working with large ICT companies as well as SMEs who are part of the ICT supply chain, to involve local placements, engagement with students, and to ensure local employment elements to contracts are all viable solutions.

Consortium approaches to ICT education should be considered, that bring the NT in as a unique learning environment i.e. through Charles Darwin Uni offering Masters degrees in partnership with other universities whereby students spend time in multiple geographies focussing on unique elements and offerings that are applicable on the global market (whilst in the NT this could include rural and remote access issues; ICT underpinning community development etc).

- How will the ideas of NT youth be incorporated into the economic summits process to position for the future? How about a youth summit and 'ideas hackathon'?

HECG Comment: The NT Government should harness the power of ICT and other elements of the accessibility agenda as discussed above in designing any hackathon. Sharing of digital diaries/ video statements, online Q&A forums etc are also viable methods. Second stage engagement could include competitions offering guided ideation and prototyping opportunities to further refine and pilot potentially viable ideas.

I look forward to discussing this submission - please do not hesitate to contact me directly on:
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Kind regards,

A handwritten signature in dark ink, appearing to be 'David Wright', with a large loop at the bottom.

David Wright
Founder and Chairman
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