Demo Abstract: Open sensor network interface for U-City service platform

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1 Introduction

U-City is a city where diverse public information is provided through IT technology. In the past, IT infrastructure for public information was not considered in city planning. However, in recent construction of new cities, this kind of infrastructure is becoming necessary. Safety, transportation, and weather information are gathered and provided to residents through the Internet, mobile devices, etc [1]. To provide this kind of information, local governments operates U-City control center, and there is an issue of increased operating cost of the city. To solve this problem, U-City business platform is designed which can incorporate diverse commercial services. Different from public information platform, a private sector can participate and provide services. This work suggests Business Service Platform (BSP) system structure where USN-based services can be provided in U-City business platform. Then, USN-based service applications are introduced on U-City platform. Business Service Platform (BSP) is a service platform of U-City for services in a private sector, and provides overall functionalities required for the creation, distribution, and billing. A service provider for U-City can develop a new application using BSP. It can also register, distribute, and handle billing using functionalities of BSP. BSP started with a target advertisement service related to public transportation information as its initial service, however USN technology in diverse areas are expected to be applied to BSP in the future. To apply such diverse USN to BSP, a general framework should be provided to integrate USN, and a system is needed that each service provider can control. In this demo, we will explain U-City service platform, which will be deployed at CHEONGRA zone of Korea, and how it is integrated to USN to provide healthcare, smart grid services, and finally major system components.

2 Business service platform for U-City

BSP provides components required for commercial services in U-City: U-service portal, U-service management, service development. It also provides BSP Open API for a development environment. BSP contains necessary core services, which are essential for developing commercial services. For example, USN, message, voice, contents trans-
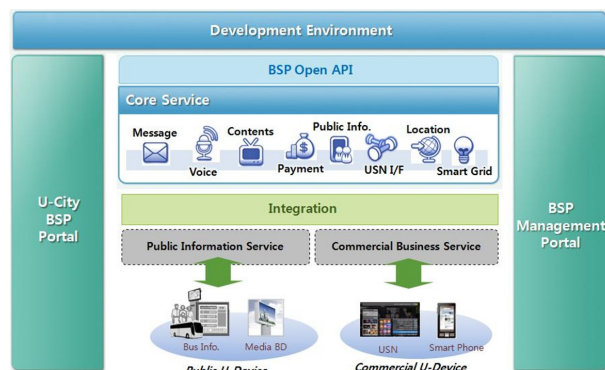
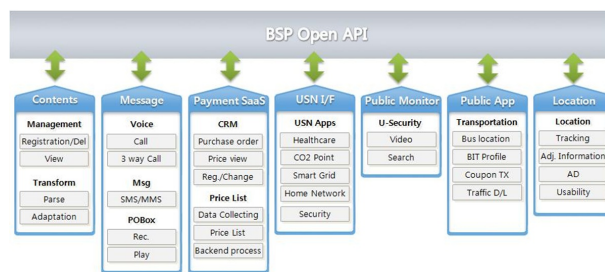**Figure 1. U-City Business Service Platform**

Figure 2. BSP functions

form, payment, location information can be used in a service using BSP Open API. By providing these core basic API, BSP supports commercialization of services in a private sector.

3 Healthcare, energy service application

In U-City, healthcare and smart grid services have to be linked to hardware like a smart phone and a USN, and also to the service area like a hospital and a restaurant. For this, BSP provides interfaces through which diverse u-devices can be linked to a service provider. In the case of healthcare, using U-Table, recommendation service is provided with a menu customized for a user. BSP also provides a functionality to report to a government when an abnormal event like food poisoning happens. In the case of smart grid, using U-Plug, a service can be provided integrating energy usage monitoring of a user and information about CO2 point. In healthcare
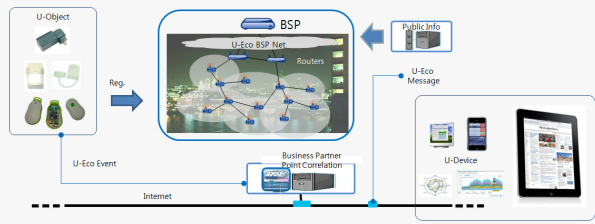
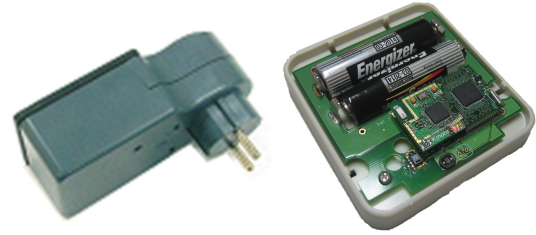**Figure 3. USN application based on U-City platform**

Figure 4. U-Table healthcare with BIS application

Figure 5. Wireless sensor devices

the amount of electricity usage and CO2 point, to residents. U-Plug hardware is integrated into this service.

6   References

[1] U-eco city project, http://www.ueco.or.kr, 2010.

and smart grid, USN is used as a way to connect services to U-Table and U-Plug, and expands the scope physical information of U-City services.

4   Demo scenario

The demo system runs three U-City services related to the public information of BSP: U-BISAD, U-Healthcare, U-Plug. In the framework of these three services, we demonstrate the integration of USN and the possibility of USN services in U-City platform and easy and intuitive network formation process using a USN router node with LCD display. Then we will demonstrate that the performance of wireless communication of a sensor node can be improved. The demo system is composed of a server, a bridge node, a router node, and a sensor node. The bridge node is composed of hardware TCP/IP converter, Kmote based TinyOS, and maintains a socket tunnel to a U-City server. The router node displays the status of currently formed network on a color LCD. The low-power sensor node, using diverse kinds of sensors, multiple heterogeneous sensor data can be merged into a single data stream of a single network. This USN infrastructure support scalable diverse wireless sensor applications, thus U-City server can support multi-WSN services. U-BISAD is a target advertisement service along the route of a public transportation, in this case, a bus. U-healthcare provides a menu customized by the health status of a user, and the services is integrated with U-Table. U-Plug provides information about