SF 62:   Urban big data systems

Fr	B	C	NY	S	T	Total
7	9	8	10	10	10	54

Beispiel:
New York City is pursuing a variety of novel approaches to capture, evaluate and further process city-related digital data.

The city is, for example, gathering data from various areas of urban life and, with the aid of them, is trying to improve or steer these urban developments and processes. In the process, the city is working closely together with the Centre for Urban Science and Progress at New York University to ensure the data is handled correctly.

However, one of the most famous examples of New York's data collection took place in cooperation with IBM. Crime statistics are analysed by IBM Business Analytics Solutions in collaboration with the police and examined for long- and short-term patterns. The findings are then directly used to optimise police tactics and strategies. A significant proportion of the marked reduction in crime in New York since the mid-90s has been attributed to this systematic adaptation of policing to statistically recorded trends.

Another example deals with tree plantations in New York's urban area. For quite some time now, air quality and the respiratory diseases recorded in hospitals have been consulted when debating where to locate new tree plantings. By doing this, the city wants to ensure that trees are planted in neighbourhoods that have the greatest need of them.

1. Differentiated description of the key field

The huge increase in city-related data, which can be attributed to the increasing digitization of cities, harbours for cities in particular countless possible areas of application, whose quantitative and qualitative range cannot yet be approximately estimated at the present time.

These potentials have already been recognized by some cities, however, which has in parts led to structured or only selective data collection and analysis. Nevertheless, all the results that have arisen on the basis of a clear objective show that they are able to better understand existing problems and to support or enhance existing processes as regards contents.

It is, therefore, necessary to define structures and goals with the aid of which useful information can be obtained from the immense pool of data and processed.

2. Reference to sustainability:

No sustainable urban development of cities can ensue from the mere collection of urban data. Rather, the data collected must first be situated in a meaningful context and integrated into processes and plans.

Insofar as the data are used in the context of sustainable urban development, they can make a significant contribution to all the components of sustainability (social, ecological, economic and as regards resilience), as demonstrated by the examples presented.

3. Relevance to industrial sectors?

Mobility: Medium
Energy: Medium
Production & logistics: Medium
Security: Low
ICT: High
Water infrastructure: Low
 Buildings: Medium
Governance: High

Brief description of the high level of importance:
At the heart of the key field is the utilisation of big data in the urban context. Since huge benefit is apparent here – especially for cities or municipal enterprises – it can be assumed that the sector of governance has to or will make more ever greater effort here.

The collection, processing and preparation of the data is mainly ensured in collaboration with the ICT sector, which is why the relevance of the key field can be considered high in this sector, too.

4. Impact (positive & negative)

Besides the already stated impact on sustainable urban development, the following positive effects can thus be expected:
• Increased understanding of urban processes and relationships as well as process optimisation through analytical evaluation.
• Creation of quantitative bases for decision-making processes (keyword: evidence-based decision-making systems)
• Early recognition of potential problems by monitoring of urban data.
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In addition, the following adverse effects can be expected:

• Increased workload for cities through data collection, analysis and dissemination.

• Municipal administration gains extensive insights into private areas of life and those worthy of protection.

5. Implementation measures:

What data may be collected and analysed according to the legal regulations of the cities in the first place must be examined. For cities, there is almost no leeway with regard to this in Central Europe, since personal rights can only be legally regulated on a nationwide basis.

Urban strategies which clearly define the specific objective behind each measure should form the basis of all measures relating to the topic of urban big data. Only in this way can useful information within the large quantities of data be identified and systematically evaluated. In addition, the responsibilities for data collection and analysis along with the powers of a relevant working group must be clearly defined.

Implementation as regards contents will first start with a search of suitable data sets. This will be followed by data analysis and the processing of the data specific to the target group in question. These data only serve their purpose, however, when they are further processed by the relevant public authorities in line with the original objective and then integrated into processes.

From a technical perspective, besides databases, tools enabling a comprehensive analysis of urban data must also be implemented. Insofar as data have to be automised and permanently analysed, further technical measures are needed (e.g. the implementation of measurement systems or the creation of uniform data standards).

As noted above, all the necessary measures to protect personal data must also be implemented.

6. Actors: Who can shape things?

The question arises as to which actors should be considered for the task of collecting and analysing personal data on a large scale in the first place. It can be assumed that when it comes to handling the data according to existing regulations and for the benefit of the general public, confidence is, on the whole, placed in state authorities.

Hence cities and public institutions above all are called on to act in this area. Thus, the complex areas of tasks may be implemented, for example, by cities in cooperation with law enforcement agencies and universities.

7. Prerequisites:

According to the problem area described above, with regard to society's scepticism towards mass data storage, it is a mandatory prerequisite for the implementation of urban big data systems that, on the part of the data collecting and evaluating authority, there is transparent disclosure concerning what data is being collected and for what purpose. Only when social acceptance with regard to such measures has been achieved will successful implementation be possible.

So that the data can be used in accordance with the underlying objectives, experts from the associated technical sections must also be involved in the data analysis.

From a technical perspective, secure data management and data analysis tools must be ensured. In addition, the extent to which automated processes can be used or implemented must be examined. Such automated processing could include data collection via metering systems as well as the transfer of data to competent administrative bodies using appropriate interfaces.

8. Obstacles/barriers:

The current scepticism of the public regarding the mass storage and processing of data must be regarded as the main barrier in this key field. As already stated, this obstacle can be addressed by the transparent communication of the scope and purpose of the data recorded.
Legal data protection regulations also have similarly restrictive impacts. Cities will, therefore, not be able to collect any type of data, but there will always be limitations, particularly with regard to personal data.
In addition, there are to date no standards relating to the collection and storage of urban data which would enable a uniform approach. This makes it very hard to exchange data between different actors.

9. Indicators:

As the benefits of big data solutions should express themselves above all in an improvement or optimisation of processes and project, the statistically quantifiable determination of performance indicators is not possible.
Nevertheless, the presence of an urban strategy for dealing with such data represents an initial indicator for similar approaches. Furthermore, it might be possible to detect the proportion of information from digitally captured and analysed urban data which are being included in strategic planning processes (proportion of evidence-based strategic decisions).

## 10.	Special features/remarks:

At this point, it must be noted that there are large differences in the way data protection issues are handled throughout the world. In the English-speaking world in particular, the protection of the population is given more weight than the right to informational self-determination. Crime mappings are, for example, made freely accessible on the Internet in the U.S. and the UK; for reasons of privacy, this is not possible in Germany.

In some Asian countries, governments even have a virtually completely free hand when it comes to how they should handle the data of their population, which obviously also permits greater latitude in this key field.