11 Smart City strategy as a means to improve residents' quality of life: The Case of Barranco, Lima, Peru

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Introduction

A Smart City is one whose sustainable economic growth and high quality of life are due to investment in human and social capital, communication infrastructure and the intelligent management of natural resources through participatory governance (Qian et al., 2019). Smart Cities connect physical infrastructure, information and communication technology (ICT) infrastructure, social infrastructure and business infrastructure to take advantage of the collective intelligence of a city. Smart Cities often implement both advanced infrastructure and modern ICTs. Likewise, Dustdar, Nastic and Ščekic (2017) state that the Smart City strategy provides more efficient services to citizens, monitoring and optimizing existing assets, such as infrastructure, to improve their quality of life.

The concept of the Smart City is not limited to the application of ICT (Albino et al., 2015): Smart Cities can also be understood as communities in which citizens, companies, institutions and municipal agencies collaborate to integrate systems and make them more efficient, to stimulate citizen participation and to continuously improve quality of life. This allows urban performance to be improved, services to become more efficient, existing

infrastructure to be monitored and optimized, and innovative business models in the public and private sectors to be encouraged (Marsal-Llacuna et al., 2015). Maldonado Amaya et al. (2020) indicate that a Smart City is composed of two concepts: urban planning and sustainable management, making use of technology to promote a more human and innovative city. Globally, an increasing number of municipalities and districts are trying to become 'smart' due to the benefits Smart Cities provide. It is necessary to understand each of the variables related to Smart Cities.

Defining The Smart City through stakeholders and sustainability

The term 'Smart City' was coined in 1994 (Dameri & Cocchia, 2013), and, from there, it has been defined in different ways. This term can create confusion if one thinks that the only requirement for a city to be 'smart' is the use of the latest and greatest technology (Boes et al., 2016). The concept of the Smart City did not evolve from the quest for a technological utopia (Kitchin, 2015). Over the years, it has been defined in different ways, depending on the objectives of each city. For example, for Angelidou (2015), the term 'Smart City' indicates a conceptual model of urban development based on the use of human, collective and technological capital for the development of urban conglomerations. The International Standards Organization (2019) points out that Smart Cities seek to offer better services to citizens and provide a supportive living environment in which smart policies, practices and technology are put to the service of the community. Essentially Smart Cities need to:

- Achieve environmental and sustainability objectives innovatively,
- identify the need for smart infrastructure,
- incentivize innovation and growth,
- build a dynamic economy that takes advantage of resources and
- prepare for the challenges of the future.

These definitions all indicate the use of technological inputs to distinctively improve life in a given city. For a city to be considered 'smart', it must also be given a good image. The appropriate distribution of space for activities and the accessibility of various services are crucial features of a sustainable city that uses its resources efficiently (Bourdic et al., 2012). Indeed, with properly managed resources, ambitious goals can be set so that any city or district can become smart. This chapter defines a 'Smart City' as one that can optimize available resources, improve residents' quality of life and increase its economic capital in order to continue growing as a Smart City.

Many different cities are on their way to becoming Smart Cities. Indeed, approximately 26 global cities expect to become Smart Cities by 2025, of which a disproportionately large percentage – 50% – are in North America and Europe (Glasmeier & Christopherson, 2015).

Becoming a Smart City is a shared, collective task that involves local institutions, companies in the tourism sector and society in general. These stakeholders are all called upon to make new technologies their own. Likewise, Appio et al.(2019) point out that for this development to take place, it is necessary to possess high levels of both human and social capital, since the innovation process is based on knowledge and learning.

Discussing sustainability in the urban context necessitates the mention of the economic, environmental, and social dimensions of sustainable development. 'Sustainable urban development' has been defined as the way to achieve a balance between the protection of the environment and the development of urban areas: equality in terms of income, employment, housing, basic services, social infrastructure and transport (Hiremath et al., 2013). Although urban development must go hand in hand with sustainable development, the two concepts are not necessarily compatible without great effort. This continues to be one of the most difficult challenges facing urban planners and academics when it comes to decision-making and planning for sustainable cities (Bibri & Krogstie, 2017)

Technological management of a Smart City

ICTs and advanced technological innovations provide the foundation for the development of Smart Cities; however, technology alone is not enough (Sigalat-Signes et al., 2020).The Internet of Things (IoT), according to Ahmed et al. (2017) has appeared due to technological advances and the rapid convergence of wireless ICTs, digital electronics and microelectromechanical systems (MEMS). The IoT is made up of those devices connected to the Internet (laptops, cell phones, tablets, Wi-Fi-enabled sensors, portable devices and household appliances); according to the Cisco report (Evans, 2011), the number of these devices in use has exceeded the number of human beings in the world. Most IoT applications, aside from monitoring discrete events, also extract the information collected by IoT objects. Data collection tools in the IoT environment are primarily sensor-equipped devices that require custom protocols, such as message queue telemetry transport (MQTT) and data distribution service (DDS). Because sensors are used in almost every industry, the IoT is expected to produce a large amount of data that can be used to identify potential research trends and analyze the impact of certain events or decisions. However, to generate higher profits, companies must