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Abstract:
City of the Future – a Smart City. A smart city is an organism which offers a sustainable and fully integrated combination of transport, security, education, healthcare and effective management of energy. Urban transport management systems (optimisation and reduction of use and maintenance costs), smart buildings (power consumption management, access control, etc.), smart infrastructure and grids (integration of telecommunication and automation systems with power infrastructure) are just a few examples of obligatory upgrades needed in a contemporary city so it could become a city of the future.

Yet, the necessary evolution of a city is accompanied by a number of sociological threats which may considerably affect its shape and unique features. Errors made today will surely have major consequences in the future.

Key words:
city of the future, smart city, intelligent city, the future of urbanism, surveillance in cities

The paper:
City of the Future - a Smart City.

"A 20th century city can offer us nothing" Rem Koolhaas

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A smart city has not been fully defined yet, both in terms of its theoretical as well as practical aspects. Yet, certain components of the entire system have been already identified: designs, implementations, solutions applied in specific venues, which may describe and become embodiments of a smart city concept in the future:

- “An ICT-active city. In order to enhance interactive features and efficiency of the urban infrastructure and to increase the awareness among city residents”¹ – this definition focuses on IT technologies as a determinant for classifying a city as a smart city. Yet, in the paper itself, in their attempt to define a smart city the authors also mention investments in human and social capital as well as into telecommunication infrastructure as elements of sustainable development.

- A digital aspect of a smart city has been described in a publication entitled Landscape and Roadmap of Future Internet and Smart Cities². An important role was attached to various sensors placed within the city and to the deployment of mobile devices and cell phones, who form a system resembling the nervous system. The authors also point to the importance of the natural environment protection (ecosystems) and of the society.

² Schaffers H., Landscape and Roadmap of Future Internet and Smart Cities, 18th April 2012
• According to Komninos, a smart city is an environment creating opportunities for developing cognitive skills and for learning. Smart cities are areas where local innovation system is enhanced by digital cooperation space, interactive tools and embodied systems, IT systems and online services, enabling the implementation of new urban functions relating to knowledge, transfer of technology, innovation, and global marketing.¹

• Cities function as living creatures and their subsystems are very similar: a supporting structure, protective layers (the skin), or nervous systems. In order to create a new type of a city – a smart city, all digital telecommunication networks must cooperate and all devices must be equipped with sensors and identifiers.²

A smart city is a living organism characterised by a complex social, legal, technological, industrial, environmental and communication structure or rather a balanced combination of these.

Gradual urbanisation and resultant transport, demographic and urban planning issues create new and difficult challenges to the city authorities, as conventional operating methods have been insufficient for some time now.

"Cities are overcrowded with people, houses are overcrowded with residents, hotels are overcrowded with guests, trains are overcrowded with travellers, and cafes are overcrowded with consumers. There are too many pedestrians on the streets, too many holidaymakers in holiday resorts... What once used to be easy to achieve, today is a true challenge: to find an unoccupied spot". This is how Jose Ortega y Gasset, a Spanish philosopher, described growing urbanisation as early as in 1929.

Contemporary cities have reached the limits of their urban development capabilities: it is no longer possible to build an additional road, to plan new parking units and ensure sufficient greenery. So, before it is time to deploy engineering (multi-level roads, car parks, or even flying means of public transport), contemporary scientists reach for methods which, to a smaller degree, interfere with urban tissue and are presently the most likely to be used: the ICT and pro-social solutions: Smart Economy (development of innovation and competitiveness on the labour market), Smart Mobility (accessibility of state-of-the-art IT and communication technologies as well as sustainable transport systems), Smart Environment (environmental protection and natural resources management), Smart People, Smart Living (educating citizens, social interactions, integration and openness to the world, but also culture, healthcare, security), and Smart Governance. Humanistic and Social concepts included in 6 categories listed above are put into practice with the use of modern technologies already functioning in some European cities:
Smart Grid Technology enables reasonable consumption not only of energy, but also of water or gas; suppliers of the utilities can effectively control the transmission process as well as effective identification and elimination of supplied utilities’ losses.
Smart Traffic Control, thanks to road sensors, effectively relieves traffic congestion and prevents new traffic jams.
Smart CCTV - street monitoring enabling effective crime prevention and control of traffic intensification.
mHealth remote monitoring solutions enable patients suffering from chronic diseases adjusting home visits to their individual needs.
In-vehicle telematics solutions provide users of electric cars with information on the nearest charging stations, their availability and the expected waiting time.
Data records of urban activity facilitate creation of more efficient long-term planning tools to be deployed by urban planners, municipal services, and transport systems.

At present, it is impossible to deploy all these systems at the same time; therefore, some cities are testing individual components:

In San Francisco, buses transmit data to the central computer which calculates the estimated driving time and displays the information on solar screens installed at bus stops. The city also recycles 72% of the waste it generates. Residents have access to an application showing the nearest waste collection site. A mobile *cabspotting* application is used by San Francisco resident to locate the nearest available cab.

Singapore, on the other hand, focuses on smart ecology. It deploys one of the most technologically advanced water management system, encompassing rainfall collection system, grey water treatment and desalination. The city authorities are determined to promote its public transport, for instance by introducing “city entrance fee” based on the current traffic. Their priority is also urban greenery and recreational areas, such as Gardens by the Bay - a park complex featuring a Botanical Garden, with characteristic solar trees – palm tree – imitating structures. In daytime, they protect against sunray while at night they emit light, thanks to the energy accumulated by solar panels.

Before the Olympic Games and the Soccer World Championships in Rio de Janeiro, the city makes considerable investments in development of urban space. The city has established one of the world’s most advanced urban monitoring centres detecting and fast responding to almost every threat in the city: from a flooding to mass sports or entertainment events, evacuation of fans from a sport stadium, or car accidents. The Rio Operations Centre can handle all crisis management stages. Starting from forecasting and estimations to immediate response action and comprehensive event analysis to enable prevention of similar threats in future.

The concepts of repairing “the old cities” (new systems in an old tissue) are followed by concepts of totally new, futuristic metropolises. It’s about a city who has the ambition to become the first world’s energy self-sustainable centre which produces the energy from renewable sources only such as sun, wind, water and biomass. This is to propagate the “Zero carbon, zero waste” idea meaning that the city is not going to emit any greenhouse gases or generate water. Inorganic waste from the city will be recycled while organic waste will be used for fuel production. Initially, cars have been totally eliminated from the city space in favour of the public transport and the Personal Rapid Transit i.e. fully automated self-propelled vehicles. The city is a kind of testing ground - if solutions applied in the process of its construction work, they will be replicated in other cities. The investment project worth nearly 20 billion USD is likely to be completed in 2025.

Smart Cities is an unwilling crash of technologists and democrats. Urban management and control systems on the one hand and, on the other hand, the man's eternal right to freedom. In spite of one-of-the kind advantages of technological solutions, the contemporary world should answer a question whether the Smart City notion should be identified with an “informed” consent to surveillance.

According to Jula Zeh's book "Corpus Delicti", a happy man is a man free from limitations which come from the human body (sickness, disabilities). He is a man brought up in a hygienic and healthy society. He is a man who has never known any physical limitations. The man believes that the surveillance helps him to be healthy (he daily reports on the quality of his sleep, does his daily workout in the gym directly connected to the switchboard which transmits data on neglected workout sessions, appropriate nutrition or stepping outside the safe/ hygienic zone (and held accountable in case of negligence). Zeh does not say when the border between comfort and surveillance has been overstepped; she only describes the consequence. She considers human strive for an ideal and luxury deplorable.
A vision of the future in the Minority Report by Steven Spielberg is also dark and gloomy but not because of an alleged war, disease or disasters. It is the extremely “orderly” organisation of the state that is scary. The price of safety is an absolute loss of privacy (data storing and spying on citizens). The hell of common surveillance is also enhanced by “smart” advertising which personally addresses each by-passer (using the popular cookies and citizens’ data base). In the future seen through Spielberg’s eyes, people will no longer have any private life and anonymity will become a luxury beyond anyone’s reach. As in Zeh’s fiction, the film contains some cracks which disfigure the convention of the plot. These are elements of very much Orwell-like utopia entwined in the poetics of the film. An industrialised society which agrees to the continuous surveillance. A system protecting citizens’ security (as in “1984”) leads to reification of individuals. The system will govern all residents’ spheres of life, their personal data and even their family affairs.

Film frame from Equilibrium

Will there be no choice again for us in the Smart Cities of the future? It is very likely. In the future, public security and citizens’ health may be more important than a mundane need of privacy and individualism. It is exceptionality of each of us; the something that makes us different seems to be the most endangered. A common social conviction that whatever is different and unknown is bad may lead to unification of human community. Actually, is it easier to exert control over an imposed, pre-defined and structured life “algorithm” than over diverse, unpredictable individuals. Under the cover of the need for security, the process of destroying characters and spontaneity may occur. The process is presented ironically but in a great detail by Juliusz Machulski, a Polish film director, in his film “Sextmission” where the future is boring and identical and any otherness is perceived as a threat and immediately destroyed. A similar approach is adopted by Kurt Wimmer in “Equilibrium”, where freedom is a crime. Equality prevails in a city, discrimination because of the colour of skin, sex or position is not an issue. However, all that has been achieved at the cost of eliminating individualism. People have their clothes cut in the same way, they have the same instruments and distribution of tools on their desks. Such world order may be easily controlled and shrivelled. So what should the city of the future be like? Should it be like Masdar? A gem built for billions of dollars for the chosen? Fritz Lang’s Metropolis seems a “must see” for urban planners of 21st century as a warning against what the future may bring. As early as in 1927, the director seemed to see the issues of the future. In his film, he divides an urban agglomeration into the uptown inhabited by the poor and the downtown full of office buildings and shopping malls. A similar issue is stigmatised by Neill Blomkamp’s “Elysium” where viewers see a spotless, sterile, blissful and prosperous Elysium is contrasted with a sand and dirt-buried Los Angeles slums swelled with mud huts.

We need to understand the difficult truth that the future of humanity will be tolerable only if both in terms of international relations, as in all other areas and we will act fairly and in accordance with the law and do not threaten to use violence. Albert Einstein
The city of the future cannot become a luxury for the rich and any effort aimed at improving the living standard and the quality of life should be oriented towards solving problems of the present times. It is also important to preserve an individual's right to privacy. Any new control and management systems should, first and foremost, serve the people and not the need for security in its absolute sense. Cities of the future should serve as landmarks in the search for the right shape for our individual and, at the same time, social life. Our future environment is going to be important to the extent that it will set some standards for the future generations. The future shape and structure of the environment depends on us only. Will the World of our creation offer conditions facilitating manipulating and easy control of others? Be warned but also guided by Dewey's words:

"The concept of culture that we know from anthropologists' research leads to the conclusions that, whatever innate components of the human nature are, the culture of a period in history and of a social groups determines their shape and structure; it is the culture that defines behavioural patterns characteristic for actions of any group, family, clan, nation, sect, fraction, class. Equally true is to say that the current status of culture defines the order and shape of innate trends as well as to say that it is the human nature that produces a particular set or system of social phenomena to achieve its own fulfilment. The core is to identify mutual impact of elements of a culture and the way that elements of the human nature influence one another in conditions set by their interactions with their current environment."

In his opinion, the core elements of the human nature could be some needs common to all people (physiological, mental and social needs):

"the need for social contact; the need to spend energy, influence the environment; the need for cooperation, supporting neighbours and mutual aid as well as the need to fight; the need for a form of aesthetic expression and satisfaction; the need for directing others and obedience; etc."

In the world of manipulation, surveillance is a desirable and needed tool. In the world of unification, control is a must. Individualism should be protected. Privacy should be protected. Human nature is fragile and susceptible to external stimuli, which makes it vulnerable. Do not create opportunities to do so. Closed, monitored urban spaces are like a reality shows on our estates. Big Brother is

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watching and analysing. Loss of freedom leads to unification and uniformity, to standardize behaviours. Would not rise to the situation shown in the aforementioned "Minority Report", when we see a crowd of people coming out of the subway and waiting to scan their eyes. May we did not see the claustrophobic world of Big Brother, in which every second of human life is under control, and the dominant feeling is fear.

Literature
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