The Smart City data challenge

How local governments can unlock data to help their citizens

March 2018

kpmg.com/au/IoT

Paul Francis
Director, Smart Cities Lead
T: +61 409 225 934
E: pfrancis2@kpmg.com.au

Katherine Tobias
Senior Consultant,
Internet of Things
T: +61 2 9335 7232
E: ktobias@kpmg.com.au

As local governments strive to deliver better services, cut costs and ensure their economies and communities are productive and vibrant, smarter decisions are vital. Data must drive these decisions, however, for most it will take a new way of thinking – becoming 'data champions' – to turn data into actions.

The need to make our cities smarter and more liveable is increasingly seen as a vital way to improve their competitiveness and resilience in today's resource constrained world. Local governments are at the centre of this challenge – delivering new and better services while also facing population change, economic disruption, decreasing revenues and fast-changing citizen expectations.

Many leading councils in Australia are developing their Smart City plans to enable their overarching strategy and meet their operational and community challenges. In the first article in this series we looked at the foundations needed for a successful Smart City transformation – and here we examine one of the key pillars of that foundation - being data driven.

As previous industrial revolutions were powered by water and oil, the extraction, management and refinement of data will be the key to the fourth revolution. Those councils able to capture it, share it and convert data into practical insights and new services will drive the most positive impact for their communities.

However, the issue is often not the shortage of data itself. As we surge towards the fourth industrial revolution, we expect a 50-fold growth in data by 2020 fuelled by Internet of Things enabled devices[1].

The challenge is the ability to gather, manage and manipulate data safely and effectively to produce actionable insights. This is no easy task when many councils have complex sets of legacy IT systems and gaps in the specialist data science and technical skills needed to unlock the value from this unique asset.

1.   IDC, 'Digital Universe Study', December 2012

Data as a core city asset

Data has been a key focus for us in Adelaide. We recognise that data is central to not only government decision-making, but also business and personal decision-making. So we've created a very comprehensive open data tool kit that allows businesses and government decision-makers to visualise a wide range of key information through a single pane of glass. And that is helping government and businesses to make better decisions about their investments.

Peter Auhl
CIO, City of Adelaide
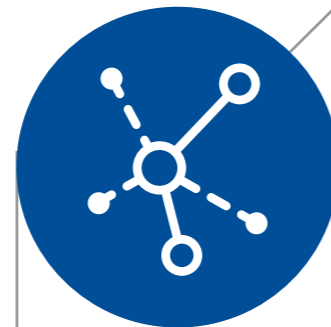
By embracing data, local governments can drive three key outcomes

Effectiveness and efficiency

With evidence, it is easier to target service delivery improvements, act earlier and faster, and reduce operating costs and inefficiencies. Predictive analytics enables local governments to preempt future events and mitigate risks. For example, the Singapore Government has constructed a 3D digital twin model of the city through the layering of the city's diverse array of datasets. The platform comprises a touchscreen which enables city planners to interactively simulate the impacts of critical events such as a gas leak, flood or terrorist attack, or to plan for construction and public works – helping to both 'optimise' and future-proof the city. Closer to home, the NSW Government's Data Analytics Centre was used to help identify buildings at risk from unsafe cladding[2].

City-as-a-service

Being data-driven enables governments to respond to citizen demand in real-time and with personalised services. By pooling insights, local governments can shift from a 'one-size-fits-all' service model to provide a 'concierge' experience. For example, Milton Keynes Council in the UK has developed the Motion Map app. This integrates data from transport operators, 2,000 sensors, and crowd-sourced from citizens, to provide real-time maps of the movement of people and vehicles.[3] It can be personalised to show the congestion level of a citizen's usual bus route, or available parking spaces close to a citizen's favourite shop, enabling people to make informed transport decisions.

Accountability and transparency
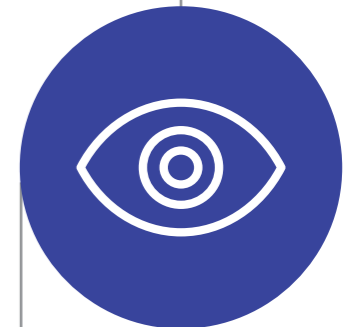
By using data to track and measure performance, it is easier to hold local governments to account. Equally, by releasing city data to the public, local governments can enhance transparency and build trust. For example, 300 public bodies in London have released their data to Spend Network, a start-up which categorises the data and produces visualisations in order to enable citizens, business and other government bodies to see where money is being spent.[4]

These are just some of the advantages of local governments' embracing data to create Smart Cities. **The challenge is – how do they get started then leverage its potential?**

2.   https://www.computerworld.com.au/article/625759/nsw-data-analytics-centre-helps-deliver-fire-safety-boost/
3.   https://www.nesta.org.uk/sites/default/files/local_datavores_discussion_paper-july-2016.pdf
4.   https://www.spendnetwork.com/

Three steps
to kick-start
a Smart City data strategy

1 Policy

A first step is to set a top-down agenda of data-driven governance. This requires a city data policy that helps to institutionalise the use of data by defining common goals, scope and requirements. This will ensure initiatives are integrated across government departments and cities, fostering a data ecosystem rather than disconnected activities.

2 Starting small

The next step is to build a business case to invest in data and analytics for internal use. A smaller project with a clear return on investment is a good place to start. For example, New York's Mayor's Office of Data Analytics (MODA) won support by creating DataBridge, a single platform which integrates data from the city's 40 agencies to enable holistic analysis and coordinated action. MODA created a risk-prediction model to help its Department of Building inspectors discover over 70% of buildings which have been illegally converted, by targeting 30% of them, rendering a 223% return on investment. Local governments could benefit from this partnership approach – perhaps a 'regional as-a-service' multi-tenant data platform to gain more insight and share the costs.[5]

3 Open data

A third step is establishing a business case for offering open data, exploring how it can benefit the broader community. For example, Transport for London (TfL) releases data to the public regarding the 31 million transport journeys made in London each day, derived from 80 sources. This data powers 600 apps and services (some developed by TfL, others by the private sector, entrepreneurs, start-ups, citizens etc.) used by 42% of London's citizens. The economic benefits for the City of London and TfL itself have been estimated at £130 million per year.[6]

An example of an application built on the foundation of open data is an Artificial Intelligence-powered 'TravelBot' which can chat with customers to inform them of real-time bus arrival information, nearest bus stops, service updates and maps. TravelBot processes TfL's data as it is generated and progressively 'learns' from its interactions, serving to significantly enhance the commuter experience.

It's not only large cities such as New York or London where these benefits can be realised. In Victoria the cities of Bendigo and Ballarat are sharing ninety datasets between them,[7] and there are well over 350 other local councils and government organisations listed on the Australian Government's open data portal who are also sharing their own data. With the rise of Internet of Things and the growth in data sources that are closer to near or real-time, these current data sets will undoubtedly continue to become a richer and more meaningful source of active operational insights across cities and regions.

5.   http://www.spatialcomplexity.info/files/2015/06/Big-Data-in-the-Big-Apple.pdf
6.   https://tfl.gov.uk/info-for/media/press-releases/2017/october/tfl-s-free-open-data-boosts-london-s-economy
7.   https://data.gov.au/organization?q=VIC&sort=name+asc

Using data to improve local services

The ASSET path to data governance

With top down support, and a strong case for investing, the following five step 'ASSET' approach can help to ensure data is leveraged.

A

Accessible

Sharing data enables a common understanding of issues and collaborative responses. Building a digital infrastructure that breaks down silos between departments, and enables city-wide aggregation of data, is key.

For example, the City of Tel Aviv focused its early Smart City efforts on "integration, breaking the silos, matrix thinking". Chief Knowledge Officer Zohar Sharon said, "In order to give good services to citizens, we have to start internally – we have to change the organisational culture and structure".[8]

Open data portals can be used to make data accessible. The City of Melbourne has published over 150 datasets on its Open Data Platform, providing information across parking, transport, the environment, waste collection, land use and demography.[9]

S

Structured

The way that data is structured determines how much value can be extracted from it, so it is important to find consistent and compatible approaches to data input, sharing and analysis to obtain maximum benefit.

Structured data refers to data that has been processed and rendered in a standard, machine-readable format. Applying standards enables interoperability across data generators, data publishers and data consumers.

Data presentation also matters, with data visualisation a powerful tool to simplify and present data in an intuitive form, and to show how that information has meaning. For example, Pittsburgh's 'Burgh's Eye View' is a responsive open data application intended as a one-stop-shop to access and understand city data. By applying filters (neighbourhood, date range, etc.), users can focus on data relevant to their needs and easily interpret it through a visual map.[10]

S

Secure

Robust security measures must be embedded within a city's digital infrastructure. As many breaches have demonstrated, relegating cyber security to the IT department alone is not feasible. Instead, 'security by design' is a stronger approach – with security controls incorporated into digital infrastructure right from the beginning.

Privacy considerations go hand in hand with these security considerations. While citizens are recognising the value of sharing their data in return for improved services, there is an assumption that their confidentiality will be protected with processes such as anonymisation and encryption. It is important to have the right security to uphold this trust.

E

Empowering

While data analytics can provide a more granular understanding of issues affecting citizens, opening up city data to the public can empower citizens to co-create innovative solutions. For example, Denmark's decision to open address data in 2005 spurred city stakeholders to develop innovations for the benefit of the city. This resulted in both significant direct financial returns, totaling €62 million (2005-2009), as well as wide-spread social benefits. GPS companies have used the data to improve the precision of car navigation systems.[11]

The City of Greater Geelong holds annual GovHack competitions, bringing together entrepreneurs, programmers and innovators to transform the Government's open data into apps to improve the citizen experience of the city. One success story is the creation of an app by university students which maps all of the free Wi-Fi in the City. As an open platform, the app is constantly evolving and now businesses that provide free Wi-Fi have the opportunity to be included on the map.

T

Trusted

Building trust between local government and its citizens is integral to establishing a strong digital infrastructure and unlocking data insights. If citizens trust local government to use data in their best interests, there is potential for new kinds of collaboration and reciprocity. Likewise, if local governments trust citizens with information, there is potential for them to be active partners in urban design and other community improvements.

8.   https://inform.tmforum.org/features-and-analysis/2016/09/tel-avivs-citizens-club-provides-personalized-city-services/
9.   https://data.melbourne.vic.gov.au/
10.   https://datasmart.ash.harvard.edu/news/article/burghs-eye-view-951

11.   http://danmarksadresser.dk/file/389579/Value_Assessment_Danish_Address_Data_UK_2010-07-07.pdf

Delivering a data driven Smart City

Unlocking the opportunities of data relies on leadership and culture. The best results come from an agile, incremental approach of trial and error that engages the whole of government – not just the analytics or IT department. Being data champions and implementing ASSET can help local governments to improve efficiencies, service delivery and accountability, and get them on track to creating competitive, attractive Smart Cities.

Contact us

KPMG's Internet of Things practice works with cities to help them take advantage of innovation in IoT and emerging technologies to make them more liveable, workable and sustainable.

Paul Francis
Director, Smart Cities Lead
T: +61 409 225 934
E: pfrancis2@kpmg.com.au

Piers Hogarth-Scott
National Practice Leader,
Internet of Things
T: +61 405 151 971
E: piershs@kpmg.com.au

Toni Jones
National Local Government Sector Lead,
Enterprise, KPMG
T: +61 409 200 721
E: tonijones@kpmg.com.au

KPMG.com/au/IoT