u-Community Manager based on Social Networks for User-Centric Community in USS

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I. INTRODUCTION

IN the ubiquitous computing environment, users can be provided with convenient services by widespread computing resources in their daily life. In order to do this, the technology is required which groups environmental computing resources into collaborative organizations efficiently. To support collaboration among multiple users and services, community computing concept is popular research area. In case of existing related works, they mainly support compositions of only one kind of member types in the ubiquitous computing environment. They cannot provide social networks models which are applicable to relations on same or different smart objects types [1]. In this paper, to make up for the weak points in existing researches, we propose u-Community Manager which supports various community constituent elements using context information. It extracts interrelated community members by social relationships among smart objects. The proposed u-Community Manager can reconfigure community dynamically by smart objects' behavior changes. We can experience an advantage of ubiquitous smart space which build collaborative environment, and interact with various smart objects easily, using proposed u-Community Manager.

II. U-COMMUNITY MANAGER

A. User-Centric Community

In this paper, we re-define a community be appropriate for ubiquitous smart space. User centric community's goal is intention or interest of users who are main body in ubiquitous computing environment. Its creation, maintenance and extinction are determined by the subject user's behavior. Community contains users or user groups located in the environment, devices which executed to achieve user's intention, services, and contents as members. It is a particular feature of user centric community. In other words, user centric community is a virtual collaborative collection consisting of users and smart objects to achieve the user's interest. In our point of view, users with mobile device are special case of smart object. Figure 1 shows an example of user centric

community. There are multiple communities and its subject is the user. It can include smart objects into community members, for example, virtual characters and network devices. Additionally, there are some relationships between community members even if the types are different. We can use those kinds of relations to extract community members and set properties.
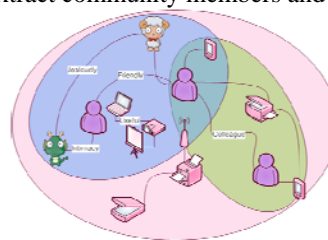

Figure 1 Concept of user-centric community

B. u-Community Manager

To support proposed user centric community defined in this thesis, we propose u-Community Manager which can be applied in ubiquitous smart space. This proposed u-Community Manager is used commonly in each smart object. It uses same interface like user centric context model (5W1H) and network protocol, so, it supports seamless interactions between different types of smart object. Figure 2 shows the architecture of u-Community Manager. The proposed u-Community Manager consists of 4 components: Understanding user's intention and interest part from user centric context information, smart objects' context Monitoring part, social networks configuration part and community members and goal setup part.
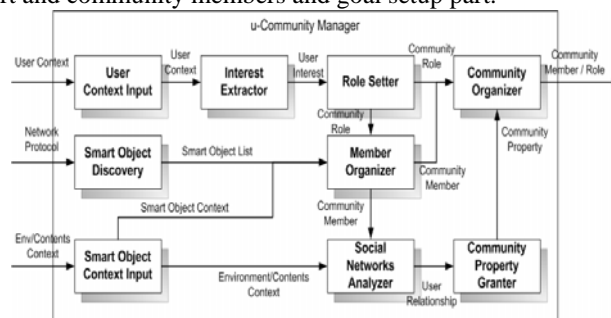

Figure 2 u-Community Manager

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[1]   M. Kumar, B. A. Shirazi, S. K. Das, B. Y. Sung, D. Levine, and M. Singhal, "PICO: A Middleware Framework for Pervasive Computing" in *IEEE Pervasive Computing,,* July-September, 2003, pp. 72-29