

WG3 Smart City Platforms - Transitioning to a new architecture

Michael Mulquin



What the deliverable is about

Provides guidance to government stakeholders on setting up smart city platforms.

Provides recommendations for technical specifications and architectures.

Provides recommendations for the process to build and implement.

There is a lot happening in a city



- All of these systems interact with each other

- All of them generate data

- All of them require good data to work well

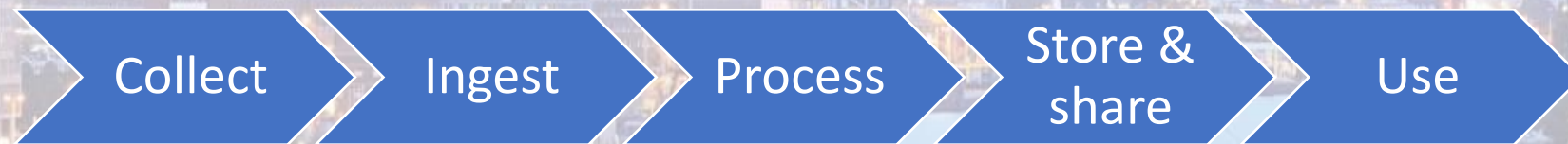
Smart City and data

A smart city is one where increasing amounts of useful data about the city are collected and used by the public administration, by business, and by the citizen to help the city work better



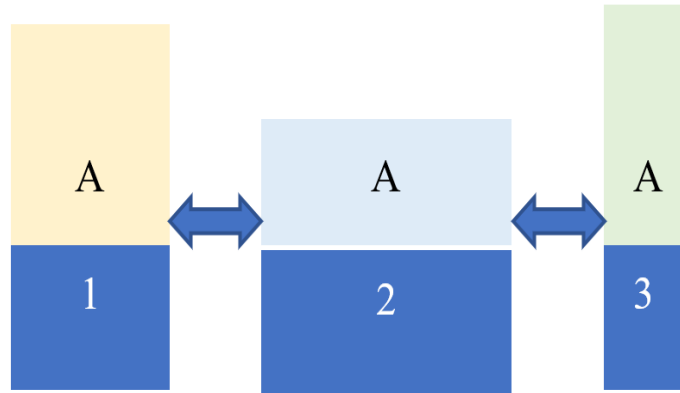
Collecting and using data

- Many agencies in the city collect data and use it for many specific applications
- Each application follows a similar process

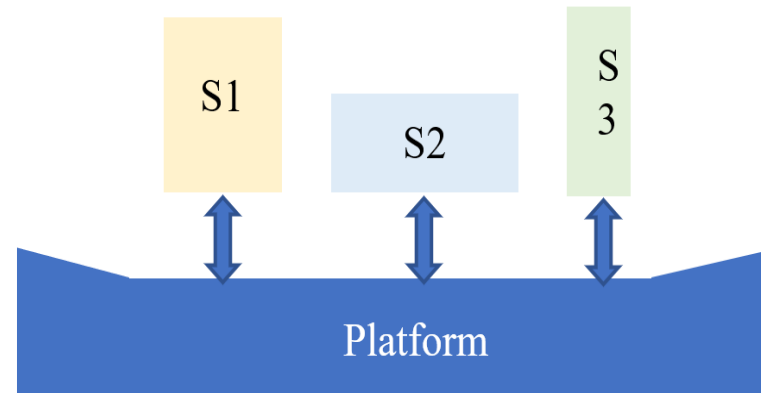


- If each application is handled separately:
 - Unnecessarily complex as the number of applications grow
 - Difficult to combine data from different applications to gain greater insight
- Cities need to develop integrated data platforms

Integrated data platforms



Delivery through separate applications sharing some common functionalities that need to interoperate



Delivery through platform based agile solutions

Instead of using many separate applications containing duplicating functionality, all common functionalities can be collected into a platform and solutions which are built on top of that platform then only need their unique functionality.

Getting there:
Three things
to get right

- Storing and using data
- Architectures
- Managing the key issues in a minimal but sufficient way

Storing and using data at scale



Data lakes and data spaces

A data lake is a centralized repository that allows a city to store all its data, static and streamed, structured and unstructured, at any scale.

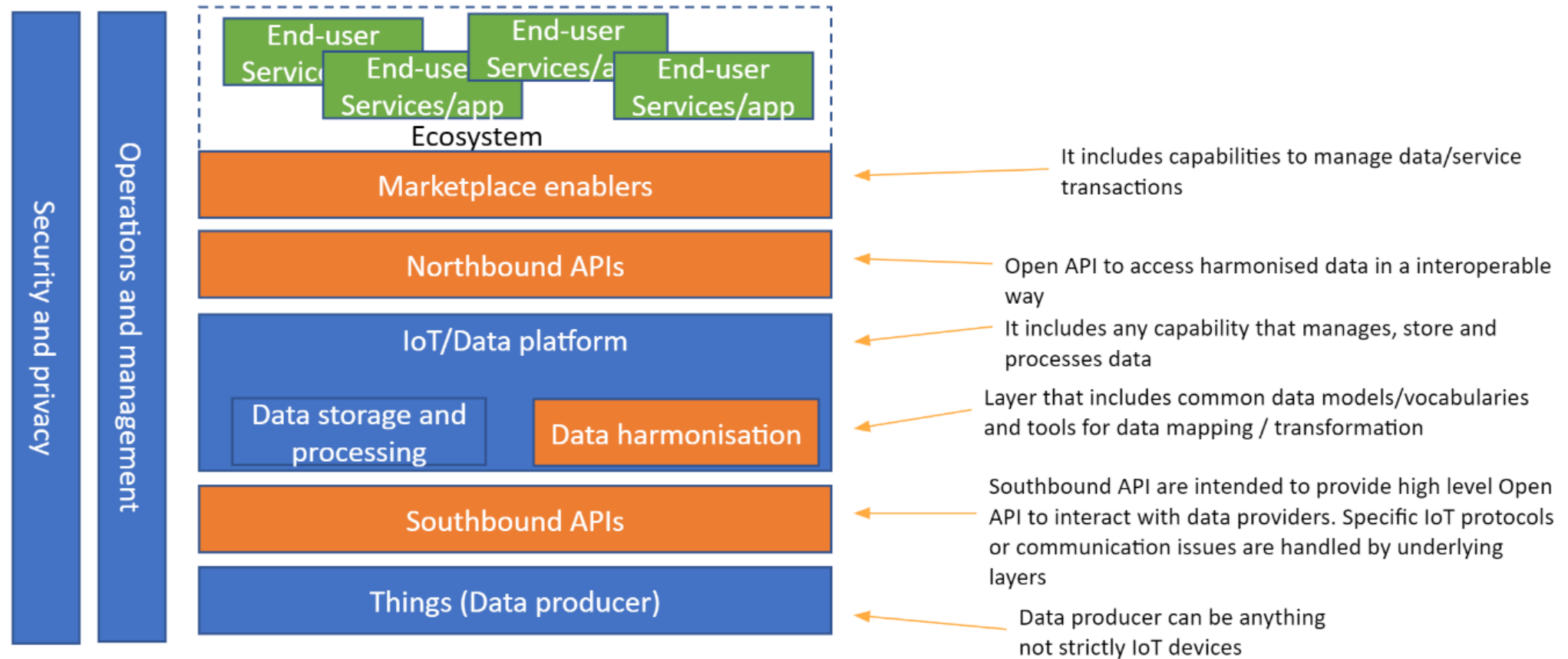
A Data Space is like a data lake, but more focused on the need to share data. All users comply with shared standards, making data exchange and sharing easy.



Local digital twins

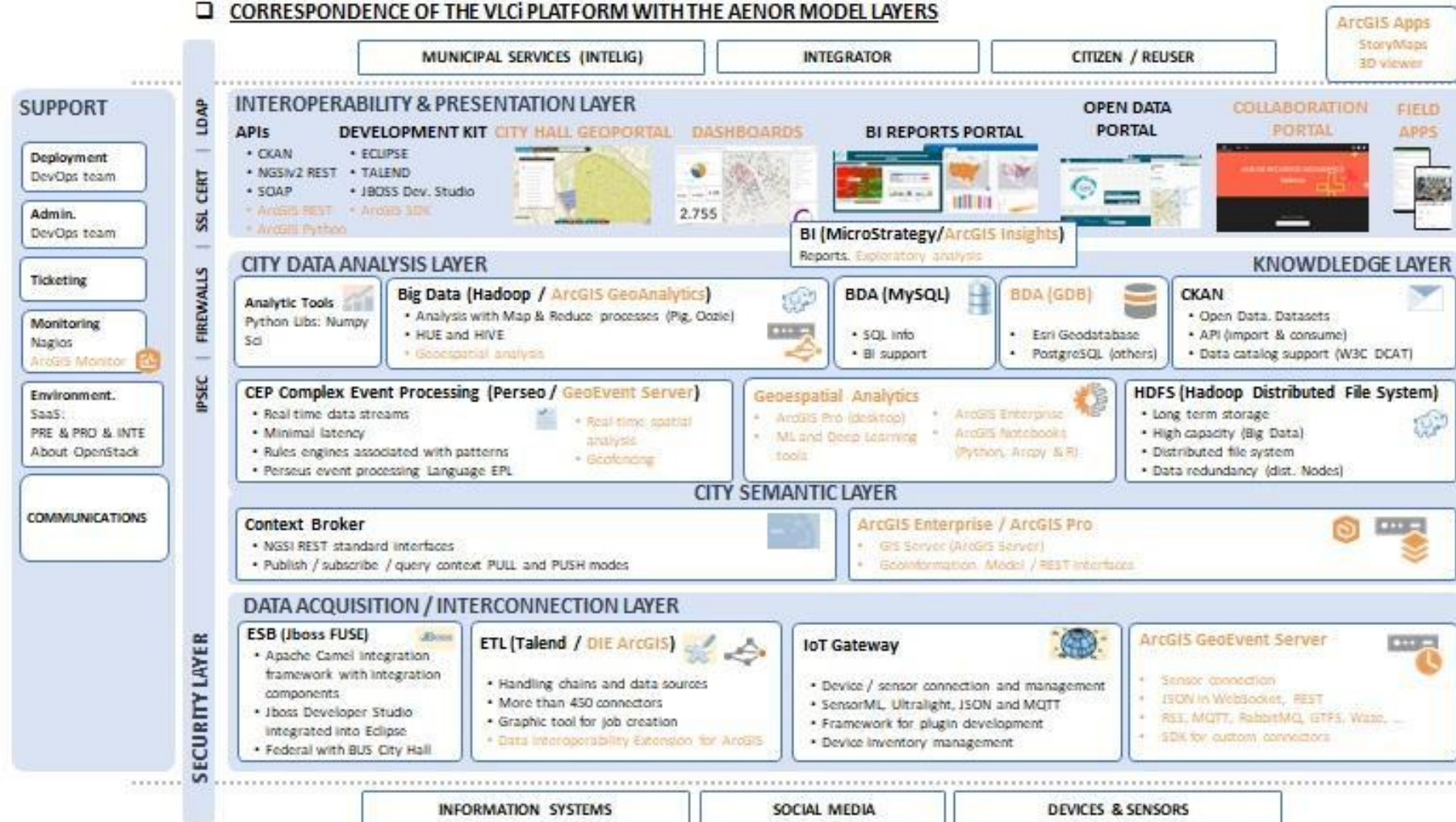
The Living-in.EU initiative defines local digital twins as a virtual representation of a city's physical assets, using data, data analytics and machine learning to provide simulation models that can be updated and changed (real-time) as their physical equivalents change

The architectural framework



Architectures

CORRESPONDENCE OF THE VLCi PLATFORM WITH THE AENOR MODEL LAYERS



Managing the data ecosystem

There are a lot of issues to tackle!

How to use data to manage physical assets?

How to handle data analytics?

How to ensure fair AI?

How to manage data security?

How to ensure data quality?

How to link context data?

How to ensure common data models?

How to manage personal data?

How to gather data usage information?

How to find the data I need?

How to agree compliance with conditions for data sharing?

How to find out about the conditions for data sharing?

How to manage geospatial data?

Minimal Interoperability

- ITU defines **minimal interoperability** as: The minimal sufficient degree needed to meet a certain requirement for data sharing, use and reuse (ITU-T, 2019). It is an approach to establishing a set of modular mechanisms across multiple application domains and geographic territories, without having to specify everything in complete detail, and without requiring complete implementation of and compliance to the entire framework.
- Minimal Interoperability Mechanisms (MIMs) are the minimal but sufficient capabilities needed to achieve interoperability of data, systems, and services between buyers, suppliers and regulators across governance levels around the world. Because the mechanisms are based on an inclusive list of baselines and references, they take into account the different backgrounds of cities and communities and allow cities to achieve interoperability based on a minimal common ground.

The MIMs
focus on what
cities need to
develop a local
data
ecosystem

The question answered by the MIMs



“What are all the basic building blocks needed to enable a city to set up an effective data-sharing ecosystem?”

The MIMs so far
– tackling the
requirements of
a local data
ecosystem

MIM	Subject	Name
MIM1	Context	Context Information Management
MIM2	Data Models	Shared Data Models
MIM3	Contracts	Ecosystem Transactions Management
MIM4	Trust	Personal Data Management
MIM5	Transparency	Fair Artificial Intelligence
MIM6	Security	Security management
MIM7	Places	Geospatial information management
MIM8	Indicators	Ecosystem indicator management
MIM9	Analytics	Data Analytics Management
MIM10	Resources	Resource Impact Assessment

Getting there: Eight steps to take

1. Develop a roadmap
2. Focus on data
3. Build with interfaces
4. Secure a minimum of interoperability
5. Keep an open mind when choosing technology
6. Prioritise partnerships and ecosystems
7. Take maturity and complexity into consideration
8. Start small, think big

This is a journey

- Let's continue working together to help all cities – especially small and medium sized cities and ones with little resources – build effective smart city platforms
- Work with us in OASC to continue to develop the MIMs
- Work through U4SSC to develop the guidance and support cities need