Implementaion of Personalization Service based on Mobile Web Service Platform

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Abstract. In this paper, we try to suggest a candidate personalization service architecture for future mobile services. We tried to design the framework and to find the required software modules for a mobile personalization service, which is related with context-aware processing and user-preference information. And, we are implementing and testing the prototype system, and finding better soultion to deploy personalization on mobile terminal.

1 Introduction

Many kinds of wireless internet service are already popular to mobile user. The system consists of mobile terminal, gateway, web server and network. From current wireless internet service, new kinds of mobile web service are now emerging with intelligent semantic web server as well as web service. To comply with these kind of service, it also demands new service architecture. Semantic and Web service technologies are possible to provide personalized and customized services to mobile users. Fig. 1 shows architecture framework for next generation mobile personalization services. This framework is our testbed environment.

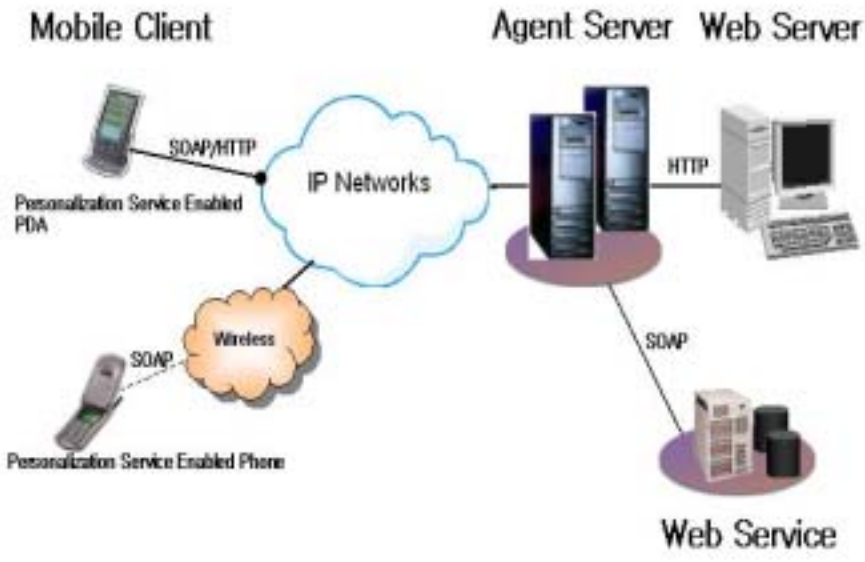

Fig. 1. Proposed Framework for mobile internet personalization service

1.1 Considerations of research

To provide personalization service, we need to review many kinds of technical aspects. The first, because of movement of user, personalization service needs to consider the location based information and user's context, i.e, mobile terminal or time schedule, etc. The second, we need to have the solution to understanding mechanism for user context. For this, database is needed to allow to access with user information. The third, we need to build to modeling the knowledge having reflected on user requirements. The fourth, current system is approached on thin client based terminal capacities which the mobile client has the minimum roles in functions. The last, there are conflicts of integration between server systems and server agents are not yet standardized on market world. Until now, even though many considerations are not resolved, mobile web service applications are studied for the achieving the goals of service automation, intelligence and personalization. Among them, we now will focus on personalization area.

Our personalization approach is based on context-ware based. Context-aware optimization and modeling is the growing issue for mobile web service[1,2,3]. And research needs context based optimization technology to support intelligent mobile web service. For current web-based services are rapidly working with mobile services. Both personalized and agile services, especially in mobile-web services, demand promptness of service by collaboration of context optimization. Therefore, context-aware optimization research that is based on multiple ontology may be applied for mobile customization.

2 Mobile Personalization Service System

The Proposal framework for context aware mobile service is shown in Fig. 2. The first two architectures are in similar to the concept of that adopted in standardization body. The last figure is our new architecture and it is now currently implementing at laboratory level, which would be candidate system for the next generation mobile framework supporting with context aware service.

As shown in Fig. 2, six levels of layers are traditional architecture on first, second figure. There are application layer, content layer, service layer, platform layer, communication layer and operating system layer. From this layer, we can put some new layer to that layer. The additional layer is personalized application, semantic content processing and context-aware service layer. These are new functions for the supporting the personalized service than that of traditional services.

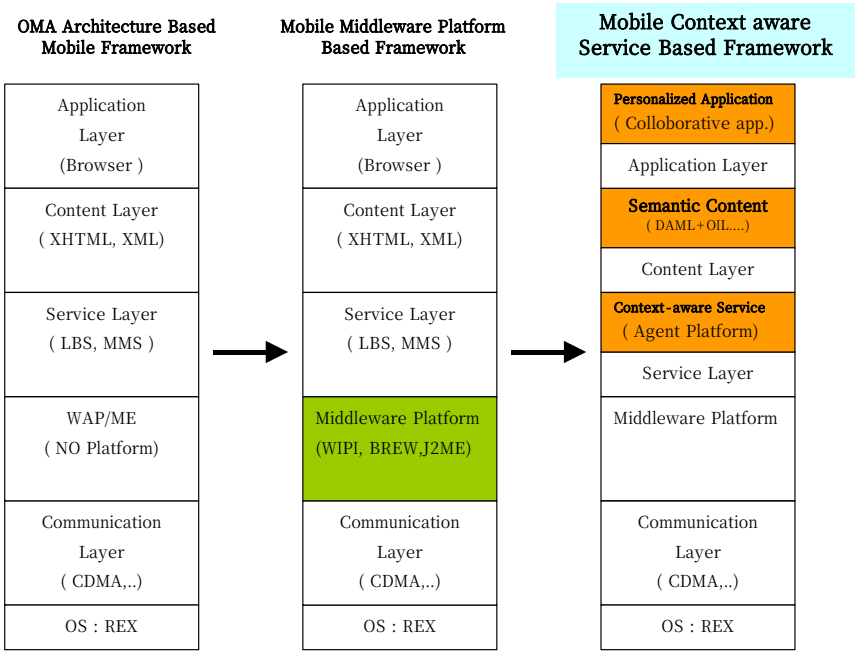

Fig. 2. Comparison for each Framework methods

2.1 System Framework

As shown in Fig. 3, our framework has five primary components: ontology, web service, mobile optimizing user agent (UA), mobile optimizing task specific agent (TSA) and context-aware multi-agent system (MAS).

A customer connects to a server by using a mobile device to access the UA. The UA provides information to the customer from the user ontology, which provides the user's personal information such as profile and preferences, and sends a request message to the TSA.

The TSA performs a request action to support corresponding service, according to optimization models executed by the Model Base Management System (MBMS). These optimization models are located in the model base, and are created by context-model matching rule base along with the model base.

A web service needs three kinds of server systems for the context-aware optimization: a general web server, a MAS embedded application server, and SOAP protocol-based semantic web servers.

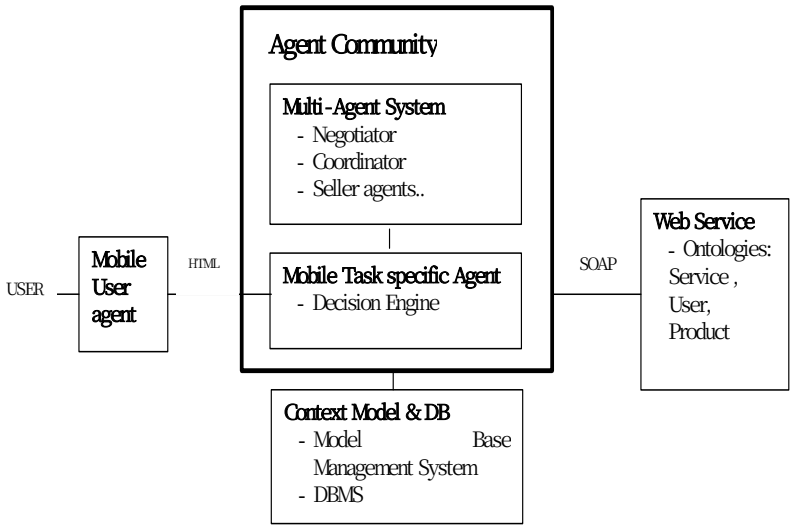

Fig. 3. Architecture of proposed System

The web server plays an important role in the CAMA-myOpt system. CAMA-my-Opt contains a decision engine in the M-optimization task specific agent (MSA) to provide accurate decision results to the customer. It also connects with MAS subsystems in agent communities. If the UA retrieves the user preferences, the decision-making engine will send the information to a negotiator on behalf of the UA, which is located in the agent community.

3 Testbed environment

Our Testbed environment is shown firgure 4. User ontology, product ontology, and service ontology are implemented with DAML + OIL, based on XML. The ontology is accessed and interpreted with Jena API. Agents are implemented with JATLite on top of JDK version 1.4.1. Communication between the UA and the client is expressed with Java Servlet Pages (JSP). Through the agent communication language (ACL), KQML, CAMA-my-Opt implements the negotiator's communication with both seller agents and the coordinator. The TSA's active environment is implemented through an Apache SOAP server, a web service communication that exists outside of the server and agent community. Information repositories such as a model base and database are implemented with Microsoft Access® 2000.

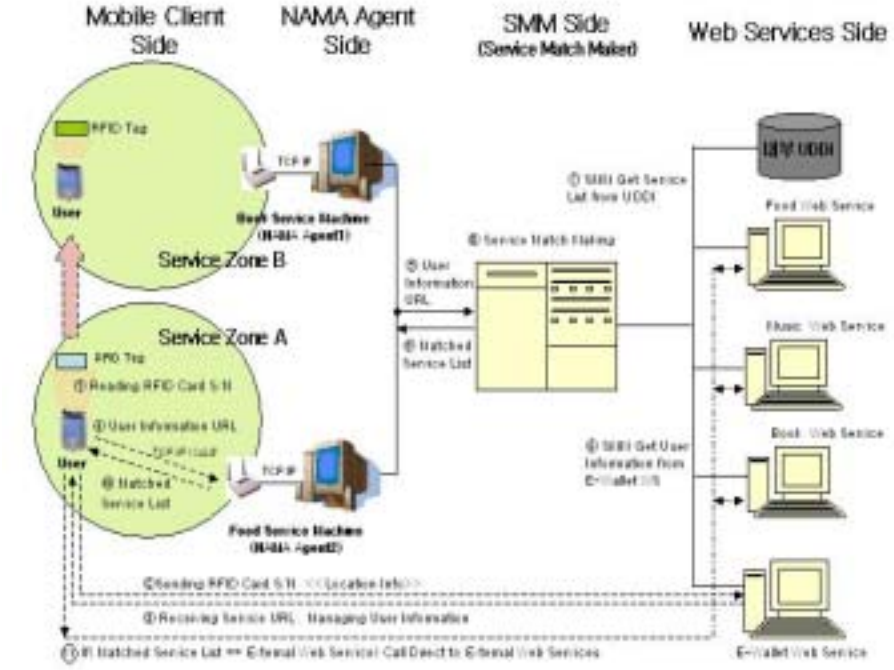

Fig. 4. Testbed System for mobile personalization service

References

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