Design and Implementation of User-Created Information Systems with Mobile RFID

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Abstract. RFID (Radio Frequency Identification) has been usually applied at physical distribution field. The Mobile RFID can be the only technology that we can lead the market. In our country, ETRI standardizes MOBION (MOBILE Identification ON), and the mobile-telecommunication companies provide the trial-mobile RFID service from 2006. In the trial-mobile RFID services, the Broker model is used to decode the mobile RFID code. However, the Broker model has some problems, such as communication overhead caused by the frequent ODS query, service performance, and various services for users. In this paper, we developed device application that is capable for filtering unrelated code from RFID service to improve the decoding performance. We also improve the performance through simplifying connection process between device application and the broker. Finally, we propose and develop the user-created information system to widely distribute the Mobile RFID service.

Keywords: mobile RFID, dongle RFID reader, user-created information system.

1 Introduction

RFID (Radio Frequency Identification) has been usually applied at physical distribution field. A mobile RFID service provides useful information to users with the cell-phone, in which RFID reader is attached or embedded. Although the developed countries dominate most of the RFID technologies, the Mobile RFID can be the only technology that we can lead the market. In our country, ETRI standardizes MOBION (MOBILE Identification ON), and the mobile-telecommunication companies provide the trial-mobile RFID service with the reader embedded mobile devices[1][2][3].

A mobile service model can be classified based on the existence of the decoding broker. If the broker is included in a model, the model is called Broker model, and the contrary is Basic model. In the trial-mobile RFID services, the Broker model is used. The model easily reflects the revised standard through only modifying the broker, not the application, because the device does not query to the ODS (Object Directory

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Service)[4][5]. The code converting and interaction with ODS are not implemented in the relatively low-capacity mobile device, but in the broker. Because of this implementation, the overhead in the mobile devices can degrade and traffic and transactions can be controllable[6][7][8][9]. Thereby, the trial service is selected to improve more stable services. However, to widely distribute the RFID service, some problems, such as communication overhead caused by the frequent ODS query, service performance, and various services for users, need to be addressed.

In this paper, we developed device application that is capable for filtering unrelated code from RFID service to improve the decoding performance. Through the definition of the packet format between device application and Broker, We also implement broker application to directly transfer service data. Finally, we propose and develop the user-created information system, in which users can create and update information by themselves, based on the convergence of the UCC (User Created Contents) paradigm to the Mobile RFID technology.

2 Paper Preparation

As mentioned above, the mobile RFID service model can be classified by whether the broker is included or not. The basic model can get the URLs through direct interaction between mobile device and ODS. The minor aspects of the model are to make device application more complex, and the model also requires the modification of application when the standard is renewed or revised because the communication traffic might occur in the low-performance device[10]. Therefore, the trial-mobile RFID service is based on the broker model in which the Broker is located between devices and ODS. A device can demand decoding only by communicating with the Broker. Once the socket connection between the Broker and devices is established, the broker is responsible for data transmission, traffic management and decoding through interaction with the ODS[11][12][13][15][16].

![Broker model](image-url)