

Smart Eco Cities, Managing Information Flows in an Integrated Way, the Example of Solid Waste and Waste Water

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Editorial

Smart cities are cities which manage their flows of waste, energy, people, goods and services in an integrated way! We all want to be smart and everything has to be smart. The benefits of attending a conference on shaping the urban future in Manchester in 2016 were advertised as manifold: explore innovative ways to use technology and data to make urban life safer, smarter and more sustainable. You would hear from those initiating and driving urban change towards a smarter city how to implement smart technologies to engage with energy, transport and other data. You would learn to explore new practices, new thinking and to obtain new contacts which would support you taking the next steps towards a more efficient city. Finally you would network with organizations from across the globe to explore more efficient ways for the smart city revolution. The expectations are high.

However, after reading this you may still wonder what smart cities are. I have to tell you that there are at least three types of definitions of smart cities, definitions which may help to understand the urban metabolism:

A. Emphasizing the use of modern technology, for example the use of internet of things for all kinds of problems (applied in a neighbourhood of Seoul, the capital of South Korea) and the importance of innovation for the city of the future.

B. Stressing transition and adaptation to rapid changes, by pooling knowledge, sharing best practices and considering different initiatives to tackle challenges faced. This is the innovative planning approach used to create the cities of the future sold by transition managers who want to increase our capability to adapt to rapid changes.

C. Pointing to different way of managing cities, focussing on managing flows in cities and using information and communication technologies (ICT) and geographic information systems (GIS) to do that in an integrated way.

I opt for the third definition. It means cities are no longer considered a collection of houses and roads, but rather the sum of a number of flows that need to be managed. Important flows are solid waste, the water cycle (including drinking and waste water) and the energy cycle (including the reduction of the reduction of CO₂ and other greenhouse gas emissions). Flows of goods result in waste flows, which require waste minimization and integrated waste management. Mobility is a flow of people and goods and requires the development of integrated infrastructure and transport policies, etc.

Now the question can be raised how much experience do we have with managing urban information flows? Two important flows are the water cycle and the energy cycle. In this definition smart cities are focusing on managing these flows. The challenge is to achieve integration in the framework of urban management, using modern information technology.

The easy examples concern utilities providing water or electricity. These examples immediately present some problems: how do we deal

with mixing the different sources of energy (wind, solar, conventional) in a rational way, trying at the same time to reduce CO₂ and other greenhouse gas emissions? In the water sector we would also like a smart and a more ecological approach. For many cities facing climate change and water shortages it means they should implement eco adaptive or integrated water resources management, which may mean trying to close the water cycle and focus on the most important issues together with the relevant stakeholders. However, like in the case of energy the challenge is also to use alternative technologies such as rain water harvesting, aquifer refill and water demand management, to increase the supply of water [1].

To make it more complicated the different flows may interact. Treating your waste water in a closed water cycle may require energy, but also generates energy that you need to consider in addition to your existing energy flows. Plus I have added the criterion sustainability. My definition of a sustainable or an eco-city is one that emphasizes that it is accessible for everyone. It is a city in balance with nature, a city that reduces, recycles, and re-uses waste, a city that has closed its water cycle and is integrated into the surrounding region. The combination: smart green or smart eco cities, requires different, more integrated or collaborating urban governance structures dealing with different sectors or issues, which are participatory and self-learning. There should be a division between different modes of governance: hierarchy, the market and collaboration. This requires leadership, an urban manager in my perspective: the mayor in many cities, or the municipal commissioner in most Indian cities.

These ideas had serious consequences for the definition of urban management which I use in my teaching and consultancies. In my book *Managing cities in developing countries* it is still simple. Urban management is 'the effort to co-ordinate and integrate public as well as private actions to tackle the major problems inhabitants of cities are facing in an integrated way, to make a more competitive, equitable and sustainable city'. If this is too long for you, the short definition is: urban management is putting a plan into practice! When you go for managing flows a new definition is required. If urban management is based on managing flows it means: 'getting the food into the city and the shit out of the city, and preferably in a sustainable way!'

Now if you think this is all impossible let me quote *The Gazette of Antwerpen* (30-4-2016: 28): Smart city, one network connects

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everything. It reports that Singapore is working on a central computer system which would monitor everything that happens in the city. It is a high-tech system, connected to your smart phones and cameras. Already in 2014 thousands of sensors and cameras were installed monitoring every movement and activity. Integrating the information the government can spot where you dump your waste, who uses a lot of electricity or is getting together to start a demonstration against being monitored all day. In principle the information is available for everybody, but the government may want to filter who gets what. This example shows at the same time the limitations of processing all the information on all these flows in an integrated way. The question becomes who decides how the results of such integrated digital management of urban information flows will be used? [2].

By way of conclusion smart eco cities are focusing on managing flows, including the flow of people (migrants, poor people, farmers, etc.) and money (remittances and investments). In the smart eco city of the future the attention goes to managing the flows smartly, taking

the interactions between different flows into account. Implementing smart technologies means indeed engaging with energy, waste, water, transport, etc. data and processing it to allow smart decision making. Smart ecological cities require integration of different information flows and this integration could take place in the framework of urban management. However, we need smart eco cities which start with a vision what they want to achieve. Then the technology can be used to drive the desired change. At the same time there is the danger of creating big brother who is watching us and who would like to use the information coming out of the different flows to 'nudge' us in the desired direction. Aldous Huxley and George Orwell have written about Singapore already some time ago.

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