

Developing a vision for a Smart City

by Suse Miessner

July 2013

Smart city is one of the buzzwords of our time. It seems to be the new trend after e-government and similar concepts in the 1990s. But what is a smart city? What makes a community smart?

Sometimes this question is answered by simply stating that a smart city uses existing technology to improve its efficiency. But this technological determinism cannot explain the growth of cities in general and the desire to make cities smarter in many ways. For example IBM states that smarter cities have to be constituted on three distinct levels: Infrastructure, operations and people (see IBM 2013).

Smart cities vs. intelligent cities vs. digital cities vs. virtual cities

Getting more deeply into the topic one also runs into the distinction between smart, intelligent, digital, and virtual cities.

Intelligent cities can be defined as cities where digital and virtual space “is combined with a real community of people and producers characterized by a high level of knowledge and innovation use.” (Komninos 2002, 198) In my understanding, the emphasis of the term digital city compared to smart city is more on the intelligent and sensing side.

Digital cities are cities “not made of bricks, steel and concrete, but of computers, telephone lines, electronic connections, and bits” (Komninos 2002, 195 with further references). A computer is the interface to take part in the making of a digital city. In that sense a city can be digital without having any physical dimension in itself but it resembles “real” cities in different ways.

Virtual cities in contrast are the cities constructed in games and other forms of electronic media. Just as digital cities they do not have a physical dimension but they also have their own underlying structures that have almost nothing to do with the real world of cities.

The reasons for city growth

This little excursion should show that the term ‘smart city’ is overused today and should not be confused with many other terms. Sometimes ‘smart city’ is used to

describe a digital, virtual or intelligent city but I think it is important to be clear about the different implications of these terms.

Instead to explore the concept of a smart city in more detail it will be useful to explore why people still want to live in cities and cities are projected to grow up to 6.3 billion inhabitants by 2050 (see [United Nations 2012, 1](#)): Towns have existed at least since the Ancient Greek times but only during the industrial revolution the rapid expansion of cities started. Obviously different factors such as the motorization of many processes and the urgent need for manpower are closely related to this but other aspects have helped the rapid city growth as well: Cities were the places of work opportunities, which does not only mean low paid factory jobs but also higher paid workers were needed. To satisfy the demand for more educated workers cities became the centers of education. At the same time the living conditions in cities in general were better than in the rural parts of the countries. Cities became a melting pot for people from different backgrounds, religions and so on. They became the social centers of the world and at the same time the centers where most financial activities took place. Lastly, many people moved to cities in the hope for higher incomes (see e.g., [Benevolo 1980](#)).

Even though these factors are described as the historical reasons for citizens to move to the cities I believe that most of them are still true today: Without further discussions cities are the financial and social centers of our modern world. Cities are the places with the highest density of educational institutions, the place for different cultures, religions, belief systems and sexual identities to come together. Cities are the places where higher incomes can be expected because most people living in cities have higher quality education and jobs. In other words: *cities are the centers of our contemporary world*.

Depending on the reader, the aforementioned might or might not be a surprising statement. When thinking of the technology determinism present throughout much of the second part of the 20th century it is surprising to me: Due to the new possibilities of new technologies we can instantly communicate between remote parts of the world. For that reason, it was argued often, spatial proximity is not needed any more (e.g., the concept of “Spaces of Flow” is partly relying on this notion: [Castells 2010](#)). If this were the case innovation hubs, such as the San Francisco Bay Area in the US or the Frankfurt metropolitan area in Germany, would not exist any more. Instead cities would not be needed any more and spatial diversity would be higher than it currently is. The consequent outcome of this line of thought is that there are still reasons why people live in cities and cities are even growing. I believe those reasons have

generally not changed much in the last 200 years. Nevertheless, to satisfy the contemporary urbanite there are much more diverse characteristics needed.

Smart city as the future human-friendly city: a personal vision

I believe that we can only build smart cities if we have a vision for what this smart city should be like. Even though I do not define 'smart city' as the end goal but as a process, I think that having a set of aims to discuss is essential. That is the reason why from this point onwards I take a personal approach to defining the term 'smart city'.

The most important characteristic of a smart city in my definition is that it is *the place where people want to live in future*. Therefore a smart city has to be a physical as well as a digital space.

I follow Lefebvre who defines space by its perceived, conceived and lived components and thereby emphasizes that space is always a social phenomenon, rather than a fixed physical surrounding (see Lefebvre 2011). Consequently following this, a smart city needs to have a **human scale**: one is able to walk and reach destinies by public transport. Taking this thought to a physical level, a smart city should be built for the human rather than 20th century car centered approaches.

In my view, transportation in a smart city is most closely related to a very political question: Since self-driving cars are already close to mass production one can easily imagine a model where private cars do not exist any more but they are shared between people. When one needs a car there would be a system to order a self-driving car; the car would pick you up and drop you off at the selected destination. In some sense **self-driving cars** would become **the new form of public transport**, but with public transportation we would also lose our travel companions and accidentally running into complete strangers on the streets. As this is not desirable from my point of view I think of a concept where self-driving cars with a certain digital call system could be combined to a public transportation-like vehicle to maintain the aforementioned characteristics of public transportation. However, the main point I wanted to make here is that the success of smart cities is to a large extent a political act: Up to now the best model to make services available to everybody is making it a public good, which at the same time means to increase taxes to be able to run and maintain the service. Only if the governments have the political will and strength to implement a service like this, it can be successful.

Closely related to the transportation issue is also that **outdoor public spaces** in smart cities remain **meeting places**. Smart cities should not become the equivalent of a Fordist factory line but spaces not occupied by commercial use where one can

accidentally run into strangers need to be maintained or created. Richard Sennett's notion that a "city is a human settlement where strangers are likely to meet" (quoted in Lehtovuori 2005, 15) is a good reminder here. Cities without outdoor public spaces to encounter strangers, to gather for political demonstrations, to meet friends and to be confronted with the otherness lose their urban character, which to me is a very important characteristic of a place I want to live in. **Urbanity** refers not only to density (quoted in Klamt 2007, 79) but also to *heterogeneity, anonymity, creativity, conflict and the unexpected* (see Klamt 2007, 79–80, 83 with further references; Häussermann quoted in Lehtovuori 2005, 15; Pile quoted in Eckardt 2008, 13).

Directly related to that idea is also that smart cities should favor **mixed uses** to the spatial segregation of for example work and leisure activities. Urban planners already called for this feature since the down sides of the first garden cities became visible in the beginning of the 20th century. However, the enormous emissions of industrial activities did not allow for a mix with residential functions. Today new technological developments can really facilitate mixed use of urban areas.

Another feature of a smart city is that it **integrates nature into the cityscape**. Nature is perfect for leisure activities and lets inhabitants relate to times of the year, locations and so on. Different cities in the world already introduced a minimum percentage of their land area that needs to be green area in order to maintain the recreational facilities inside the cities themselves (e.g., Helsinki, Finland).

The quest to prevent nature from destruction is also related to a **new resource management policy** that smart cities should have. Smart cities should save as many natural resources as possible: This includes the monitoring of water and electricity use, as already implemented today, on the level of every household but also increasing the reuse of water wherever possible even before it is sent to the purification plant. It is already state of the art in some regions to reuse the water from bathroom sinks in the toilet flush. But I think that all this can be taken further in a truly smart city: Using rain water for toilet flushes, building houses so that they need less artificial light and increasing the efficiency of technology to use less energy for charging devices are just simple examples that will not just prevent us from wasting natural resources but also decrease current emissions.

Again a closely related point should be brought up here: Smart cities should provide an **education** to develop even smarter cities. Different authors have suggested that new technologies are almost irrelevant to the development of a smart city, but people are (e.g., Di Maio 2012). Instead educating people to build smarter technologies and even more important, which kind of technologies to build, how to use them and how they interact with other technologies is the key factor in building smart cities. We

must forget the technology determinist thinking and focus on the social and political side of building smart cities and communities. Di Maio has also stated that “technology is mostly irrelevant unless policy-makers, city managers, heads of department and city CIOs get the fundamentals right.” (2012)

Many more features of my smart city vision could be explained in more detail here: For example a smart city should make good use of open data by cooperating between different sectors, parts of the city, residents, cities, regions and countries. It should also combat crime and ensure safety to anyone at any time but not by monitoring crime and notifying people where they should not go but by educating criminals, looking for the real causes of crime and cope with these wherever possible. In addition smart cities should be places where interaction between different generations is made easy, where the younger generation teaches the older ones about new technological advances and the older generation helps raising the younger generation’s children. A smart city is a place where everyone is given the opportunity to work according to one’s own schedule and abilities, where social welfare exists and the community helps the weakest members. A smart city is a place where homelessness doesn’t exist. It is a place where a certain level of anonymity is combined with social responsibility. It is a place that does not think of itself as of any nationality, race or religion. It is a melting pot for cultures and believe systems and tolerant towards all of them as long as they tolerate the community.

Summary and open questions

In this essay I have tried to show the difference between smart cities and intelligent, digital, and virtual cities. I have then discussed why people still want to live in cities even though the current technological advances make spatial proximity to some extent redundant. By that I emphasized that it is not technology that determines the future of our cities or what kind of smart city we develop but it is the communities living in these cities. In the last part I argued that we have to develop a vision of what our smart city should be like in order to discuss the paths we are taking with others.

Instead I could have also discussed smart cities as a political or social issue or taken a historical approach to smart cities, which would have shown that every city was smart for its time and always tried to become even smarter.

Or I could have focused on the paradox that urban planning is always concerned with time spans of many years in future whereas new technological advances are very rapid. How could an urban planner possibly foresee what will happen within the next

20, 50 or even 100 years? Even though Nikos Komninos answers this question stating: "What is asked of urban planners today is not to represent a given order of ideas or values, but to invent urbanities for flexible economies and information-based technologies." (2002, 188) I believe there are many nuances to be explored in this field.

However, in this essay I wanted to concentrate on developing smart city characteristics and a vision that consequently follow the reasons why people live in cities. I offer my own initial vision for a smart city and hope to develop it further in future.

References

- Benevolo, Leonardo. 1980. *The History of the City*. Scholar Press.
- Castells, Manuel. 2010. *The Rise of the Network Society*. Cambridge, Mass. [et.al.]: Blackwell.
- Di Maio, Andrea. 2012. "Technology Is Almost Irrelevant for Smart Cities To Succeed." August 10.
http://blogs.gartner.com/andrea_dimaio/2012/08/10/technology-is-almost-irrelevant-for-smart-cities-to-succeed/.
- Eckardt, Frank. 2008. "Introduction: Public Space as a Critical Concept. Adequate for Understanding Istanbul Today?" In *Public Istanbul. Spaces and Spheres of the Urban*, 13–20. Bielefeld: transcript Verlag.
- IBM. 2013. "IBM - Smarter Cities - Building and Carrying Out Ways for a City to Realize Its Full Potential." *Smarter Planet*. July 17.
http://www.ibm.com/smarterplanet/us/en/smarter_cities/overview/index.html.
- Klamt, Martin. 2007. *Verortete Normen : Öffentliche Räume, Normen, Kontrolle Und Verhalten*. 1. Aufl. Stadtforschung Aktuell : SF. Wiesbaden: VS, Verl. für Sozialwiss.
- Komninos, Nicos. 2002. *Intelligent Cities : Innovation, Knowledge Systems, and Digital Spaces /*. London ;: Spon Press,.
- Lefebvre, Henri. 2011. *The Production of Space*. [Nachdr.]. Malden, Mass. [u.a.]: Blackwell.
- Lehtovuori, Panu. 2005. *Experience and Conflict : the Dialectics of the Production of Public Urban Space in the Light of New Event Venues in Helsinki 1993-2003*. Espoo: Helsinki University of Technology, Centre for Urban and Regional Studies.
- United Nations. 2012. "World Urbanization Prospects. The 2011 Revision. Highlights". New York. http://esa.un.org/unup/pdf/WUP2011_Highlights.pdf.