**CHAPTER-1**

**INTRODUCTION**

The Internet of Things is a novel cutting-edge technology that offers to connect a plethora of digital devices endowed with several sensing, actuation, and computing capabilities with the Internet, thus offering manifold new services in the context of an intelligent environment. These services are transforming cities, universities, hospitals and other institutions by improving the quality of human life through various resources including smart lighting, parking, etc.

Gartner, Inc. forecasts that the enterprise and automotive Internet of Things (IoT) market will grow to **5.8 billion** endpoints in 2020, a 21% increase from 2019. That’s a lot of devices.

Other estimates that push IoT projections farther into the future provide even more striking numbers, forecasting as many as [125 billion IoT devices](https://sst.semiconductor-digest.com/2017/10/number-of-connected-iot-devices-will-surge-to-125-billion-by-2030/) by 2030.[2]

The Internet of Things (IoT) is a revolutionary communication paradigm that aims to bring forth an invisible and innovative framework to connect a plethora of digital devices with the Internet. Thus, it intends to make the Internet more immersive and pervasive. The emerging IoT market is continuously gaining momentum as operators, vendors, manufacturers, and enterprises begin to recognize the opportunities it offers. [1]

An IoT-based smart eco-system includes a large number of devices in the network. The concept of a smart atmosphere can succeed only if it has the ability to provide connectivity to every available IoT device with sensing capabilities that produce significant information. IoT devices can use any available communication networks such as public Wi-Fi, Bluetooth, cellular networks (LTE/LTE-Advanced), and satellites to communicate with the cloud-based application center. However, ensuring connectivity in smart cities poses several challenges such as:

* Providing connectivity to devices with high mobility (e.g., high-speed trains and vehicles)
* Connectivity transition from device to network level and vice versa
* Ensuring connectivity to massively deployed devices in the absence of communication networks

Successfully implementing the Internet of Things (IoT) requires a change-management approach. The first element of change management is to identify a pressing need and develop a vision for how to addresses that problem. High investment costs and security deter university managements from implementing a fully IoT-based eco-system. Our project hopes to take the first step in this direction.