



Securing Australia's competitive advantage in the hyper-connected world

White Paper

Australia's continuing economic prosperity and social well being will depend upon securing competitive advantage in the technology-driven future where disruptive automation and innovation will transform every aspect of life and business.



Abstract

Transition to the digital economy is now the basis for sustained global prosperity and social wellbeing. However, not every country will succeed in the transition and whole societies are facing a declining future. Underpinning the digital economy is hyper-connectedness enabled by extreme technology-driven automation and prolific innovation. The technologies utilise data collected on a massive scale and ever more sophisticated analytics-based applications. The power of the applications is unprecedented and is fundamentally disruptive across traditional industry and sectoral boundaries. Countries which thrive in this new era will be the ones that fully embrace the innovative possibilities of these powerful new digital ecosystems. Australia has many attributes to succeed in the digital economic era. However, it has a fundamental gap in a technology base supporting hyper-connectedness.



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1. Introduction

The world's economy has transitioned many times over its history. However, in 2015 the world entered a ten-year transition cycle which is unprecedented in scope and impact. In broad terms, it can be described as the era of the digital economy and this has taken over the world's growth mantle. The digital economy is accelerating, characterised by hyper-connectedness enabled by highly disruptive digital technologies and information intelligence. By its very nature, the digital economy is commoditising every economy and creating an entirely chaotic market dynamic.

Australia must be more proactive and take a leadership position in what has become a global race of nations. Continuing reliance on fortunes derived from natural resources won't be enough for future economic certainty. Australia's investment in education and multi-culturalism means it can relatively easily shift gears and fully utilise the knowledge capital and creative energy of its people. The assumed benefit from being a fast-following adopter of technology is obsolete. This only made sense when the life-cycle of technology was five or more years. Abundant and rapid technology innovation is now fundamental for sustained wealth. The consequential market environment is also new and the absolute winning formula is to be first to every market. Also, innovation for growth is no longer just in the realm of large corporations. Innovation has most potential if multi-sourced from anybody and in any context. Therefore, governments have an obligation to incentivise hyper-connectedness and wide-scale technology-based innovation.

Australia must decide to embrace the disruptive reality of the new hyper-connected world. As we outlined in our previous paper, ***1A new world of cities and the future of Australia***, there is a fundamental urgency to unleash the collaborative and digital creativity of all Australians. Australia's states and territories are considered to be best placed to drive the transition. States and territories typically have digitisation strategies but now need to step-up on hyper-connectedness and innovation.

Hyper-connectedness is characterised by dynamic and shared inter-working amongst people, machines, societies and businesses. It goes well beyond simple device connectivity and process automation. An ecosystem in itself, its boundaries are defined by opportunities, common interests and shared benefits. States and territories can adopt digital platforms to hyper-connect everything from any infrastructure through the full 360-degree operation of cities and communities. Most practical will be to work in partnerships to deploy properly scaled and secured state/territory-wide digital platforms for use by every city.

There is an urgency for Australia to set a course to take a leading position in the hyper-connected world. Australia has many essential attributes for success but is currently lacking enabling policies and ubiquitous digital platforms to take full advantage. This paper argues that states and territories are the natural starting point for establishing these policies and deploying relevant digital platforms. They should be supported by a national approach that prioritises a consistent approach to enabling infrastructure and assets for use across cities and communities.

2. National competitiveness reshaped by technology

Modern digital technologies are driving significantly disruptive changes into societies and economies around the world. These changes were first substantially experienced in the decade starting 2005. New levels of digital connectedness enabled the likes of online banking, online customer services, online entertainment, social networking and social commerce. Classic examples highlighting the value of connectedness include Facebook, iTunes, eBay, Amazon, LinkedIn, and Airbnb. However, in the decade ahead underlying change impacts will be characterised by hyper-connectedness and highly-responsive control systems utilising sophisticated data analytics across multiple industries and economic sectors.

1 A new world of cities and the future of Australia, Nokia Whitepaper, Warren Lemmens, Geof Heydon, 2017:
<https://resources.nokia.com/asset/200799>

Hyper-connectedness is a term describing our world as it evolves from billions of digitally connected people to tens of billions of connected “things.” This is a commodity world of mass customisation. It is a world driven by sophisticated intelligence processing and extreme levels of automation. In his book ²**The Seventh Sense**, Joshua Ramo explains hyper-connectedness as an unprecedented phenomenon in world history. He describes a constant state of market shock as digital technologies continuously disrupt. His ‘Seventh Sense’ concept expresses a fundamental shift in human attitude and insight needed when thinking about the nature of markets and competition. A hyper-connected world underlies rapid innovation and there is an almost infinite number of new market opportunities.

Economies which cultivate this ‘Seventh Sense’ will derive a fundamental competitive advantage. To be ready for this hyper-connected world and to cultivate the Seventh Sense, a country like Australia needs to mobilise its population around digital enablement and innovation. Australia can gain competitive advantage in its own right through investment in community digital assets. The digital asset base will help empower any city or community across Australia to build their own future. It will better connect communities into the growing digital economy, energise creativity, evolve more inclusive communities, pull through new jobs and open dynamic export market opportunities.



**Harvard
Business
Review**

March 2016

“Digital is not just part of the economy - it *is* the economy”

3. Digital assets and innovation vital for growth

Digital assets describe the totality of skills, structures and technology platforms. These assets are essential in a commoditised economy where prolific innovation is the basis for creating wealth. However, digital assets are not only a platform for invention but also essential for communities to be effective. Further, a process of innovation to constantly improve the community is a basis for new export markets.

Australia’s tradition of being a “fast follower” will not work in this digital age. ³**Digital America Report** by McKinsey Global Institute in December 2015 highlighted three areas of innovation important to communities, namely; labour market efficiency, capital efficiency, and multifactor productivity. Improvements in these areas could positively lift GDP 6 to 8 percent above baseline projections. This does not account for the broader growth from new markets.

Labour market efficiency – innovative talent platforms can cultivate effective agglomeration and enhance social inclusion.

Capital efficiency – Internet of Things (IoT) platforms can improve asset utilisation and be used to proactively influence positive experiences.

Multifactor productivity – digital platforms can optimise cost structures and elevate performance of the community.

2 The Seventh Sense: Power, fortune and survival in the age of networks, Little, Brown and Company, Joshua Cooper Ramo, 2016

3 Digital America: A tale of the haves and have-mores, McKinsey Global Institute, James Manyika, Sree Ramaswamy, Somesh Khanna, Hugo Sarrazin, Gary Pinkus, Guru Sethupathy, and Andrew Yaffe, 2015

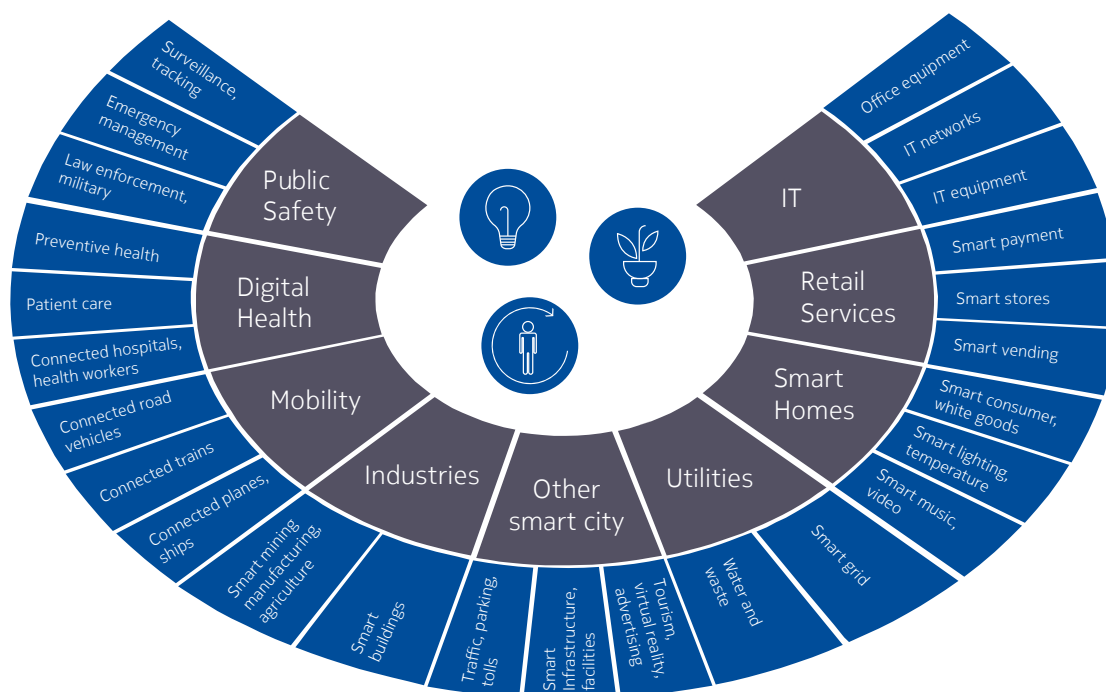


Figure 1. Many new and yet to be discovered sectoral automation opportunities

4. Communities are crucibles for digital innovation

Communities can be defined as any shared common interest across a group of people. There are no constraints on what constitutes an interest and the groups of people can be geographically or virtually connected. A clear and distinctive advantage of people living in a city is the ease they can be both geographically and virtually connected. The most vibrant communities are known to be the most connected. In economic terms this connection leads to high rates of quality innovation and productivity. It is called economic agglomeration and makes cities a natural vehicle to create wealth in the digital economic era. In fact, cities have become the primary growth engines for national economies.

Consequently, national governments are intervening ever more in the social and economic evolution of their cities. Great examples of blending social (urban) and economic development can be found in the United Kingdom. After more than 20 years of experimentation with city models, the UK has fathomed the importance of creating urban environments which both attract talent and are highly connected. Digital automation of urban environments has been found to be key and it is essential to have a city connected seamlessly across its total assets. This seamlessness is derived from collecting an abundance of data across the whole of the city. This enables clever analytics and prolific innovation across all facets of city life and operations. It integrates life and productivity experiences across people, buildings, public spaces, infrastructure and commerce. It reinforces both the brand of a city and its international reputation.

Cities are crucibles for digital innovation and importantly are essential economic growth engines. Cities have become incubators of innovation and also make the consumer markets for the innovators. It is important to have local markets to provide a basis for expanding globally.

In Australia it is essential that expectations are properly set about the role of cities in the digital economic era. Today there is a misplaced interpretation that cities are equipping themselves for their new role. The reality is that Australia's cities and their administrators only exist to service rate payers using local taxes raised. They do not have the skills nor resources to scale and respond to the heightened demands of innovation in the digital economy.



Australia's cities need to be equipped for social and economic development for this era of dramatic social and economic transformation. This includes investments to implement capabilities for digital innovation readily accessible by communities. These platforms do not exist today and they require coordinated and standardised approach to design and implementation. Nokia advocates state and territory leadership in this area.

5. Communities and City Digital Platform

Cities and communities will only substantially benefit from City Digital Platform if it is secure, trusted and operationally reliable. City Digital Platform is mission critical and requires high availability. It utilises an ICT architecture incorporating sensors, security, networks, data-centres, databases, application development and end-to-end operations management.

The necessary scale of such a platform is significant and requires professional, technical and operational ICT skills. Any one community or city will find it challenging to independently deploy and operate City Digital Platform. Furthermore, core network/data-centre infrastructure, end-end operations management and cyber security are probably best performed across a whole state/territory geography. A city or community can then implement local networks and establish their own innovation ecosystems.

City Digital Platform enables a community to solve local problems and importantly shape and create their future. A community can become a better partner to businesses and universities and therefore attract investment. A community might decide to become a net exporter of energy. A community might perfect multi-mode transport and optimise travel times. The possibilities are boundless and any one innovation can potentially lead in the world.

Indeed, the Australian Government recognized the economic value of cities and their importance to fostering knowledge-based industries in its 2016 Smart Cities Plan. It advocates a renewed national focus on cities, emphasizing the value of partnerships between different levels of governments and the private sector to accelerate the delivery of relevant infrastructure.

Importantly, cities and communities must integrate people within their urban fabric. This is a broad topic but there are two high-level measures describing this integration. Firstly, sustainability is the most commonly identified urban measure. In terms of Maslow's five level "hierarchy of needs" sustainability largely addresses the lowest three tiers of his pyramid. It basically measures the quality of life when people are living together in an urban environment. Secondly, personalisation, a measure rarely mentioned in literature as related to cities because it can easily be assumed to be a by-product of sustainability.

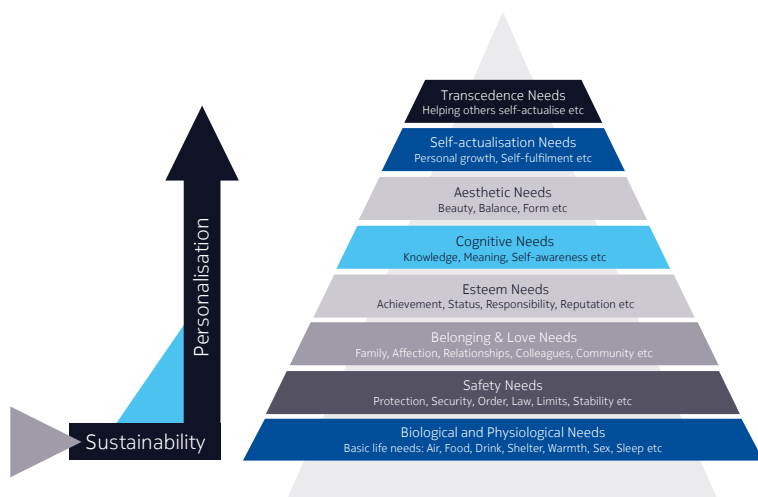


Figure 2. Extended Maslow's Hierarchy of Needs with mapping of Sustainability and Personalisation Measures



Personalisation should be highlighted. It is probably the most important measure because it focuses on individuals and their emotional feelings. Personalisation strides across the layers to the top of Maslow's Hierarchy which in Figure 2 has been extended to eight layers for contemporary relevance. In the digital economic era the attractiveness of a city for talent and facilitating collaborative business is paramount. With sustainability alone, a city is efficient. With personalisation added, a city is fully effective because it becomes a place where people want to live, work and play.

Personalisation aligns well with the Australian archetype around personal freedom and inter-personal relationships. Personalisation is potentially an economic differentiator and a key theme to be developed for all of Australia's cities and communities.

6. Describing City Digital Platform

City Digital Platform is essentially a tightly performing distributed Cloud architecture which dynamically connects millions of sensors and devices to data centres running applications in hosted environments. It is designed for critical applications and multi-tenancy use. It supports innovation ecosystems of partners across citizens, businesses, academia and governments. It also implicitly secures and protects consumer rights and information because appropriate information sharing is fundamentally important.

City Digital Platform does not exist in Australia today. If it is considered to exist at all, it exists as a piecemeal patchwork of disparate enterprise-oriented ICT systems with no long-term foundation. The current mode lacks standardisation, is labour intensive and detracts from the focus cities need to solve local problems and build their future.

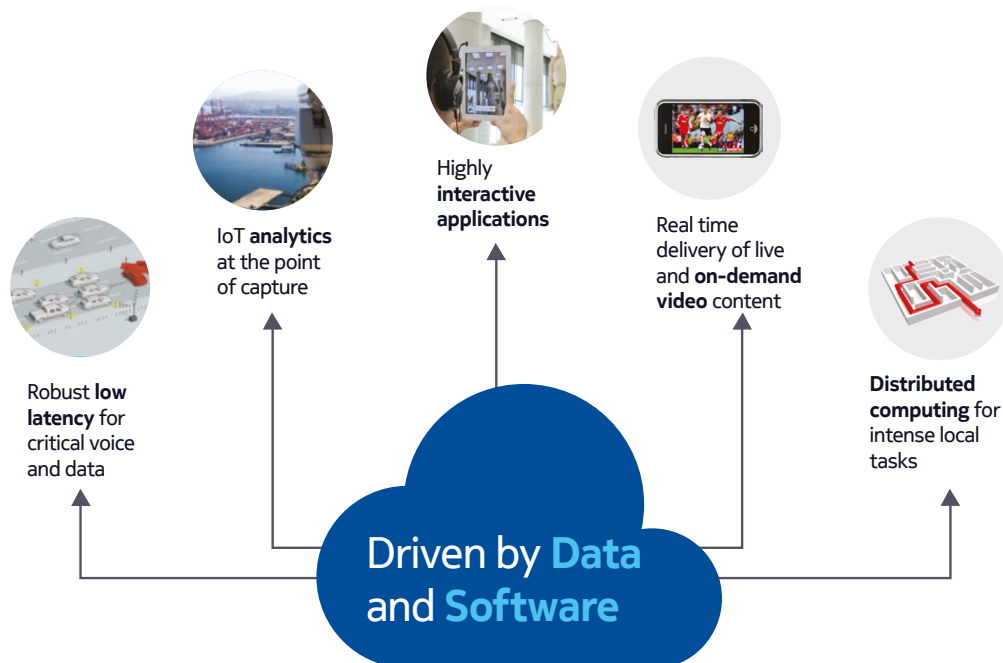


Figure 3. City Digital Platform is Cloud-based

Possibly underestimated today are the requirements to support an expansive range of device types and an almost limitless number of possible applications. Future applications will range from simple binary decision making controls through to complex systems driven by sophisticated data analytics. Most complex applications directly impact life or business and require high performance and high availability. Enterprise



networks are not designed for this range of application types nor to be mission critical. A trap for cities is they forget about the important need to upgrade their enterprise networks. This is often because in the early stages of smarter city initiatives they only deploy sensors to gather new information about city assets. These sensors are invariably connected to an existing enterprise or internet network. However, as the city matures it tends to use new collected data for more critical applications and deploy new sensors. This evolution is constrained by the existing network.

To help visualise the meaning of mission critical consider 50 city services that might all be delivered every day of a year. Given nominal enterprise performance levels the failure rate will likely mean any one service will be unavailable at least one full day in a year. This level of performance is counter to the needs of modern cities. The only way to address this is to design and deploy City Digital Platform at scale and with high performance and resilience. A community cannot achieve this on its own, but it can be achieved and indeed optimised across a state/territory.

A distinctive advantage of City Digital Platform is that it sits at the intersection between data and innovative business models. The more data that is collected and processed the more possibilities arise for innovation. Data is the basis for some of the most disruptive business models in recent years. Consider Uber disrupting the taxi industry because it correlates passenger location with driver location and personalises the trip. Consider Airbnb which correlates travel data with property data and personalises the experience. Data will increasingly be processed from both public and private sources. The scale of the collection and processing of data will be immense but achievable with City Digital Platform.

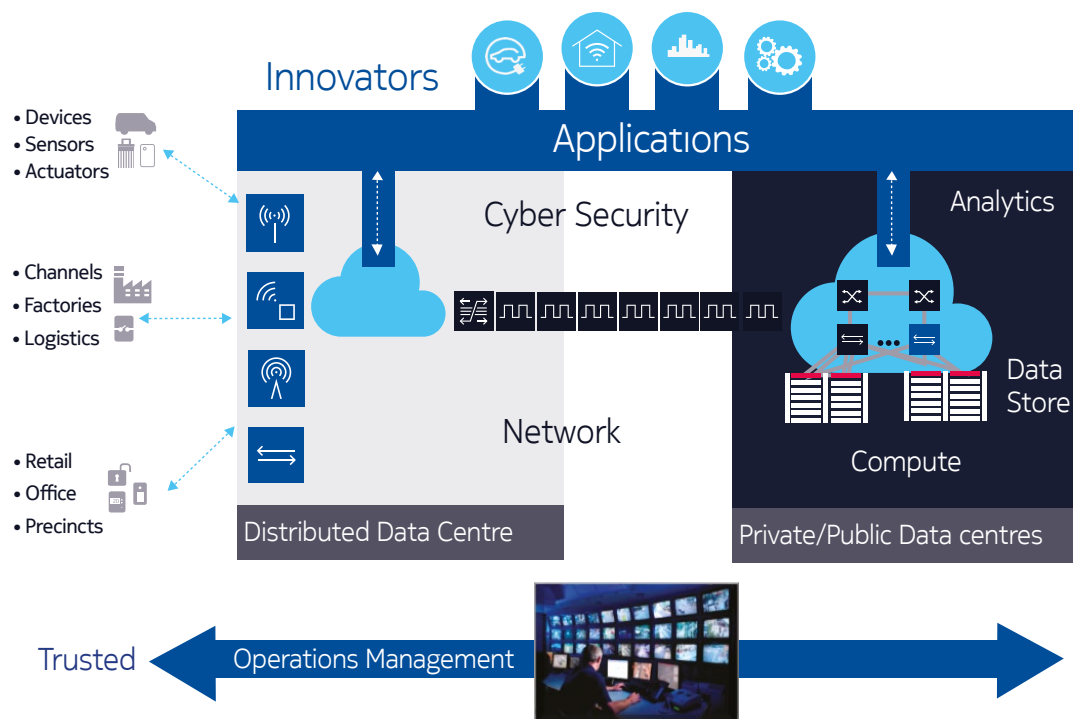


Figure 4. City Digital Platform is defined by an ICT infrastructure, operations and innovation architecture

Another advantage of City Digital Platform is that privacy and security is part of the end-to-end design and can be managed centrally. Increasingly the risk of security breaches and hostile attacks mandates dynamic security controls and effective device management across the millions of devices, sensors and actuators. It is essential to be connected into global security frameworks, to utilise both remote device management and sophisticated attack analytics. The design of City Digital Platform will allow the network to automatically quarantine problem devices, isolate compromised infrastructure and maintain integrity of services and personal data.



7. Nokia's engineering of City Digital Platform

City Digital Platform is an engineered system of integrated functional building blocks. It is an ICT resource which can delegate defined functions to cities and communities. It can also wholly exist in a single city or community context but would ideally be implemented at a state or territory level for use by multiple cities and communities.

Figure 5 outlines Nokia's defined fifteen building blocks underpinning City Digital Platform.

In a city context the building blocks each require their own deployment and ongoing support structure. Consequently each building block needs to be assigned to a responsible operating entity. The total cost of ownership for each building block can be used to determine assignment of responsibility. Ongoing cost structures will largely be determined by scale of operation. However, scale will need to be balanced against the need to localise accountabilities for achievable outcomes. Therefore it makes sense for some building blocks to be implemented at the level of state/territory whilst others are implemented at a city/community level.

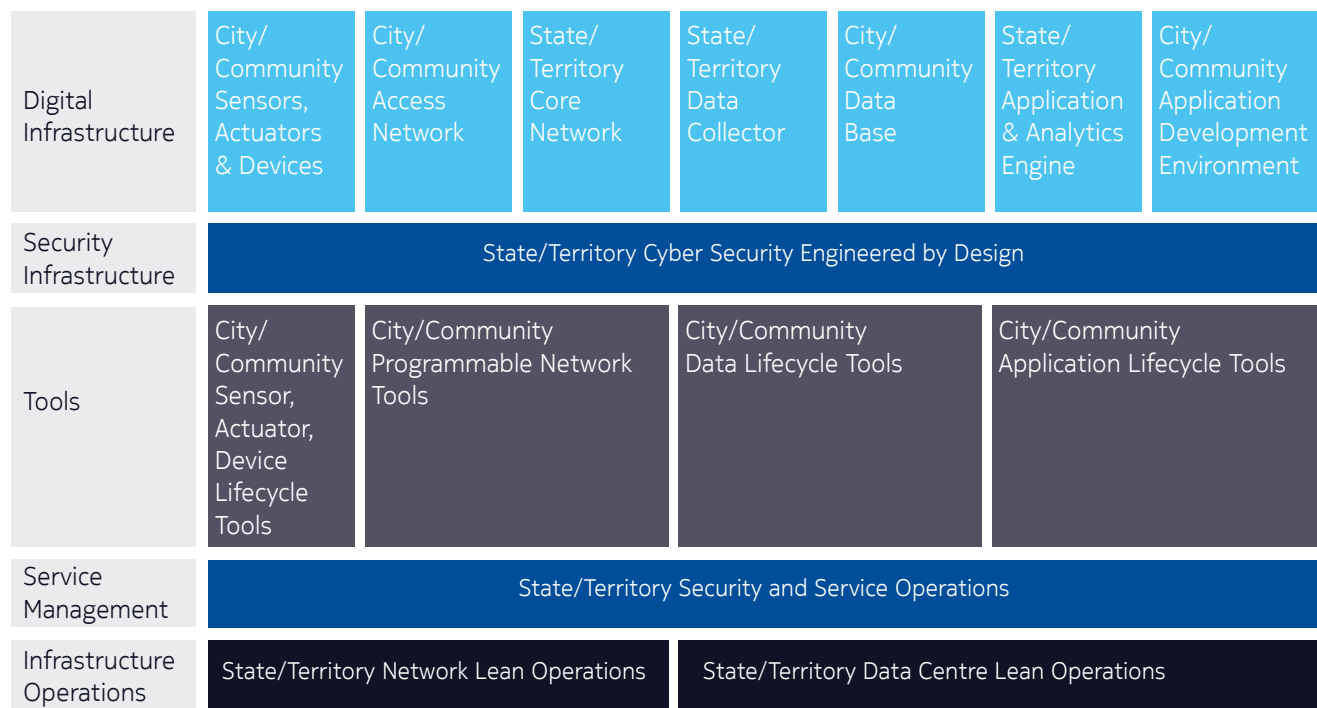


Figure 5. City Digital Platform is a state/territory ICT resource which delegates defined functions to cities and communities

Figure 5 suggests a possible mapping of building blocks between state/territory and cities/communities. For example cyber security is a complex, end-to-end practice requiring significant skills and integration into global security frameworks. It is therefore probably best the responsibility of a state or territory. Otherwise for a city/community it may be sensible to delegate responsibility for access network functions for connecting thousands of sensors. Similarly it may be sensible to delegate responsibility to cities/communities for deploying tools, with a potential additional benefit for local innovation ecosystems.

Building blocks are designed using modern technologies suited to the era of hyper-connectedness and the massive scale of programmable applications. Nokia recommends that states and territories use the building block approach to establish an end-to-end design and to assemble their own preferred ecosystems of partners.



The technical architecture must be “plug and play” to allow choice from the many functional products and services available from innovation leaders like Nokia and other suppliers across the technology market. Nokia is already working with many of these other suppliers and also has its own ecosystem of preferred partners.

7.1 Key attributes of City Digital Platform

Digital Infrastructure – must be considered Mission Critical Infrastructure and provides the foundations for robust, application relevant performance and operation. It needs to be kept in mind that all city utilities and agencies including transport, water, energy will depend on this digital infrastructure for safety, productivity and efficiency requirements.

The seven building blocks shown in Figure 6 describe the underlying digital infrastructure and capabilities of City Digital Platform. Each block has been assigned a nominal responsible owner between state/territory and city/community. There is also an assigned state certification to allow a region or city to adopt and implement a state or territory standard.

Nominally assigned State/Territory responsibilities		Reasons for assignment
Core Network	Common use and State/Territory-wide, programmable, secure optical and IP routing network for all City/Community and Government services	Shared infrastructure Large scale Non-discretionary investment Critical operations Lowest unit cost
Data Collector	Common use data-centre platform for securing, capturing and pre-processing collected data	
Application & Analytics Engine	Common use data-centre platform for application development and massive data analytics processing	
Nominally assigned City/Community responsibilities; State/Territory certified		Reasons for assignment
Sensors, Actuators & Devices	End-point devices deployed for the collection of data and actuation control	Local needs and priorities Manageable scale Discretionary investments Local operations Local cost structures
Access Network	Local network, wireless and fixed line, for connecting any devices, anywhere at anytime	
Data Base	Logically defined and secure data base for storing local data and supporting applications. Utilises State/Territory certified data base systems and standards for storage, deployment and operation	Reasons for State/Territory certification Wide-scale innovation required Trusted data/applications essential Compliance (e.g. privacy) Multi-vendor sourcing
Application Development Environment	Locally supported application developer tools and ecosystems. Utilises State/Territory certified development tools and standards for deployment and operation	

Figure 6. Nominal assignment of responsibilities between state/territory and city/community for digital infrastructure



Security Infrastructure – must ensure a trusted customer environment and be designed into the end-to-end technical architecture and is a combination of physical and virtual embedded technologies including Artificial Intelligence.

Nominally assigned State/Territory responsibilities		Reasons for assignment
Cyber Security Engineered by Design	End to end embedded design and operation encompassing end-point profiling & lifecycle management, dynamic firewall management, advanced security analytics network wide, standards based access control & monitoring, integration into global cyber security operators	Highly specialised skill domain Global scale of operation Non-discretionary investment Critical standards & operations Lowest unit cost

Figure 7. Nominal assignment of responsibilities to State or Territory for Cyber Security Management

Tools – must support local operational productivity, compliance management and security operations and should take full advantage of Software Defined Networking (SDN) and Virtualisation technologies for programmability as well as sophisticated development and management.

Nominally assigned City/Community responsibilities; State/Territory certified		Reasons for assignment
Sensor, Actuator, Device Lifecycle Tools	End-point device management including regular updates and upgrades	Local needs and priorities Manageable scale Discretionary investments
Programmable Network Tools	API based development environment for application specific network service requirements. Enabled by Software Defined Network technology	Local operations Local cost structures
Data Lifecycle Tools	Data management for compliance, customer experience and operational efficiency	Reasons for State/Territory certification Wide-scale innovation required
Application Lifecycle Tools	Application management for compliance, customer experience and operational efficiency	Trusted data/applications essential Compliance (e.g. privacy) Multi-vendor sourcing

Figure 8. Nominal assignment of responsibilities to communities using state/territory certified tools

Service Management – must be end-to-end across all services delivered on top of the digital infrastructures and include security management.

Nominally assigned State/Territory responsibilities; with delegated functions		Reasons for assignment
Security and Service Operations	End to end operational management encompasses all device end-points through networks to data centres and applications. Operational management covers deployment functions, provisioning functions, assurance functions and security. Deployment and provisioning includes delegated functions to local operations in Cities/Communities. Assurance also includes delegated functions to local operations in Cities/Communities as well as incorporates change management controls. Security is fully integrated into global security operations centres. All management should be based on Lean Operations systems and practices to ensure the maximum extent of automation and a need for only a small number of highly skilled operators running 7/24 operations.	Highly specialised skill domain State/Territory scale of operation Non-discretionary investment Critical standards & operations Lowest unit cost Delegated functions Delegated local operations centre Local workforce, including field Locally prioritised response Standard practices used Full visibility of operational status

Figure 9. Nominal assignment of responsibilities to State with delegated function to Cities/Communities



Infrastructure Operations – must utilise Lean Operations practices and methods to affordably scale for the hundreds of millions of sensors and devices to be operated in various networking configurations across cities and local communities.

Nominally assigned State/Territory responsibilities; with delegated functions		Reasons for assignment
<p>Network Lean Operations</p>	<p>Lean Operations is based on Lean Manufacturing principles, already well established by automotive manufacturers. It is a closed-loop model for processing operations data and using advanced analytics to automate responses to operational problems. Historically, assurance responses have been based on manual tickets being launched per problem. Modern network and data centre design enables massive collection and processing of operational data together with massive analytics based decision making for fully automated corrective actions. Inevitably there will be a fall-out of problems requiring manual intervention. The objective is to minimise the number of these but even then the problems are automatically assigned. This manual effort may be assigned locally. Otherwise, the State/Territory Infrastructure Management Centre should only need small numbers of staff. A typical benchmark is 3 people per shift.</p>	<p>Specialised systems domain State/Territory scale of operation Non-discretionary investment Critical standards & operations Lowest unit cost</p>
<p>Data Centre Lean Operations</p>		<p>Delegated functions</p> <p>Work order assigned local fixes Local field workforce State/Territory prioritised response target Standard practices used Full visibility of fix status</p>

Figure 10. Nominal assignment of responsibilities to state/territory for infrastructure operations management

7.2 Capital and expense funding options for City Digital Platform

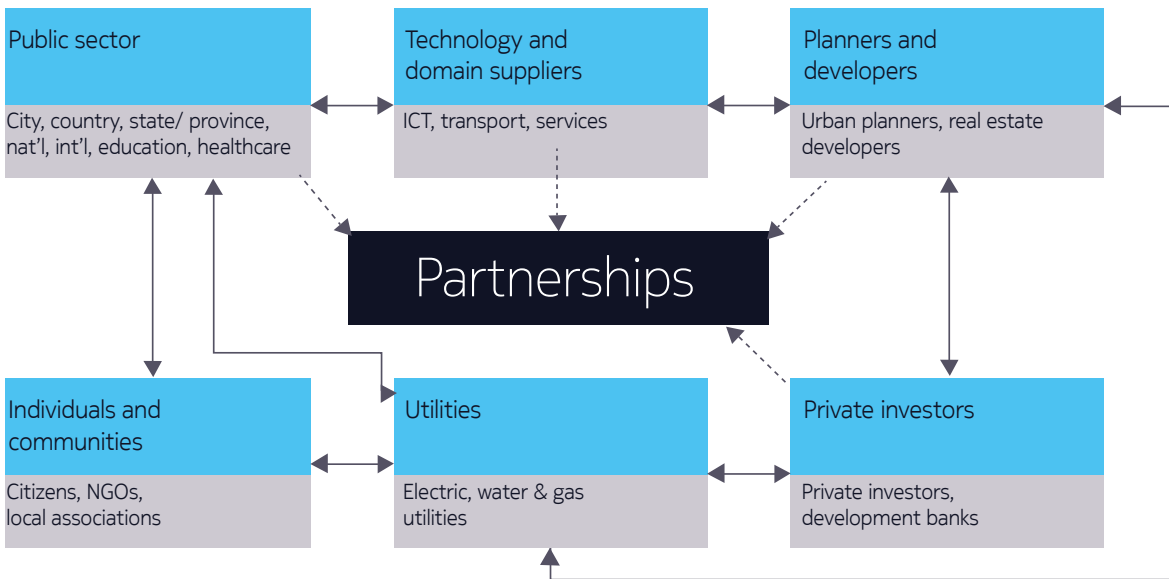
As recognized by the Australian Government's 2016 Smart Cities Plan, long-term investments are required to help establish the infrastructure required for cities in the digital era. It highlights the importance of partnerships between different levels of governments and the private sector to accelerate investment.

City Digital Platform has components of shared common infrastructure (state/territory) and purpose built infrastructure (cities/communities). The combined asset provides an important foundation for wide-spread innovation, productivity and efficiency improvements across the state/territory, cities/communities and the national economy.

City Digital Platform will be used for many applications serving many different functions and outcomes including utilities (eg. energy) and sectoral (eg. transport) groups. Some of these applications are yet to be conceived. No matter what, it will:

- Advance economic strength across all metro and regional areas,
- Enhance social cohesion across the state/territory and its cities/communities,
- Enable vibrant and collaborative innovation, ensuring the state/territory remains competitive, and
- Step-up the state/territory-wide and global connectedness of citizens, businesses, academia and governments.

An initial requirement will be the establishment funding for baseline state/territory and city/community infrastructure and operations. A follow-up requirement will be funding to expand and evolve the baseline infrastructure over time. In most cases around the world, government seed funding is provided, supported by a business case. A long-term business case should be developed assuming the multi-faceted benefits expected from the Platform. The likely most long-term funding model would involve commercial Public-Private-Partnership (PPP, Figure 11) entities.



Source: IDC Government Insights (2014)

Figure 11. Example Public-Private-Partnership framework

Once the Platform is established, its operational expenses (OPEX) might be funded on a usage basis. In most cases usage is directly paid by users and beneficiaries. Increasingly, OPEX funding can be obtained indirectly using creative revenue models based on revenue share, sponsorship, advertising or share gain business models for example (Figure 12).

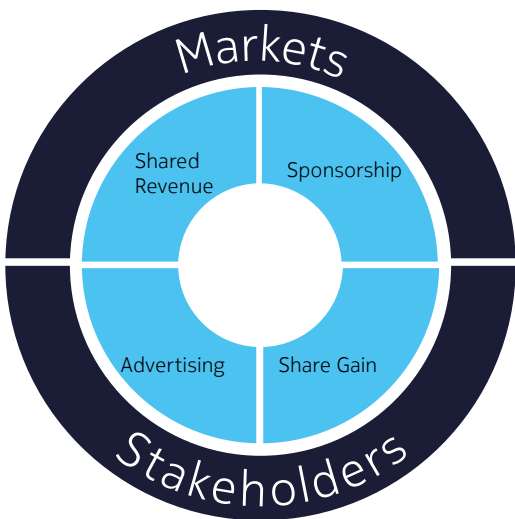


Figure 12 - Example of alternative funding models for OPEX



8. Nokia's six imperatives for State/Territory leadership

Nokia advocates six imperatives to take a leadership position in the hyper-connected era:

- 1. Eliminate device, data and applications stovepipes** - provides a city/community the ability to take control of itself and offer sustainability and personalisation services holistically to become an effective partner to business and people. Communities must have single jurisdiction controls (health, transport, utility etc.) and an abundant data repository that is readily accessible by any software developer. This may require using special vehicle bodies beyond the local council and also defined standards such as for shared/interoperable data.
- 2. Establish a standard state/territory-wide City Digital Platform** - the current ten year cycle (from 2015) can be defined as a period of massive scale automation. This is a hyper-connected and data-driven period requiring high integrity digital infrastructure to tap any data from across a city (simple telemetry data through to intense 3D video data) and process this data for augmented city response, often in real-time. This requires scaled and secure digital infrastructures which cities do not have today. City Digital Platform defines the digital infrastructure and operations.
- 3. Unleash a state/territory level movement around digital innovation** - fully recognise the extent of impact of digital disruption and the emergence of the Digital Economy. Reverse Australia's current backward trending on key metrics - such as technology readiness, business sophistication and innovation - important to succeed in the digital era. Raise awareness of the impact of digital disruption and the need for innovation to create the next generation work-force structure for jobs.
- 4. Establish a collaborative dynamic across Australia** - the digital economy is massively disruptive across traditional sectoral boundaries and is driven by new concepts and new technologies. To identify new market opportunities or to survive market disruption requires sharing of knowledge and ideas. This is not a norm across Australia and must be highlighted as a cause for survival and future prosperity. Communities can make a big difference by emphasising collaboration.
- 5. Lead the world on a new personalisation measure** - in the context of cities, personalisation is a measure which has unique possibilities when digital data and analytics are abundantly available. In thinking about communities or cities and the possibilities from a hyper-connected world, personalisation will set an underpinning and differentiating theme for Australia as it plays on the global stage.
- 6. Facilitate dynamic Public-Private-Partnerships for city innovation** - financing for success in the digital economic era will depend much more on entrepreneurial shared risk and reward models than ever before. This is largely because of the emergence of unbounded new digital markets and the chaotic nature of disruption. Most evidence points to dynamic Public-Private-Partnerships (PPP) being the only agile way to adapt in what is a high stakes game. More traditional PPPs are functional consortiums and have not resulted in the improved innovation which must be more characteristic of successful PPPs in the future.

9. Conclusion

Australia is faced with the inevitability of a chaotic world and commoditised markets. Our current standard of living is in jeopardy and it faces a future decline. Australia has a second chance because it has key ingredients for success in the digital economy. The most significant exception is the technology sophistication needed to empower the country to take a leadership position at the world table. Fast following will no longer suffice.

There is an urgency for Australia to set a course to take a leading position in the hyper-connected world. This paper argues that states and territories are the natural starting point for establishing these policies and deploying relevant digital platforms. With the appropriate Federal Government policy direction and support,



each state and territory has the opportunity to grab control of its future by deploying a City Digital Platform. These investments will help unleash the creative energy of cities and communities which can better solve their own problems and invent new market opportunities. This will add significant momentum to innovation development and to transitioning the workforce into the new digital economic era. Most importantly it will underpin an essential differentiated basis for sustained economic prosperity and employment.

References

1. A new world of cities and the future of Australia, Nokia Whitepaper, Warren Lemmens, Geof Heydon, 2017: <https://resources.nokia.com/asset/200799>
2. The Seventh Sense: Power, fortune and survival in the age of networks, Little, Brown and Company, Joshua Cooper Ramo, 2016
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