

## Urban COCKPIT & UrbanPULSE

### PART OF SMART SOLUTION 8: BIG DATA MANAGEMENT



Figure 1: The Urban COCKPIT

- Real time big data storing, analysing and processing to gain KPIs, predictions and recommendations by UrbanPULSE
- Cross organisational reuse, repurpose and recombination of traffic, mobility, environment, energy, smart district and smart home data
- Cross City Information, decision making and planning support by an Urban COCKPIT

INTEGRATED  
INFRASTRUCTURES



Cologne

Technical partners: [ui!] – the urban institute

Contact: Stephan Borgert: [stephan.borgert@the-urban-institute.de](mailto:stephan.borgert@the-urban-institute.de)





Figure 2: Urban COCKPIT. Tile View on the Left, Map View on the Right

## What is the solution?

Figure 1 on the front page shows a possible setting of the Urban COCKPIT for the city of Cologne.

On the left hand side different tiles for different urban data are configured. Important KPIs and information are provided to deliver information about the current state of data quality and the state of the city. Tiles can have one or more backsides for further indicators and information. On the right hand side the map view of the COCKPIT is shown. On the map view are geographic details to the data provided. Filters can control the amount of data to be shown. Zooming in the map provides more details, zooming out a better overview.

The Urban COCKPIT fulfils two main purposes. Firstly, in contrast to cockpits and dashboards of certain urban sub systems, cross city information can be provided. Secondly, it serves as decision making and planning support tool. Before data and services can be connected in a targeted manner, the humans behind the data and services must connect themselves. The Urban COCKPIT is a helpful tool to obtain the current data and

service state and quality to develop new smart city solutions and innovations.

## How does it work?

The image overleaf (Figure 2) depicts the high level architecture of the overall system. On the bottom layer urban data, produced by different urban subsystems, are delivered to the Open Urban big data Platform (OUP), called UrbanPULSE. The connections are realized using open data and open protocol standards.

The OUP is normalizing, storing and processing the data in real time and applies different modules and services to generate value added data like KPIs, predictions or recommendations. Real time means the time for processing the

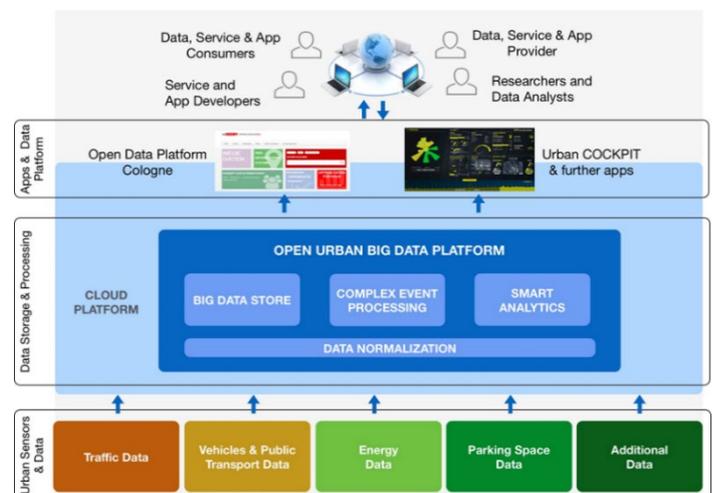


Figure 3: High Level Sociotechnical System Architecture

data is lower as the time receiving the data by application programming interfaces. The OUP supports the reuse, repurpose and recombination of different data types. Thus, advanced use case like intermodal traffic or mobile tickets, which can be used for different transport modes, can be developed. The use cases are not limited on the traffic domain but can also be developed for infrastructures like smart grid, smart districts, smart waste or smart home. The platform is compliant to the DIN SPEC 91357 "Reference Architecture Model Open Urban Platform" to avoid vendor lock ins. Smart Analytics Services and modules can also be provided by 3th parties.

Application programming interfaces to access stored data as well as value added data and services can be provided to data catalogues or data market places. Cologne uses a CKAN based platform called Open Data Platform Cologne.

The Urban COCKPIT itself is an application, using UrbanPulse APIs.

## Business Model Used

The Urban Software Institute GmbH (= [ui!]) is developing the UrbanPULSE platform and the Urban COCKPIT and offers them to cities and urban management companies. Furthermore [ui!] offers services for data integration, analytics, development use cases, designing and implementing the COCKPIT

and more. Customers, who want to develop connectors and services by their own, can buy a developer licence including access to the full source code of the platform. Purchasing a reseller licence is another option. Value added real time data services, like traffic situation or traffic light switch predications, are part of the offer as well. Real time traffic control predictions can be used e.g. to environment sensitive traffic management.

The business models can be adapted to every individual city needs and requirements.

## Integration with other smart solutions

Urban COCKPIT and UrbanPulse works well in combination with the other smart solutions and can be used as enabling technology. One example is the smart solution "mobile station" where many different means of transport are accessible from one spot. At a mobile station users can choose between bikes / ebikes, shared cars / ecars, and buses or trams. They can also park their car and use the charging stations for loading their eCars / ebikes. All the relevant data for a mobility station can be integrated into the UrbanPULSE and represented in the Urban COCKPIT, to gain a quick and easy overview of the current or historical usage of the mobility stations.

## Expected impact

We expect 3 impacts:

1. Using the Urban COCKPIT as overall city monitoring tool enables faster reactions on unexpected events and delivers new opportunities for better city planning.
2. Using the Urban COCKPIT as bridge from the technical system to social system, i.e. the humans behind the data and services, supports the faster development of new innovations, value proposition models, use cases and solutions.
3. Because the UrbanPULSE is compliant to the DIN SPEC 91357 Standard for Open Urban Platforms (OUP), uses only open standards and protocols to integrate urban data and is not limited to a certain smart city domains like traffic or energy, the technical development of solutions and innovations can be done quickly and without the need of using third party modules. On the other hand third party modules can be integrated easily to gain fast progresses.

## Potential for replication

The solution can be replicated in any European cities easily as it not depends on proprietary standards and is not limited to certain urban data domains. As cloud solution it can be scaled and adapted to the city needs. Small cities can be supported as good as very big cities.