A Preliminary Survey on Smart Specialization Platforms: Evaluation of European Best Practices

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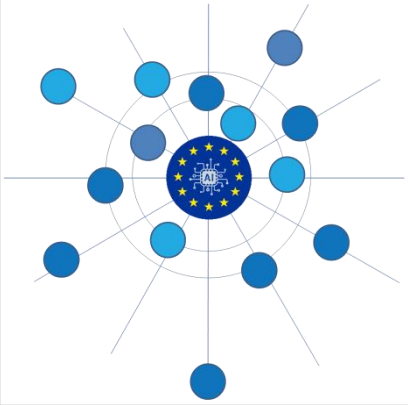

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RESEARCH OBJECTIVES

(i)
investigate the relationship between smart urban development and the use of open data platforms

(ii)
understand how these are useful for defining actions and strategies that facilitate the planning of a smart city

(iii)
understand if it is possible to find platform's common characteristics that allow cooperation of intentions between European Union cities

a systematic and cross-reading of some European platforms' good practices in smart city solutions and projects, highlighting:

THE SCOPE OF THE SMART CITY AND SUSTAINABILITY/ FINANCING

OPEN DATA EXPLOITATION

TECHNICAL CHARACTERISTICS

2_ The role of EU in open data platforms: legislation on Smart City and Artificial Intelligence

EU LEGISLATION IN SMART SOLUTIONS AND ARTIFICIAL INTELLIGENCE (AI)

2021
- European Interoperability Framework for Smart Cities and Communities (EIF4SCC)
- Artificial Intelligence ACT

2020
- Shaping Europe's Digital Future
- Smart Cities Marketplace

2019
- Join, Boost, Sustain

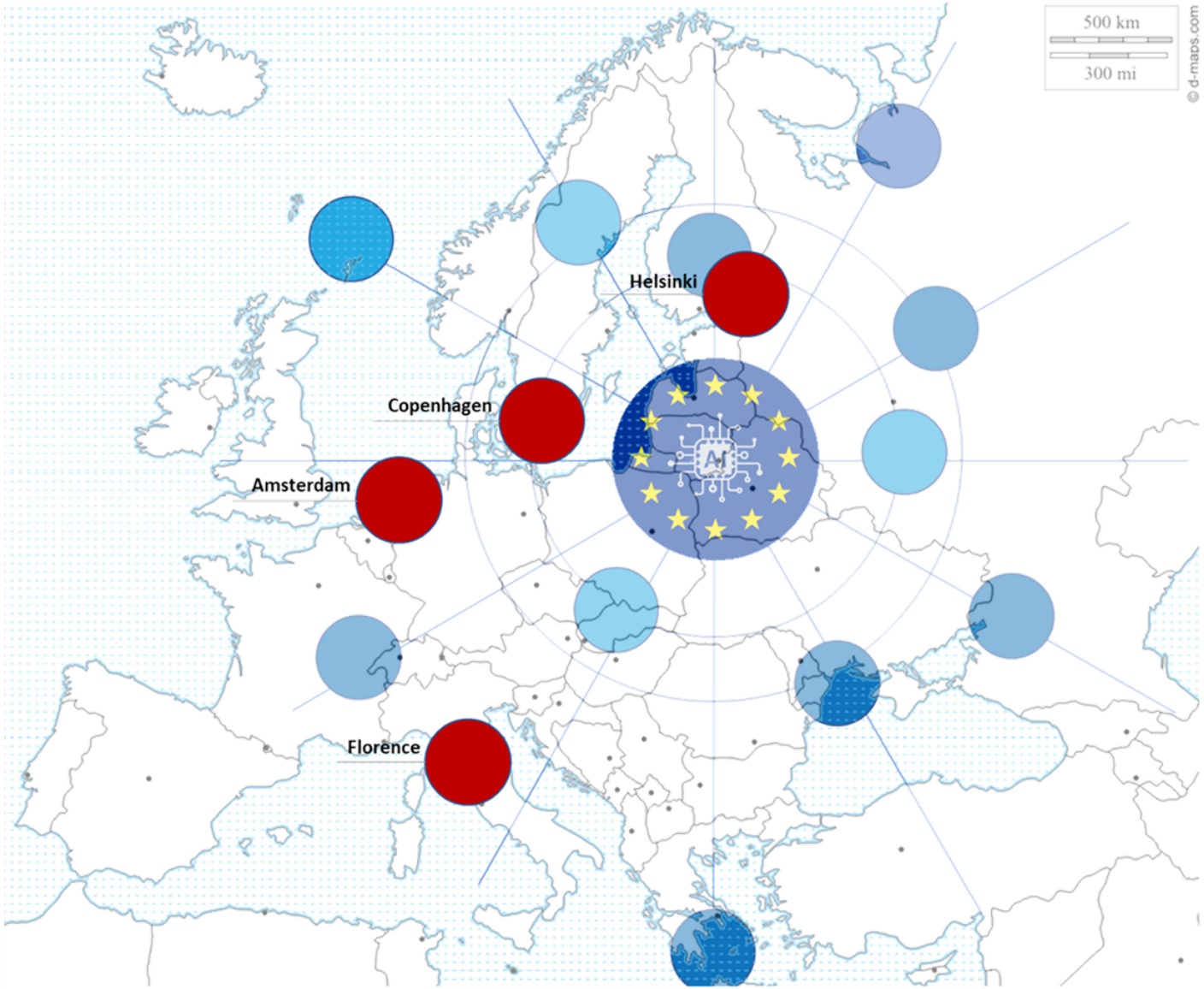
2016
- ISA² - Interoperability solutions for public administrations, businesses and citizens

2015
- A Digital Single Market Strategy for Europe

2014
- Connecting Europe Facility

3_European best practices: research methodology for the analysis of Smart Specialization Platforms

Methodological approach and application to case studies



Amsterdam

Country	Netherlands
Province	North Holland
Region	Amsterdam metropolitan area
Population	821.752

Amsterdam Smart City (ASC)

Helsinki

Country	Finland
County	Uusimaa.vaakuna.svg Uusimaa
Sub-region	Greater Helsinki
Population	631.695

Helsinki Smart Region (HSR)

Copenhagen

Country	Denmark
Region	Capital
Municipalities	Copenhagen, Dragør, Frederiksberg, Tårnby
Population	602.481

Copenhagen Smart City (CSC)

Florence

Country	Italy
Province	Tuscany
Region	Florence metropolitan area
Population	382.258

Florence Smart City (FSC)

3_European best practices: research methodology for the analysis of Smart Specialization Platforms

Methodological approach and application to case studies

AMSTERDAM SMART CITY (ASC)	HELSINKI SMART REGION (HSR)	COPENHAGEN SMART CITY (CSC)	FLORENCE SMART CITY (FSC)

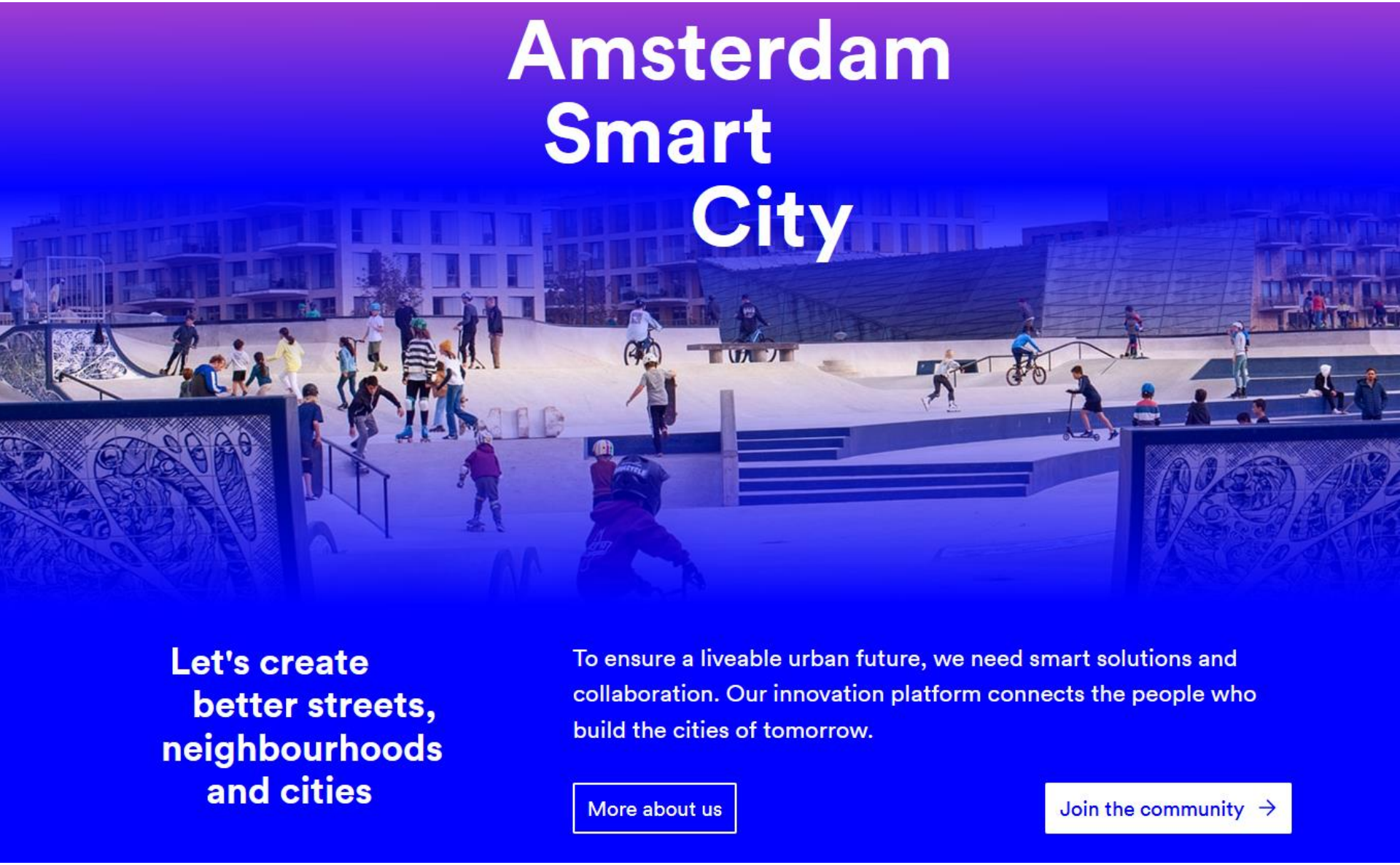
a specific analysis of the contents that Highlights the scope of

THE SMART CITY AND SUSTAINABILITY/FINANCING

THE OPEN DATA EXPLOITATION

THE TECHNICAL CHARACTERISTICS

AMSTERDAM SMART CITY (ASC)



AMSTERDAM SMART CITY (ASC)

Amsterdam Economic Board

Amsterdam Smart City

public-private initiative
20 permanent partners: governments, academic institutions, social organisations and innovative companies active in the metropolitan area of Amsterdam

32 **territorial projects** focused on the energy transition and connectivity

First European municipality to launch a Smart City programme based on a model that enables **bottom-up projects** in various sectors: circular economy, digital connectivity, energy, health, mobility and jobs of the future

Several **awards** as the most successful smart city in the world: Chief Digital Officer Club in 2014, World Smart Cities Awards in 2012 and the European City Star Award in 2011

AMSTERDAM SMART CITY (ASC)

Role of governance, which, when combined with the aim of efficiency, environmental performance and quality of life, has the potential to promote public engagement

The open web platform has two roles: a "connector and an information exchanger.

The **website as a conn**ector means that it helps people, not only in the city of Amsterdam but also around the world, to get in touch with others, to contribute to urban innovation, and to gather related information about projects that are currently going on

The **website as an inform**ation exchanger indicates that it facilitates suppliers and demanders to share their ideas, information, knowledge, and projects

AMSTERDAM SMART CITY (ASC)

(i) **Circular City**. Amsterdam has established a circular economy innovation program to implement material reuse strategies by converting waste into electricity, urban heating and building materials

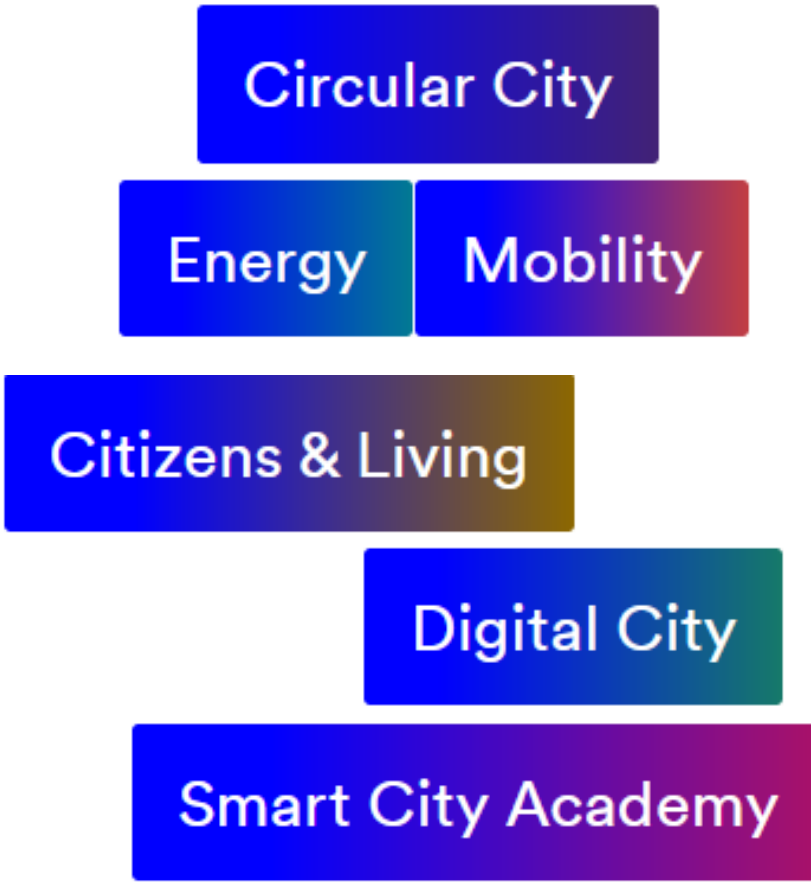
(ii) **Energy**. The city of Amsterdam has the to provide every citizen with a solar panel in the next few years

(iii) **Mobility**. Amsterdam is considered the cycling capital of the world; 32% of traffic movement in Amsterdam takes place by bicycle, and 63% of its inhabitants use bicycles daily. Since 2008, car sharing has increased by 376%

(iv) **Citizens & Living**. To keep Amsterdam liveable and to find innovative tourism initiatives, the municipality works with its citizens

(v) **Digital City**. People are more connected, and technology has become part of the daily life of the citizens of Amsterdam

(vi**) Smart City Academy** provides available knowledge on smart city projects and helps with project development. Professors, teachers and students study starting, managing, collaborating and scaling smart city projects



HELSINKI SMART REGION (HSR)

HELSINKI SMART REGION (HSR)

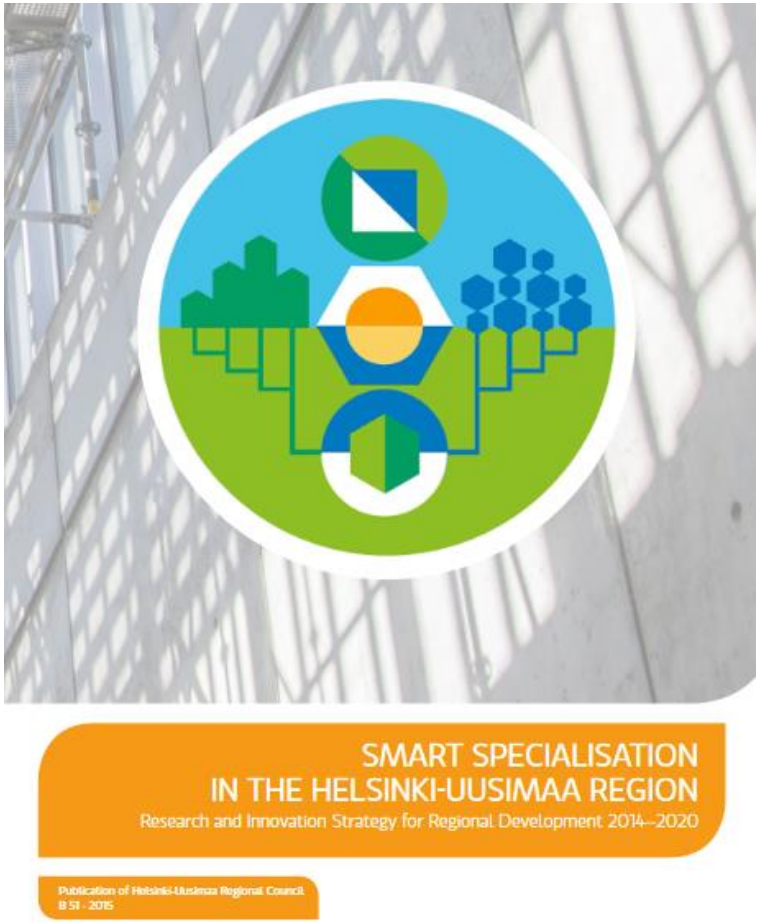
Helsinki Smart Region

Helsinki Smart Region is a regional strategy of smart specialisation that promotes the participation of different actors in the European Union's international networks and cooperation projects

HSR is linked to the EU initiative "Smart Specialization Platform" , which assists EU countries and regions in developing and implementing their smart specialisation strategies

The purpose is to improve regional innovation potential and to foster international collaborations by prioritising sustainable growth via the effective use of the Region's economic, environmental and social resources

HELSINKI SMART REGION (HSR)



FONTE:
http://www.onlines3.eu/wp-content/uploads/RIS3_strategy_repository/FI_Smart_Specialisation_in_Helsinki-Uusimaa_Region_-_Research_and_Innovation_Strategy_for_Regional_Development_2014-2020_B_51_-_2015.pdf

strategy is not limited to the Finnish capital of Helsinki (over 650,000 inhabitants)

it expands to the entire Helsinki-Uusimaa region, with 26 rapidly growing municipalities, even very small ones of about 2,000 inhabitants.

HSR project allows, on the one hand, to test smart and digital pilot solutions for cities and municipalities of different sizes and, on the other hand, to create a network of co-utility between territories with different socio-economic characteristics (urban, agricultural, pastoral ones)

HELSINKI SMART REGION (HSR)

Innovative Ecosystems

Citizens' city

The citizens in Helsinki-Uusimaa are active, creating together with companies and cities agile, user-focused services and solutions. The region is a world leader in making data public and using it to create new businesses. Helsinki-Uusimaa is big enough for systematic development of significant technologies and social innovations, and small enough to make it feasible in practice, too. This theme covers areas such as transportation, housing, urban planning, and healthcare.

Climate neutrality

The Helsinki-Uusimaa Region has set a goal to be carbon neutral by 2035. A transition to a low carbon society requires significant changes to our infrastructure, mobility, and built environment. The Helsinki Smart region is a major operator in developing the most ambitious clean technology in the world, and we have the proven capacity to develop new service models. Climate neutrality theme covers areas such as circular economy solutions, new forms of energy, bioeconomy innovations and new materials.

Industrial modernisation

The Helsinki-Uusimaa Region produces various configurable products using for example industrial IoT and mobile technologies. We develop leading edge technologies for future industry and processes. In Helsinki-Uusimaa there is a broad innovation activity in different fields of strategic value chains such as self-driving vehicles, smart health, hydrogen technology, and cyber security. Areas covered by the theme include, for example, new industrial processes, health technologies, robotics, and travel.

COPENHAGEN SMART CITY (CSC)

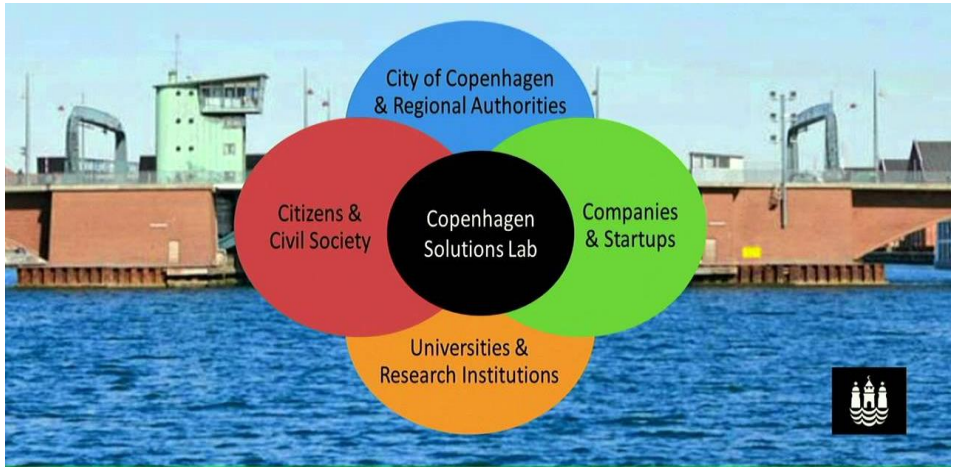
COPENHAGEN SMART CITY (CSC)

ICT Development Index 2017

Copenhagen is one of the 20 cities included in the Nordic Smart City Network, a collaboration initiative joining five countries with the aim to explore the Nordic way to create smart, sustainable, and liveable cities

In 2014 Copenhagen won the World Smart Cities Award [ ] for its Copenhagen Connecting (CC), a project based on the intelligent use of data (wireless data from mobile phones, GPS in buses and sensors in sewers and garbage cans, etc.) to create a greener city, a better quality of life and a better business climate.

COPENHAGEN SMART CITY (CSC)



The City has provided itself with a smart plan (CC Plan, in cooperation with private companies such as Rambøll and the University of Copenhagen, the University of Aalborg, the Technical University of Denmark (DTU) and the IT University of Copenhagen), and investments to implement it

Copenhagen's smart city approach is firmly anchored in the three main objectives of achieving carbon neutrality by 2025; creating a greener, more sustainable, and the more liveable capital city; and supporting economic growth

FLORENCE SMART CITY (FSC)

Together with San Sebastian (ES) and Bristol (UK), it is one of the three leading cities in the European project Replicate, which allowed an exchange of experiences and a sharing of problems and solutions with geographically different realities, thanks to the former STEEP EC project

Key factors:

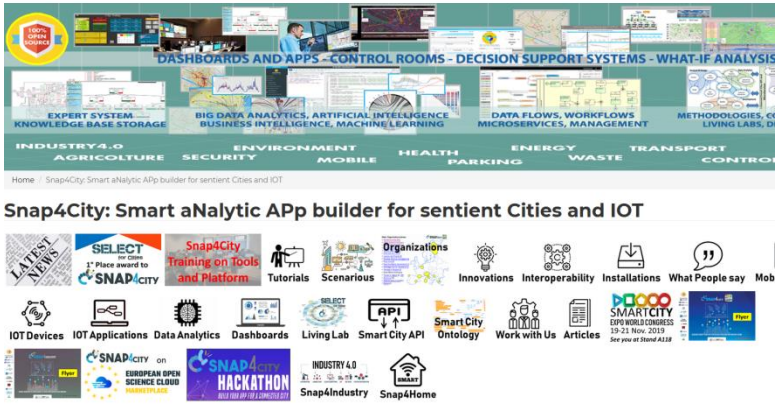
a) strong collaboration of all the stakeholders across the value chain: public administrations, technology experts, companies, end-users, etc.;

b) the city must be considered a complex system of processes strictly interconnected;

c) building up a Smart City requires time, resources, clear vision and strong leadership.

https://replicate-project.eu/

FLORENCE SMART CITY (FSC)



Snap4City is fully GDPR compliant and supports Living Lab implementation and management of IoT Applications, community and Multi Organization solutions, resources, heatmaps, AI and predictive models, traffic flow reconstruction (from Sii-Mobility), routing algorithms (from Sii-Mobility), What-IF simulation models, knowledge base and federated Smart City API, scalable processes, scalable data analytics, user profiles, Mobile Apps, IoT MultiBroker and MultiProtocol, Digital Twin local and global, BIM, etc.

Being completely open-source, modular and scalable, this solution has had the advantage of growing with the needs of the city by adding components, reconfiguring and exploiting the components already present on the territory, without any Vendor-lock-in, protocol-lock-in, technology-lock-in and solution lock-in.

Vital connection between open data platforms and **SMART URBAN DEVELOPMENT**

Made through artificial intelligence, these platforms can be connected with the **REALITY OF THE CITY**

Using different data, the platforms manage to interpret the **NEEDS OF CITIZENS** in other fields

By combining them, they create a dynamic interoperability capable of giving the city networks a **REAL CONNECTION**

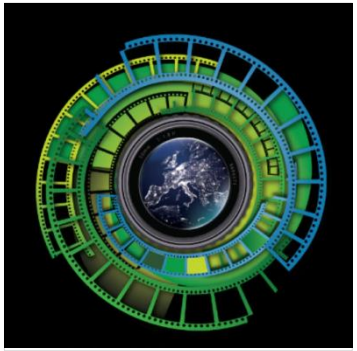
FOCUS ON

- **smart city and sustainability/ financing**
- **open data exploitation**
- **technical characteristics**

3.2_RESULTS
3.2a_ Scope of the smart city and sustainability/financing

Smart cities projects have demonstrated a positive impact on improving the environmental conditions and liveability of cities and the economic returns for citizens and public administrations

A key aspect of selected smart cities projects is to rely on revenue streams for economic sustainability coming from different sources



Deloitte a network of companies in audit, consulting, financial advisory, risk advisory, tax and legal fields, tries to list them as follows:

(i) Financing model payments

(ii) Availability payments

(iii) Savings sharing

(iv) Shadow tolls

(v) User fees/charges

(vi) Rate type payments

(vii) "Pay-as-you-go"

(viii) Subscription

(ix) Advertising-based

Considering the different domains (government service, health service, security-safety issues, mobility, energy, waste, etc.) in which a smart city can generate revenues, an important impact on results is related to smartening public services like lighting, parking, waste management without forgetting the relevance of accessible Data storage

Due to this huge amount of data coming from different domains, the risk is to create separate data silos that do not allow to correctly evaluate project returns and exploit the full potential of smart city applications.

Recently, cities are becoming more aware of multiple directions data channels and are abandoning an approach based on simply connecting data sources.

Open Data and citizens' engagement in their use can improve the quality of public services and bring to develop new applications and digital services that exploit the reuse of public data

3.2_RESULTS
3.2c_Technical characteristics

GIS Geographical Information Systems

strong push on data and services aggregation to exploit higher-level machine learning business intelligence tools and control room dash-boards

smarter mobile apps that offer smarter services using a wider range of data

Most of the Smart City API services are focused on a single city/area and expose a limited number of services contextualised on the same geographic area, for example info-mobility, point of interest (POI), routing, smart light, smart parking, etc.

This means that in most cases, passing from one city/area to another, the users have to get other applications to get the same services

This also happens for the lack of interoperability among the Smart City API, SCAPI, at the semantic level

CKAN Comprehensive Knowledge Archive Network

CASE STUDIES
AMSTERDAM
HELSINKI
COPENHAGEN
FLORENCE

Smart City API to provide and create services and data for web and mobile applications

IoT solutions based on IoT brokers

Examples of Smart City APIs are Km4City (Knowledge Model for the City) API, and E015 (Digital Ecosys-tem E015)

to develop smart city solutions, the usage of Smart City API can be the way to provide smarter applications that can take into account multiple aggregated data sources and data analytics, such as reasoning and predictions on parking, traffic flow, and people flow, weather, etc.

4_DISCUSSION AND CONCLUSIONS

1) **the cities that use open data platforms to accelerate their intelligent growth, rely on Artificial Intelligence (AI),** seen as a fast-evolving family of technologies that can bring a wide array of economic and societal benefits across the entire spectrum of industries and social activities

2) **this approach aims to enhance urban living by integrating more sustainable solutions and addressing city-specific challenges across various policy sectors**, including energy, mobility and transport, and ICT. **It builds on the engagement of the public, industry and other interested groups to develop innovative** solutions and participate in city governance

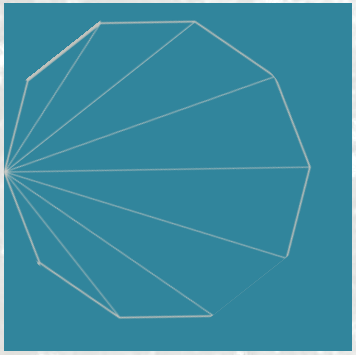
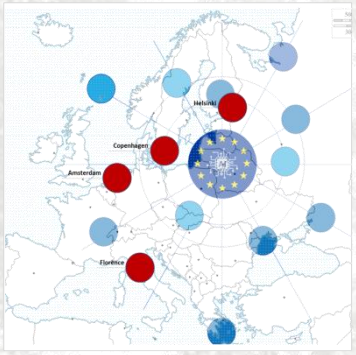
1) **for a controlled and dynamic manage-ment, the smart city requires planned planning actions that connect, at the same time, several sectors. This characteristic allows for defining actions and strategies that facilitate city management.** In fact, the platforms allow a functional connection between different sectors that helps administrations to make planned decisions in the urban ecosystem

2) **there are different characteristics that the platforms can implement to allow cooperation of intentions between different Euro-pean cities. This is highlighted by the European Union, which defines standards and regulations that serve to standardise these platforms as much as possible**

single digital market

Smart City

interoperability and connectivity



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