Smart City Implementation Models Based on IOT Technology

1[1]. Ramya.E 1[1]. Affrudeen.B, 1[1].Abinaya.R,
1[2] &1[2] &UG Scholar, 1[1]Assistant Professor ECE

ABSTRACT: IOT (Internet of Things) is the network of physical object-devices, vehicles, buildings and other items embedded with electronics, software, sensors, and network connectivity which help to inter connect. The internet of things senses objects and remote controlled across existing network infrastructure. According to Gartner, 260 million objects will be connected by 2020. Several companies and government tried to refer with IOT in initial times, but nowadays in manufacturing, retail and SOC (Social Overhead Capital) industries, successful practices are built in a best way recently. In this paper I summarized tangible IOT based service models which are helpful to academic and industrial world to understand IOT business.

INTRODUCTION:

Most of the world's population today is in cities. By 2030, the population of the cities in the world is expected to be around 3.3 billion to 5 billion. In Israel, about 6 million people live in urban areas. Due to resource constraints, there occurs a problem in the future to provide the necessary services to the residents. To continue to serve and improve the standard of the growing population, it's necessary to develop smart cities. The Smart City aims to make optimal use of all resources, while maintaining an appropriate balance between environmental and economic costs. In the Smart City, maximum use is made of ICT to improve the functioning and supervision of the variety of systems and with an emphasis on saving of resources like energy, water, land and other natural resources. The main categories that define smart cities include the quality of the environment, energy, water and wastewater, transportation and traffic, information and communication systems, quality of life, government, economics, human resources, housing and land use, homeland security, and emergency preparedness. In order to manage and promote the issue in Israel, two and half years ago the Smart City Administration was established, at the initiative of the Ministry of Energy. There are many advantages in promoting smart cities in terms of national benefits: promoting the business sector, creating competitiveness, improvement of living standards and also proper utilization of resources. Israel has unique conditions, which include an educated populace with high use of information systems. Israel also faces quite complicated challenges which include severe land shortage, a problematic security situation and also excessive concentration of the population. A methodology of holistic thinking has to be developed with an extensive and inclusive thought process which is required. The city has to be built as a body with the work progressing at each stage which includes back and forth correlations. Such a process was executed in several cities worldwide, although the whole subject is in its embryonic stage. In all cases, intensive and smart use of ICT technology was done to improvise the systems of education, health, infrastructure, safety and emergency preparedness, retail and trade, public participation, understanding of culture and the unique DNA of each city.

DEFINITION OF IOT:

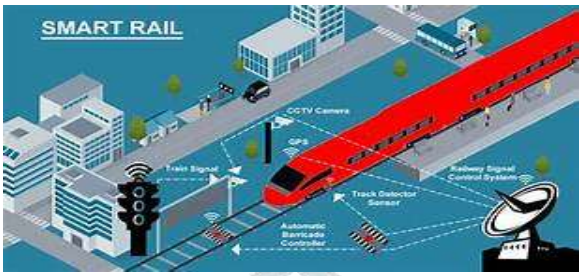
The rapid development of Information Technology (IT) which led to a hyper connected society in which the objects are connected to mobile devices and Internet to communicate with one another. In the 21st century, the motto is that we want to be connected with anything anytime and anywhere, which is already happening in several places in the world. The core component of this hyper connected society is IOT, which is also popularly referred to as Machine to Machine (M2M) communication or Internet of Everything.

SMART CITY IMPLEMENTATION MODELS BASED ON IOT:

Recently, several local governments have been aiming to implement IOT-based smart city by constructing a test bed for IOT verification and also an integrated infrastructure. This movement also corresponds to the creative economy which is brought by the Korean government. In this chapter, smart city implementation models based on IOT that can be implemented by local governments are described through few examples.

SMART TRAFFIC SERVICE:

The smart traffic system can monitor all the traffic issues and also the illegal parking of vehicles. Smart parking refers to the construction of a platform that enables us to know the real-time checking of available space and parking rate (prices) in areas that require parking and also facilitation of reservation or payment through web i.e., via internet . The citizen participation-oriented illegal parking prevention service is an improvement of the illegal parking crackdown of the traffic authority by allowing the citizens which includes the victims of illegal parking to conveniently report such violations through their smart phone. Further, the smart safe crosswalk service can contribute to the prevention of pedestrian accidents and also the secondary car accidents by detecting the pedestrians in children protection zones, and by alerting pedestrians and approaching vehicles via electronic display boards.

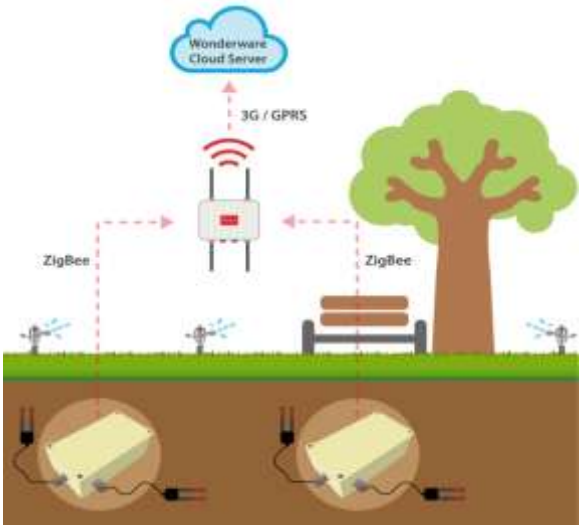


SMART EDUCATION SERVICE:

Smart Educated Service provides real-time and interactive high-definition (HD) lectures that feel like face-to-face meetings at home via high-definition (HD) services and wide-area Internet infrastructure. Instructors participate in the lectures by using equipment in private educational institutions or individual places and also the foreign language teachers in other countries can access this Smart Education Service through the Internet.

SMART IRRIGATION SYSTEM:

The smart irrigation system was developed to optimize water use for agricultural crops with the help of microcontroller. The system has a distributed wireless network of soil-moisture and temperature sensors placed in the root zone of the plants. In addition, a gateway unit handles sensor information, triggers actuators and transmits data to a web application. An algorithm was developed with threshold values of temperature and soil moisture that was programmed into a microcontroller-based gateway to control water quantity. The system was powered by solar panels and had a duplex communication link based on a cellular-Internet interface that allowed for data inspection and irrigation scheduling to be programmed through a web page.



CONCLUSION

This study is significant in outlining general information about IOT, such as definition, market size, and status of IOT, which has become a hot IT topic nowadays, and in presenting applicable IOT business models to help business entities and research institutes participating in related projects build a smart city as part of the future vision of local governments by reflecting the new information paradigm of IOT.

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