

A Framework for Task Retrieval in Task-Oriented Service Navigation System

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Abstract. Mobile access to the Internet is increasing drastically, and this is raising the importance of information retrieval via mobile units. We have developed a task-oriented service navigation system[6] that allows a user to find the mobile contents desired from the viewpoint of the task that the user wants to do. However, the user is still faced with the problem of having to select the most appropriate task from among the vast number of task candidates; this is difficult due to the fact that mobile devices have several limitations such as small displays and poor input methods. This paper tackles this issue by proposing a framework for retrieving only those tasks that suit the abstraction level of the user's intention. If the user has settled on a specific object, the abstraction level is concrete, and tasks related to the handling of the specific object are selected; if not, tasks related to general objects are selected. Finally, we introduce two task retrieval applications that realize the proposed framework. By using this framework, we can reduce the number of retrieved tasks irrelevant to the user; simulations show that roughly 30% fewer tasks are displayed to the user as retrieval results.

1 Introduction

The mobile Internet web is expanding drastically from various viewpoints, such as the number of subscribers and the volume of mobile contents[1][2]. i-mode, which is NTT DoCoMo's mobile Internet access service and also a trademark and service mark owned by NTT DoCoMo, is one of the most successful mobile service in the world[3], with over 44 million subscribers and counting[4]. i-mode users can access more than 4,800 approved (by NTT DoCoMo) sites dedicated for i-mode users and over 85,000 independent sites specifically designed for the use by i-mode handset[5]. As the mobile Internet gains in popularity, information retrieval through the mobile web must be made easier and more efficient.

We have developed a task-oriented service navigation system[6] that allows a user to find the mobile contents desired from the viewpoint of what user wants to do. For this system, we modeled the mobile user's daily activities as user tasks and associated those tasks with relevant mobile services that assist the user's activities. Tasks are categorized according to the concept of places, called domains in the task-model, where each task is likely to be performed. This is

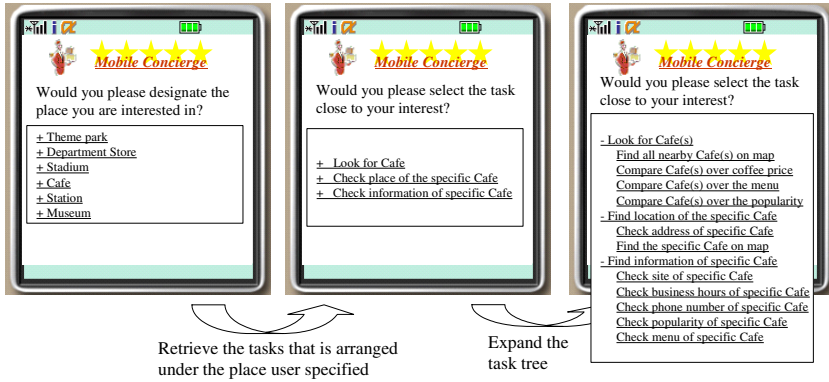


Fig. 1. Simulation view of task-oriented service navigation system

efficient because a mobile service is used most often outside the home. At first, a user selects the place user is interested in. Next, the task list for the selected place is retrieved and sent to the mobile device. An example is given in Fig.1. If the user wants to drink coffee, when in an unfamiliar location, the user selects Cafe domain, and the tasks associated with Cafe domain are shown. The user is shown tasks related to cafes and selects the most appropriate task. The task-model consists of multiple layers, and the user can uncover deeper layers by clicking a task node on the display. After selecting a task, the user is provided with a list of contents whose functions are relevant to the selected task. The task-oriented approach, which arranges the mobile contents according to the function of the contents instead of the name of service category, allows the user to find the service desired by selecting the task that uauer wants to do.

A remaining problem is that the user must select the most appropriate task from the vast number of task candidates displayed. Unfortunately, current devices have several limitations such as small displays and poor I/O operations. This paper tackles this issue by proposing a framework for retrieving tasks and forming a task list that suits the user’s intention. The problem of forming the items of the menu list to suit the user’s intention has been tackled in the field of personalizing mobile sites.

1.1 Past Approaches to Personalizing Mobile Sites

Most prior research takes the approach of utilizing the user’s profile or usage history to arrange the contents of a web site to suit the user’s intention. Corin et al. proposed the “Web site personalizer”, which can make frequently visited destinations easier to find by making the anchor text bold face[7]. It also highlights a link that interests the visitor, and elides uninteresting links based on the usage history. Christoforos et al. proposed “mPERSONA”, a personalized mobile portal[8]. mPERSONA transforms the content provider’s Metadata Tree, which is the semantic structure of the content of the provider’s site, into the user’s