



Cognitive Cities

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SMART AND COGNITIVE CITIES

A smart city is an urban area that uses different types of electronic Internet of things (IoT) sensors to collect data and then use insights gained from that data to manage assets, resources and services efficiently. using that data to better improve the operations across the city.

This includes data collected from citizens, devices, buildings and assets that is processed and analyzed to monitor and manage traffic and transportation systems, power plants, utilities, water supply networks, waste management, crime detection, information systems, schools, libraries, hospitals, and other community services.

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Not many years ago, the idea that a city could be smart was considered a science fiction and now it is difficult to find a region of the planet where some form of smart city initiative has not been embarked (Almirall et al., 2016)



Drawbacks or disadvantages of smart city

We might understand smart city, if only we had enough data. As data is commonly considered the oil of the digital era.

Public authorities lack the expertise, high-tech companies become central actors of the smart city which corporate interests of multinational companies.

The creation of technological lock-ins that bound cities to particular platforms and providers.

Concerns on data ownership and privacy arise.

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Drawbacks or disadvantages of smart city

Neglecting social and democratic dimension on the expense of understanding more technological and policy aspects.

Citizen participation and democratic decision-making is essentially limited since private interests are highly prioritized.

Social tensions and conflicts tend to be reproduced and magnified while little space seems to be left for people to do anything other than adjust to the conditions of the smart mentality.

Moreover, solutions implemented worldwide entail the danger of deepening inequality by sharpening the digital divide with the exclusion of the offline populations.

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Cognitive city

Cognitive city refers to a virtual environment where goal-driven communities gather to share knowledge and steadily learning through constant interaction with its citizens through advanced ICT. It becomes continuously more efficient, more sustainable and more resilient.

A virtual cognitive city differs in that shared data is critical for the group's performance, and the community consists of members spanning diverse expertise, backgrounds, motivations, and geographies but with a common desire to solve large problems.

The virtual cognitive city is steadily learning through constant metadata generated by activity in the user community.



SMART AND COGNITIVE CITIES

The information flow in smart cities is usually unidirectional; for example, citizens and governments receive real-time information on urban traffic conditions and they are notified in case there is any emergency or outage.

The information flow in cognitive cities is multidirectional; citizens and governments not only receive information but also deliver information to others, such as other devices and sensors, operating platforms or other humans, so that the systems learn and adapt their behavior.

On the other hand, the role of the individual citizen is fundamental and not inferior to that of ICT, and city's cognition results as a derivative of their constant interaction.

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SMART AND COGNITIVE CITIES

Briefly, cognitive systems are systems capable of sensing, perceiving and responding to changes in their environment, and therefore, adapting to it. To achieve this level of computing, cognitive systems must be:

- (1) adaptive,
 - (2) interactive,
 - (3) iterative and stateful and
 - (4) contextual.
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SMART AND COGNITIVE CITIES

The cognitive city approach adopts a more holistic perspective on intelligence; introducing the concepts of cognition and learning but also imprecision and uncertainty, intelligence becomes dynamic, heterogeneous and multi-faceted.

Cognitive cities cannot be created from scratch, they emerge through the continuous interaction among people, institutions and technology.



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