Chapter 5
AI and FPGA-Based IoT Architectures, Models, and Platforms for Smart City Application

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ABSTRACT

Anything that has an IP address is IoT-enabled. In this chapter, the authors have surveyed nine different IoT-enabled designs from IoT-based water management cyber-physical system (IoT-WMCP) to IoT-based random access memory (IoT-RAM). They have also surveyed a platform called Quickscript. The Quickscript platform is used to develop natural language based IoT system. The nine different IoT-enabled designs discussed in this chapter are IoT-enabled bicycle called Mo-Bike, IoT-enabled house, IoT-enabled water utility, IoT-enabled mining, IoT-enabled healthcare, IoT-enabled frame buffer, IoT-enabled RAM, IoT-enabled key generator, and IoT-enabled wi-fi encoder. In cyber physical systems for water supply, researchers are able to integrate IPv6 addresses into sensors, actuators, and controllers used in water supply systems. The IPv6 address is integrating into every object available in the city so that researchers may track any object when need occurs. We may locate freely available IoT-enabled bicycles if we need to go anywhere, and we may also trace bicycles in case of theft by criminals.

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INTRODUCTION

In this chapter, we shall observe the enormous consequences of the internet on our lives. We are linked with so many things that are already having internet connectivity and play a vital role in our lives. As well as the Internet has gained space in our everyday work, and we are, in a way based on it. With the emergence of AI and the internet of things (IoT), the concept of incorporating smart elements/devices in our daily life is a reality now. We are more connected, secure and advanced than ever before. There are multiple possibilities of IoT enable design. Some of these are: IoT facilitates Bicycle, IoT facilitates Coffee Pot, IoT enables Bank, IoT enables Camera, IoT enables Cart, IoT enables House, IoT enables Light Bulb, IoT enables Water Utility, IoT facilitates Car, IoT enables Police Emergency, IoT enables Travel, IoT enables Frame Buffer, IoT enables RAM, IoT facilitates Key Generator, and IoT enables Wi-Fi Encoder. These possible IoT enable designs are shown in Fig. 1. Not only this there are endless possibilities by virtue of IoT can shape up our lives.

Now, the world is adopting the internet of things (IoT) and has a remarkable effect on our routine lifestyle, especially in Water Management Cyber-Physical System (Pandey et al., 2018). This chapter is motivated by the IoT concept and discusses a way through which electronic devices and other equipment will get an IPv6 address to become IoT enable electronic circuits of Frame Buffer (Musavi et al., 2015), RAM (Moudgil et al., 2015; Moudgil et al., 2015) and Encoder (Singh et al., 2015) and Key Generator (Kaur et al., 2014; Kumar, Pandey, & Das, 2013). The chapter will also discuss the hope and prospect to