Evolution to Smart Cities

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more than 50% of world population lives in cities

Key
- Cities over 10 million people (greater urban area)
- Predominantly urban 75% or over
- Predominantly urban 50 - 74%
- Urban 0 - 49%
NEW URBAN AGENDA

with subject index
The New Urban Agenda presents a paradigm shift based on the science of cities. It underlines the linkages between good urbanization and job creation, livelihood opportunities, and improved quality of life, which should be included in every urban renewal policy and strategy.

http://habitat3.org/the-new-urban-agenda/
RESOURCES MANAGEMENT AND EFFICIENCY

(Source: Vettorato, 2018)
Is SMART CITY the right concept to reach the GOAL of resources efficiency in cities?
What is a Smart City?

SMART CITY
SMART:

- Differentiation from a "normal", or even "stupid", city?
- Concept invented by CISCO and IBM in 2010
- How technology (IoT) can improve living conditions in cities?

Smart cities are a leading manifestation of the internet of things (IoT): they involve the use of sensors – either standalone or added to physical devices – to generate data that can be communicated, integrated and analyzed to enable some aspect of city life to function better in some way. Data flows may be used singly or in combination with other flows, or in combination with historical (ie accumulated) data from the past.
CITY:

• “a place where people live that is larger or more important than a town…”

• cities might be defined as social, economic, religious or cultural centers

• Thus, we can refer more easily also to “communities”
2018

Smart Cities 3.0
Citizen Co-Creation

Smart Cities 2.0
Technology Enable, City-Led

Smart Cities 1.0
Technology Driven

2005
SMART CITIES 1.0: TECHNOLOGY DRIVEN

- Smart Cities 1.0 is characterized by technology providers encouraging the adoption of their solutions to cities that were really not equipped to properly understand the implications of the technology solutions or how they may impact citizen quality of life.
Why here?
Why this?

Citizens part of a larger efficient machine...
Masdar City to become the world’s first green and net-zero energy in the world by 2016

Only about 5% of the original six square kilometer building area has been developed.

Developers expected 50,000 permanent residents and 40,000 commuters

There are only 300 permanent residents of Masdar City and 1700 commuters.
This phase has been led by cities, as opposed to technology providers. In this generation, the municipality—led by forward-thinking mayors and city administrators—takes the lead in helping determine what the future of their city is and what the role is for the deployment of smart technologies and other innovations.
CityBikes app, App&Town, SOS info built thanks to Open Data of the City

IoT trash cans report their real-time status

ApparkB and Bicing encourage smart mobility

Smart City Campus Innovation Area to promote synergies and innovation in urban solutions

Smart City Expo World Congress
• SMART CITIES 3.0: CITIZEN CO-CREATION AND MULTIPLE BENEFITS

• smart cities are beginning to embrace citizen co-creation and multiple benefits models for helping to drive the next generation of smarter cities.
SMARTER SMART CITIES

The "smart cities" agenda is mainly focused on top-down technological initiatives (embedded sensors, data integration and analytics). The real smart cities of the future will mobilise human intelligence as well as artificial intelligence, bottom up creativity as well as top down control.

1. TOP DOWN SMART CITIES
City planners and corporations use IT infrastructure to optimise the flows of people and goods and deliver public services more efficiently.

2. CONNECTING TOP AND BOTTOM
People use open data released by local authorities and companies to create services, and local authorities collect data from citizens to improve their services.

3. BOTTOM UP SMART CITIES
Citizens generate and share data to improve the way their city works, they act collectively and connect with each other to share resources.

Barcelona: Has embedded sensors in the city's infrastructure to monitor and manage water use.
IBM: Has designed a centralised Intelligent Operations Centre to coordinate and manage all of a city's services.
Plant's Urban Operating System: Is marketed as a way to manage the entire urban landscape.

FixMyStreet: Allows citizens to map local issues from potholes to confusing signage and bring it to the attention of local authorities.
Streetbump: An app that identifies potholes by recording "bumps" data, providing the city with real-time data on road conditions.
Betri Reykjavik: A platform which crowdsources opinions on city services and users can identify the most popular issues debated by the council.
Smart Citizen Kit: The Smart Citizen project uses low cost sensors and a web platform to enable citizens to capture, share and make sense of environmental data about their city.
Changebyus: A place for citizens to put ideas into action to make their city a better place to live.
BlindSquare: Uses crowdsourced information and GPS to help blind people navigate the city.
Peerby: Promotes collaborative consumption by allowing neighbours to share or rent their possessions.
Living labs

Users
Target group & behavioural definers

Private actors
Practical know-how & resources

Knowledge institutes
Expertise & scientific substantiation

Public actors
Long term perspective & regulatory role

Real-life context

(Kris Steen, Ellen van Bueren 2017)
Multiple benefits

Smart Energy Development of Cities

- SMART MOBILITY & CONNECTIVITY
- SMART BUILT ENVIRONMENT
- SMART ECONOMY
- SMART GOVERNANCE
- SMART COMMUNITY
- SMART SERVICES
- SMART NATURAL ENVIRONMENT

SSEDP

Bisello, Vettorato et al. 2016
What's next?
SMART CITY 4.0?
BOOKLET OF POSITIVE ENERGY DISTRICTS IN EUROPE

PREVIEW
A compilation of projects towards sustainable urbanization and the energy transition

Urban Agriculture

Research for AGRI Committee - Urban and Peri-urban Agriculture in the EU
Nature-based solutions are designed to bring more nature and natural features and processes to cities, landscapes and seascapes. These innovative solutions also support economic growth, create jobs and enhance our well-being.

(EC 2018)
NATURE-BASED SOLUTIONS

Ecosystem-based approaches

Restoration
Infrastructure
Management
Protection

Societal challenges

Human well-being

Biodiversity benefits

©IUCN
NBS provide multiple benefits and help tackle different societal challenges at the same time

(Tiago Freitas 2019)
An impact evaluation framework to support planning and evaluation of nature-based solutions projects

An EKLIPSE Expert Working Group report
Let´s conclude!

- SMART CITY concept is in rapid evolution
- It started from an ICT technology based approach to reach a very holistic and integrated framework
- It provides innovative solutions to improve the capacity of cities to managed resources efficiently
- But...
  - The provided set of solutions must be customized according to site specific needs
  - Communities must be involved from the beginning in the co-creation
  - Technology is not always the solution
  - Integration is a must
Thank you

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