

European Alliance Against Coronavirus

Monday 13th July 2020 at 8:30

Cities as a challenge for ICT Technologies

Working format is based on “Gilles Rules”:

1. conceptual framework
2. needs and disruptions
3. solutions

Speakers:

- Vasco Lagarto, TICE.pt
- Daniela Monteiro, Porto Digital
- Luis Antunes, University of Porto
- Rafael Caldeirinha, Polytechnic Institute of Leiria

[Link to session's recording](#)

1. CONCEPTUAL FRAMEWORK

Definition of Smart Sustainable City (SSC)

“A Smart Sustainable City is an innovative city that uses Information and Communication Technologies (ICTs) and other means to improve quality of life, efficiency of urban operation and services and competitiveness, while ensuring that it meets the needs of present and future generations with respect to economic, social and environmental aspect.” This is the definition created by IUT-T’s Focus Group on Smart Sustainable City and presented during the session opened by Vasco Lagarto. He underlined **how the smart city’s thematic priorities were aligned with the EU Urban Agenda and featured in the Pact of Amsterdam**. At the top of this list, we can find jobs and skills in the local economy while urban poverty, housing, circular economy and urban mobility are following the priority.

Shared experience by Porto Digital

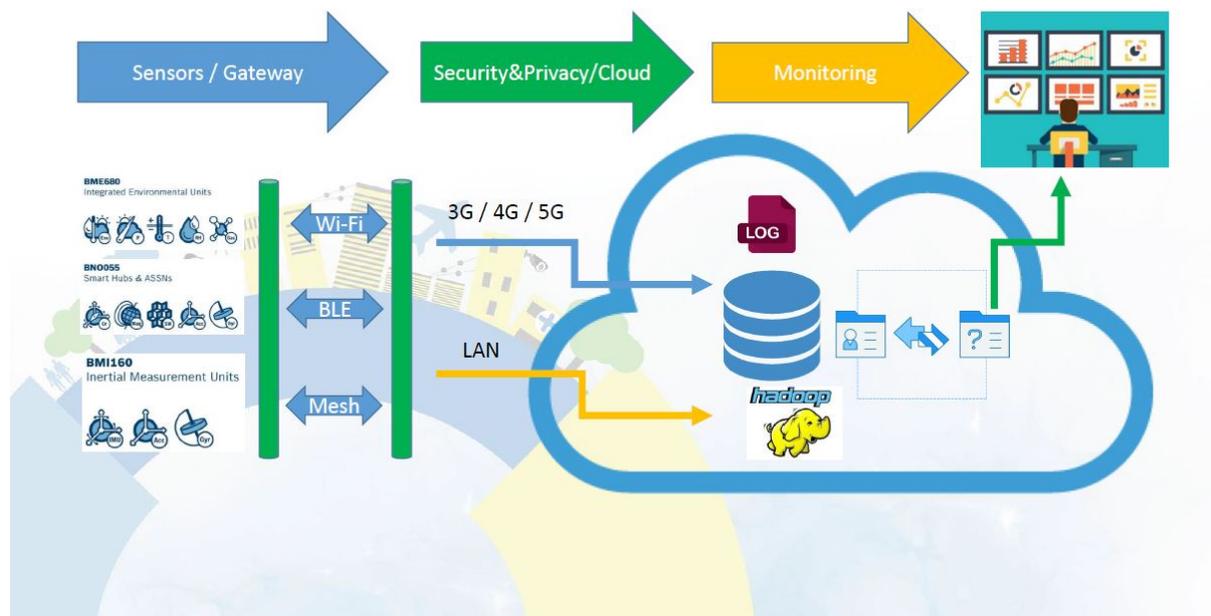
Daniela Monteiro was the second speaker and she started her speech with the presentation of Porto Digital. It is “a private non-profit association. It was created in 2004 by the Municipality of Porto, the University of Porto and the Portuguese Business Association (AEP), in cooperation with the company Metro of Porto, in order to promote ICT projects within the context of the city of Porto and its metropolitan area”. The city of Porto has 30+ tech communities, 50+incubators & workplaces and 70 R&D centers. As Daniela said this means Porto is a “catalyst of opportunities and innovation.” They work as an innovation agency, support the connection between city and business, and provide technological infrastructure. **They consider the city as a market, where government, people, mature companies, technology, entrepreneurs, and innovation come together.**

They work with other networks to scale up and exchange experiences. The manifesto of scaleUp Porto is based on trust because all the stakeholders are contributed to have a unique role. It is important to

remember that without involving people, it is impossible to create innovation only across the market. Indeed, innovation is a cross-sectoral process which must involve citizenships, companies, governments, regional and local authorities because by working together they can create the conditions to support scaleup. Cooperation through multi-level governance in the EU and co-creation with citizenship are key to Porto Digital's mission of turning cities and communities into smart and sustainable place, **using technology for a good purpose and seeing the city as a citizen-driven ecosystem.**

Data security and networking in smart city

Luís Filipe Antunes, professor of Computer Science Department at University of Porto, presented an interesting process for a more effective use of city's data: "Before making a city smart, you should make it safe." He created an end-to-end security system, in which different sensors and gateways in the city are secured and monitored. Especially during the monitoring phase, it is possible to understand which the **useful data is to improve the quality of life of citizens and make the city smart.** It is very important to find an effective way to manage the data because its volume and value – up to billions of EUR – is going to increase.



Rafael Caldeirinha from Polytechnic Institute of Leiria presented an interesting project called "Invisible 5G". To meet the problems of **deploying 5G in the cities**, the goal of Invisible 5G is to incorporate small antennas into the streets' furniture and cities' landscape (especially in the historical part on downtown). They could be integrated with a lower level of exposure to radiation for the people, as they work with small cells. One of the main scopes of the project is to highlighted how sensors are the main devices necessary to build a valuable city's networks.

2. DISRUPTIVE CHALLENGES

2.1. Value of data in smart cities

Over the last ten years, data have become a primary source of value for many existing businesses and technological drivers for new enterprises, showing its relevance among different industries, from the digital sectors to manufacturing ones. Smart cities are architectures build on a “*phygital*” network (both *physical* and *digital*), connecting different data across urban areas by means of sensors installed on field (i.e. traffic lights, streetlamps, etc.). The amount of data generated has increasing importance for existing businesses and for both private and public services. Moreover, creating an “urban network” allows to increase the value of the data since on one hand, it allows to create a real time mapping of different areas of the city, using different point of views (i.e. Traffic situation rather than pollution levels, etc); on the other hand, it increases consistency and representativeness of the information, allowing matching analysis between different types of data. Hence, smart cities may represent a primary source for reliable information, acting as catalysts for innovative projects, involving different sectors.

2.2. Compliance with GDPR policies on data management

The development of smart cities requires the application of sensors to physical objects, using them as a mean for gathering, transferring, and processing data through specific software. Data represents an incredible source of Value for businesses hence their regulation at European level by the GDPR (*General Data Protection Regulation*) policies. Smart cities generate enormous amounts of data due to the quantity of sensors that must be installed, connecting all the parts of the city. With such volume, it becomes more and more expensive for companies to keep the pace to homologate the data gathered to the principles of GDPR, especially regarding transparency and security.

2.3. Change in network’s infrastructure configuration

Considering the hardware necessary to build a smart city’s network, this mainly includes two types of devices: (i) sensors, to gather data that will be processed afterwards, and (ii) antennas, in order to exploit the 3G/4G/5G standards for remote data transfer. Due to the necessity to place sensor on physical objects, antennas must be necessarily placed on the infrastructure too. Antennas must be then moved to the “street level”, undergoing specific regulations limiting the transmitting power (especially for 5G, in order to copy with the radiation emission; this represents a design challenge, since antennas have now lower range, due to the transmitting power lowering). They also have to be mounted on a large number of exiting physical object; as a consequence, these devices must be produced in smaller dimensions to be easily integrated in compliance with the current laws.

All sensors in the cities need to be secured. For this, the cities need to work closely together with the manufacturers.