

Chapter 9

Connecting One Belt One Road Countries via Wireless Sensor Network

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ABSTRACT

The economy of China grows rapidly due to the advent of wireless networks. The networks provide connection between nodes (sensors, gateways, systems, people, etc.) for data transmission and communication seamlessly. This is a crucial element to achieve sustainable economics. It is worth mentioning that wireless communication is the optimal solution compared with wired communication given the fact that China has a huge land area and the largest population in the world. Traditional wireless technologies like 4G, Bluetooth, ZigBee, ISA 100.11a, and WirelessHART have been well addressed in literature. In this chapter, the focus is moved to 5G, LoRa, IEEE 802.11 af, ah, ax, and ay. Selected applications health monitoring, toxic gas monitoring, connected target coverage problem, and mobile crowd sensing are discussed in detail. Geographic routing, wireless charging, and wireless coexistence are challenging issues that need to be addressed in the near future.

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INTRODUCTION

Everybody and object are interconnected via wireless communications seamlessly. It is crucial element because wired communication has restriction on connectivity. When it comes to China, the massive land mass creates fundamental challenge for wired communication (particularly fiber-optic communication). This is the reason for the largest number of mobile users in the world. The level of digital infrastructure construction of many countries along the Silk Road is relatively low, which provides big chance for mobile communication equipment, fixed-line broadband upgrades, data centre and cloud platform. In addition, the development level of each country's information industry varies so companies can implement a niche market strategy and expand the profit margin. China's telecommunications industry is relatively sound and capable of providing complete solutions and cost-effective products. It has enterprises with international competitiveness which can be a basis for enhancing international communications connectivity.

Every growing of data provides tremendous opportunities for data analytics. In doing so, different types of sensors must be utilized to collect the data continuously and has good streaming rate. The world has changed rapidly and it seems that existing wireless protocols cannot fulfil the entire requirement for desired applications, that's why many new protocols have been released or soon to be released and they have been addressed in this chapter. To realize the potential of evolving wireless sensor network technologies and software architectures we need to move away from traditional approaches towards an adaptable service oriented hybrid architecture, which should ideally run on the platform for wireless sensor devices, to minimize redundant protocol stack overhead.

One Belt One Road (OBOR) strategy is a key policy initiated by China. It targets on achieving innovation and social inclusive economic growth for sustainability (Visvizi, Lytras, Damiani, & Mathkour, 2018). A key characteristic in China (and many underdeveloped countries) has numerous villages (rural areas) and are migrating towards main cities. Smart villages and cities services have gained attention not only increase people's quality of life bringing but also facilitating foreign business (Lytras, & Visvizi, 2018; Visvizi, & Lytras, 2018).

The contribution of the chapter is (i) an up-to-date state-of-the-art is presented in the field of emerging wireless standards as the supporting elements of fast and reliable data transmission; (ii) key applications are discussed which are hot research topics; and (iii) challenges are highlighted as future research work to build sustainable OBOR network.

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