# Nation Building Now in the Hands of Cities and Communities

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## Abstract

For a number of reasons over the last five to ten years we have seen a shift in politics, moving away from the centre towards the extreme edges. Many people have been dragged along with this, as many of the mass media outlets are highlighting and fuelling this polarisation. At the same time the power of the cities is increasing, and here it seems still to be possible to gather much broader support for 'national' interest projects in relation to digital infrastructure, sustainability and smart city platforms for interconnected LED street lighting, waste and water management, smart parking and other applications. What however, is often still missing is a holistic approach towards the development of smart cities; this needs to be led from the top and to be supported by a 'smart council'. A major stumbling block towards the development of a smart city is the many silos within a city, resisting the sharing of infrastructure and other relevant assets, resisting open data and open government. There are however, good examples both nationally and internationally of councils that are moving in the right direction.

## Governments fail to build national consensus

For a number of reasons over the last five to ten years we have seen a shift in politics, moving away from the centre towards the extreme edges. Many people have been dragged along with this, as many of the mass media outlets are highlighting and fuelling this polarisation. This is not about shooting the media messenger, but about the media becoming active players in the politicised debates.

What has also become clear is that the longer this polarisation continues the more difficult it becomes to find common ground around the centre. That is happening in particular in America, but it is also taking place in Australia. This development is much less pronounced in Europe, partly because it has an extra body on top of the national politics – the EU – that is still able to provide high-level 'common interest' policy directions that are positioned much closer to the centre.

Polarisation makes it increasingly difficult to build national consensus around issues that traditionally received bipartisan support, such a national infrastructure, social institutions and the longer-term future of the country.

What is happening now is that in each election cycle we see an almost complete demolition campaign from the opposition party of the policies that are introduced by the sitting government. This, of course, is putting us further and further behind countries that are able to build more constructively on top of the policies of the past. By all means make changes and adjust focus, but continue the process, especially in projects that require long-term vision and long-term implementation with long-term outcomes.

The role of government on all levels should be to provide the vision and broad high-level strategies; but then to work up from the grassroots level, with the people, to fill in how we are going to get there. As is clear from overseas examples, with the appropriate policies in place and with appropriate government facilitation, private industry will provide most of the investments needed.

In Australia , there now seems to be a significant divide between, on the one hand, federal and state policies and, on the other, what the people actually want – be it in healthcare, education, infrastructure such as the NBN, sustainability and renewable energy, taxation or elsewhere.

## People are rather for smart environments

Also we see councils, disillusioned by not receiving the infrastructure such as FttH and smart grids, essential in becoming a smart city (Zygiaris, 2013). BuddeComm (BuddeComm, 2015) has discussed the smart city concept with over 50 councils since 2000. Towards the end of that decade many local councils slowed down their smart city process as they got the message that the federal government would deliver them the first-class broadband infrastructure for this. A similar position was taken in the wake of the Smart Grid Smart City project announced by the previous Federal Government, as they linked that to a policy that would lead to the national rollout of smart grids. Both nation-building projects fell victim to the lack of continuity from the next government.

At the same time we see many people continuing to do what they believe makes sense for them. They install PVs, oppose CSG and other fossil fuel mining projects. They save energy, they continue to support projects such as FttH (Bakaul et al, 2011); they bypass the healthcare system and use new apps, internet services and wearable technologies.

# Cities are leading where federal policies fail

This brings me to the cities and local communities. This is where these activities are taking place, and we see an increased interest at this level for far more progressive policies that are linked to what the people actually want.

Moving on from their disappointment regarding federal projects such as the NBN and smart grids, the first local councils are now once again picking up the smart city developments they started a decade ago to see what they can do to improve the situation for their citizens.

They know how essential these developments are for them. With federal and state governments faltering they deliver the bi-partisan continuity needed to develop a smart city; it is now the cities that are looking at nation-building policies and nation-building projects, albeit on a community level. One significant problem is that in Australia city councils have significantly less power than most of their counterparts in other parts of the world.

Nevertheless we see cities working towards net-zero plans in relation to carbon emission and the generation of renewable energy. Most new corporate buildings follow a similar trajectory and many businesses are now seriously looking into alternative energy plans, micro-grids and battery storage.

City-based infrastructures for LED street lighting, waste and water management, smart parking and other applications are now being looked at again, and by sharing infrastructure and linking it to Wi-Fi networks and the NBN, cities can start implementing their smart city concepts. By creating intelligent city-based platforms – which cut across silos – great efficiencies can be created and, supported by big data and data analytics across the silos, new services and applications are being made available to the citizens. From here the broader community can be engaged and the platform can be used for a range of add-on developments such as Apps for the city. This opens up new opportunities, innovations and the development of new entrepreneurial small businesses as well as new jobs, especially in the 'sharing economy'.

# PPPPs – cities collaborating with citizens and private enterprise

Interestingly, as I have mentioned over all these years, hardly any new money is needed in order to get these projects off the ground. What is needed, however, are good policies that stimulate the private sector, in collaboration with the city, to make the necessary investments. Local councils can facilitate these processes and work closely with their citizens, businesses and other organisations to create a fertile environment for this to

happen. If cleverly done, much of this can be done in a PPPP with limited out of pocket costs to the cities involved.

PPPP stands for Public Private People Partnership.

In the projects we have been involved in, we established stakeholder groups, leading people within the city who represent the broader community: they include business, education, health, transport, community services, welfare organisations and so on. The council supports this group by providing a secretariat and a coordinating and facilitating function. Through community meetings the stakeholders assist council in explaining and promoting the smart city concept, inviting people to participate and creating citizen engagement: a smart city is a city where people are connected and actively engaged.

## The need for leadership from the top and 'smart councils'.

It is however, essential that these initiatives are taken by a 'smart council'. This means that first of all leadership will need to be provided by the mayor, as he or she stands above the silos and can direct the silos to collaborate. The greatest blockage to a smart city are the ivory towers within councils; a smart city can never be achieved unless it is led by a smart council. This requires open ICT systems, open data, open government and the sharing of infrastructure and other critical assets.

Most smart city projects currently under development in Australia don't have that overall vision in place and are not yet supported by a 'smart council' and as such the projects that are developed are silo-based; sometimes such projects are even based on proprietary infrastructure technologies, making it impossible to use the infrastructure for other applications. There are a number of councils that are worthwhile watching as they are moving forwards developing a holistic approach; they include: Adelaide, Perth, Newcastle, Maroochydore and Lake Macquarie.

Another issue that needs attention is what I call 'death by pilots'. Many cities have developed many pilots and even when successful they die because of lack of scalability, but mostly because of that lack of a holistic approach and a lack of that all essential leadership from the top.

Rather than everybody running their own pilots and projects, collaboration should be applied: for example LED street lighting is high on the agenda of many councils and if this is done smartly that should be linked to a WiFi network (in order to facilitate other applications). If this works in one city it is important to learn from that city rather than starting yet another pilot to test the same project in another city. Regional collaboration is an obvious solution, and the councils in SE Queensland are a good example of such

collaboration. I am involved in a project supporting the creation of a similar collaboration platform for the councils situated between Sydney and Newcastle.

There are also plenty of examples around the world that we can learn from. Below I have highlighted the cities where I have had first-hand experience on their smart city developments: Barcelona, Amsterdam, Tokyo and Chattanooga (Tennessee, USA).

## Barcelona – One of the Smartest Cities in the World

Over the last 10 years Barcelona – the second-largest city in Spain, with a population of 4.5 million – has excelled in adopting new technologies to make itself smarter.

The origin of this approach can be traced back to the hosting of the Olympic Games in 1992. They used that opportunity to transform the city from an old and dreary place to one that has taken a front-row position in the modern age. At the start of the process it was one of the most unprofitable cities within the developed economies; now it is one of the most profitable, with an annual budget of US$1.8 billion. Ever since embarking on this journey – with, of course, its ups and downs – the city has continued on this path and, since the early 2000s, it has been in the top ten of the smartest cities in the world, often reaching the top position.

Its mayor Xavier Trias is a much sought-after person on the international smart scene circuit. Colleagues from all over the world are visiting his smart city. He is one of the world's best champions of the smart city concept and his city leads the world in developing the international standards essential to create open and interconnected systems that underpin the concept. They are truly creating a 'hyper-connected' city. In March I stayed in this city for a week and I had a good opportunity to test this out.

Outdoors one notices the smart elements of public transport, which is highly efficient, with excellent information about when the next bus or train departs (often at intervals of three minutes). There are several apps for GPS-based parking advice (Zhou & Golledge, 1999), integrated public transport travel information and a range of (virtual) tourism applications. The flow of cars through the city and all-encompassing WiFi coverage (over 700 public hot spots, apart from the hundreds of private ones in restaurants and other premises, basically providing access everywhere in the city, including metro stations, parks, main streets, etc), are other noticeable elements. This also means that QR codes and NFC applications are available everywhere and are used with coupons and special offers by the businesses providing services based on these technologies.

For citizens there are many other services, which are accessible through the 'Apps4Bcn' (Walravens, 2014) portal, allowing full interaction with all elements of council, as well as access to some of the most obscure information people need or want. It also links people

together, and people with experts, and it covers all sorts of topics (sport, culture, business, etc.). It is an excellent platform for networking, spotting business opportunities, organising events and forming partnerships.

The extensive nature of access has also prompted the city to become one of the first to adopt a Mobile ID, providing secure personal authentication by means of digital certification. Once set up (this has to be done in person) citizens can have access to the electoral roll, pay municipal taxes and fines. This development is currently in its pilot phase.

Some of the ICT elements Smart Barcelona (Bakici et al, 2013) focusses on are:

- Urban traffic management (roads, tunnel and air), aimed at more efficient and sustainable urban mobility;
- BCN airport monitoring and control;
- Irrigation smart management
- Scada for escalators and fountains (urban control);
- Urban works monitoring.

Its vision is based on building a resilient city that is self-sufficient through social integration, social cohesion and more efficient and sustainable urban mobility; a city where its citizens are provided with the tools to maximise their productivity and lifestyle requirements, including universal access to culture, education and healthcare. This focus includes a business-friendly environment with a special focus on SMEs.

Environmental sustainability is high on the agenda and the aim is to become a zero-emission city. The city's airport is another example of its smart city approach. This fully-controlled environment handles over 1,000,000 signals and includes control of all escalators, elevators and passenger-moving walkways; power management; air conditioning; and fire safety systems. It also involves monitoring support for the automated luggage transport system.

As we are seeing elsewhere, a smart city is a significant cost reducer. By using a holistic approach, it cuts through the silos and uses ICT as a horizontal layer, sharing infrastructure and other resources. This is reducing the overall investment costs in infrastructure as well as in energy consumption. Such a smart city also reduces travelling times and avoids unnecessary delays. By simply being smarter the city will automatically reduce pollution – for example, a highly efficient and effective transport system is increasing the use of public transport, something that is very visible on the train and metro systems (Dohler et al, 2011 ).

Being an early adopter, the city is now also well-positioned to reap the benefits of connected information management (big data). It had been aware of the need for better insight into the effectiveness of its local government and has been an early pioneer in open data government. For that reason the GPS, M2M and IoT technologies are widely used.

Apart from its own data sources it also includes data from social media and a range of other data sources relevant to the operation of a smart city. They use cloud-based systems to gather, connect and analyse the data in order to get good executable outcomes. Still in its pilot phase, the big data exercise provides near-real-time insight into structured and unstructured data, using any internet-connected device that can enhance services and business opportunities, improve safety, and boost collaboration between the city, its citizens, and businesses.

## Amsterdam Smart City

In April Frans-Anton Vermast, a strategic advisor on connected communities of Amsterdam Smart City travelled through Victoria and NSW, where he presented on smart city developments to state governments as well as to the cities of Melbourne, Sydney, Bendigo, Newcastle, Lake Macquarie and Gosford and Wyong.

Key projects within Smart City Amsterdam (Baron, 2010) include:

- City-zen – Smart Grid – Largest Smart Lab in Europe – In the City-zen project several innovative solutions are demonstrated in the field of smart grid, heat networks and sustainable housing;
- Smart Electric Energy Boat;
- E-Harbours – ReloadIT;
- Ship to grid;
- Vehicle2Grid;
- Flexible Street Lighting.

Amsterdam Smart City was initiated by the Amsterdam Economic Board, telco KPN and electricity operator Liander back in 2008.

KPN the Dutch Telecom incumbent says: "The core objective of the new partnership is to give (SME) companies the opportunity to test innovative applications in practice. For the last two years Amsterdam Smart City together with Liander, AIM and the City of Amsterdam have already been making this possible for various stakeholders with a strong focus on energy transition."

Liander the Amsterdam electricity operator says: The aim is "to offer the people of Amsterdam smart technological options that enable them to save energy and make optimal use of the latest developments, such as electrical transport and domestic generation of clean energy."

# Tokyo

One striking element in my visit to this city was that everybody I met and discussed this topic with mentioned 'the disaster'. This is how they refer to the Fukushima nuclear disaster. They almost never specify the 'nuclear' disaster; if they don't just use the word 'disaster' they refer to it as 'the earthquake'.

There has still been no decision made regarding the restarting of the 50 nuclear power stations in Japan. Businesses are calling for it but public opinion is still very much against it; especially women. In the meantime the cost of providing the country with other (fossil) resources is costing them billions of dollars.

The official policy of the government is:

- Priority 1: energy saving
- Priority 2: renewables
- Priority 3: developing export opportunities from all of this for economic growth.

I had a very interesting presentation with Professor Kazuhiko Ogimoto. A key element that he adds to the above priorities is 'flexibility' – his view is that a multi-energy mix will have to be developed in order to safeguard the way of life, affordability and sustainability.

Smart communities have become a central policy issue in Japan (Samuels, 2014). As in many countries this is now the broader concept, moving away from the more limited smart grid focus. But the definition of smart communities that is used in Japan is much broader even than what is being talked about elsewhere in the world. It is seen more as a social experiment than an energy or ICT issue. It broadly includes the following elements:

- Strengthening community help (self-help) – comfort, health, safety, security (community awareness)
- Urban revitalisation (resilience) – life and business defence against disasters
- Business continuity and energy independence in the event of emergencies

With increased climate change events around the world, the new definition of 'smart community' as set by Japan is also relevant to other parts of the world. The key is that this can only be implemented through smart policies and smart management. Lack of holistic national policies and the will to implement them is a serious area of concern.

Following the Japanese line of thought, the infrastructure that underpins this is the power grid; on top of it is the layer that manages the energy for buildings, communities, factories, homes, hospitals, transport (rail), etc. This is made possible through the ICT tools.

This approach is very much driven by the 'emergency scenario', and it made me rethink my conceptual approach to smart communities. It is an interesting subject for further discussion.

Despite many good initiatives Japan also suffers from the 'death by pilot' syndrome. Upscaling pilots and projects to regional, nationwide or even municipality-wide levels remains elusive; the issue being that the investments needed cannot be monetised by the private sectors involved. The benefits are social and economic and this requires government investments and/or governments taking the financial risks for the projects. Furthermore any of these benefits are long-term, while significant upfront short-term investments are needed.

It looks as though it takes events such as 'the disaster' to spur governments into action; but even then large-scale implementation is becoming increasingly entrenched. Political stalemates – a global phenomenon – are making decisive action in the national interest very difficult.

## Chattanooga Smart Grid / Smart City

Chattanooga's municipal utility Electric Power Board (EPB) serves some 150,000 households and businesses across 600 square miles. In the decade up to 2010, the energy company developed a plan for the upgrading of its electricity network. The city needed to find a way to ensure that the investment achieved far greater advantages than just automating meter readings. EPB sought a solution that not only benefited the utility, but more importantly delivered value to the community by improving quality of life and opening up economic opportunities (Budka et al, 2014, Davidson & Santorelli, 2014).

They built an FttH network providing 1 Gigabit-per-second Internet speed to every premises – urban or rural, business or residence – with Internet speeds that are unsurpassed in the Western Hemisphere – from 50 Megabits-per-second all the way up to one Gigabit-per-second are accessible here.

As a consequence of its smart city policy, Volkswagen established its North American headquarters here and Amazon opened a larger distribution centre in the town.

Furthermore, the network serves as the conduit for 80 billion data points on electricity use per year that help the utility run more efficiently, reduce outages, and give customers more control over their monthly electricity expenses.

With power outages previously costing $100 million/year to private businesses served by EPB, the new FTTH network enables a much smarter network that will radically decrease those outages and thereby make businesses more productive.

## Conclusions

Councils will have to take a leadership role in developing smart cities in order to keep pace with the technological developments that their citizens are embracing and the expectations they have in relation to the economic, social and lifestyle aspects of their city. Increasingly less leadership can be expected from other levels of government yet at the same time it are the councils who are facing the brunt of issues such as economic transformation, the need for job growth, sustainability and liveability, city infrastructure and the life style of their citizens.

With leadership from the top – typically the mayor – a smart council should form the basis of any further smart city projects. One of the major stumbling blocks is the many silos that operate within the city and this needs to be replaced by a more horizontal approach, whereby ICTs can play a key role in achieving this.

Based on a vision of the medium and long term future of the city and with leadership from the top councils should establish smart city platforms that would allow for the sharing of infrastructure and other resources as well as for open data and open government initiatives.

Once such an environment is created, councils should look for PPPs who can use the platform and develop the smart city projects, basically without any significant out of pocket costs to the cities.

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