Plug and Play SensorApp Service Scenarios

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Abstract— Smart devices including smartphones are spreading rapidly. Smart people having smart devices want to use smartly. In order to do this, they try to experience after searching and downloading, installing a variety of APPs. These efforts are unnecessary and a waste of time and results in making them unwisely. Now you do not have to search the required APP. Our scenario tells you the useful APP. For example, let’s assume a case where you purchased a smart appliance. You will receive the app for advertising and introducing smart appliances into the store. If you download and install it, you can understand about the product you’re using this app. After buying a smart appliance, you will install and receive exclusive apps for smart appliance control works. This is just a Plug and Play SensorApp Service.

Keywords— IoT, Smart Device, Sensor, App, Uploading

I. INTRODUCTION

This paper introduces a Plug and Play SensorAPP service scenario using open APIs of SVM(Sensor Virtual Machine). In computing, a Plug and Play device means that facilitates the discovery of a hardware component in a system without the need for physical device configuration or user intervention in resolving resource conflicts [1]. Plug and Play SensorApp service, without the need for configuration or user intervention of the physical device, it can be defined as a service to facilitate the discovery of the application.

Our research direction is the direction of the light sensor network configuration between the sensor nodes were in progress at the existing sensor networks, sensing data transfer between the sensor nodes participating in sensor networks, sensing data acquisition and sensor through a gateway/actuator control technologies are differentiated. The sensor device is advanced smart device constituting the sensor network, a technology that can utilize freely smart terminal.

In the performance of the service to utilize to personalize the interior and exterior of the smart sensor device terminal, applications for smart devices that interact with sensor nodes can be varied widely depending on the service, and to take advantage of the sensing device. This characteristic may be a simple sensing information delivery application in accordance with the service, the application may be to control the sensor device, when applied to the place or the space may be an application that manages the space [2]. Such a function to support personalization of external physical sensor is referred to as SVM[3].

SVM proposes the direct connection type between smart devices and sensor nodes that is a type using embedded network interface in the smart device and the sensor node is a way to enable direct communication.

Figure 1. Direct Communication between the smart device and the sensor node

Figure 1 shows the direct communication type using wired USB and wireless types, Bluetooth, NFC(Near Field Communication), IEEE802.15.4.

II. PLUG AND PLAY SENSORAPP UPLOADING CONCEPT

In performing the service to utilize to personalize the sensor node installed in and out of the smart device, applications for smart devices that interact with sensor nodes can be varied and a wide range depending on the type of service to take advantage of the sensing device. Depending on the service characteristics of a simple sensing and communication applications might be, when applied to the application or the location or area to control the sensor node can be an application managing the space.

A service is made by a study on how to create a new service by combining a variety of sensors are becoming more diverse. Therefore, there is a need technology that provides a wide range of applications as appropriate when you need a wide range of services to the users of smart devices.

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Figure 2. Example of an air conditioning control system

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An example of a service that applies to a place or space, a smart terminal position in the mall is able to run the application, which passes the location information, store information, such as discount information in the shopping mall.

By combining the various sensors by the studies on how to create a new service is made, the service is becoming more diverse, indicating the time required for proper application in a variety of applications as a variety of services to users of the smart device technology is needed.

The P&P SensorAPP Uploading module may provide a way to be driven by receiving the application through a personalized external sensor on the user’s smart device. It provides the application uploading process using SVM APIs to the smart device from external sensor nodes. To automatically download and install the SensorAPP from the sensor node, the smart device is able to search Sensor app profiles.

Without having to retrieve information about the application to be required in the space where the user is located in advance, it can be easily transmitted to the time required.

A. Messages between a smart device and a sensor node

Referring to Figure 3, a communication connection between a smart device and a sensor node can then check the transmission process of the application program. On smart devices driven application transmission system, a smart device sends a request message, the configuration shows the sensor node sends a response message.

A SensorProfile message and a SensorApp message are used. Profile message includes information of Sensor Application program such as name, version, stored position, network interface type, etc.

If a SensorApp is stored in the memory location of the sensor node, a SensorApp Request message is used. The sensor node received the SensorApp Request message transmits a SensorApp file stored in the memory as a Response message. If a SensorApp is stored on the internet, the smart device can the smart device finally had to load the SensorApp. Then, it can install, run and enjoy that.

B. Sensor node hardware

Figure 4 is a photograph of the sensor node to perform these functions. The sensor node has a communication module for connecting the smart device. The communication module is in the form that can be selected in view of the operational characteristics. All communication module used in the test is a commercial product. We were making a board to be operated by the sensor node. And the sensor node is equipped with a memory to store information of SensorApp and a SensorApp file. This arrangement can offer greater convenience to a user who wants to make a sensor node. After just copy the SensorApp in memory and you are asked to turn on it[4].

Figure 3. Message procedure for Smart device driven system

Figure 4. Sensor node HW
C. Development smart device

After connecting to the sensor node, the smart device requests a profile message. It analyses the profile message to determine the SensorApp information. If a SensorApp is stored in the memory location of the sensor node, send a request message to sensor node. And then, it receives fragmented SensorApp messages, stores a file after defragmentation and installs that. This process provides a convenient to design and implement the service scenario.

III. SERVICE SCENARIOS

We propose a few service scenarios that can be applied to the P & P SensorApp Uploading.

A. How to start Smart Appliances

You can buy the product like as a smart TV, a smart cleaner, a smart refrigerator from Mart and electronics stores. Smart products purchased may be equipped with an application sensor. This application sensor is working to deliver a profile of SensorApp. The smart device user may receive a profile of SensorApp from the connected application sensor.

This SensorApp may be a program for smart product. For example, if it is a smart TV, it may be a remote controller for a smart TV.

Figure 6 represents the operation of the smart device applying this scenario.

B. When the smart device user enters the new space

When the smart device user enters the new space, one of Sensor nodes in that area informs the application that can be used in its place.

Figure 7 is a view showing a shopping information service application of the P&P SensorApp concept. The smart device user enters a mall. The user can request the transfer of the application to the sensor node based on the obtained profile.

Sensor nodes can transmit the SensorApp to smart device. The SensorApp may be a program necessary to the user who enters the store. For example, a mall indicating the location of a store in the mall neighbor Maps app, discounts or sales of stores information about social commerce apps and shopping malls that offer coupons may include at least one of the apps that provide.

IV. CONCLUSIONS

So far, by receiving a useful executable application through the sensor node on the user's personalized smart device we investigated a way to drive. According to the method described in this paper is passed to the appropriate application received regardless of time and place for collecting the surrounding information, and may control a peripheral device. Further, without having to search for information about the application is required in the space where the user is located in advance, it can be easily transmitted to the time required.

Two service scenarios are described in the examples. These may contain the functionality of the smart device and the sensor node. It will be applied to identify the various possible service scenarios.

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REFERENCES

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