

Use Case Approach to the City's Data Strategy

What is the City of Cape Town Data Strategy?



The Data Strategy supports the City's efforts to build a culture of evidence-based decision making, by maturing its systems, tools, processes and capabilities to use and manage data for the public good. It recognises that:



- ⚙️ Data is a shared asset
- ⚙️ Data is a collection of public assets that should be managed and used to maximise public benefit
- ⚙️ Data should be multi-use, across departments, spheres of government and with the public
- ⚙️ Data should be transformed into meaningful and relevant information, to effectively support strategic and operational decision-making and performance



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The collaborative process to operationalise the data strategy

The FCSA team worked closely with the City's Data Coordination Committee, data science and economics teams, and relevant line departments to operationalise its first data strategy.

A "use case" approach was used. This means that data products were developed for specific users, to support their functional needs and create tangible outcomes that produced immediate value and impact, while simultaneously working to improve the maturity of the City's data system, across four main themes:



1. Data Governance: Data Governance workstream on practises that assist with establishing best-practice Data Governance.



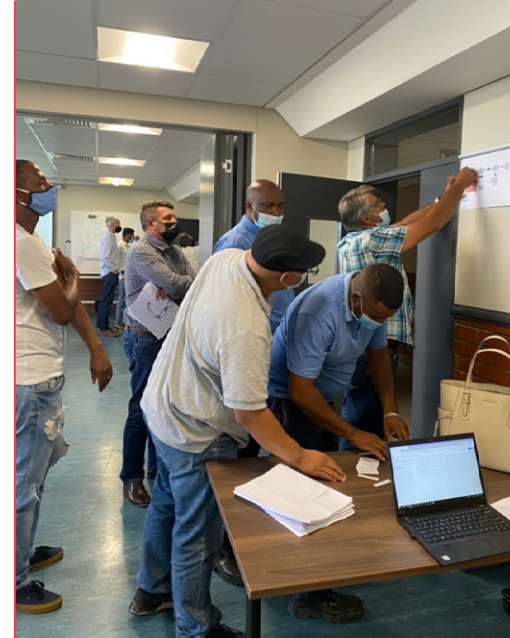
2. Data Capabilities: Data Capability workstream on impacts that might affect skills and organisation structure.



3. Data Architecture: Data Architecture workstream on impacts that might affect how data is collected, analysed, stored, and how data is transferred across different boundaries.



4. Data Culture: Data Culture workstream on the practical implementation within the City of these best practises through demonstrating their viability through use cases.



City of Cape Town energy department officials engaging as part of user needs and capabilities assessments

The data strategy is for decision making in support of the City's strategic objectives.

Why? Informed and timely support for leaders making decisions while implementing strategies (IDP), plans (infra & services) and managing events (Covid)

What? Descriptive and analytical tools, systems and capabilities

How? Agile use case methodology, emphasis on function need, architecture, governance and capabilities, representation and avoiding bias



What was produced:

Foundational documents

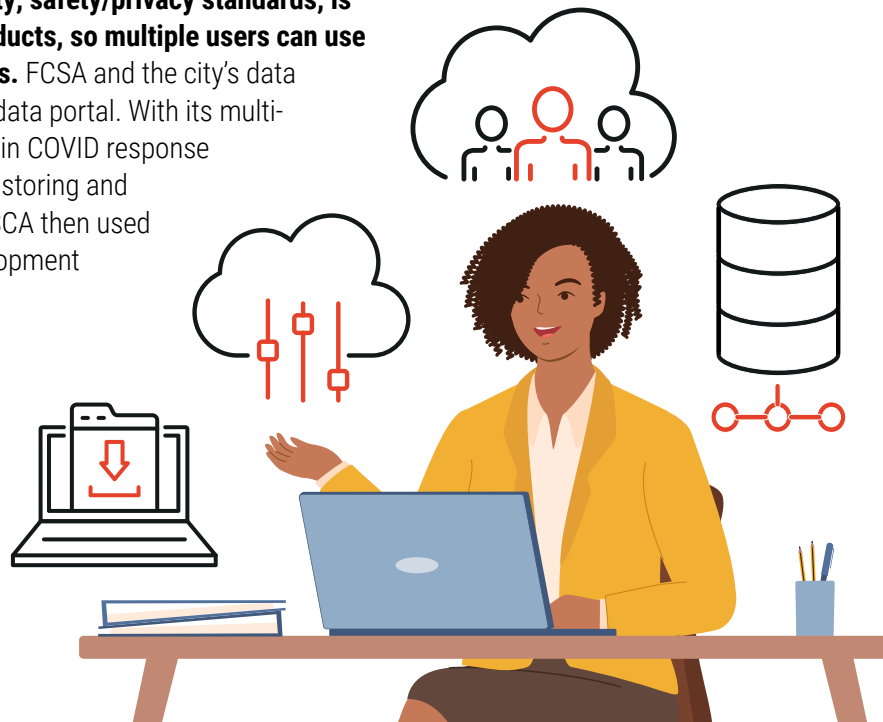
In the first year, foundational work was done to understand best practice approaches on issues such as Master Data Governance, Data Inventories, Data architecture standards, and more. These provided guiding principles for the use cases' approaches to these aspects of working with data, and inform the City's continued maturity for system-wide implementation of the data strategy.

A year 1 deliverable recommended improved systems to know what is knowable. The City has since been working on a web-based data inventory system and access classification which will link to its new data roles. The FCSA team collaborated with the city to support the above data strategy streams with documentation on global good practise, roadmaps and frameworks. This included support on data inventory and taxonomy, and a framework for assessing and choosing use cases based on their potential to have immediate value and impact on the City, as well as their ability to test data strategy assumptions and provide feedback into actualising strategy implementation.

CKAN Data flows and storage

The ability to extract data from City systems or external sources, and store it in a central location that meets all interoperability, safety/privacy standards, is fundamental to creating impact from data products, so multiple users can use the data in multiple ways for multiple purposes. FCSA and the city's data

science team set up and implemented a CKAN data portal. With its multi-user capabilities, it has become a critical nexus in COVID response work, providing the city with a data platform for storing and sharing critical data internally and externally. FCSA then used this in the interventions below. During the development of the Asset Management Use case data tool, it enabled bidirectional data sharing and access, and it enabled city systems to ingest the data collected during the Informal Settlements case. Embedded within the City, this asset now supports multiple data sharing and usage, and data tools.



COVID

The FCSA model suite

LOGISTICS

Facilities management

Plan facilities optimally to manage fatalities

Health model

Improve clinic and testing outcomes

Quarantine & isolation

Predict key gaps in requirement

FINANCE & ECONOMICS

Requirements model

Monies required to support logistics

Economic impact

Projects impact on tax jobs & household income

Revenue scenario

Project impact on revenue for the city

INFORMAL SETTLEMENTS

Informal settlements information management system

Combines static data with operational data

Response Model:

A risk based decision making framework that maps the impact of a decision on elements of a system

CKAN & S3:

Environment that enables access and sharing of data across the COVID-19 teams, city, province & national stakeholders

Asset management

Infrastructure performance is key to reliable service delivery. Maintaining and renewing infrastructure across a large and complex network requires visibility into day-to-day operational standards and performance metrics. Electricity Asset Management Use Case developed a data tool to improve asset management decisions regarding substation maintenance, refurbishment, and replacement. Performance dashboards were provided, as well as data quality training.



City of Cape Town officials exploring uses of minisubstation performance data early in the user design process



Data equity for informal settlements

People need to be counted and included in strategic planning, operational responses, and planning considerations. Formally housed people and people who consume formal services are often linked to a specific data set, whereas informally housed people are not. The informal settlements use cases focused on addressing this gap – by connecting informal settlements’ dwellers to water and sanitation operational systems for fault reports; and by implementing an innovative survey system that provides residents with residents certificates, offering FICA valid tenure status as well as a data source for informal settlements services and upgrade planning.

Applied Economics

Project managers need tools to design projects with the greatest public benefit at the lowest cost. Based on Cost Benefit Analysis, the City’s internal economics team developed an appraisal methodology that fits within the City’s standard project design and stage gate processes. We applied the methodology retrospectively to the MyCiti Phase 1A project with the transport directorate and to future planning scenarios for water desalination investments. The City’s team, capacitated to use the methodology, has also used the tooling and methodology for internal applications, including the decision to host the FormulaE.

We also explored tools to model income thresholds for abilities to pay for municipal bills and transport services, complimented by training tools, workshops with line departments with an interest in price signalling and income-sensitive tariff setting.

Spatial economics was another explorative area, exploring common and frontier descriptive, analytical and predictive spatial urban economics tools and practices and providing recommendations for improving the CCTs capabilities in line with its existing economics and data approaches.

Service Delivery API

A comprehensive API scope specification and the development of additional API capabilities were developed by FCSA with the City’s data science team, with the goal of improving the usability of existing APIs and developing future APIs. The goal of this is to empower internal and external users to access datasets and to connect to “living dataflows” to optimise the use of data. As one example, improving the City Service Request API, which is a “pipe” of live service request data, can allow residents to access service delivery status through WhatsApp (or other common messaging platforms) by developing a WhatsApp bot service.

As part of the collaboration between CCT and FCSA, data analytics modules have been implemented. In a city environment, once there is a data culture (governance, capabilities, systems, etc), more advanced techniques can be leveraged. A machine learning computer model developed by the City’s data science team and FCSA team to automatically classify images submitted to the service request system (for example, potholes can be recognized and classified in a photo) in order to optimise responses to service requests.



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Lessons



Stay the course

Remaining focused on the primary service delivery or planning problem that you are trying to solve will keep the project and team on track



User design

Meet people where they are, whether it's a field worker or a senior manager everyone has different needs and expectations that should be included in the design of new products and processes



Implement strategy by doing

Innovation is by definition not immediately understood by the majority of recipients. Strategy that sets a theoretical framework can only be tested, galvanized and adjusted by experience from implementation. Highly technical topics such as data governance and architecture benefit from the ongoing buy-in, momentum and investment that is achieved by showing practical value and impact on a "real-life" business level, rather than trying to get city leadership and users to understand a long-term vision that is theoretical and technical.



Expect (and embrace) complexity

When attempting to shift a large, public organisation such as a City there are going to be differing levels of maturity (be it in governance, capability or systems) and technical expertise across the board. Embrace this complexity to build capability for implementing innovation (such as a data strategy) at differing levels across the system/organisation, rather than trying to get everyone to the same point at the same.



Sometimes you need to be boring: A sustainable solution that works is better than a new innovation that doesn't

It's important not to approach implementing data strategy and tools by creating/finding an innovative technology or solution and looking for a problem that fits it. The "exciting" part of innovation in this space is understanding the problem and deploying a solution that is sustainable by the current context and ecosystem and sometimes that means using existing technology and human processes.



"Market"/communicate success and impact

Learn how to use communication well and translate impact from implementing data strategy and tools into stories that can build momentum and understanding, and shift culture with the city.

What happens next?

The tools and processes developed during this three year collaboration showed the potential impact of embracing data science and advanced analytics to solve City challenges and bring multiple stakeholder groups into the fold of evidence-based decision making.

While we leave behind many working data assets in support of the City's service delivery and planning functions, this learning experience will inform improvements to the City's data strategy going forward.

