

Guide to Open Government chapter 3

Smart Cities

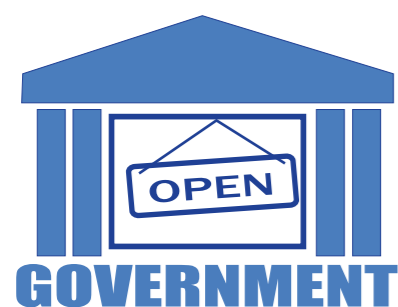
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Lifelong
Learning
Programme

chapter 3

Smart Cities



Guide to Open Government chapter 3 - Smart Cities

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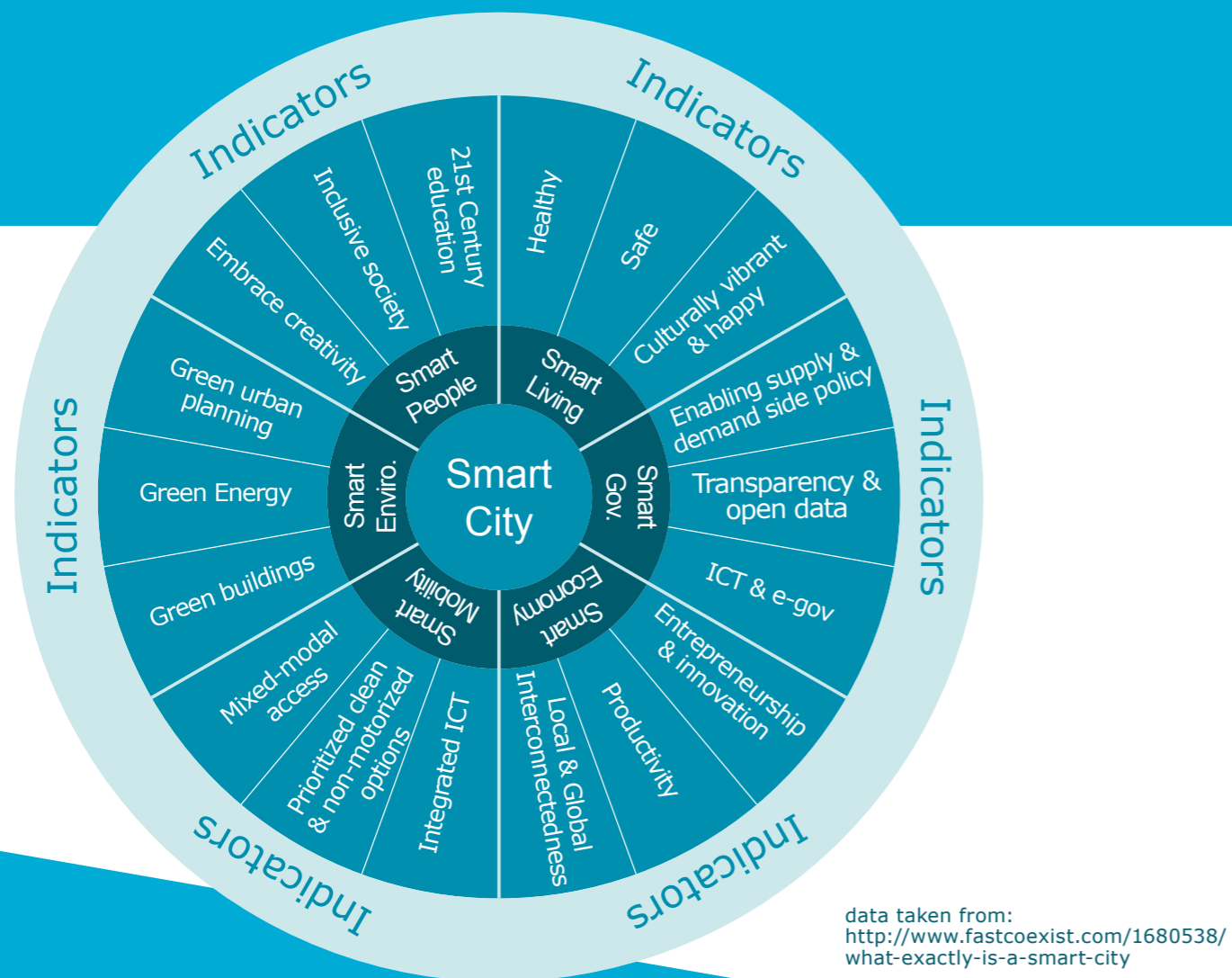
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What is a Smart City?



The concept of smart cities originated at the time when the entire world was facing one of the worst economic crises. In 2008, IBM began work on a 'smarter cities' concept as part of its Smarter Planet initiative. By the beginning of 2009, the concept had captivated the imagination of various nations across the globe. Integrated approach to improving the efficiency of city operations, the quality of life for its citizens, and growing the local economy. Most cities can agree that there is real value in having a smart economy, smart environmental practices, smart governance, smart living, smart mobility, and smart people.

Smart Governace

Means joined up within-city and across-city governance, including services and interactions which link and, where relevant, integrate public, private, civil and European Community organisations so the city can function efficiently and effectively as one organism. The main enabling tool to achieve this is ICT (infrastructures, hardware and software), enabled by smart processes and interoperability and fuelled by data. International, national and hinterland links are also important (beyond the city), given that a Smart City could be described as quintessentially a globally networked hub. This entails public, private and civil partnerships and collaboration with different stakeholders working together in pursuing smart objectives at city level. Smart objectives include transparency and open data by using ICT and e-government in participatory decision-making and co-created e-services, for example apps. Smart Governance, as a transversal factor, can also orchestrate and integrate some or all of the other smart characteristics.

Smart economy

Means e-business and e-commerce, increased productivity, ICT-enabled and advanced manufacturing and delivery of services, ICT-enabled innovation, as well as new products, new services and business models. It also establishes smart clusters and eco-systems (e.g. digital business and entrepreneurship). Smart Economy also entails local and global interconnectedness and international embeddedness with physical and virtual flows of goods, services and knowledge.

Smart mobility

Means ICT supported and integrated transport and logistics systems. For example, sustainable, safe and interconnected transportation systems can encompass trams, buses, trains, metros, cars, cycles and pedestrians in situations using one or more modes of transport. Smart Mobility prioritises clean and often non-motorised options. Relevant and real-time information can be accessed by the public in order to save time and improve commuting efficiency, save costs and reduce CO2 emissions, as well as to network transport managers to improve services and provide feedback to citizens. Mobility system users might also provide their own real-time data or contribute to long-term planning.

Smart Environment

Includes smart energy including renewables, ICT enabled energy grids, metering, pollution control and monitoring, renovation of buildings and amenities, green buildings, green urban planning, as well as resource use efficiency, re-use and resource substitution which serves the above goals. Urban services such as street lighting, waste management, drainage systems, and water resource systems that are monitored to evaluate the system, reduce pollution and improve water quality are also good examples.

Smart People

Means e-skills, working in ICT-enabled working, having access to education and training, human resources and capacity management, within an inclusive society that improves creativity and fosters innovation. As a characteristic, it can also enable people and communities to themselves input, use, manipulate and personalise data, for example through appropriate data analytic tools and dashboards, to make decisions and create products and services.

Smart Living

Means ICT-enabled life styles, behaviour and consumption. Smart Living is also healthy and safe living in a culturally vibrant city with diverse cultural facilities, and incorporates good quality housing and accommodation. Smart Living is also linked to high levels of social cohesion and social capital

Why We Need Smart Cities

Dimensions of a Smart City / characteristics

These are some potential uses and characteristics of Smart City initiatives: The Europe 2020 energy target could be addressed through initiatives that focus on Smart Environment or Smart Mobility.

Smart Economy and Smart People initiatives are oriented towards employment and education targets, which include e-skills development. Moreover, improving citizens' skills should make them more employable which in turn supports the Europe 2020 employment targets.



Smart Governance and Smart Living initiatives address poverty and social exclusion through measures including improvements to the quality of life, a focus on citizen connectivity (including e-government services) and the use of open data to create citizen services.



The majority of **Smart City** initiatives have the potential to support innovative growth and R&D. They are funded by a variety of sources, including government and private companies, which share a common interest in progress in this area. To contribute to the innovation and R&D target by further stimulating private sector R&D investment, it is essential that projects are evaluated and lessons learnt from them to enable further development.



Smart cities provide people with a way of life that is more convenient and comfortable, while still being conscious of the environment. Here we consider peoples lifestyles in terms of the different activities they engage in during their daily lives: living, work, study, and travel.

The global environment in which people live and people's thinking and values about their way of life are undergoing significant changes. If people and the Earth are both changing, then surely the cities that link them together must also change. Here, we discuss the smart city in terms of global environmental change and changing lifestyles.

Another factor behind the need for smart cities is the changes taking place in consumer's thinking and values about their way of life. These changes are appearing in the internal factors that affect people, including their style of consumption, the value they place on services, and their opportunities for work and study.

- the intelligence, inventiveness and creativity of the individuals who live and work in the city as 'creative city', gathering the values and desires of the 'new creative class' made by knowledge and talented people, scientists, artists, entrepreneurs, venture capitalists and other creative people, which have an enormous impact on determining how the workplace is organized, whether companies will prosper, whether cities thrive or wither.
- the collective intelligence of a city's population: 'collective intelligence is the capacity of human communities to evolve towards higher order complexity and harmony based on the institutions of the city that enable cooperation in knowledge and innovation, through such innovation mechanisms as differentiation and integration, competition and collaboration.
- artificial intelligence embedded into the physical environment of the city and available to the city's population: communication infrastructure, digital spaces, and online problem-solving tools available to the city's population.

Becoming a smart city improves efficiency, creates a positive environmental impact, enhances security, improves health, and simplifies construction permitting. These results lead to a more livable, appealing, and economically viable city that is attractive to new citizens and businesses. The smart city can meet the highest expectations for environmental, social, and economic sustainability.

Definitions:

Smart Cities Council: “A smart city is one that has digital technology embedded across all city functions”/ Smart Cities Council. “The smart city sector is still in the “I know it when I see it” phase, without a universally agreed definition. The Council defines a smart city as one that has digital technology embedded across all city functions”

What Hitachi means by a smart city: “The next generation of cities will need to satisfy consumers’ values, and deliver convenience and prosperity while also responding to changes in the global environment and urban environment. Cities that achieve a well-balanced harmony between a range of perspectives, from lifestyles and economics through to the global environment.” In Hitachi’s vision, a smart city is one that seeks to satisfy the desires and values of its residents, with the use of advanced IT to improve energy efficiency and concern for the global environment as prerequisites, and in so doing maintains a “well-balanced relationship between people and the Earth.”

Frost & Sullivan: “We identified eight key aspects that define a Smart City: smart governance, smart energy, smart building, smart mobility, smart infrastructure, smart technology, smart healthcare and smart citizen”. Frost & Sullivan is a global growth consulting firm which provides market research and analysis, growth strategy consulting, and corporate training services across multiple industries including automotive, healthcare, internet and communication technology, and more. Its headquarters are located in Mountain View, California, with offices in over 40 countries.

IEEE-Institute of Electrical and Electronics Engineers-Smart Cities: “A smart city brings together technology, government and society to enable the following characteristics: smart cities, a smart economy, smart mobility, a smart environment, smart people, smart living, smart governance.”

Business Dictionary: “A developed urban area that creates sustainable economic development and high quality of life by excelling in multiple key areas; economy, mobility, environment, people, living, and government. Excelling in these key areas can be done so through strong human capital, social capital, and/or ICT infrastructure.”

British Government: “The concept is not static, there is no absolute definition of a smart city, no end point, but rather a process, or series of steps, by which cities become more ‘liveable’ and resilient and, hence, able to respond quicker to new challenges”

Caragliu and Nijkamp: “A city can be defined as ‘smart’ when investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic development and a high quality of life, with a wise management of natural resources, through participatory action and engagement”.

Giffinger et al.: “Regional competitiveness, transport and ICT economics, natural resources, human and social capital, quality of life, and participation of citizens in the governance of cities.

Summarizing Smart City concepts:

A Smart City is a city well performing in 6 characteristics, built on the ‘smart’ combination of endowments and activities of self-decisive, independent and aware citizens.

Smart Economy

- Entrepreneurship and innovation
- Productivity
- Local and Global Interconnectedness

Smart Mobility

- Integrated ICT
- Prioritized clean and non-motorized options
- Mixed modal-access

Smart Environment

- Green buildings
- Green energy
- Green urban planning

Smart Governance

- Transparency and open data
- CT and e-government
- Enabling supply and demand side policy

Smart Living

- Healthy
- Safe
- Culturally vibrant and happy!

Smart People

- 21st Century education
- Inclusive society
- Embrace creativity

Smart Cities strategy across EU and process of governance

Smart Cities EU-funded projects

European Commission - Digital Agenda for Europe
A Europe 2020 Initiative

In Smart Cities, digital technologies translate into better public services for citizens, better use of resources and less impact on the environment.

A smart city is a place where the traditional networks and services are made more efficient with the use of digital and telecommunication technologies, for the benefit of its inhabitants and businesses. With this vision in mind, the European Union is investing in ICT research and innovation and developing policies to improve the quality of life of citizens and make cities more sustainable in view of Europe's 20-20-20 targets.

The smart city concept goes beyond the use of ICT for better resource use and less emissions. It means smarter urban transport networks, upgraded water supply and waste disposal facilities, and more efficient ways to light and heat buildings. And it also encompasses a more interactive and responsive city administration, safer public spaces and meeting the needs of an ageing population.

To speed up the deployment of these solutions, the European Commission has initiated the European Innovation Partnership on Smart Cities and Communities that will bring together European cities, industry leaders, and representatives of civil society to smarten up Europe's urban areas, in July 2012.

Discover the EU-funded projects that are helping create smart cities with better public services for citizens, better use of resources and less impact on the environment, thanks to digital technologies.

<http://ec.europa.eu/digital-agenda/en/node/72869>

Practice-Smart cities

Case Studies

<http://www.hitachi.com/products/smartcity/case/index.html>

Project 1 - Smart city TU Wien

Since 2007, the TUWIEN team works on the issue of smart cities. In cooperation with different partners and in the run of distinct projects financed by private or public stakeholders and actors the European Smart City Model was developed. Basically it provides an integrative approach to profile and benchmark European medium-sized cities and is regarded as an instrument for effective learning processes regarding urban innovations in specific fields of urban development.

Against the background of economic and technological changes caused by the globalization and the integration process, cities in Europe face the challenge of combining competitiveness and sustainable urban development simultaneously. Very evidently, this challenge is likely to have an impact on issues of Urban Quality such as housing, economy, culture, social and environmental conditions.

This project, however, does not deal with the leading European metropolises but with medium-sized cities and their perspectives for development. Even though the public attention the vast majority of the urban population lives in such cities, the main focus of urban research tends to be on the 'global' metropolises. As a result, the challenges of medium-sized cities, which can be rather different, remain unexplored to a certain degree. Medium-sized cities, which have to cope with competition of the larger metropolises on corresponding issues, appear to be less well equipped in terms of critical mass, resources and organizing capacity.

Project 2 - What is a Smart City?

Project 3- Smart cities

Smart cities, are the result of the growing importance of orienting our life toward sustainability. These cities use infrastructures, innovation and technology to reduce energy consumption and reduce CO2 emissions.

Project 4 - EIPSCC

The European Innovation Partnership for Smart Cities and Communities

Combines Information and Communication Technologies (ICT), energy management and transport management to come up with innovative solutions to the major environmental, societal and health challenges facing European cities today.

With the aim of coming up with scalable and transferable solutions to contribute to the EU's 20/20/20 climate action goals, it looks to reduce high energy consumption, green-house-gas emissions, bad air quality and congestion of roads.

The Partnership aims to overcome bottlenecks impeding the changeover to smart cities, to co-fund demonstration projects and to help coordinate existing city initiatives and projects, by pooling its resources together.

Recommendations:

1

Smart City initiatives can be considered a useful vehicle for cities to achieve their Europe 2020 targets.

2

Becoming a smart city is a long march. It requires planning. It requires leadership. It requires financing. It also requires seeing the barriers that may stand in your way.

3

Development that meets the needs of present citizens without compromising the needs of future citizens is important for the prosperity of all cities

4

New and innovative technologies can help turn challenges into opportunities, a growing number of cities are committing to a smart city vision in order to meet the challenges of sustainable development.

5

IT enables a city to add value and make life easier for citizens in multiple ways in areas such as infrastructure, transportation, utilities, education, and buildings.

6

In the smart city, government becomes a platform for citizen participation rather than simply a service provider.

On the next page there's a quick summary of how problems inherent in traditional cities are addressed with a smart city approach:

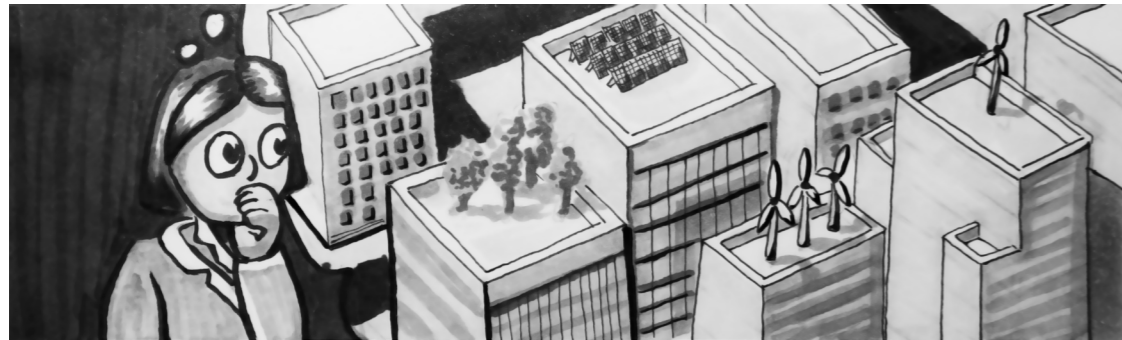


	THE PROBLEM	THE SMART CITY SOLUTION
PLANNING	Ad hoc and decentralized Cost savings aren't realized Limited potential for scalability of investment	Coordinated and holistic Resources are shared Cost savings are fully realized Investments are scalable Improved city planning and forecasting
INFRASTRUCTURE	Costs more money and resources to run Runs inefficiently	Optimized with cutting-edge technology Saves money and resources Improved service-level agreements
SYSTEM OPERATORS	Guess at infrastructure conditions React to problems Can't deploy resources efficiently to address problems	Enjoy real-time reporting on infrastructure conditions Predict and prevent problems Deploy resources more efficiently Automate maintenance Save money
ICT INVESTMENTS	Piecemeal and siloed Deliver suboptimal benefit Don't realize economies of scale	Centrally planned Deployed across city departments and projects Deliver optimal benefit Provide maximum value and savings
CITIZEN ENGAGEMENT	Limited, scattered online connection to citizens Citizens can't make optimal use of city services (or easily find them)	Complete and singular online presence Citizens can easily find and use services Citizens can participate in smart city initiatives Two-way communications between government and people Specialized services focused on the individual citizen Citizens can both contribute to and access real-time intelligent city data
SHARING DATA	Departments and functions are siloed Departments rarely share data and collaborate on initiatives	Departments and functions are integrated and/or shared Data is shared between departments and better correlated with other data services Results are improved Costs are cut

5 steps to make a City Smart

Vision:

setting the goal and the roadmap to get there



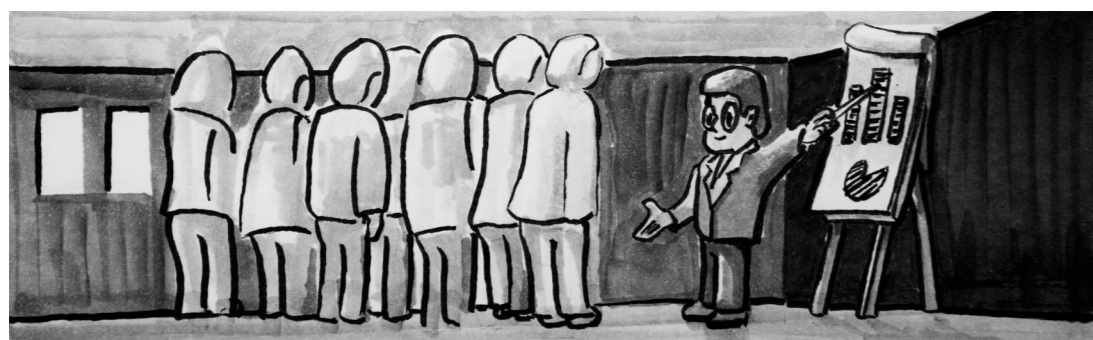
Integration:

combining information and operations for overall city efficiency



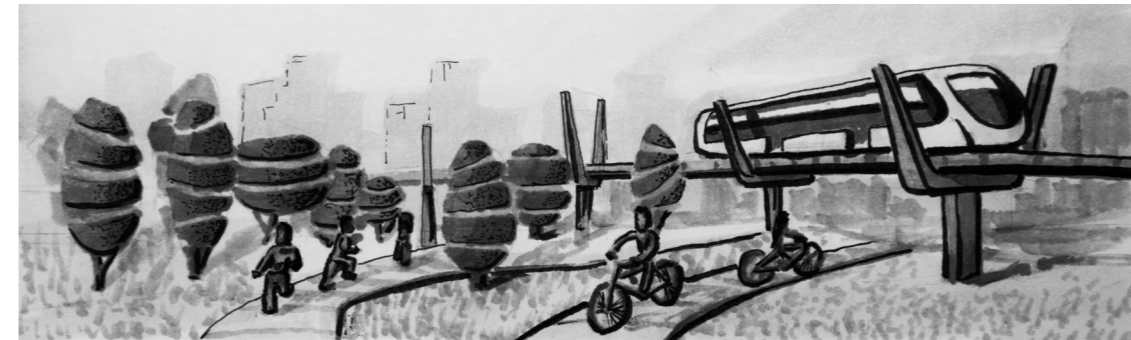
Collaboration:

driving collaboration between global players and local stakeholders



Solutions:

bringing in the technology to improve the efficiency of the urban systems



Innovation:

building each city's specific business model



References

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Europe 2020

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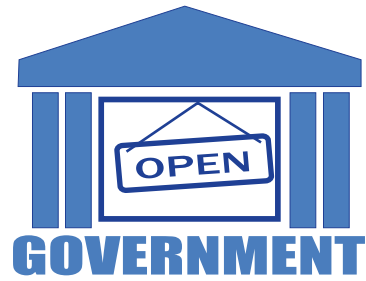
What exatly is a smart city on facts coexist

Smart City on businessdictionary.com

Compare smart City facts and numbers

Smart Cities on ec.europa.eu

Smarter Cities on IBM.com



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