BROADBAND
FOR THE TROPICS

Tropical Innovation Project Outlines

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SYNERGISING TECHNOLOGY- DRIVEN TRANSFORMATION IN THE TROPICS

Tropical Innovation Project Outlines

Background

We are proposing a set of three independent, lightweight projects that 'connect the dots' between many entities that are already innovating around tropical knowledge. A common thread is the use of digital technology to build services and insights that can be used as both demonstrators and initiators of new approaches to life and business in tropical Australia.

Three themes are addressed:

1. Living in the Tropics,
2. Business in the Tropics, and
3. Energy and Water Management in the Urban Tropics.

Many of the virtual services developed may be hosted at the Townsville Knowledge and Innovation Centre (TKIC) being developed by Anittel.com.au situated on the JCU campus (http://www.afr.com/p/technology/nbn_spurs_regional_data_centre_push_prQ5Yt4ifFfJW0hyWyj0YJ).

The TKIC will also use the 'Tropical Data Hub' infrastructure to both store and serve data products and services (http://www.tropicaldatahub.org). This is a JCU lead project designed to aggregate research, government and user contributed data sets about the tropics worldwide. Development and infrastructure costs for the TDH have been provided by JCU, the federal department of DIISRTE, the Queensland government and the Queensland Cyberinfrastucture Foundation.

Project 1 - Living in the Tropics.

Goal

This project aims to enhance the livability – and therefore attractiveness – of tropical cities as sustainable centre's of population and business.

To achieve this goal, a range of engagement and aggregation activities will be undertaken to improve access to and use of existing and developing information sources regarding all facets of living in the tropics.

In essence, many of the planning and process decisions regarding how we live in the tropics have historically derived from data and experience with life in temperate regions. However, environmental set-points are very different between the two weather zones - differences in temperature and relative humidity result in vastly different outcomes for the

same action, i.e. thermal mass building products and walkability.

There is a great deal of long term experience and information regarding best practice behaviours to optimise personal comfort and efficient living in the dry and wet tropics, yet factors that affect the way we live in the tropics are still based upon temperate foundations. Why? One of the main reasons is ease of access to this information. By collating and connecting location-relevant information and experiences, decisions regarding life in the tropics could then be based upon more appropriate foundations.

Presenting tropics-relevant information to all members of the community in a contextually appropriate and accessible manner will facilitate the application of tropics-relevant decision making to life in the tropics. The result?, innovative outcomes that not only improve the sustainability of life in the tropics, but also provide marketable products and services applicable to the global, tropical population.

Project 1 will also build on existing NBN demonstrator projects that have been undertaken in northern Queensland, building sets of discipline specific portals to present flexible, integrated services to the public.

Project

The project will leverage software infrastructure developed in its partner projects and focus more on the public engagement aspects of the tools. Methods such as workshops, apps, collective social learning programs and exploiting the reach of the BftT will be applied to educate the community about wide scale benefits of applying ICT to tropical living:

- Tropical medicine - easily understood information regarding tropical diseases (transmission, symptoms, ways to avoid infection, local practitioners).
- Community resilience - connecting to your community and encouraging communal, resilient behavior (e.g. what resources people are willing to share or provide access to).
- Best practice adoption of telemedicine and remote access services.
- Sustainable practices and products that can also capture and feedback into the outcomes of sustainable behavior change in the population.
- What is a Smart Sustainable home and how to manage energy and water use for optimal comfort when living in the tropics?
- Contextually relevant (geographic, temporal) environmental information - i.e. weather, Natural Disasters, etc.
- New urban planning tools related to tropical livability and walkability emerging from contemporary research programs.

Organisations/entities to involve: JCU, Local Governments, Ergon Energy, AURIN, Townsville & Mackay Medicare Locals, Construction industry, Qld State government.

Project 2 - Business in the Tropics.

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Goal

This project seeks to boost the tangible benefits digital IT services have when deployed in dispersed population centers such as in-tropical Australia.

In achieving this goal, regional ICT business capacity will be developed and aligned with general business participation in the Digital Economy, fostering a more resilient regional business environment.

Project

The project partners will leverage their deep connections with business and local governments to build the cultural change necessary for adoption of modern cloud based ICT services. Recent repeated seasons of natural disaster have heightened awareness of the need for the more reliable ICT networks and services that recent NBN rollouts permit.

It will also trial innovative applications of ICT in tourism – critical to the northern economy.

Example activities include:

- Effective remote backup and disaster recovery strategies including cloud based backups.
- Effective remote office communications and collaboration between remote sites including teleworking.
- Easy and transparent coordination of collaboration opportunities – building industry clusters.

To demonstrate the tangible benefits to business of digital ICT services in tropical Australia we propose a companion sub project: Near total penetration of smart phones means travelers are actively using these devices to assist in planning and coordinating their travels. The individual cost to a small tourism operator to build a quality online or mobile experience is high and requires a level of resources and expertise that is in limited supply. Hence, most operators are not yet exploiting the *full* potential of mobile ICT to engage, promote and maintain connections to potential and existing client.

Imagine then an alternative… consider the impact that a holistic approach to mobile ICT would have on tourism in Cairns. Smartphones, instead of being 'occasionally' useful in assisting travelers, could become a virtual concierge. A total 'engagement platform' for alerting visitors to events and attractions and connecting them to relevant businesses. A total Cairns mobility package would be an 'eco-system' of mobile applications so that even the smallest business could provide visitors the capacity to quickly plan, book and modify a visit, maximising their experience of the region.

As well as guiding visitors and building a seamless and customised experience such applications could also gather useful data. For the first time, real time trends on visitor preferences and movements would be available for business: planning, improvement and development. These tools could allow for the connection with tourists to continue post-visit, informing them of new attractions etc. and assist in return visitation.

All of the above outcomes could be achieved with a coordinated mobile ICT development foundry whereby developers work with the Cairns tourism authority (and other tourism authorities in tropical Australia) to build an adaptable suite of applications. Significantly, this content and model would have world wide export potential and foster a new industry for tropical Australia, one that is based on the existing strengths of the region.

Organisations/entities to involve: JCU, Digital Cairns, ICT Business Networks, Anittel, Chambers of Commerce and Business Enterprise Centres.

Project 3 – Energy and Water Management in the Urban Tropics.

Goal

To develop the tools and systems needed to gather the essential background data sets on tropical cities required for reengineering our model of a tropical city. The current model of development in tropical Australia is largely based on patterning developments in the temperate southern regions. This adds unnecessary costs to construction, long-term maintenance and operations to households as well as creating unfavorable risk profiles with respect to natural disasters.

While many innovative solutions for tropical architecture exist and are being developed, these need to be embedded in a larger innovation that recognises urban design, transport and livability to create environments that are more suited to Australia.

Project

This is a dot-joining project. The project partners will work towards implementing an end-to-end environment that will gather the real-time water consumption, temperature both inside and outside roofing as well as energy use for 5,000 homes across northern Queensland. This project will leverage upon council investments in smart water meters, Ergon Energy investment in smart energy meters, real-time technology from Taggle, environmental monitoring from JCU and ScienceMob, the JCU Tropical Data Hub and the Townsville City Council (TCC) Smart City project with IBM.

Existing smart water and power meter trials in Townsville will be augmented with temperature sensors yielding an unprecedented view of the real time temperature and thermal comfort across the city. Data will be gathered on all housing types and across all locations within the city. This data will be synthesized with data on energy and water consumption to build a model of consumer behavior and high-resolution temperature or 'heat maps' of the city. TCC will use this data to improve walkability in the tropics by understanding where to build shade and shelter structures, plant trees and improve urban accessibility. Designers will use the data set to understand the real world performance of homes and spaces and redesign them for higher level of thermal comfort and lower running costs.

There has never been an attempt to gather comparable data such as this at the scales suggested here. The unique alignment of projects, skills and technology in Townsville today give us an unprecedented opportunity to understand and design tropical cities for the 21st century. On the ground value will emerge for the construction industry, householders and utilities while improving livability.

The outcome of this project will then become the template for urban design throughout tropical Australia and exportable throughout the tropical world.

Organisations/entities participating: JCU, Townsville City Council and other northern local governments, BftT, Ergon Energy, Taggle Inc., ScienceMob Inc., AURIN, QCIF and IBM.