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Smart Mobility and Smart Environment in the Spanish cities

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Abstract

Cities play a key role in sustainable development. Urban growth must be managed in ways that support and drive economic development, and achieve social cohesion and environmental sustainability. The concept of Smart Cities emerged in the same way as Smartphones or Smart TVs. A number of initiatives are being developed as part of Smart City projects; however, there is a lack of consistent indicators, databases and methodologies for assessing, financing, and implementing these kinds of initiatives. Smart City projects today are classified according to six clusters known as *axes*: Mobility, Environment, Government, Economy, People and Living. The main aim of this paper is to show dynamically and graphically the scope of development of Spanish Smart City initiatives in terms of mobility and environmental issues, as two of the fundamental axes of Smart City development. The study was carried out in the 62 cities in the Spanish Smart Cities Network (RECI). The interactive map describes the status of Spanish cities by means of socioeconomic and demographic indicators and provides a thorough assessment of the maturity of Smart Cities based on their variables.

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1. Introduction

The concentration of people, companies and organisations in cities promotes creativity, innovation, diversity and economic growth (Harrison and Donnelly 2011). The synergy between the different sectors also increases economies of scale and is crucial to a country's sustainable development (AMETIC 2012). Although over 80% of global GDP is generated in cities, cities also have the highest pollution levels worldwide (Dobbs et al. 2011).

Urban development, encouraged by the boom in the urban population, has brought about several imbalances in cities. Cities must now embark on a process of transformation by developing strategies to meet the challenges of creeping urbanisation, demographic change and the new demands caused by climate change and the depletion of natural resources. It is therefore crucial to manage and plan a city's expansion by supporting economic growth and competitiveness, while maintaining social cohesion and environmental sustainability (AMETIC 2012; ARUP 2010). This involves multiple actors, high levels of interdependence, and different fields of action, in addition to conflicting goals and social and political complexity; consequently, a holistic and multidisciplinary approach is necessary (Abdoulaev 2011; Fernández Güell and Collado Lara 2014; Giffinger et al. 2007).

Urban planning today is regarded as the integration of a plurality of interests and active public participation and now it takes a more participatory approach, with new ways of representing data such as GIS, Geographic Information Systems, and new techniques for participation thanks to ICT, Information and Communications Technologies.

The concepts of Digital City or Connected City are closely linked to ICT in urban management and planning. A recently coined and more popular term is Smart City. The Smart City concept differs from the others by emphasising environmental and social capital and not only technology. It implies the use of ICT to provide sustainable economic development, tools for the judicious management of natural resources, and improvements to our quality of life, and offers an excellent opportunity to manage the urban future. ICT tools are essential for transforming traditional cities into a Smart ones (Holzer and Kim 2006). Ruddolf Giffinger in *Smart Cities Ranking of European medium-sized cities* (2007) classified smart initiatives into six axes: Government, Mobility, Environment, Economy, Living and People.

Interest in Smart Cities has generated several deliberations, but not yet a sufficient progress has been made in implementing and evaluating related initiatives. A Smart initiative might be evaluated through an integrated approach covering environmental, social and economic needs (Abella and Ruiz 2015). There are rankings of different city qualities such as education or economy, and comparative studies of cities are emerging based on the Smart concept.

Urban mobility is playing an increasingly important role in urban growth. An efficient public transport system can solve congestion problems, although Smart Mobility aims to go one step further by searching for innovative and sustainable ways to provide mobility for people in cities –by developing environmentally-friendly public transport fuels and propulsion systems supported by technology, and the proactive behaviour of citizens (Neirotti et al. 2014).

The environment and sustainable lifestyles are key features of Smart Cities. The premise of the Smart Environment is the use of technology to improve the knowledge of environmental conditions and services such as electricity, water and gas, in order to change people’s habits, avoid waste, benefit the environment and improve the efficient use of resources. Chourabi emphasised on environmental factors, these initiatives have an impact on the city liveability and sustainability and should be taken into account when considering Smart initiatives (Chourabi et al. 2012).

2. +CITIES PROJECT

There are numerous Smart City initiatives underway in the Spanish and European framework (Giffinger et al. 2007; Manville et al. 2014). However, indicators and standardised methodologies are required to evaluate, prioritise, implement and manage this type of projects. There is also a lack of easy-to-use visual tools for interpreting the vast amounts of information produced by these projects. The 2014 European report entitled *Mapping Smart Cities in the EU* clearly highlights the potential of mapping the situation of smart cities (Manville et al. 2014).

+CITIES project is coordinated by TRANSyT (UPM) and funded by the Spanish Ministry of Economy and Competitiveness’ State Plan for Scientific and Technical Research and Innovation 2013-2016. This project goes one-step further by using maps as a dynamic tool to visualise database and not only as a way of representing data as static results. It resolves the shortcomings of visual tools and serves as a systematic method for assessing Smart City projects.

2.1 Objectives

The +CITIES project is aimed at developing a comprehensive framework for assessing mobility and urban services projects to advance the knowledge of this field and define methods for making informed decisions on smart investment strategies in the Smart Cities context. This system is of great interest to public and private bodies as a tool for prioritising, developing and implementing strategies. Figure 1 shows the structure of the project development.

A survey taking into account experts’ opinions to complete the assignment was conducted involving different fields related to cities. The experts’ vision from a sort of institutions is essential to reinforce and validate the project.

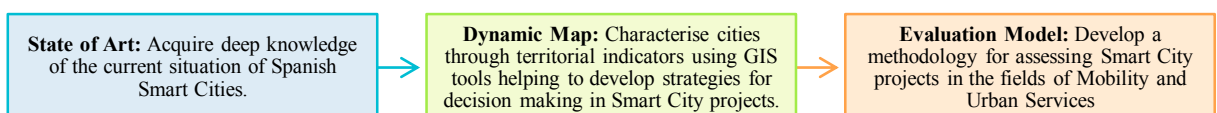


Figure 1. +CITIES Project Structure

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