

Global Futures Cities Programme

Sharing data-oriented experiences and knowledge among cities within the Global Future Cities Programme



Foreign, Commonwealth
& Development Office

UN  HABITAT
FOR A BETTER URBAN FUTURE

FOREWORD

As fast as the pace that the world's population is growing in urban areas (from 50% in 2008 to an estimated 70% in 2050), cities have become significant generators of massive, diversified, and rapidly produced data volumes. The world is becoming more digital, and these technologies, while having great potential, also present great challenges.

The many agents involved in delivering urban services face the defiances of responding to the increasing local demand for improved services while staying in tune with the latest technologies. Hence, aiming to provide better service, municipalities worldwide face the various challenges associated with improving decision-making efficiency. Delivering substantial data-oriented evidence requires interoperability and reliability among technological solutions, effective capacity building within civil servant staff on strategic-operational-and-technical levels, and transparent and safe relationships with citizens.

The **UK Prosperity Fund Global Future Cities Programme** has provided an outstanding opportunity for cities to implement innovative solutions for tackling local urban planning, mobility, and resilience challenges.

As a shared resource to all these urban issues, data is increasingly seen as a critical element for defining policies, frameworks, and services. However, it is a demanding resource in many aspects, requiring appropriate hardware apparatus, well-defined architectures, and, mainly, skilled and proactive human resources.

On 28th January 2021, UN-Habitat organized a **City-to-City Dialogues Session** to address this subject as part of the Global Future Cities Programme's Knowledge Management Component, linked to the Capacity Building Component. The online event had participants from different parts of the globe, including Brazil, South Africa, Malaysia, Thailand, The United Kingdom, and Germany. Prolific city-to-city knowledge exchange on critical issues around data-oriented solutions within municipalities, such as experiences, best practices, and challenges, were shared and discussed. This report provides the main takeaways and details from the presentations.

For accessing the presentations and the complete recordings of this session, please visit the Community Forum of the GFCP Knowledge Platform
(scan or click the QR Code below)



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Global Future Cities Programme

In 2015, the UK government established a new cross-government Prosperity Fund worth £1.3 billion from 2016-2021 to promote economic growth in developing countries. The **Global Future Cities Programme (GFCP)**, a component of the larger fund, aims to carry out technical assistance for a set of targeted interventions to encourage sustainable development and increase prosperity while alleviating high levels of urban poverty in 19 cities in 10 countries based on three thematic pillars: urban planning, transport and resilience. While these pillars cover three clear fields, there is a common ground on the potential of embedding smart/digital technology and data analysis platforms in urban governance and management processes.

To ensure quality in the GFCP's overall delivery, UN-Habitat has been engaged by the UK-FCDO as a strategic and capacity building partner. The Urban Lab of UN-Habitat has been deployed for taking an integrated, inter-disciplinary and impact-oriented approach to enhance inclusive and sustainable urban development at different scales: local, regional and international. Through this role, the Urban Lab provides participating cities with strategic, policy and technical advice, enabling cities as partners to be informed clients and in developing their overall capacity and ownership to ensure delivery and the projects being sustained in the longer term.

Currently, the Urban Lab supports the delivery of GFCP along three core areas to embed global goals and to promote policy change:

1. Strategic Advice and Technical Recommendations:

Interventions will be strengthened, and stewardship of proposed interventions will be enhanced beyond GFCP.

2. Capacity Development:

City authorities are expected to increase their technical capacities and effectiveness to sustain urban planning, transport, and resilience interventions. City authorities are expected to be in a better position to finance interventions.

3. Knowledge Management:

Awareness will be increased about inclusive and sustainable urbanization, and lessons learned from the interventions and the Programme will contribute to the scalability and replicability of best practices.

The composition and organization of GFCP allow the Urban Lab / UN-Habitat to combine normative and operational workstreams. To facilitate three core areas' delivery, the Urban Lab has engaged an implementing partner, the UK Built Environment Advisory Group (UKBEAG). The UKBEAG offers access to a broad network of professionals within the built environment sector, leveraged to deliver the capacity development components.

CITY TO CITY DIALOGUES

City to City Dialogues

Among the 30 urban interventions of the GFCP, a wide range of technology-driven solutions are being deployed: from urban data hubs in Recife, Cape Town and Bangkok, smart mobility solutions in Ho Chi Minh City, Johannesburg and Iskandar, and smart urban planning in Bursa, Durban, Cebu, and Surabaya.

During its Data Strategy and Economics Project implementation, the Cape Town team reached out to UN-Habitat to obtain further information and practical examples from other cities on implementing effective processes involving digital data within public services and its challenges. Such demand has been identified as a critical aspect for the City of Cape Town and many other cities of the Programme.

This Session intends to enable that knowledge exchange is facilitated with other cities in the Programme. It involved diverse Local Authorities, Delivery Partners and specialists, enabling network creation and providing elucidative debate and knowledge sharing of crucial issues around best practices, lessons learned, challenges and other impacts of the digital revolution of data on public services.

Relationship with the Programme Capacity Building Component

As Strategic Partners, UN-Habitat and the UK Built Environment Advisory Group (UKBEAG) provide capacity development activities as a complement to other elements of the GFCP. The capacity building component had its implementation linked with the Knowledge Platform and complemented by UKBEAG with a series of interactive sessions between January and March 2021.

The present **City to City Dialogues Session** aims to strengthen networks between partner cities. It will serve as a reference point for the UKBEAG for the next tailor-made capacity building activities, helping to address international standards, evidence-based design, citizen-centric data applications, among others.

Experiences of transition to Digital Cities

Chris Cooper (United Kingdom)

Smart Cities standards consultant
British Standards Institute (BSI)



How to adopt the smart approach?

We need to think of standards as a good thing, because they give you foundation and confidence for delivering smarter communities and achieving the SDGs. Consider the following steps:

1 Start with a vision

What do you want to be famous for, what do you want to be realized for moving forward into the future?

2 Combine such visions with basic principles For example, the use of data to protect citizens, the use of data to deliver the SDGs.

3 Create a framework of outcomes

Do it once understanding where you want to be (vision) and how you will get there (principles). It is good to think of the SDGs as a starting point of what you want to achieve. For example, if a vision is to achieve air quality and the principles are to do that without compromising economic growth, the outcome would be a reduction in PM2.5 while growing GVA (Gross Value Added).

4 Create several data points

This is a crucial move because data is fundamental towards becoming a smarter place.

5 Transformation through moving out of the silo

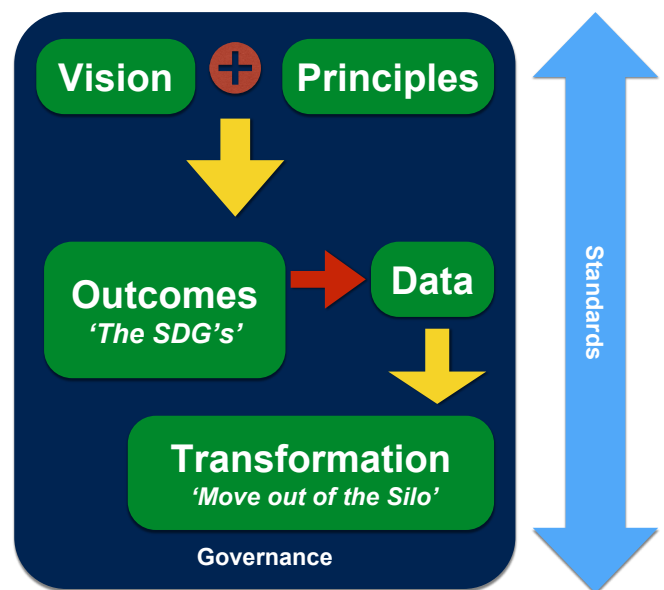
How to use data is a main challenge for city planners. In a smarter community you have a blended set of responsibilities, where you have to work across the silos. This is done through using the standards, because they give you confidence that the data you are asking for is in the right format, at the right time, is trustworthy and has quality.



Chris Cooper addressed how to use standards effectively in the implementation of strategies for smart communities. Cities should combine visions with

basic principles, towards achieving specific outcomes. Moreover, it is crucial to break up data silos and enable the information marketplace.

The smart approach scheme



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"Governance is about making sure that you work together and have a good alignment of outcomes linked to visions and principles, creating space for discussion. You might find that where the city wants to get to is outside of the visions and principles. But how to discuss that? The principles are not static, so the standards facilitate the discussion."

What does good look like?

(Based on ISO 37106)

A smart community should be visionary, collaborative, digital, interoperable and transparent. It uses privacy-by-design, is citizen centric, allows for open data, is focused on outcomes and has good quality governance.

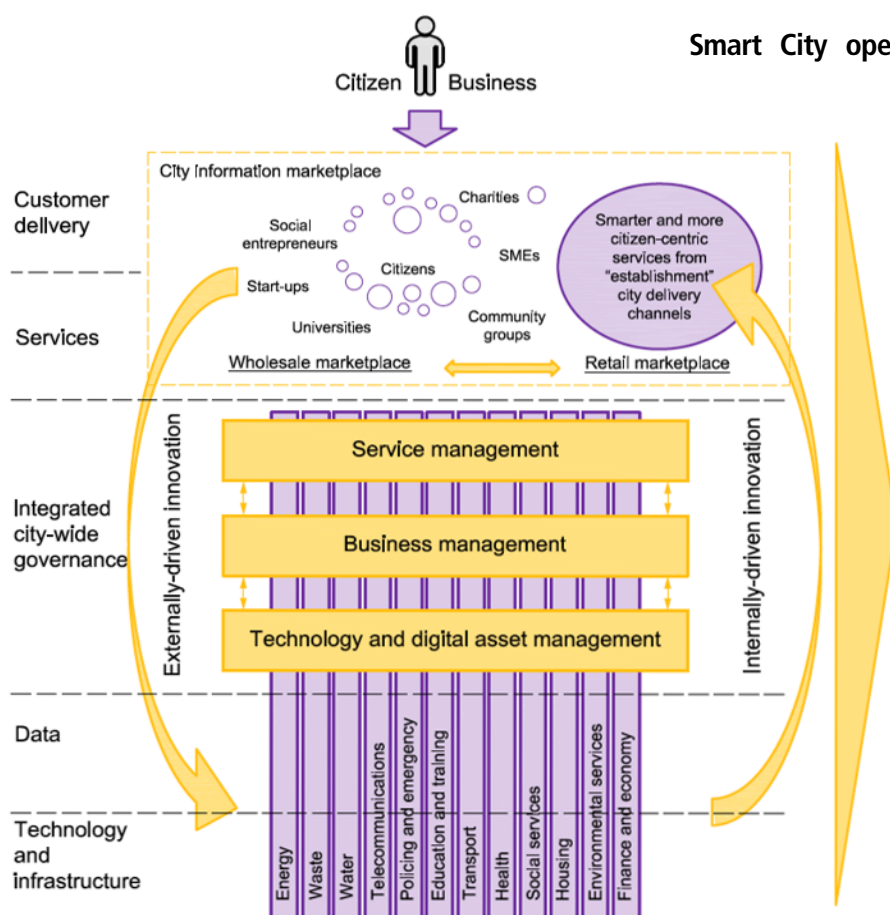
One crucial element: **the information marketplace**

How do you realize your communities' information marketplace? On the ground, this means providing open data from the various different silos and making that data accessible and secure. It also means using a computer program or interface, connecting data via a machine to a machine. Therefore, you can create a new dataset by bringing different data sets together and that new data set can be put back into the marketplace.

The information marketplace is:

- where you can exchange, buy and sell;
- where citizens, business, governments and service delivery agencies can extract new value;
- where you advertise how you are achieving your outcomes;
- where you measure success against outlined visions and principles.

"Look at your visions, your principles, identify outcomes for the SDGs, then bring the ingredients to the information marketplace. That will ensure the delivery of the impacts and outcomes that your city needs. And this will not necessarily come from technology organizations persuading for cities to buy what they have to offer. Rather, it will allow to focus on transformations while bringing silos together and looking across them through integrated city governance."



Smart City operating model: the information marketplace (taken from ISO 37106)

Impact:

- City data unlocked from individual silos
- Logical separation of data, service and customer delivery layers
- Externally-driven innovation:
 - Enablement of new marketplace for city information and services
 - Citizens, SMEs and social entrepreneurs enabled to co-create public services and create new value with city data
- Internally-driven innovation:
 - Improved and integrated service delivery
 - Resource optimization
- Ability to drive city-wide change at speed

Open Data: New forms of collaboration in the digital city

Gesa Ziemer (Germany)

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**City
Science
Lab**

Introducing the CityScienceLab

The CityScienceLab organizes many collaboration initiatives: through city engagement, citizens can speak to each other; through stakeholder engagement, employees can talk to each other and work in an interdisciplinary way; it applies mapping and interactive tools so that people can work together and collaborate.

However, city planning is not just about speaking; it is a lot about co-designing, collaborating, and scenario-planning. Thus, setting out a lab can help strengthen collaboration because a lab is a neutral space, as scientists do not represent the interests of political parties or companies. Therefore, it is good to set out labs as third spaces to experiment and where innovation can occur.

The Lab is setting up in Hamburg (Germany) a digital participation tool where people can look at maps, speak about housing, mobility, environmental protection. If you have data, a good data hub, and sound policies, you can have multiple geographic layers and stats discussing how they want their city to be. The Lab combines online and offline, on-site and out site, including people who have no affinity to technology also to work analog.

Contemporary challenges: data silos and ethical issues

Cities are big data producers. IoT technology has improved, and cities produce a lot of different data on mobility, economic, and social issues. Cities have always been making data, but what is new is that we have more data than before, so we should not have data silos anymore. A pre-



Gesa Ziemer focused on how urban data can facilitate collaboration, looking at open data hubs as a pre-condition for cooperation. Such data hubs, led by academia, can create neutral spaces of discussion and respect data protection. Data hubs need to involve designers for good management and representation of data. They should also work towards breaking data silos and promoting different levels of multi-stakeholder collaboration.

condition for the work at the CityScienceLab is trying to break the data silos, benefiting from the growth of linkages opportunities. Researchers should curate the data so that it is understandable and people know how to work with data.

A lot of ethical questions come with smart city solutions. Concerning data protection, essential issues to consider are trust levels, fear of surveillance, and data ownership. Therefore, it is also vital to set urban data hubs while having transparency laws.

"We need to have good quality, replication, and standards for urban data hubs. Cities put energy and money into these as a technological structure, but they forget to involve designers, so people do not know how to use the data. Design and good media representation are fundamental to make data visualization easier. If we have a good data hub, we can start to collaborate, but we need new collaboration formats."

Levels of collaboration

There are five different levels where we collaborate (this framework can be used for evaluation if you want to emphasize collaboration in your city or region):

- authority to authority
- authority to citizen
- citizen to citizen
- authority and citizen to science
- authority and citizen to industry

What kind of new practices of urban collaboration do we have in cities?

- collaborative data production (e.g., cyclists collecting air quality data), which should be combined to official data
- collaborative mapping (e.g., open street maps)
- collaborative designing (e.g., in the built environment using BIM)
- collaborative decision making
- collaborative co-producing (e.g., creating a community centre together), in which citizens are not just advising but also implementing

Local authorities trying Open City Toolkit in Bhubaneswar, India



EXPERIENCES FROM CITIES

Melaka towards Big Data: needs and management

Datuk Salhah Binti Salleh (Melaka - Malaysia)

Deputy State Secretary (Development)

State Economic Planning Unit - Melaka Chief Minister's Department



Using data and related challenges

When it comes to using data in any city, it is not the numbers that matter, but what we do with the numbers to develop the city. It is essential to emphasize data analysis during decision-making in terms of tracking progress on critical priorities. When we talk about data, it is vital to take into account some challenges:

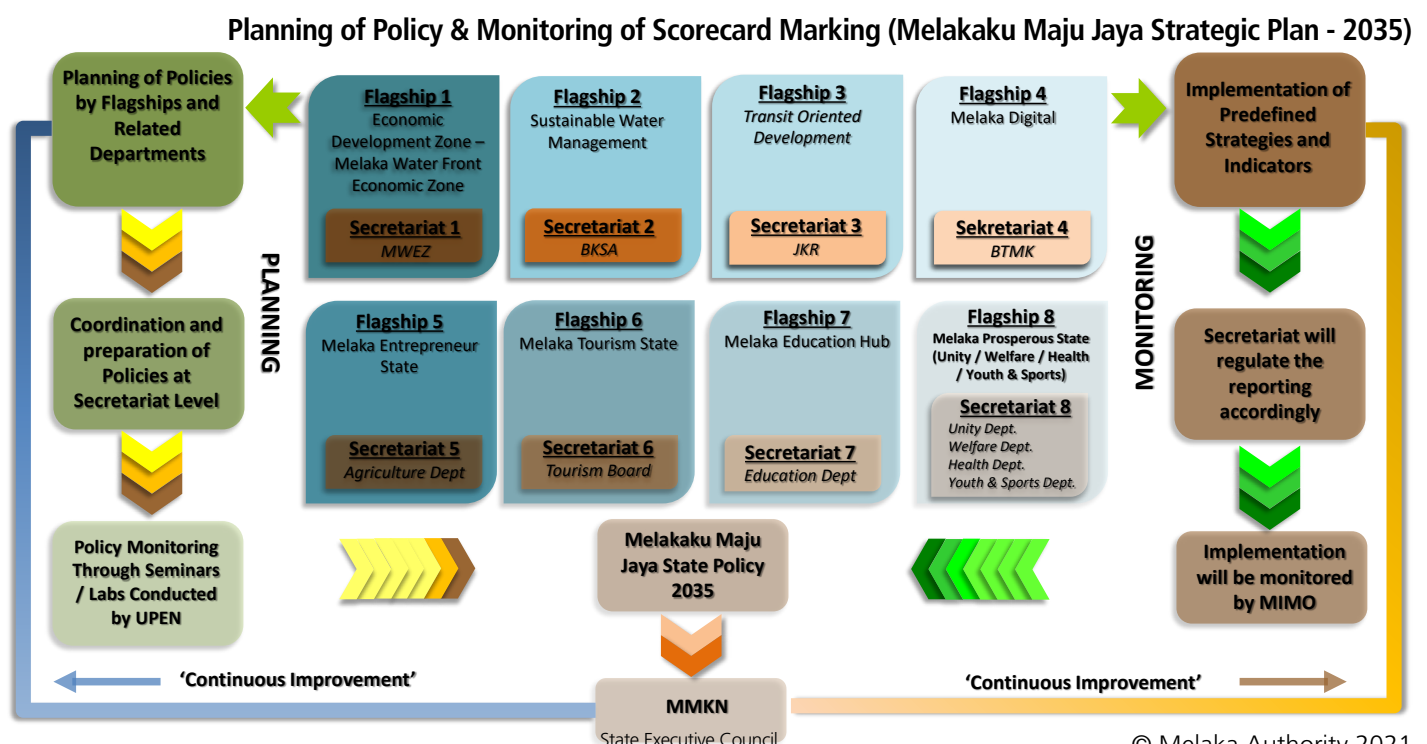
- data and information scattered all over
- inadequate data and information
- data systems that are decentralized
- data and systems that are not integrated
- issues with data and information ownership
- lack of skills in data analysis
- slow or inaccurate decision-making



Datuk Salhah Binti Salleh focused on handling data management and how the use of data presents many challenges for municipalities, including Melaka. To tackle these challenges, Melaka developed a Big Data Initiative Framework, which will support the City's Strategic Plan while building capacity and improving decision-making.

The Strategic Policy Plan

Through the state planning unit, the state government decided to develop a strategic policy plan using the existing data and gathering new data. The Plan comprises five key areas supported by eight flagships following the SDG indicators.



EXPERIENCES FROM CITIES CONTINUATION

The first flagship is the Melaka Water Front Economic Zone, a new economic area where we want to explore the existing potential of Melaka and the UNESCO heritage site to attract investment. A specific government department will release each flagship to construct and implement the framework. The process mechanism is divided into three steps: policy planning, implementation, and monitoring.

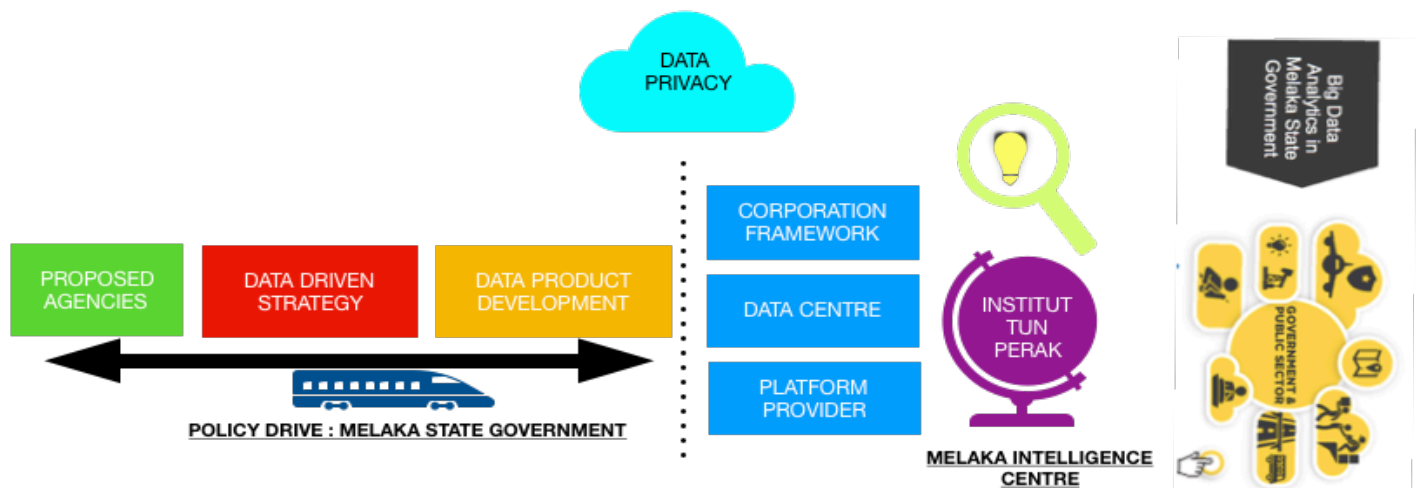
"Data gathering and data analysis are very important for development. Therefore, we have to gather as much data as possible, both new data and existing data, which can generate valuable information for relevant government agencies. Data allows for more accurate plans, benefiting citizens, businesses, and government (state and federal)."

Using data and related challenges

The Melaka State Big Data Initiative Framework will support the development of the Strategic Plan and has the following objectives:

- **improve the decision-making process to enable more strategic planning and more effective monitoring of government services**
- **implement data analysis to gain knowledge or insights which are descriptive, diagnostic, predictive, and prescriptive**
- **increase the capabilities of civil servants in the field of Data Science**
- **maximize the usage and sharing of Government data and social media data**

Melaka State Big Data Initiative Framework objectives



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EXPERIENCES FROM CITIES

Data-driven Smart Sustainable City in Iskandar

Maimunah Jaffar (Iskandar - Malaysia)

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Iskandar Smart City and main principles

We started our smart city framework in 2012, for which data is essential. Also fundamental is the Iskandar Malaysia Urban Observatory Data Analytics, linked with projects we are currently doing. It is imperative to understand how we want to approach the smart city and how it can provide informed decisions.

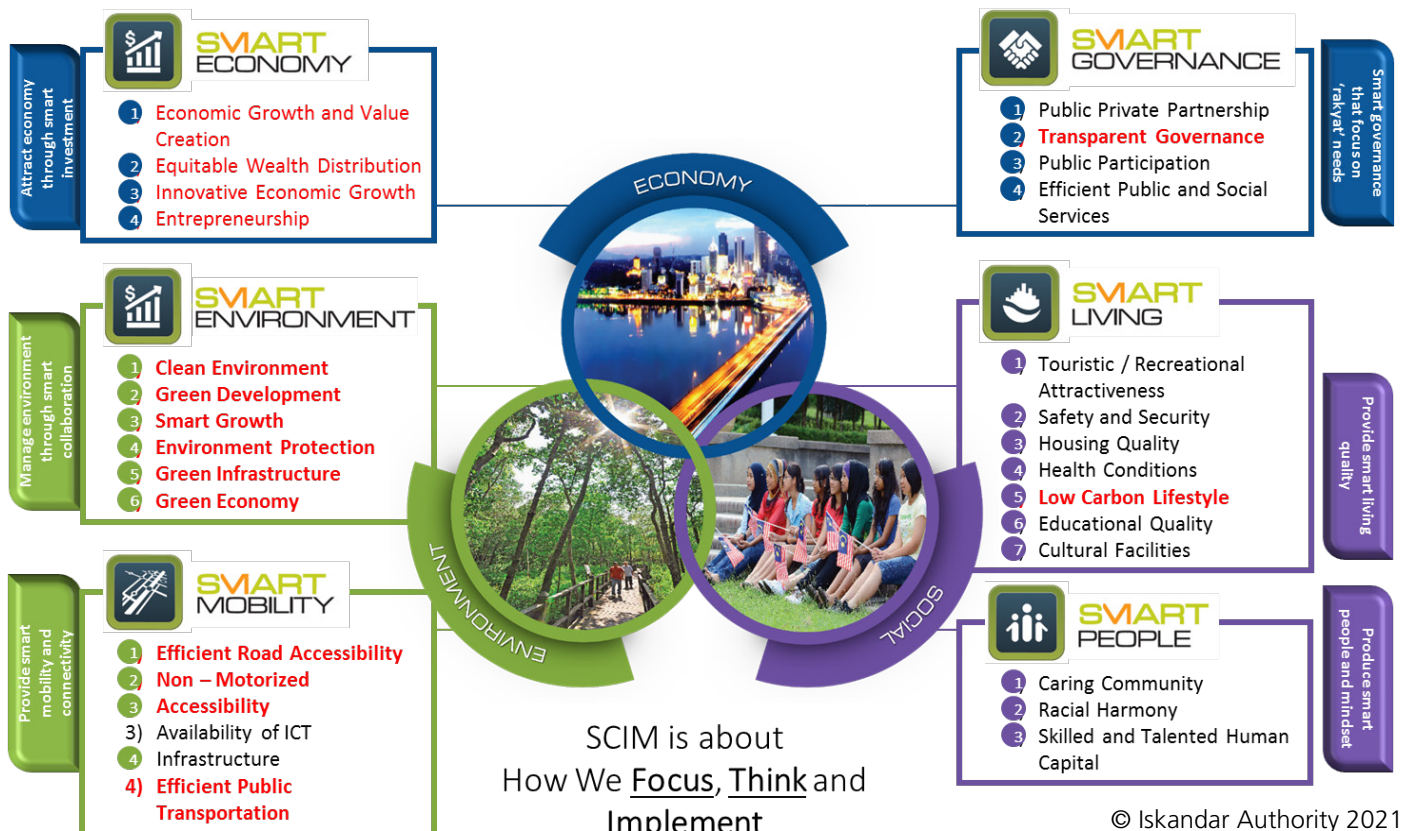
Iskandar defined established six dimensions for a smart city framework: **Smart Economy, Smart Environment, Smart Mobility, Smart Governance, Smart Living** and **Smart People**.

Also, three enablers for driving smart cities have been considered: **ICT connectivity; municipality as the driver (including data analytics and public services improvement); and collaboration with the private sector in providing solutions.**



Maimunah Jaffar focused on the collection, management, and use of data in the context of Iskandar, a city that is making a substantial effort in integrating its data management through the City's Urban Observatory, referring to the SDGs. Meanwhile, data has been crucial for implementing smart mobility and resilience planning comprehensively. Through a collaborative data governance system, the city is including the community and integrating different agencies. Yet, the use of data brings many challenges, especially around coordination, standardization, and awareness.

Iskandar Malaysia Smart City Dimensions



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The Iskandar Malaysia Urban Observatory

Iskandar Malaysia Urban Observatory is a central data centre to collect, integrate and analyze data. As such, we monitor both the SDGs and the Iskandar Malaysia Comprehensive Development Plan. The urban observatory also functions as a knowledge hub that provides technical services to our external partners.

The Urban Observatory has some essential components: the hardware, the storage, the data, and its relation to the dashboard.

It is essential to take into account data analytics while fostering economic growth. To drive the economy, we have to also look at transportation, spatial planning, quality of life, natural environment, utilities, and how the people on the ground benefit from economic growth.

The Smart Integrated Mobility Management System

The **Smart Integrated Mobility Management System** is part of the Global Future Cities Program. The project is about developing the mobility framework integrating all the mobility within the region and utilizing data for evidence-based urban and transport planning.

The Skudai River Monitoring and Management

In this project, we manually manage the data, but we are doing a good job integrating everyone and understanding the causes. The project is an excellent example of how data can assist in:

- focus enforcement at root cause areas
- developing a new policy for hot spot areas
- improving maintenance in identified areas
- creating a system to identify hot spot areas

Engaging with the community and other government agencies

How do we collect data aligned to the SDG and to our comprehensive development plan? One way is through gender equality and social inclusion groups. This is how we engage the community, so they form their steering committee and assist us with the right questions on the ground. In this way we learn to work with the community to give us accurate data.

At the same time, we engage with other government agencies. However, we realized that most of the data is not up to date, and the agencies are unable to share some information due to data policy and confidentiality. How can we collect and integrate this data, and how should we handle this data?

Challenges and moving forward

There are many challenges in actually collecting, managing, handling data:

- stakeholders need to understand the importance of data and how to use it for informed decisions
- we need to see how data can support the strategies and how we want to move forward
- how we can do a service level agreement with agencies to make sure they share the data and share the data with them
- collaboration and data that comes from various platforms

For moving forward, we need to:

- develop co-ownership and collaboration agreements with key stakeholders
- coordinate data sharing with various partners
- improve tracking of government and SDG goals and outcomes (transportation, welfare, crime, etc.)
- enhance policymaking and improve smart city management by using authoritative data
- guarantee the sustainability of the platform while collecting data

EXPERIENCES FROM CITIES

Open data in the City of Recife: a successful strategy in publishing data

Homero Cavalcanti (Recife - Brazil)

Director of Information Technology Solutions
City of Recife

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Why are we publishing data?

We decided to publish the open data of the city government of Recife to the population based on the following motivations:

- to multiply opportunities of solutions created by the population
- to professionalize management for transparency
- a government decision to turn the initiative into a strategic goal
- acknowledging legal support in the municipal and federative legislation and the content from the Brazilian public administration with the Open Government Partnership

Legal guidelines

Federal and municipal legal frameworks present complimentary guidelines regarding the opening of government data. The Brazilian law of information access (2011) requests:

- disclosure as general precept and secrecy as an exception
- disclosure of information of public interest, regardless of claim
- use of means of communication made possible by information technology
- encouraging the development of a culture of transparency in public administration
- development of social control in public administration.

Moreover, the Municipal Law (2013) requests:

- ensuring unbureaucratic and straightforward access to information of a public nature



Homero Cavalcanti addressed the experience of publishing open data in Recife. Recife is publishing data following national and municipal legal frameworks. Open data is also being

used to foster collaboration, entrepreneurship, and improvement of services. However, the city faces challenges, such as the quality and availability of data and stakeholders' resistance in making data public. The city is implementing diverse open data strategies, such as a data hackathon and a mobile app for easy access.

What is open data?

It is data that anyone can access, use and share. It becomes usable when made available in a standard, machine-readable format. Moreover, its license must allow people to use the data in any way they want, including transforming, combining, and sharing it, even commercially.

"We have several motivations to open Recife's database, other than the law of information access. These include: creating solutions for the city, service improvement, stimulating innovation, creating new insights in the public sector, fostering entrepreneurship, bringing the city closer to people and universities, and engaging the population."

EXPERIENCES FROM CITIES CONTINUATION

How we began

The agreement of the project with the mayor of Recife guaranteed the financial tools and a trained and motivated technical team. To catalyze the project, it was essential to: **establish partnerships and consultancy with universities; set programs to encourage innovation; assimilate the concept internally; define the purpose; disseminate the idea; break down resistances; and involve agencies and secretariats.**

Solutions

Regarding the datasets by organization, we have more data from health, mobility, and education secretariats. And the three most accessed data sets are traffic lights, health units, and traffic accidents.

Hacker Cidadão is the official hackathon of the City of Recife, which aims to encourage the use of city's open government data and the creation of innovative solutions.

Open data also paved the way for international innovation projects, such as GFCP and French development agency, supporting the open data strategy and the Conecta Recife app.

Conecta Recife app makes effective use of the open data in our portal, so population can easily access digital sets in the city.

Challenges, difficulties, strategies, and benefits

Challenges faced throughout implementation

empower the team, define policies and standards, prepare the infrastructure, build the open data portal, identify, collect and obtain authorization for publication, treat data, launch the portal.

Difficulties

data quality, data availability, data formats. Also, the secrecy culture, because it is usual to hear people asking the following questions when we want to publish data: What benefits do I get with the publication of open data? Why should I expose myself or my department? So, we have to work on these questions during the process.

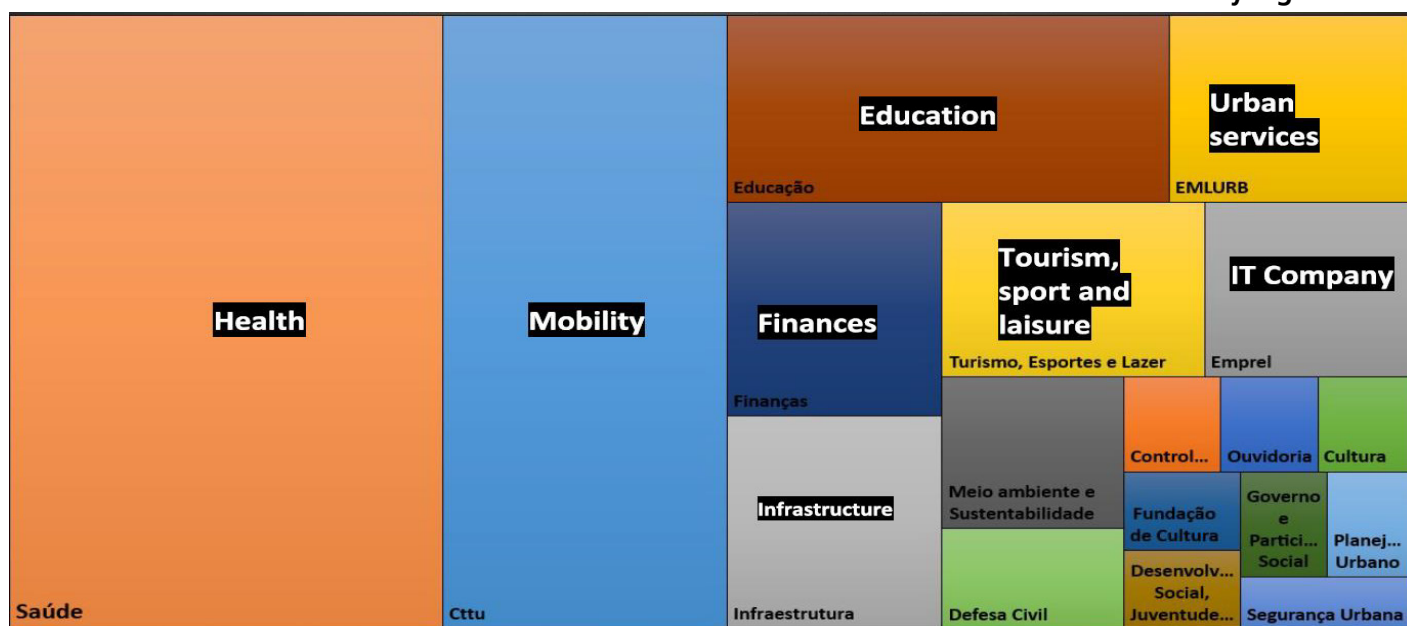
Strategies we adopted

choose bases that are already mandatory for publishing by law, such as public schools; selecting non-sensitive data, like bike paths or the vaccine calendar.

Benefits

community recognition, apps creation, open innovation, new projects, and resources.

Recife Datasets by organisations



EXPERIENCES FROM CITIES

Digital solutions involving public data of Bangkok MA government

Nutchuda Mongkolchart (Bangkok - Thailand)

City of Bangkok



Towards inter-agency integration in Bangkok Metropolitan Area

The existing institutional configuration of the Bangkok Metropolitan Area is divided into three offices, covering urban planning, infrastructure, transport service, education, healthcare, waste management, security service. The concept of BMA's operation is to modify data from silos of each agency, reaching standardization and inter-agency integration, leading to efficient city management. A considerable amount of data is collected by different departments, but data sets are organized in silos. Moreover, platforms are not integrated to be compatible amongst various agencies. Therefore, a centralized data repository is required to support decision-making, integrated planning, and operations.

The BMA Enterprise Architecture Framework

The BMA has established an enterprise architecture framework that targets infrastructure focusing on the management perspective, comprising four components: business architecture, data architecture, application architecture, and technology architecture.

Our main missions are focused on five areas:

quality of living, skills and knowledge, mobility, city management, and internal management.

Internal agencies under the central administration are preparing data catalogue, metadata description, and data dictionaries following the government policy data governance framework in terms of data operations. This work will lead to integrated public store services. Additionally, the BMA also provides the data service to the public through its website, the Bangkok Information Centre, the city data sharing, and the open government data of Thailand.

Nutchuda Mongkolchart focused on digital solutions involving public data in the Bangkok Metropolitan Area. BMA is trying to integrate multiple agencies and reach standards of data management through a centralized data repository. The government is also providing open data in an online portal. An integrated data hub has been allowing for practical tools for data management and decision making. Moreover, there have been efforts in assessing the data strategy compared to other cities in Thailand.

BMA Enterprise Architecture Framework



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Assessing and benchmarking

The conceptual framework for assessing digital development readiness consists of six parts: **policy and legislation; digital capabilities; public services; smart back office; secure and efficient infrastructure; digital technology practices.**

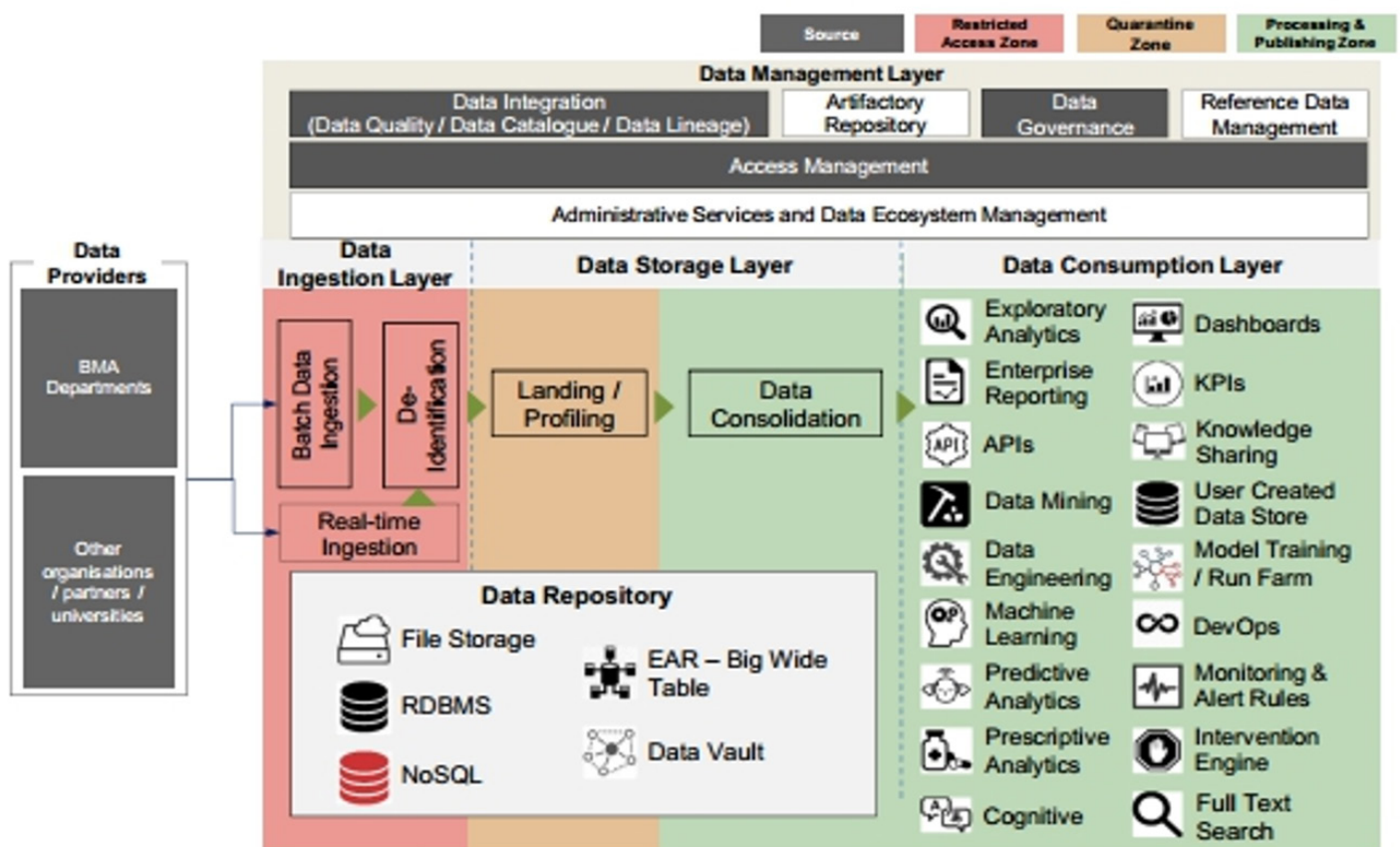
EXPERIENCES FROM CITIES CONTINUATION

"In terms of the measurement of digital development, the digital development agency is a public organization that defines rankings compared to other local administration agencies in other provinces. The most prominent performance is related to its secure and efficient infrastructure. However, we still have a lower score in digital technology practices' performance."

The integrated data hub

The integrated data hub was implemented under the UK FCO Global Future Cities Program to effectively develop the **S Framework**, put the designs, and create the road map to implement the integrated data hub and building. This allowed the BMA to have adequate data management tools and decision-making for city management, providing better information services to the government, private, and public sectors.

Integrated data hub framework



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EXPERIENCES FROM CITIES

City of Cape Town: data-informed decision-making

Delyno du Toit (Cape Town - South Africa)

Manager for Organisational Performance Management, Corporate Services
Leader of the Data Strategy Implementation Co-ordination



Challenges faced in Cape Town

The main challenges in the city are increasing urban poor indigent population, stagnation or low growth rate base, decline in municipal revenue streams, water crisis, uncertainty in light of global climate and economic change.

Therefore, we have to do more with fewer resources. To maximize impacts, we harness the available data and knowledge, so that decisions are based on evidence as far as possible. These, data systems are used to understand risks and design effective services to achieve goals. However, data only becomes meaningful when widely available and appropriate so it is easy to understand.

Our need for a data strategy

The data strategy views data as a shared asset to maximize public benefit. The data strategy is not always about fancy analytics, but rather improving day to day decision making to get the most out of public resources. Data does not replace insights brought by people or the years of experience on the ground. It is the population that should bring a common view and insights into what is happening on the ground. Therefore, it is important to transform data into meaningful and relevant information to effectively support strategic and operational decision-making.

The city is sitting with a large amount and variety of data sets. The challenge is that one could put a lot of effort into cleaning and organizing all of this data, without having any effective results. So, it is crucial to identify specific key interventions with a high likelihood of result in change to

Delyno du Toit addressed Cape Town's data-informed decision-making approach, focusing on the data strategy. Cape town has an increasing amount and variety of data to inform planning decisions while 'giving voice to infrastructure potentially'. Yet, listening to people with experience on the ground and identifying critical interventions remains crucial for effective data and information use. It has been vital to the city to set an unambiguous data governance framework, organized into a management team, coordinating committee, and workstreams. Furthermore, the city is making efforts towards effective infrastructure, capacity building, enhancing collaborations, creating a data culture, and tackling ethics principles.

optimize service delivery. As such, data can make decisions more reliable while 'giving a voice to infrastructure'. We have a lot of assets on the ground which is not always visible, so data and census available to the city gives us insights into what is happening in that world. Data is growing exponentially and we need to utilize it.

Making data actionable

In the data governance framework, the management team is key. Feeding from the management team 12 directors are representing the coordinating committee. They are responsible for guiding the data decisions and the data strategy, as well as feeding back into the line and feeding into the data coordinated in six workstreams. Each workstream has a lead coordinator: **Data Architecture, Data Capabilities, Data Collaboration and Partnerships, Data Culture, Data Governance, Data Privacy.**

EXPERIENCES FROM CITIES CONTINUATION

What we are doing to deliver

Data architecture

as the data grows, instead of buying more services, you can utilize your infrastructure to the maximum. But how do we do that? How to grow with data and together maintain security?

Data capabilities

working with data is dependent on the individuals and skills of the organization, to understand where are the gaps, how do we upscale. So, what skills do we need to bring going forward?

Data collaborations

the city is lucky to have strong universities. It is important to set these partnerships with academia and industry to make the sharing of data easier.

Data culture

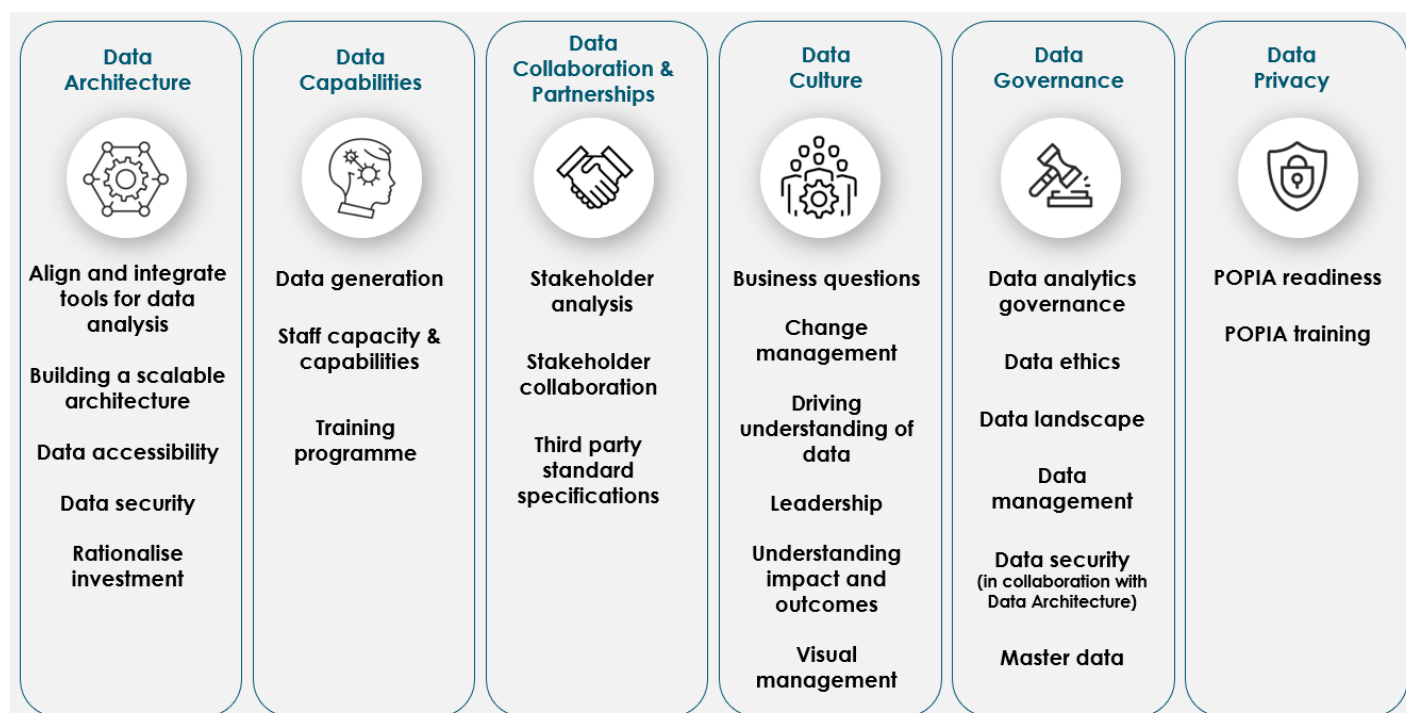
How do we change discussions? People should look at data before they make decisions. Managing the covid-19 crisis is a good example of that.

Governance

Issues around ethics, how do we manage data in the organization. As we work with data we need to make sure we do it responsibly, without compromising individuals.

"As part of the data strategy, we are also focusing on economics. We are building cost-benefit analysis tools for projects and exploring the ability to pay of residents. We are exploring how to highlight gender and social inclusion through data."

Cape Town goals on delivering data outcomes



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EXPERIENCES FROM CITIES

Improved data integration, collection and analysis to facilitate collaborative informal settlement action in Durban

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Challenges in Durban

Like many cities in South Africa, a quarter of the population of Durban live under the poverty line, facing the legacy of spatial segregation and unequal development. There are 580 informal settlements, characterized by overcrowding, disaster, high rate of communicable disease, vulnerability of crime and climate change risks. Although the city has been installing basic services in informal settlements since the 1990s, like taps and toilets, many remain without basic infrastructure, such as electricity, waste collection, sanitation, roads, stormwater control.

Durban's resilience strategy focuses on collaborative informal settlement action. Accordingly, data management is a key constraint in how the city makes strategic decisions within the context of informal settlements.

Informal settlements and data challenges

When covid-19 hit the country, our ministry of human settlements, water and sanitation offered to instal water tanks and additional taps across settlements to prevent the spread of the virus. So we had to identify those communities that had a particular vulnerability due to a lack of water and sanitation. As soon as the projects started being implemented, we realized there was incompatibility of data (number of settlements and number of toilets installed) coming, on the one hand, from the water and sanitation department and, on the other hand, from the housing and shelter department. We tried to partner with NGOs and CBOs in the collection



Sarah Watson focused on existing challenges and proposed solutions in Durban, regarding informal settlement's data management.

During response action to covid-19, the city faced major challenges in data compatibility and standardization while implementing emergency water and sanitation infrastructure in informal settlements. This is an example of how complex the data ecosystem in informal settlements is, as it involves multiple stakeholders, different government departments and levels. Therefore, the city is developing an Informal Settlement Information Management Solution that will facilitate the collection, integration and analysis of city-level data.

of data, but such data was not comparable with municipal data as communities give different names to streets and neighbourhoods.

Through FCSA support, we decided to tackle 2 immediate priorities: a system for communities to report faults or failures in service delivery around water and sanitation; a data-crunching exercise of comparing different sets to identify which settlements needed additional taps, toilets and water tanks. However, people in informal settlements were not reporting faults due to a lack of technology, lack of understanding and trust in the reporting system. Moreover, the data-crunching was not implemented due to an inability of reaching an agreement on data sharing clauses with other departments.

Informal settlements data ecosystem

The data ecosystem in informal settlements is complex and messy: multiple sources of data; different municipal departments, each with their silo data; different spheres of government (local, provincial and national); multiple stakeholders (communities, NGOs, academia). The complexity is not only around the IT and the technology system that supports storing and sharing data but also protocols, rules of the game and traversal coordination. There is a huge number of potential use cases for informal settlements data management system: developing a project pipeline, planning, feeding into business plans for housing projects, built environment performance plan, trying to look at land tenure, illegal land invasion.

"How are other cities looking at proprietary versus custom made versus open source systems? Who owns data systems and data sets? How do you validate or verify data? How and what data projects are shared with communities from whom the data has been collected? How can technology assist to collect information in informal settlements, which by nature are not planned and not documented? How do we create a progressive open data culture that facilitates service delivery?"

Improved Data Integration, Collection and Analysis to Collaborative Informal Settlement Action in Durban

The project aims to develop an Informal Settlement Information Management Solution that will facilitate improved collection, integration and analysis of city-level data.

Phase 1 (complete)

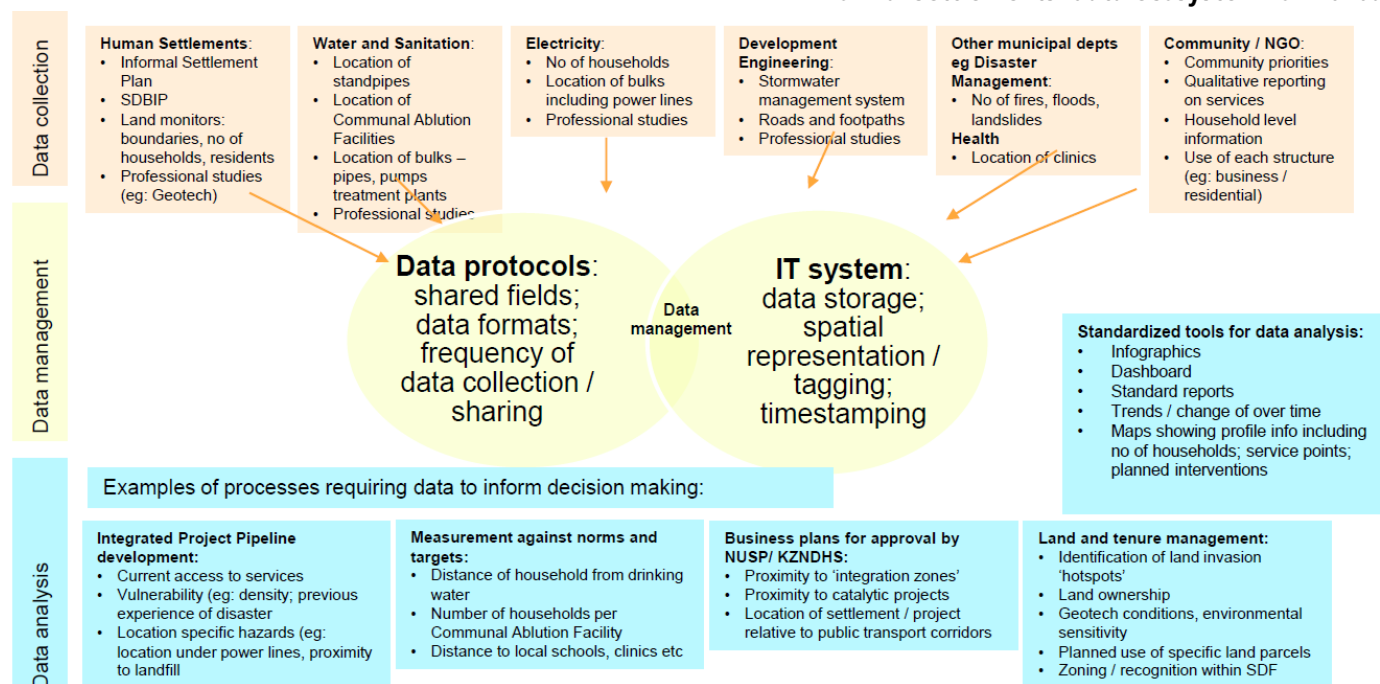
Developed broad principles of data governance, based on global best practice data principles and the South African government enterprise data policy. Moreover, stakeholder engagement was used to understand data and process gaps and related challenges around the management of data.

Phase 2 (current)

Developing a technical specification for an informal settlement management solution. This includes deeper stakeholder analysis, business process requirements, design of user journeys and technical specifications.

Phase 3: Will design and implement the informal settlements information management solution.

Informal settlements data ecosystem for Durban



MAIN TAKEAWAYS AND REFERENCES

Challenges

Data production in cities brings several challenges, including ethical questions, such as data privacy, fear of surveillance, and data ownership.

Some common challenges in multi-sector data governance are:

- **different agencies are not coordinated**
- **data comes in diverse formats**
- **issues with data quality and data availability**
- **data from community-based and non-governmental organizations may not be compatible with official information**

Breaking data silos and integrating different sectors

Integration can be reached by:

- **using standards**
- **guaranteeing standardization, quality, and replication of data**
- **enabling the information marketplace**
- **curating data, so it is understandable and easy to use**
- **establishing data governance frameworks towards software/hardware balance**
- **creating integrated data hubs that centralize data management**

Open data

Open data is crucial to allow for transparency and collaboration. Participatory processes around data bring community voices and help the municipality asking the right questions. Among its benefits, fostering collaboration, innovation, and entrepreneurship, and improving decision making and urban planning are some of the most emphasized. **Open SDG Data Hub** is an inspiring reference and can be accessed [HERE](#).

Following existing guidelines and laws

Data strategies should refer to existing legal frameworks (municipal, national) and consider international standards and guidelines. **ISO 37106** is a good reference and you can find it [HERE](#).

Partnerships with external stakeholders

For Local Authorities, it is crucial to partner with academia, the private sector, community-based and non-governmental organizations. Providing spaces that allow for converging collaboration forms around data and smart/digital solutions (such as urban labs) can be a great driver for innovation. **Open Innovation** is a strategy that converges many of these aspects. For further information, click [HERE](#).

Comprehensive use of data

What matters the most is not how much data you have but how to use it. For that, it is essential to have a well-established vision and principles. Referring to the SDGs and the New Urban Agenda is a good starting point. It is also necessary to listen to people with experience on the ground and identify critical interventions before having significant efforts in processing and managing large data sets. **Data4SDGs** is an inspiring source and can be accessed [HERE](#).

Data privacy

As more data becomes available in disaggregated forms and data-silos become more integrated, privacy issues are increasingly a concern about what data is collected and how it is used. Clear norms, policies and legal frameworks will help to regulate opt-in and opt-out, data mining, use, re-use for other purposes, transfer and dissemination. These are enablers for citizens to better understand and control their own data, while still allowing for rich innovation in re-use of data for the public good. A valuable guide by **UNSDG** can be found [HERE](#).

Awareness and capability

Creating a data culture and awareness is the goal for people to understand the importance of data. Capacity development of local staff is critical. Identifying missing skills in the local team and providing proper capacity development is a goal to be achieved. **DESA** has a rich database of capacity building tools and can be accessed [HERE](#).

For further information, questions and suggestions,
please visit the Community Forum of the GFCP
Knowledge Platform:

<https://community.urbanagendaplatform.org/>

Or reach us through the e-mail:

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