DKSR
Data Competence for Cities and Regions

INTRODUCTION
Urban Data Platforms

What is an Urban Data Platform? What can municipalities and municipal companies use it for? In this Knowledge Bundle, you get to know about the value of Data Platforms.

You have questions? Don't hesitate to contact us – via square@dksr.city!

Urban data platforms as key infrastructure for cities

Services and processes in cities are becoming increasingly data driven. Smart waste bins can signal when they are full, occupation of parking spaces can be monitored and displayed in real-time using sensors, and mobile applications for routing and mobility options are used by citizens on daily basis. There is abundant evidence and best practices that show how digital solutions can provide brand new insights into city life and needs, aid the development of new and better services, and serve as booster for innovation and more democratic governments. At the heart of all these solutions lays data. Data is measured, collected, and communicated to providers that, in turn, process it and transform it into services. In the current data landscape of our cities, this process is often done in silos. That means, isolated processes in which data that is produced for one purpose is not shared or linked with other data sets. This isolation can be counterproductive as data often proves the most valuable when linked and re-used. In this context, Urban Data Platforms (UDPs) have recently emerged as the means for cities that wish to connect and make the most out of data. Numerous cities have already set up UDPs and started to demonstrate their role and value for digital transformation.

What is a UDP?

UDPs have emerged during the movement towards Open Data and the success of platform-based businesses like Amazon, Airbnb, and Uber. A UDP is in essence a digital platform that combines data from both public and private sectors, from various systems and infrastructures (e.g. sensors, cloud service, mobile devices, analytics, social media, etc) and makes it available to different actors.

The European Innovation Partnership for Smart Cities and Communities has defined Urban Data Platforms as: "the logical city data architecture that brings together and integrates data flows within and across city systems in a way that exploits modern technologies, providing the building block that enables cities to rapidly shift from fragmented operations to predictive effective operations, and novel ways to engaging and serving city stakeholders".[1]

Data sets that are connected to UDPs can be used infinitely. From a functional point of view, UDPs provides the infrastructure that can be used by cities

Open Urban Data Platforms

Following the DIN definition, an open urban platform is an "urban platform that uses open standards and interfaces to guarantee compatibility and interoperability with other systems and other urban platforms (DIN SPEC 91357). For a city an open platform offers the possibility to customise the platform to particular needs, exchange data as well as components or modules related to the platform with third parties, and to avoid vendor lock-in and technology-debt situations. These "openness" requirement go es beyond interoperability and the use of open standards. A UDP can follow standards but if the supplier does not allow for third party service delivery on top of the platform, then is not an open urban platform.

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[1] European Innovation Partnership of Smart Cities and Communities, 2015. Memorandum of Understanding-Towards Open Urban Data Platforms for Smar Cities and Communities. Available at https://digital-strategy.ec.europa.eu/en/news/memorandum-understanding-towards-open-urban-platforms-smart-cities-and-communities

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to attract a wide ecosystem of users, citizens, government, and companies that jointly create private and public value. They enable the development of tools that increase data access, new (re)uses, visualization and modelling, and can have a key role in the development of new services and products which contribute towards the UN SDGs.

What are UDPs used for?

Mainly, UDPs are of high value a) to improve city services and decision making b) to contribute to more resilient and sustainable cities and c) to stimulate innovation, participation, and democracy. They provide (often real-time) insights of the city dynamics across different domains. These insights will vary depending on the solution and the particular set-up and needs of each city, and can include:

Operational insights on the properties of city objects and activities that can be used to identify potential improvements – e.g. for better public services delivery

Critical insights to monitor and react to emergencies and crises – e.g. flood warnings

Analytical insights to identify and understand correlations and generate forecasts. These are also useful for understanding impacts of innovation and derive evidence on challenges and opportunities in cities – e.g. traffic flows for better mobility planning

Strategic insights to better draw strategies and goals, plans, and decisions in cities – e.g. emission targets

Are UDPs a critical infrastructure for today's cities?

One of the questions surrounding UDPs is if they should be considered critical infrastructure. Traditionally, the terms "critical" or "vital" infrastructure have been used to refer to physical infrastructure of key importance for the development and functioning of countries and cities (e.g. roads, energy grids, and telecommunication lanes). A recent study found that experts increasingly see UDPs as "vital public infrastructure" in the modern urban landscape. As it is explained, UDPs are instrumental in the digital integration of assets and infrastructure, and therefore, become critical themselves. Without UDPs, data stays in silos and its potential remains unleashed.

Approaching UDPs as critical infrastructure requires considering their dual nature: on one hand they generate public value creation, on the other they enable profit by users of the data on the platform. That means, making a financial case for Urban Data Platforms is not as straight forward as it is with other critical infrastructure. UDPs represent horizontal infrastructure upon which many use cases can be built, and the returns and benefits of each are not always captured in monetary values. For example, a solution for reducing energy consumption might save costs, while also contributing to decrease

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carbon emissions. This complexity makes traditional return-of-investment analysis more difficult, and requires the bundling of several use cases and their tangible and intangible benefits. This approach might be useful for those trying to build a financial case for UDPs, particularly when using taxpayer money. A research on cities which are currently working with UDPs shows they have justified investments based on critical infrastructure reasoning that is not limited to a monetary business case but to broader public value.

A matter of trust

Since UDPs are part of the public domain, their governance is more complex than that of platforms with mere commercial purposes. By making data available, UDPs can enable a levelled playing field and nurture trust among actors. When the correct security measures are taken, the sharing of data is done in a safe and secure way, as the technological components of UDPs allow for protecting and safeguarding private data. This trust is further rooted in governance principles at the core of UDPs: interoperability, openness and transparency. The majority of UDPs strive for interoperability with other UDPs. Platform openness refers to the extent with which citizens and organisation can join the platform without prior selection by the platform manager. Transparency encompasses access to information on how the platform works, the algorithms it integrates, how data is used, by whom.

By allowing collaborative experience between, for example, public service providers, companies, governments, research institutions, citizens, UDPs serve as basis for improving mutual trust. For data governance in an UDP context, a clear definition of roles for provisioning and processing of data is vital. Data ethics are another important dimension when it comes to governing data.

UDPs in action

Cologne

The DKSR UDP supports the connection of different data sources from different partners that serve as basis for a micro mobility dashboard. Data sets on shared bikes, weather stations, public transport stops, electric scooters, city events, parking garages, and construction sites are networked for an easy monitoring and visualization of city dynamics. Metrics on the sharing offers and their position in the cities are used for city planning.

Mainz

To increase the attractiveness of e-vehicles in the urban area, reduce traffic emissions, and gaining better understating of user behaviour, the DKSR UDP supports the real-time monitoring of electrical vehicle charging spaces. Using sensors, the incorrect use and faulty charging processes can be identified. Additional monitoring of parking space occupancy is planned.

Hamburg

The UDP in Hamburg integrates and networks data sets from different areas (e.g. administration, health, construction, mobility, logistics, transport etc).. Several projects have been implemented including visualizations of city trees, monitoring of water quality in public bathing spaces, monitoring of noise levels, etc.

Is your city already using an UDP to make the most out of data? Now that you have learned about the importance of UDPs and their potential, it is time to start working with your own UDP! We invite you to talk to us as we have can accompany you, no matter your starting point, in your platform journey. All you need is to contact us at square@dksr.city!

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