

Data Governance & Integration for Smart Cities

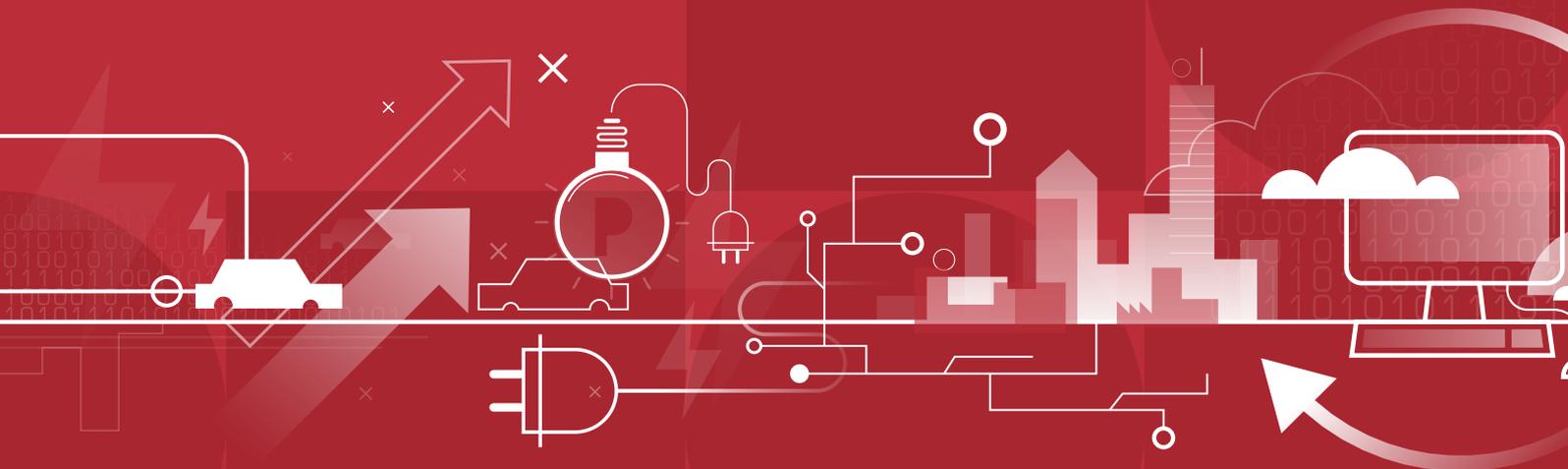
SmartImpact is a two year project funded by the European Regional Development Fund under the URBACT programme. The aim is to promote Smart, sustainable urban development, helping to make cities more liveable with the support of technology.

This theme paper introduces the key issues for Smart city data governance and related infrastructures.

Data is at the heart of a Smart city and is increasingly important for managing city operations and driving urban development. Through the Internet of Things (IoT) more and more devices produce data and respond to digital commands. In cities this means that we have an exponentially increasing amount of data that could help us better understand our urban challenges and improve city services.

Challenges exist because not all data belongs to the city and is therefore not available and actionable. Private companies hold enormous sets of data with high relevance for the city. The municipality needs to find ways to engage with third parties and also to ensure they retrain the cities own data assets when commissioning services.

New city governance methods have the potential to harness an array of urban data, building intelligence that can vastly improve the planning and efficiency of services throughout the administration. Information about transport, lighting, waste, parking and energy can be provided in real-time and within a single data platform. Using a well designed urban platform, intelligent algorithms allow us to build a genuine picture of how each city operates and from there services can be designed to meet both growing and changing needs.



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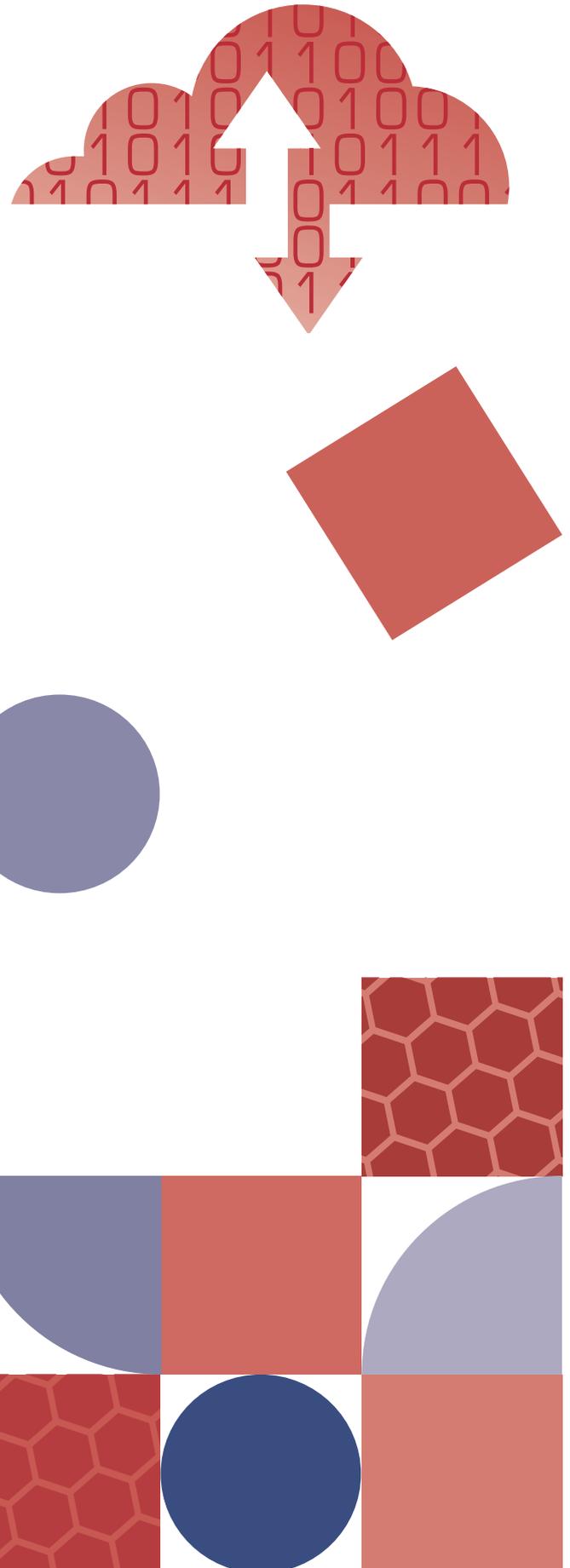
Key issues for SmartImpact partners

Urban data can now be gathered from a wide range of organisations and places. It can be static or real-time, public, private or commercial. The foremost challenge faced by cities is how to synthesise and make useful the data coming from many differing formats and categories.

Urban data governance is the process of decision making on data related issues that impact questions of common good, business value and civil society. It is a value and policy driven matter. At its core lies the question; what can cities do to govern data in the best interest of its citizens without jeopardising potential business opportunities that lie within urban data sets.

Challenges arise when working with a wide range of stakeholders and delivery partners and managing a citywide data infrastructure. The city is handling multiple sources of data from a range of owners and must assume responsibility for the intrinsic complexities of this sharing. There is also the need to balance the inherent ethical and commercial tensions and conflicting expectations between the providers and consumers of city data.

A Smart city must invest wisely in an urban platform that is able to configure, share, and make useable, rapidly increasing volumes of data, especially when supported by logical data architecture. It must understand its own policy requirements in relation to urban data platforms and open data. This requires a new type of governance, one that supports the design, value and use of a data platform.



Lessons learnt from SmartImpact partners

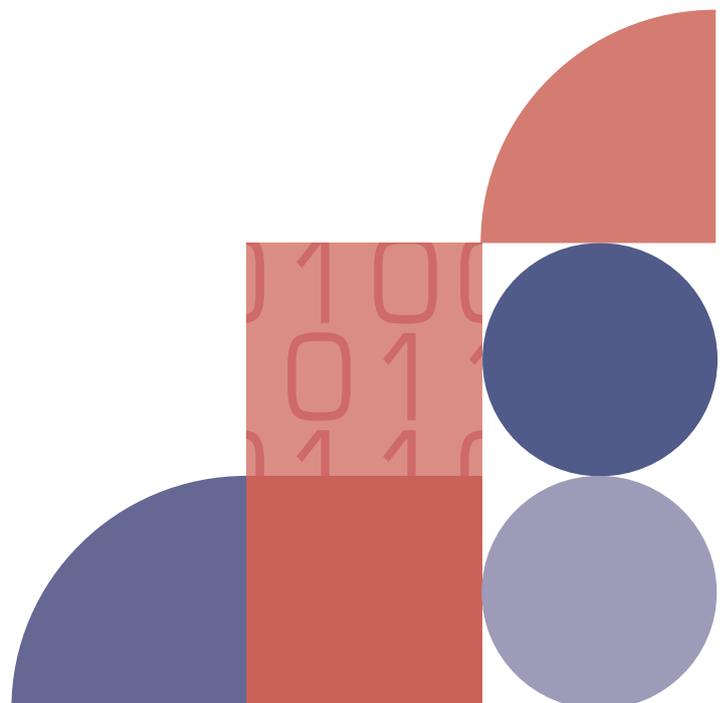
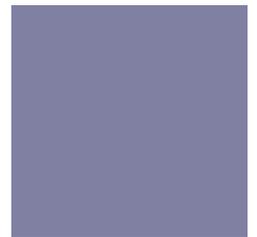
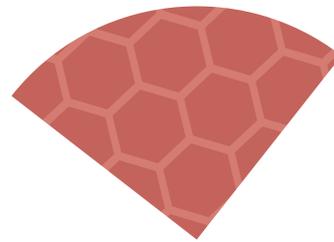
In order to maximise the interoperability between data and services, data platforms and similar solutions need to use open, non-proprietary application programming interfaces (APIs) and data formats.

Who owns the data collected by Smart cities is both an ethical and political question because ownership entails control. Cities should use their position when issuing public contracts to fully leverage control of urban data. Written into contracts, they can outline the city's right to own and use data that stems from their public space.

The foundations of a successful Smart city are based on effective partnerships. In order for this new governance to thrive, partnerships between the private and public sector need to mature.

To be democratic and stimulate innovation the infrastructure must be open and provide access to data at a significantly detailed level. The raw data should be publicly available without compromising the privacy and security of citizens. This will contribute to innovation by providing valuable information to local, regional and national businesses. By adding a standard 'data ownership clause' in procurement contracts, municipalities can ensure they gain access and (often a non-exclusive) ownership of all data produced under a certain third party service contract. Cities like Dublin and Eindhoven have successfully piloted this in their procurements.

Data standards need to be included in municipal service contracts and align with the city's requirements. Data needs to be interoperable and machine-readable. Here the challenge is in organising the use and standard provision of data throughout all municipal departments and service providers. The new EU General Data Protection Regulation GDPR, 2018, provides a framework for the protection of privacy and personal data.



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A Smart society charter - seven data principles

These principles were developed in cooperation with a range of partners working with the city of Eindhoven. The intention is Smart city agents can adopt, extend and reflect on these principles when building new or improving existing IoT and data infrastructures, platforms, services and applications.

1. Privacy first

First and foremost privacy for citizens and users should be guaranteed. Everyone should be given insight into the data that is collected and from there, control over the way it is and will be used. An ethical framework should always overlay new projects that extend practices into areas not addressed by current legislation.

2. Open data and interfaces

Having collated and sorted the data, a Smart city can leverage real benefit by making data publicly available and enabling access to IoT and data systems through open interfaces. This openness allows the market to rush in, stimulating new business models and emerging services that rely on generating added value, rather than exploiting licenses on data or exclusive rights on the infrastructure.

3. Embrace open standards

Wherever available, the IoT infrastructure, connectivity, platforms, devices and services should be built on open or broadly agreed de-facto standards. Using recognisable and established standards will better facilitate the evolution of that infrastructure and its resultant services. This openness also sustains a competitive market, helping to prevent vendor lock-in and improving cost efficiency.

4. Share where possible

All IoT and data developments should provide well defined, easily accessible, stable interfaces for sharing and reusing existing assets. Shared use of grids, sensor networks, connectivity and software components will lower the barriers for their adoption, increase connectivity and stimulate interoperability.

5. Support modularity

The adoption of a modular architecture with well defined open interfaces should be the core of any IoT or data driven development. This modularity helps to ensure flexible growth through interoperability between platforms, services and applications.

6. Maintain security

The reliability of components, platforms, solutions and services must be constantly safeguarded. Ensuring confidentiality, integrity and availability is vital to essential services and a core part of the infrastructure, which must be safeguarded to the highest possible degree.

7. Accept social responsibility

Providing new technologies and services, collecting and combining data may result in unforeseen affects for both citizens and our society.



This paper is intended to be a guide to some of the relevant issues arising in connection with how cities can use / create / develop governance structures that can help them to drive transformative change using technology.

The other theme papers in this series can be found at: www.smartimpact-project.eu

Further information on SmartImpact network visit: <http://urbact.eu/smartimpact>