

Two-Way Preference-Based Information Service in Ubiquitous Environment

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Abstract. We propose two ways of information service in ubiquitous environment which are in shop service and at home service. In shop service is a live recommendation in shop, based on short term preference. Short term has a temporary structure that can be performed implicitly by observing the customer's behavior and situational information. At home service is a service after the customer has already finished shopping, based on long term preference and favorite reason. Long term preference generally holds user preference and does not depend on situations. Furthermore, we also propose implementation overview of these two services.

Keywords: information service, mobile service, preference based, ubiquitous.

1 Introduction

The evolution and pervasion of technology such as cellular phone, PDA and the progress of research on the ubiquitous information environment, have caused the environment as a hardware/software system that can provide anytime and anywhere services to be being in place. Especially, users have special interests in some products, they need more time for thinking and searching more details about those products for making decision. However, we have been studying about related researches. There have been several studies on mobile with camera-phone and record interesting products with QR-code or tags. For example, mobile life memo[3], visual tag-based service[2]. Mobile life memo is a recommendation service that perform when the user memorize interesting product by himself with camera-phone. Then, the system can recommend related products to the user. In addition, visual tag-based service studies about camera-phones to recognize visual tag-based service that can apply use such as theme park virtual queuing system.

The study presented in this paper addresses this information service. More specifically we propose information service that does not require any extra time or effort from the user. This service is two ways of information service in ubiquitous environment which are in shop service and at home service.

In shop service is based on short term preference. Short term has a temporary structure that can be performed implicitly by observing the user's behavior and situational information.

At home service is based on long term preference and favorite reason. Long term preference generally holds user preference and does not depend on situations. Favorite reason is an important data that can be collected by user’s rate item and comment. This study considers the characteristics of user’s preference focus on “short term preference”, “long term preference” and “favorite reason”.

2 Motivation

A lot of people have ever been in this situation, when we go to shop and find several interesting items, then you can not make a decision. You have been trying to think with consideration of those details i.e. specification, brand and price. However, we still need more time to decide. It would be helpful if we could have a system which can provide more information on those interesting items to home, then we can have more time to make a decision. To solve this problem, this study proposes two-way preference-based information service which in shop service and at home service. In shop service is a recommendation service in ubiquitous environment while at home service is a service outside the shop to recommend pleased product and give more information to help the customer make decision. In addition, the shop has to ask some question about reason and user’s background interests for create user’s model in next time.

3 System Framework

In this section, we show system framework (Fig.1) including explain system structure and process.

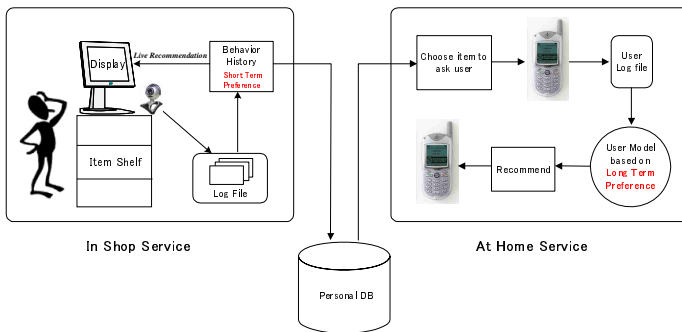


Fig. 1. Overview of two ways information service

1. In shop service: based on short-term preference

In shop service is a live recommendation in the shop. The monitor on shelf shows live information based on temporary preference that calls short-term preference. The

service performs immediately and shortly while the customer stays in shop. We describe system process as follows:

1. When the customer comes in to shop, checks a member with RFID reader. If customer is non-member, system automatically registers for temporary member and record temporary preference (behavior history).
2. The customer walks around the shop for shopping. He/she see, touch, selects items. The ubiquitous environment which has cameras around the shop automatically records customer's data in log file.
3. Instantly, the system performs recommendation based on temporary preference from log file. The customer can see interests item information from the monitor on the shelf near he/she position.

2. At home service: based on long-term preference

After the customer has already finished shopping already, the shop's system has implicit recorded the customer's profile, preference and interested items. The system processes and analyzes the top of interested items and recommends to the customer by e-mail via cellular phone or PC.

At the same time the system will also ask the reasons on interest in those items. Once customer replies answer, then the system will continuously create user's model. We can describe system process as follows:

1. After the customer has already finished shopping, shop's system automatically creates e-mail about the top of interested items and sends to the customer.
2. The customer replies answers which are reason and comment about interested item to shop's system.
3. The shop's system collects customer's answer from various items. This data collects into system server where can analyze to continually create user's model.

4 Implementation Overview

In this section, we focus on implementation overview of in shop service and at home service.



Fig. 2. In shop service

(1) In shop service: We have built a 30 square meter room as a shop with ubiquitous environment which has cameras around shop (Fig.2). The shelf of items has a monitor on the top for live recommendation including a camera near item's position for recording customer activities to log file.

(2) At home service: User interface have been developed for cellular phone (Fig.3). We prepare web application server for recommend message to the customers. The system communicates with all users via Java mail. The implementation overview is shown in Fig.2 and Fig.3



Fig. 3. At home service

5 Concluding Remarks

In this paper we have proposed: 1) in shop service has been developing for live recommendation in ubiquitous environment which this study considers the cameras. 2) at home service has analyzed the top of interested items and recommends to the customer including ask for reasons on interesting in those items. These reasons are useful information for developing next user's model.

3) implementation overview has shown our shop with items and camera. Moreover, user interface has been prepared for recommendation by e-mail via cellular phone.

We are developing smart algorithm to create user's model. We will continuously develop and implement the system for evaluate this proposed service.

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