Chapter 1
What Constitutes a Smart City?

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ABSTRACT

This chapter provides an insight into what is meant by a Smart City and the underlying factors that make a city smart. The authors answer the question of "what constitutes a smart city" by presenting a multi-faceted approach including a detailed analysis of classical smart city definitions, attributes of a smart city, industry viewpoints and efforts by standards developing organizations. Through this approach, a common theme is established which best describes a smart city. The content of this chapter can therefore form the basis of developing a standard definition of a global smart city, and subsequently can be used to develop a framework to measure the performance of a smart city. The authors also propose a definition which in their view provides a reasonably holistic description of a smart city. However, they recognize that a smart city may mean different things to different stakeholders, and therefore has a strong dependence on the "lens" through which a smart city is viewed.

INTRODUCTION

Governance, technology, communication, transport, infrastructure, people, economy, environment, natural resources, innovation, and quality of living are only some of the characteristics that factor into the definition of a "smart city." There is no one unique definition that fits all. Rather, what a smart city is can be highly subjective, depending on the circumstance and the lens through which it is viewed.

To date, there is no standardized definition of a smart city, although some are starting to be proposed. In recognition of this gap, several Standards Developing Organizations (SDOs) including the International Telecommunication Union (ITU), International Electrotechnical Commission (IEC) and the International Standards Organization (ISO), have all started efforts in earnest, to develop a globally accepted definition of a "smart city". The ITU Focus Group on Smart Sustainable Cities has proposed the following definition of a smart sustainable city:

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 aspects.

Why is a smart city important enough to warrant a standardized definition?

The answer lies in the rapid urbanization of our planet – with projections of 70% of the global human footprint to be located in an urban environment by the year 2050. As per the United Nations (2013) World Economic and Social Survey, Africa, Asia and other developing regions will house 80% of the world's urban population in the coming years. While urbanization can bring progress, it can also pose challenges: how do we achieve sustainability concurrently with urban growth? Social, economic and environmental issues have become tightly interconnected. Information and Communication Technologies (ICT) provide cities with platforms to become "smart" via the efficient management of city services. These can range from water, energy, waste, transport to government, education and healthcare. The construct of a smart city should result in higher living standards for its inhabitants, especially through the conscious application of ICT.

This chapter will provide an overview of a smart city in a systemic and methodical fashion. Different points of view will be presented, and common attributes and functions of a smart city will be developed thematically using multiple sources including industry, standards organizations and other studies related to indicators and indices of a smart city. A common set of terms will then be developed to best describe these multiple views in a comprehensive and holistic manner. Finally, a proposed definition of a smart city shall be presented by the authors, with full recognition that there are many other possible variants depending upon the subjectivity of the "lens" of a given smart city stakeholder.

APPROACH

In considering what exactly is a smart city, one of the challenges is that there are so many viewpoints, each valid in its own right. A smart city has many different connotations and interpretations. All of these different facets are important, but a holistic overview is essential to the process of finding an answer to the question "What constitutes a smart city?". A comprehensive description which addresses these different viewpoints will be invaluable. In order to develop such a description, a detailed and methodical analysis was developed in the form of a combination of top-down and bottom-up approaches.

Figure 1 illustrates the approach followed, and this chapter describes the journey towards establishing "What constitutes as Smart City".

The following steps were followed:

1. Conduct a comprehensive data collection exercise to develop an understanding of what a smart city means from different viewpoints:
   a. A study of the many different classical definitions found in the literature.
   b. Identify what are some of the key common attributes for a smart city.
   c. An understanding of the different ICT centric corporate / industry views of a smart city.
   d. A look into what the different standards development organizations (SDOs) are doing in relation to smart cities.

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