Whitepaper

What makes a Smart Community?

April 2014

Summary

What is a Smart Community?

Smart Communities are cities and regions that use information and communications technology (ICT) to enhance and diversify economies, solve social and infrastructure problems, support growth and enrich lives in the 21st century.

In a changing Global and National Economy, the ability of communities to turn to digital technology to create high quality employment, increase community participation and make themselves great places to live, work, start a business and prosper in the future is vital.

This Whitepaper explores the best practice elements that encapsulate the creation and strategy of a Smart Community.

Commencing in 2014, the **Broadband Today Alliance** is presenting an awards program for Smart Communities. The program has been established to recognise the achievements of communities in Australia who are developing and delivering initiatives that enhance the economy on a platform of digital technologies and broadband connectivity.

The Awards will recognise the National Smart Community of the Year and a Runner-up in each of the following 3 categories:

- Communities with a population under 50,000
- Communities with a population under 100,000 and over 50,000
- Communities with a population over 100,000

In the Awards phase, the BTA develops nominations for candidates from its own research and information submitted by cities and regions. Describing the community's background, challenges, strategies, programs and results, they are reviewed and scored by an independent panel, who select the award winning communities.

This Whitepaper has been produced as a framing document to guide communities applying for the National Smart Communities Awards program. It is anticipated that this Whitepaper will assist Communities to highlight their achievements and outline the benefits of initiatives that have been implemented as detailed in the Assessment Form nomination for the National Smart Communities Awards.

The intended audience of this Whitepaper is Cities, Regions and Communities in Australia who are planning or implementing Smart Community initiatives using next generation broadband connectivity and digital technologies.

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Building Blocks of future Smart Communities for Digital Service Delivery

Ubiquitous connectivity – always on

Ubiquitous connectivity is the essential infrastructure of the 21st century – the contemporary equivalent of the rail and road infrastructure which fueled economic development through much of the 20th century. Access to high-bandwidth, competitively priced Internet and mobile network connectivity anytime/anyplace is viewed by most governments as an essential platform for a modern economy.

Anytime/anyplace devices – convenience

The mobile phone revolutionized the way people lived and worked in the late 1990s and we are seeing the next phase of this revolution in mobility play out with the latest generations of smartphones, tablets, and laptops.

The Apple iPad in particular has reshaped people's perception of a device that is primarily designed for accessing services from the cloud via a Wi-Fi or 3G network. Other tablets and netbooks are blurring the boundaries of the "phone" and the "computer." The iPhone and Android smartphones with their app stores have also transformed the way people think about buying and using applications. Combined with other forms of interface devices such as surface computing, kiosks, and point-of-sale devices, we are rapidly reaching the point where increasingly useful and relevant online services are available anytime/anyplace.

Collaboration platforms – teamwork

Unified communications and collaboration platforms are maturing to bring together previously discrete technologies such as voice, SMS and email messaging, calendars, office automation tools, online meetings, and video conferencing. These platforms can significantly increase the productivity of teams, enable remote working, and minimize the need for travel for meetings. The latest generation of online meetings and high-resolution video conference systems, such as Cisco's WebEx and TelePresence, offer a genuine alternative to face-to-face team meetings.

Cloud computing – IT as a service

Cloud computing refers to the provision of computer processing, storage, and applications as a service over the Internet or a secure private network on a pay-as-you-go basis. This makes computing services available from any broadband connection without the need to buy and own the back-end computer hardware and software.

Cloud computing will be a powerful enabler of Smart Community initiatives because it makes massive computing and storage power and sophisticated applications available to anyone, be they an individual, a small business, an not-for-profit, a local authority, or a large metropolitan government. As cloud computing services become

more mature and trusted, they will reduce the threshold of funding and technical knowledge required to implement a new application. This will drive a wave of digital-enabled innovation throughout cities and society.

Geospatial platforms – place-based data

Free or low-cost online geospatial platforms such as Google Maps and Microsoft Bing Maps, combined with GPS and other location-sensing technologies in mobile phones, have made it a lot easier, faster, and cheaper to present and manipulate data on a map or aerial image. Interactive maps are a powerful way to visualize and locate assets, resources, and services in a local community or neighborhood, and are invaluable tools for engaging citizens in planning dialogues.

Internet of Things – real-time data

As connectivity becomes more ubiquitously and reliably available and as the cost of devices falls, Smart Communities are seeing increasing possibilities for connecting a wide range of sensors to the Internet via wired or wireless communications such as RFID, Wi-Fi, and 3G networks. Examples include still and video cameras; and sensors for temperature; humidity; light; vibration; spatial location and orientation; wind; electricity, gas, and water consumption; the mass and velocity of objects; the health status of people and devices; etc. Once sensors are connected, data can be recorded, analyzed, and stored for retrieval by any Internet device from any location. Practical uses already well established include remote security monitoring, monitoring of energy consumption, food traceability, and the remote status/health monitoring of devices, vehicles, and people.

Advanced analytics – fact-based decisions

As more and more data is available in the Internet of Things, and as analysis tools become more sophisticated, we will see a rapid growth in innovation associated with making fact-based decisions and controlling events based on real-time data. Advanced analytics and business intelligence systems will provide the means to detect patterns, generate alerts, predict trends, and visualize information in oceans of data. The rise of advanced analytics systems will be accelerated by synergy between the Internet of Things (more data) and cloud computing (scalable processing and storage capacity).

Open access to public data – many eyes

The open standards trend has also extended to data as government agencies have recognized that "more eyes are better" when it comes to adding value to data. Many countries have followed the path initially set by the US government's data.gov website for publishing government datasets.

Digitally controlled devices – real-time control

There is a universal trend towards appliances and devices being digitally controlled to enable their integration into computerized home, building, and infrastructure control systems. For example, home automation technologies allow heating, cooling, lighting,

window coverings, and security systems to be controlled from a central computerized controller – and even remotely via a mobile phone or laptop. Digitally controlled devices are a key enabler of smart buildings and smart transport systems.

A key issue here is that the devices and systems required for digital control need to be built in at the time of construction – they can be very expensive to retrofit. A sensor, for example, can often be retrofitted using wireless networks, but actually controlling an appliance or service will likely require motors and actuators. If these are not present in the installed equipment, it may not be economically feasible to retrofit them.

Social networking – interactivity

Web 2.0 design patterns and software capabilities have had a big impact on the appeal and engaging quality of online services. The participation, interactivity, ease of use, and evolutionary nature of Web 2.0 applications are well suited to enabling and supporting community activity. Wikis such as Ning and Wikia and blogging platforms such as Blogger or WordPress have made it a lot easier to publish and share information and to mobilize community action.

Social computing platforms such as Facebook, Twitter, LinkedIn and Instagram have proven to be popular platforms for creating and sustaining online communities of interest. Facebook in particular has matured from being used solely for social/informal networking to also being used for maintaining a wide range of more formal networks based on particular organizations, campaigns, cities, communities, and issues. Social networking platforms will become increasingly powerful tools for building social networks in Smart Communities.

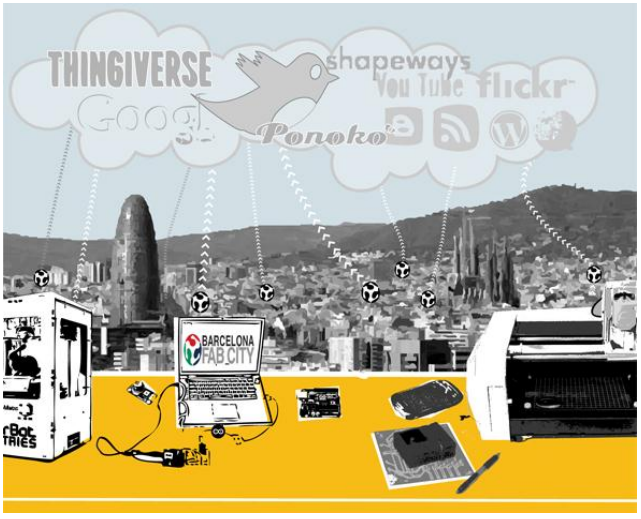

Image Source: complexitys.com

What makes a Smart Community?

"Smart Communities use information and communication technologies and data to be more intelligent and efficient in the use of resources, resulting in cost and energy savings, improved service delivery and quality of life and reduced environmental footprint – all supporting innovation and the global economy".

The Smart Community approach typically consists of the following:

- Advocate the integration of infrastructure and processes as a solution
- Promote the use of digital technologies to increase capacity of existing infrastructure and services
- Believe in citizen involvement and citizen-focused service delivery

The advancement of Smart Communities requires four critical ingredients:

- Leaders who inspire the pursuits of future sustainability and growth
- Governments, Industry and citizens who collaborate
- Communities that leverage proven ideas and solutions to build more for less
- Communities that nurture a vibrant digital society to strengthen social capital, engender digital inclusion and aid economic growth

According to the Broadband Today Alliance, there are 3 elements to a Smart Community

1. Smart infrastructure

2. Smart capacity

3. Smart innovation

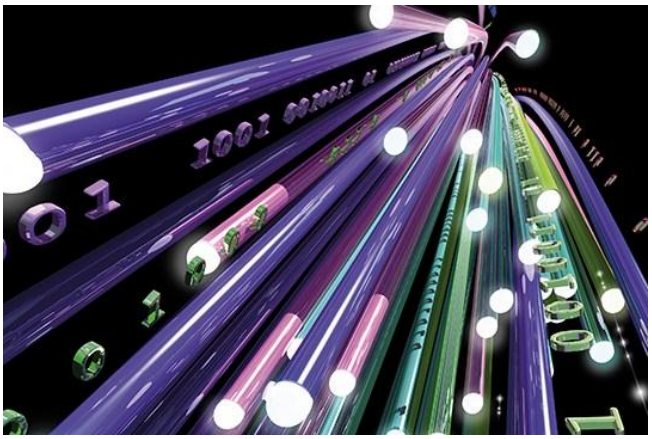

Image Source: International Telecommunication Union

Smart Infrastructure

Connectivity

Digital connectivity is a key building block for any smart community. To maximise benefits for service users and citizens, Smart Communities harness digital technologies. Affordable, ubiquitous connectivity can underpin transformational change in public services and will play a major part in closing the 'digital divide'.

The speed of change in the last 20 years has been dramatic and keeping pace with this change remains a critical factor to deal with.

As consumers continue to embrace new technologies at an extraordinary rate, the desire to be connected to high speed services, all of the time, keeps growing. Global mobile data traffic is expected to increase 13-fold between 2012 and 2017. More and more public services are moving online due to the need to deliver efficiency savings and the ability to personalise services through online platforms.

To ensure citizens benefit from services, such as telehealth, telecare and e-learning, and businesses can take advantage of new business models, such as micro payments or 'cloud solutions', Smart Communities work with the technologies market to provide affordable, reliable connectivity that is accessible anywhere in the city.

Smart Communities also develop initiatives that stimulate demand for high speed services, resulting in greater availability of such services and widespread growth in the availability of next generation infrastructure.

Connectivity can include:

- Fixed Line services
- Mobile Services
- Wireless / WiFi services
- Data Centre Services

Enabling Regulation & Planning for Digital Infrastructure

To provide reliable and fast digital connectivity anywhere across the city, Smart Communities put the right infrastructure in place. Digital infrastructure covers a diverse range of elements, such as civil engineering works to put fibre optic cabling into the ground, or the installation of new mobile tower sites and Wi-Fi infrastructure. For Smart Communities, this means planning, regulating, working with commercial investors and potentially investing in and providing this infrastructure.

Technology developments and access to digital services are critical to any community's economic, environmental and social development. Today, private investment models by telecommunications providers for digital infrastructure tend to focus on the most lucrative and commercially viable areas of a city or region. While this approach can provide for the majority, it leaves behind pockets of poorly served areas that gradually become less attractive for investment. If left unaddressed, these areas can quickly fall into a state of decline. Smart Communities actively develop plans to encourage longer term investment in digital infrastructure via a number of different approaches.

Creation of legislation and regulatory regimes allow Smart Communities to provide incentives and sanctions in support of sustainable behaviors by organizations and individuals.

Benefits include:

• Significant reductions in traffic disruption due to less civil engineering on highways

• Properties that are future-proofed for connectivity are more attractive for inward investment

• Greater availability of next generation open access infrastructure will lead to new entrants coming to a Smart Community, resulting in increased competition, greater choice and innovation, and more affordable services

• Greater provision of data services will support local businesses in achieving global growth

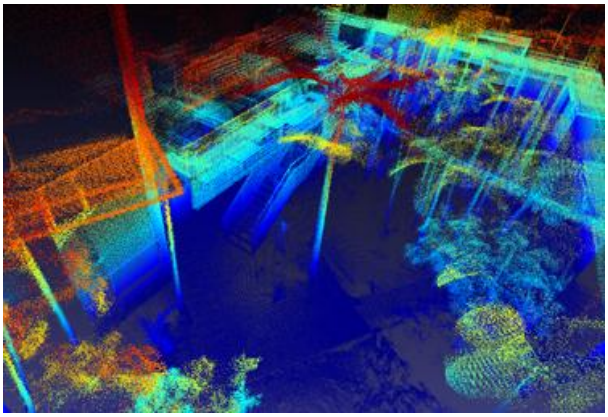

Image Source: CSIRO

Smart Capacity

Digital Inclusion

A smart community needs all of its citizens and businesses to have the digital skills and capability to use current and innovative technologies. And all citizens should have the ability to access data and participate in informed decision making for themselves and their communities. Digital inclusion is widely defined as: "The use of technology, either directly or indirectly, to improve the lives and life chances of people and the places in which they live."

A smart community is one that knows how to find and use information and is able to effectively access useful and usable information in a way that is meaningful to them. By supporting and providing a range of programs that focus on developing community skills in using digital technologies - not only searching but providing content and using the tools to engage and interact, Smart Communities aim to ensure that all members of the community have ample opportunities to contribute to community and economic development, regardless of their income or education level.

The barriers to digital inclusion cover social, economic, technical and cultural issues that may be experienced by many groups in society. Addressing the broader reasons and impacts of non-participation is critical to developing appropriate solutions. Digital inclusion therefore recognizes how the combination of elements may limit participation in the digital economy. The range of elements that Smart Communities strive to place focus on include:

Access: infrastructure (next generation bandwidth capacity and affordable and reliable Internet connections); computer hardware and software; publicly provided access.

Digital Literacy: basic digital technology information and training to increase user confidence in using both the technology (i.e. PC) and online content/applications/services (i.e. how to extract value from their use).

Awareness: increase awareness of the benefits and uses of digital technologies and identify and promote the value proposition from technology for all users in relevant and appropriate economic and social terms by focusing on the transformative effects of technology rather than the technology itself.

Integration: integrate ICT into the social fabric of everyday life (i.e. in the functioning of communities and institutions) and embed technology in people's lifestyles and into the lives of local communities.

Support: provide technical and training support and implement a supportive regulatory regime to engender user confidence and trust and to address issues of privacy, security, and consumer rights.

Applications and Content: develop and produce compelling online content and applications to motivate use and enable users to maximise the benefits of their ICT use.

Skills and Employment

A Smart Communities aim is to raise the level of digital skills for citizens of all age groups and businesses and to create an environment that supports creativity, knowledge sharing and experimentation to drive the digital economy with new digital applications, services, community enterprise, job creation and economic growth.

Ensuring a Smart Communities people, businesses and communities can successfully use technology and have the right skills to succeed in tomorrow's world will be vital to:

- Supporting people in securing work and keeping them in jobs
- Helping businesses achieve global success
- Making sure communities become vibrant, healthy and sustainable places to grow up and grow old

Ensuring the growth Smart Communities will be about accelerating access to opportunities, by nurturing skills and talent across our communities and by focusing on creating an environment that supports jobs, enterprise and innovation in a digital age.

Tools and technologies, such as the cloud, electronic invoicing, mobile working and data storage are rapidly changing both the marketplace and operating environment and can transform businesses to embrace more efficient and effective business processes. For many though, adopting these tools is proving a challenge. While many businesses recognise the benefits of technology, take-up is not as it should be and is inhibiting businesses' capacity to grow. Through a demand stimulation programme, Smart Communities: build cross-sector digital capability and capacity for global competitive advantage in areas, such as open data / big data, technology and innovation; explore new business models and revenue streams; and drive uptake of ultrafast digital connectivity - a recognised driver of economic growth.

Digital Economic Development

Smart Communities are actively encouraging the creation of technology-intensive business or R&D clusters, special economic zones, or technopolises to attract and stimulate the growth of hardware- and software-intensive industries.

Image Source: cw.routledge.com

Smart Innovation

Innovation

Smart Communities nurture an eco-system that promotes innovation and generates local regeneration and social and financial value for its participants. To do this, they develop creative solutions that address the needs of current and emerging markets.

We are already seeing the way in which technology and data is bringing about seismic shifts in how services are delivered in novel and unpredicted ways. On the one hand these are solutions that make use of data and digital technologies to create personalised, location specific services and applications. On the other hand these are about using data and digital technologies to change traditional business models and help traditional businesses to be more competitive. Creating the enabling culture, environment and tools to support SMEs, communities and social entrepreneurs to innovate and develop solutions that address the challenges of the future are a key priority.

Encouraging external innovation and putting in place the mechanisms for internal innovation will generate key benefits:

- Better access for SMEs to the public sector market, e.g., reduced tender times and requirements
- Improved value for money on public sector procurement and service innovation
- More targeted, better focused local service delivery through insights from open data
- Job and business creation with the development of innovative products and services

- Emergence of new business models, e.g., consumer led digital health solutions or services based on demand aggregation

E-government

Smart Communities are ensuring that all appropriate public services are available online, over the phone, or both to boost productivity and reduce unnecessary travel.

To accelerate the provision of government services digitally, Smart Communities are adopting a 'Digital First' policy, committing to using digital channels as their primary or preferred form of service delivery. Fundamentally, 'Digital First' means transforming transactions with their clients from hard copy to digital and, where face-to-face contact is necessary, from in-person interaction to video interaction where appropriate.

The next wave of opportunities to improve the quality and effectiveness of government services are likely to be driven by access to (appropriately anonymized) public sector data sets and 'big data'. The largest beneficiaries may be taxpayers – McKinsey Global Institute estimates that by learning from big data the public sector in Europe could reduce overheads by 15-20 per cent.

Mobility

A core requirement for a community to function is the mobility of people, goods and supplies. Easy and affordable connections between all parts of a city are a key factor for the prosperity and wellbeing of inhabitants. Smart Communities focus on seamlessly bringing together city systems, services and infrastructure, and by using information and communication technologies to create better insights for citizens as well as planners. It aims to create an environment where transportation and mobility are centred on individual requirements, and greener, cleaner and more affordable; and where transport infrastructure is exploited to its fullest.

Smart Communities enhance existing infrastructure's usefulness through technology and exploit data from many sources and move towards best use of data analysis for monitoring and operation of a community.

Open Data and Information Marketplaces

As part of the wider digital economy, Information Market Places are emerging where data and information is widely available to all, either free of charge or as a trading commodity. Exploitation of these Market Places enables the creation of new services, e.g., big data processing and analysis, visualisation and enrichment of services through new intelligence. Providing local government open data and encouraging others to release open data is one important step to support economic activity.

In line with the Government's open data agenda, more and more local authorities and public sector organisations are making their own data available free of charge, in a reusable format and with a clear license to allow others to use it for their own purposes (including commercial).

Open data is often linked to increased transparency and accountability of Local Government activities to taxpayers. Yet it is clear that sharing open data free of charge can also create additional economic and social value. The potential benefits from the use of open data are broad:

- Analysing previously separate datasets together can generate new insights and trends, e.g., between environmental, health and social behavior data), leading to better targeted services that address user needs and allocation of resources to the areas of most need, e.g., using real-time traffic incident and congestion data to reroute ambulances
- Businesses create new commercial applications and services by aggregating, enriching and analysing data either directly for the end consumer or for other organisations. Open data adds value to proprietary data by giving it new context
- Value is created by the community and SMEs.

Digitally enabled utilities

Smart Communities are planning for future use of real-time metering and control systems for smart grid electricity networks and gas and water utilities. These systems allow improved usage reporting, more cost-reflective pricing, and more efficient alignment of supply and demand to reduce overall resource consumption.

Other examples of Smart Innovation are:

Urban action forums: e.g. www.greatcities.org, www.livableplaces.org and www.planningalerts.org.au – forums for discussion of urban-planning issues and strategies, and for mobilizing local action.

Community service interfaces: e.g. www.fixmystreet.com and www.seeclickfix.com - websites that empower citizens to issue service requests to local government and hold them accountable for action.

Hyper-local websites: e.g. www.everyblock.com – websites focused on individual neighborhoods and "meet the neighbors" websites such as www.streetparty.org.uk and www.groupsnearyou.com.

Personal support networks: e.g. www.tyze.com – a platform for encouraging people to form support networks to care for the infirm, disabled, or elderly.

Volunteering networks: e.g. www.govolunteer.com.au and www.volunteerhq.org – platforms for facilitating volunteering and matching volunteers with opportunities.

Seniors peer support: e.g. www.eons.com and www.boomj.com – social networking sites for seniors.

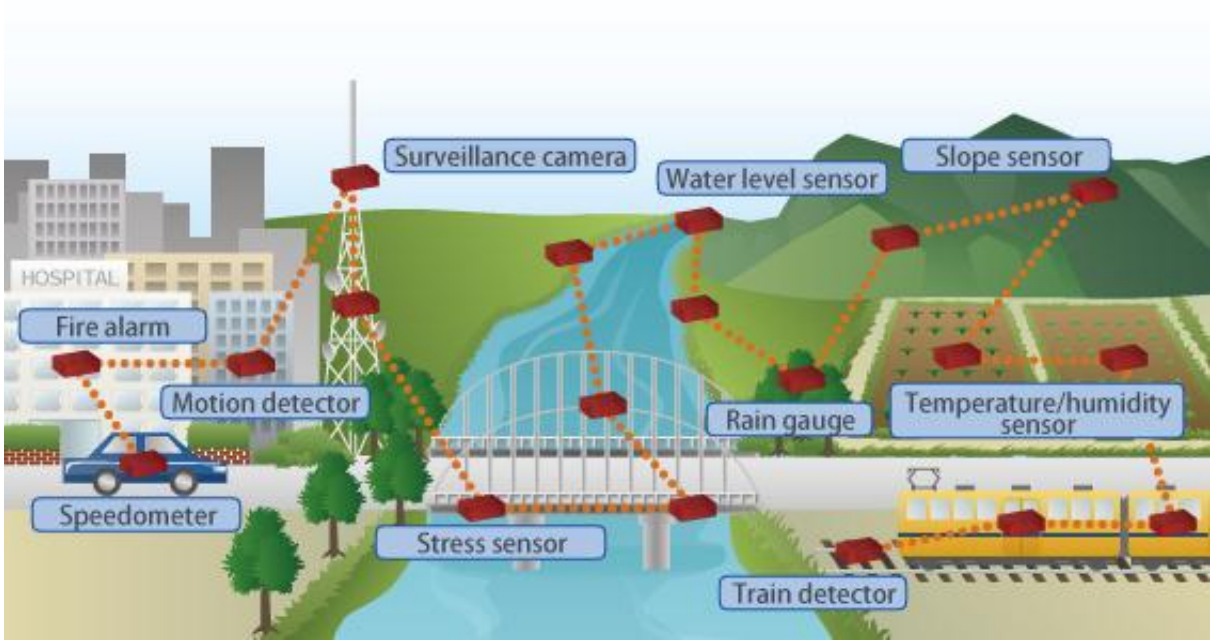

Image Source: Fujitsu

Appendix

Further Reference

Broadband Today Alliance

www.broadbandtoday.com.au

Intelligent Community Forum

www.intelligentcommunity.org

Smart Cities Council

www.smartcitiescouncil.com

Cisco Smart+Connected Communities

http://www.cisco.com/web/strategy/smart_connected_communities.html

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Birmingham Smart City Roadmap

Digital Birmingham

Published March 2014

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About the Broadband Today Alliance:

The Broadband Today Alliance (BTA) is a collaborative alliance of local government, Regional Development Australia (RDAs) and Regional Organisations of Councils' (ROCs) built on the premise of sharing information and advocating for the resources to assist the localised transition to a digital economy. Over 135 local governments are represented with over 8 million Australians represented across all states and Territories.

The BTA is an officer level organisation and, in its current form, has been in existence for over two years and prior to that for a further 2 years as the South East Queensland Broadband and Digital Economy Working Group aligned under the Council of Mayors SEQ. In response to interest from other local governments and regional organisations such as RDA's, the group has grown to become a national organisation with members from all states and territories.