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Smart Cities

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ABSTRACT

Smart cities have been considered the wave of the future. A smart city integrates information and communication technology (ICT) in a secure manner so as to manage the city's assets. This paper presents a brief overview of the concept of the smart city. It is argued that smart cities promise sustainable development and a high quality of life for the residents.

Key words: intelligent cities, digital cities, information cities, ubiquitous cities, flexicity, cyberville

1.0 INTRODUCTION

Cities play a major role in economic and social aspects of life worldwide. The majority of world's population resides in cities. According to the United Nations, 2008 marked the year when more than 50 percent of people (3.3 billion) lived in cities [1]. Cities' services and infrastructures are being stretched to their limits to support the population growth. Modern cities are monstrous communities, with millions of residents. They are the economic engines of the modern world because they generate economic opportunities. Cities bring individuals together and foster interchange of information by people of different cultures and skills. They collaborate, compete, and evolve together with other cities. As people change cities, cities change them.

2.0 DEFINITIONS

There are several definitions of smart cities. The word "smart" can be used to describe any device that can process information and can communicate with something. The term "smart cities" is a fuzzy concept and there is not a one-size-fits-all definition of the concept.

A smart city is a high-tech urban area that connects people, information and technologies in order to increase life quality. Smart cities are those communities that pursue sustainable economic development through investments in human and social capital and manage natural resources through participatory policies. A smart city monitors the conditions and integrates critical infrastructures such as bridges, tunnels, roads, subways, airports, seaports, and buildings. Components of a smart city include smart people, smart governance, smart homes, smart infrastructure, smart technology, smart economy, smart mobility, smart living,

smart parking, and smart environment [1]. Some of these components are illustrated in [2] Figure 1.

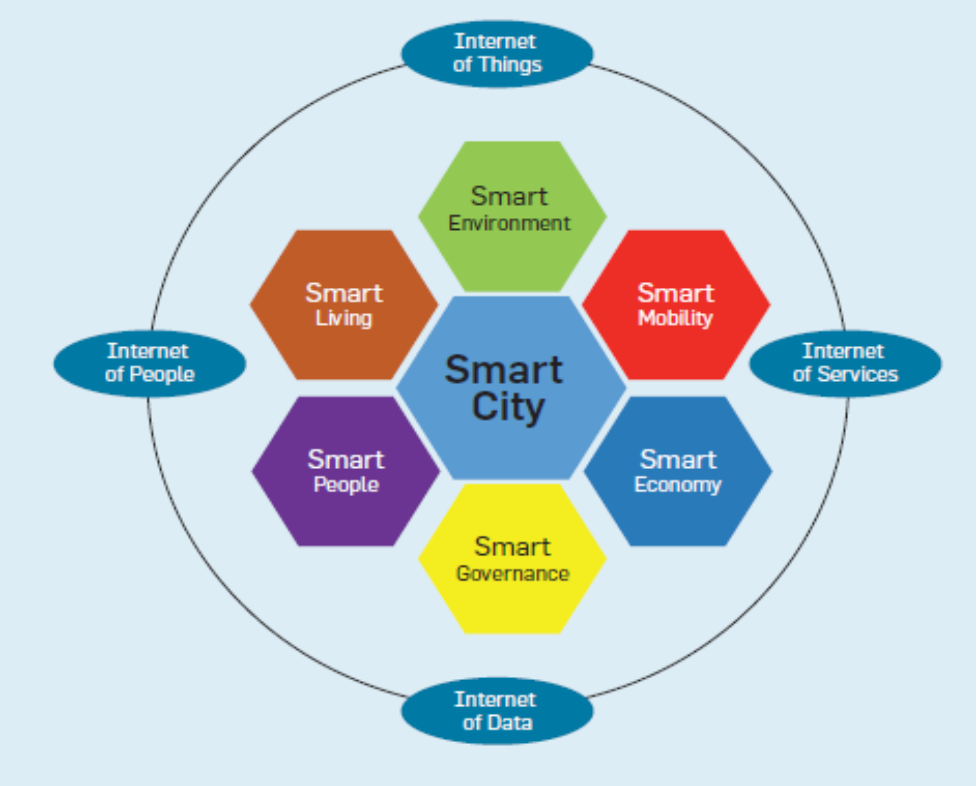

Figure 1: The main components of a smart city [2].

3.0 FUNDAMENTAL TECHNOLOGIES

The intelligent city has a wide range of electronic and digital technologies that enable its devices to communicate. Two closely related technologies, the Internet of Things (IoT) and big data (BD), enable the transformation of traditional cities into smart cities [3]. Smart cities have been equipped with heterogeneous electronic devices based on the Internet of things (IoT), which is a worldwide network of physical objects using the Internet as a communication network [4].The IoT is the technical backbone of smart cities. The IoT is the network of interconnected devices (called Things) including computers, smartphones, sensors, buildings, structures, vehicles, actuators, and wearable devices. It has four components: the “things”, the local area network, the Internet, and the cloud.

The large quantity of data generated by thousands of sensors and devices in a smart city creates a big data. The BD refers to a group of large data sets that would be hard to process using traditional data processing. It is a high-volume, high-velocity, and high-variety information that requires special information processing tools [5].

4.0 CHALLENGES

Several initiatives all over the world have been launched to transform towns or cities from scratch to smart cities. For example, India decided to set 100 smart cities in May 2014. South Korea initiated 47 U-City (Ubiquitous City) projects in May 2013. So far no city has fully become a smart city.

Building smart cities has its potential barriers and challenges [6]. Smart cities around the world are diverse in their characteristics. Standards (such as established by ISO and IEEE) can play a crucial role in the development of smart cities. We must ensure that the information is secure and the people are secure. Since networks are believed to be the least secure parts of the system, cities must ensure that the networks are safe before embarking on smart city initiatives. Everyone is needed online and needs to be able to access services in order to realize the full benefits of IoT.

5.0 BENEFITS

There are many benefits that result from transforming a city into a smart one. Smart cities act as magnets for highly educated individuals and skilled workforces. Experts claim that smart cities could be efficient and more enjoyable places to live. The smart city initiatives have lofty goals of improving governance and enhancing quality of life for citizens. Smart cities offer untold benefits for government and citizens—service provision, quality of life, and security. These benefits include integrated transport system, tourism, health, educational facilities, smart healthcare, smart energy, smart homes, crime prevention, smart infrastructure, safety and security, disaster management, and waste management.

6.0 CONCLUSIONS

All around the world, cities want to be smart and are implementing smart cities initiatives. Typical cities actively pursuing smart city strategy include Chicago, San Francisco, San Diego, Denver, Pittsburgh, Austin, Scottsdale, Dubuque, Ottawa, Amsterdam, Manchester, Bangalore, Lagos, Beijing, Tokyo, Montreal and Vancouver. Smart cities are being pushed by big high-tech companies. Local governments now face the need to transform themselves into smart cities. They must select the transformation strategy that helps them realize their ambition. Making cities smarter will continue to be important.

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