Chapter 5
Framework and Structure of Smart Cities

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ABSTRACT

This chapter introduces the core part of the smart cities technology reference model. From the perspective of the overall construction of urban informatization, this chapter puts forward five levels of elements and three support systems. The upper layer of horizontal level elements has a dependency on its lower layer, and the lower layer serves the upper layer. Each layer completes its own functions, and the layers cooperate with each other to improve the overall efficiency; the vertical support system has constraints on the five horizontal level elements, standardizing the information interaction between layers and promoting the overall development of the model.
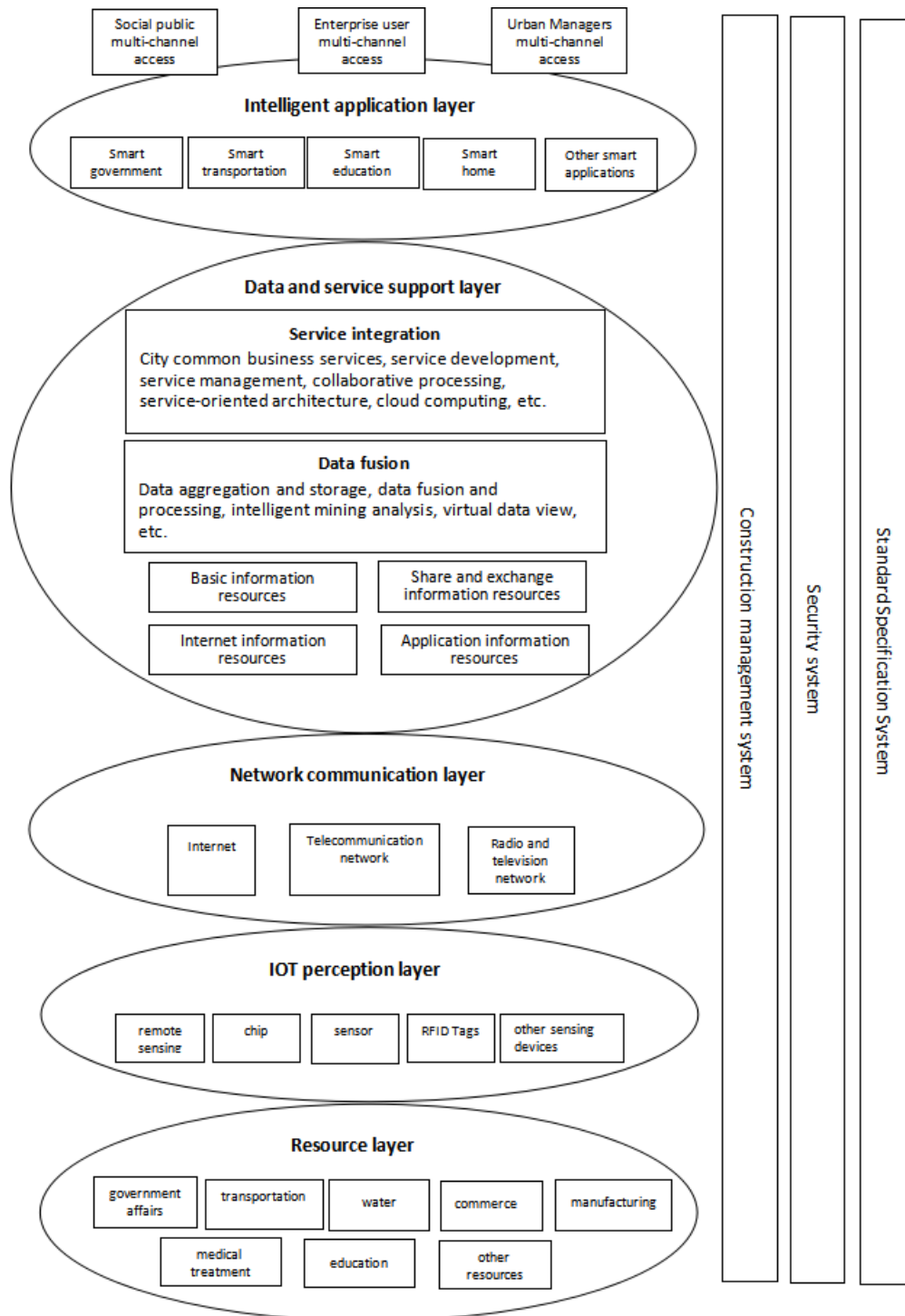
A smart city, originated in the field of media, refers to a municipality using various information technologies or innovative concepts to open up and integrate urban systems and services, so as to improve the efficiency of resource utilization, optimize urban management and services, and improve the quality of life of citizens (Abdoullaev, 2011). A smart city fully uses a new generation of information technology in all walks of life in the city. Based on the next generation of innovation (Innovation 2.0) in the knowledge society, it is an advanced form of urban informatization. To deepen the integration of informatization, industrialization and urbanization is helpful to alleviate the "big city disease", improve the quality of urbanization, realize fine and dynamic management, and improve the effectiveness of urban management and people's livelihood quality (Caragliu, Del Bo, & Nijkamp, 2011).

The hierarchical structure of smart cities is based on the Internet of things (Zang, Li, & Wei, 2018), which is divided into five layers: resource layer, perception layer, network layer, platform layer, and application layer. The frame structure (China Urban Science Research Association, 2013) is shown in the figure below.

Figure 1. Framework and structure of smart cities

Social public multi-channel access

Enterprise user multi-channel access

Urban Managers multi-channel access

Intelligent application layer

Smart government

Smart transportation

Smart education

Smart home

Other smart applications

Data and service support layer

Service integration
City common business services, service development, service management, collaborative processing, service-oriented architecture, cloud computing, etc.

Data fusion
Data aggregation and storage, data fusion and processing, intelligent mining analysis, virtual data view, etc.

Basic information resources

Share and exchange information resources

Internet information resources

Application information resources

Network communication layer

Internet

Telecommunication network

Radio and television network

IOT perception layer

remote sensing

chip

sensor

RFID Tags

other sensing devices

Resource layer

government affairs

transportation

water

commerce

manufacturing

medical treatment

education

other resources

Construction management system

Security system

Standard Specification System

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