Smart City Implementation Models Based on IoT Technology

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Abstract: *IoT (Internet of Things) is the network of physical objects-devices, vehicles, buildings and other items embedded with electronics, software, sensors, and network connectivity-that enables these objects to collect and exchange data. The internet of things allows objects to be sensed and controlled remotely across existing network infrastructure[1]. According to the Gartner, 260 million objects will be connected by year 2020. Several companies and governments have tried to make references with IoT in initial times, but nowadays in manufacturing, retail and SOC (Social Overhead Capital) industries, successful best practices are built recently. In this paper I summarized tangible IoT based service models which are helpful to academic and industrial world to understand IoT business.*

Keywords: IoT, Internet of Things, Smart city, Creative economy, Sensor, Business model

1. Introduction

In this paper, the definition, status, components, and standards of IoT (Internet of Things) are introduced, and possible business models that can implement IoT in a smart city are examined. There are many research data on IoT in Korea, and IoT case studies have been conducted in other countries as well. However, there were few studies on IoT business models that were directly applicable to national and regional development in Korea. This study was conducted to present practical service models using IoT in line with domestic circumstances, and, thereby, it is expected to contribute to academic circles and related industries.

2. IoT

2.1 Definition of IoT

The rapid development of information technology (IT) has brought forward a hyper connected society in which objects are connected to mobile devices and the Internet and communicate with one another [2]. In the 21st century, we want to be connected with anything anytime and anywhere, which is already happening in various places around the world. The core component of this hyper connected society is IoT, which is also referred to as Machine to Machine (M2M) communication or Internet of Everything (IoE).

## 3. Smart City Implementation Models based on IoT

Recently, many local governments have been aiming to implement an IoT-based smart city through the construction of a test bed for IoT verification and an integrated infrastructure [4]. This movement also corresponds to the creative economy that is emphasized by the Korean government. In this chapter, smart city implementation models based on IoT that can be implemented by local governments are described through examples.

3.1 Smart Traffic Service

1) Service Outline
Major smart traffic services include smart parking services to prevent illegal parking and facilitate convenient parking [5], citizen participation-oriented illegal parking prevention services, and smart safe crosswalk services. Smart parking refers to the construction of a platform that enables real-time checking of available space and parking prices in areas that require parking and facilitation of reservation/payment through Web and mobile connections. The citizen participation-oriented illegal parking prevention service is an improvement of the illegal parking crackdown system of the traffic authority by allowing citizens (including victims of illegal parking) to conveniently report such violations through their smartphones. Furthermore, the smart safe crosswalk service can contribute to the prevention of pedestrian accidents and secondary car accidents by detecting pedestrians in children protection zones, and alerting pedestrians and approaching vehicles through electronic display boards.

2) Service Diagram
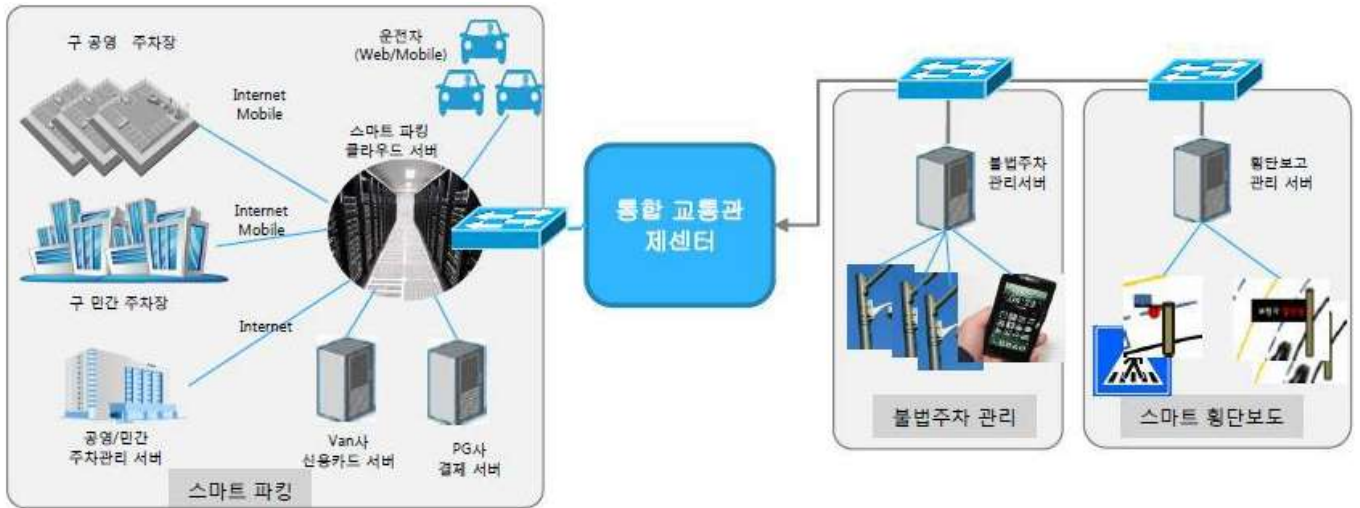
**Figure 1:** Smart Traffic Service Diagram

3.2 Smart Education Service

1) Service Outline

This service provides real-time, interactive high-definition lectures that feel like face-to-face meetings at home through high-definition (HD) services and wide-area Internet infrastructure. Instructors participate in the lectures by using equipment in private educational institutes or separate places, and even foreign language teachers in other countries can access this service through the Internet.

2) Service Diagram
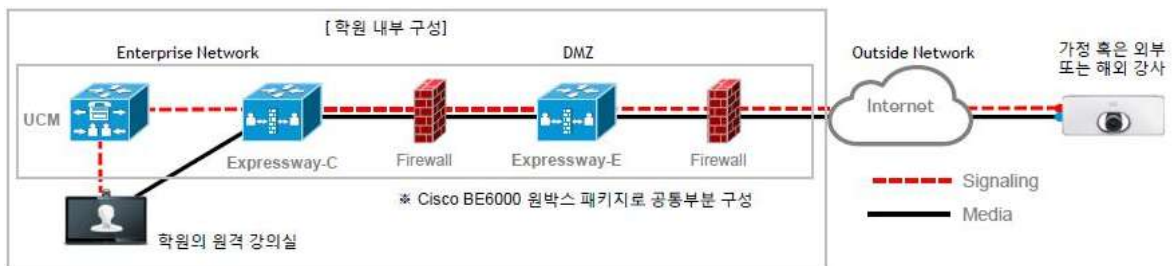
Figure 2: Smart Education Service Diagram

4. 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. A limitation of this study, however, is the lack of available data in Korea that hinders the required empirical analysis on the benefits of IoT technology. We hope that more research in this field will be conducted in the future.

References

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