A Community-Based Semantic Social Context-Aware Driven Adaptation for Multimedia Documents

Adel Alti, Computer Science Department, University of Setif, Setif, Algeria
Sébastian Laborie, LIUPPA/IUT Bayonne, Anglet, France
Philippe Roose, LIUPPA/IUT Bayonne, Anglet, France

ABSTRACT

This paper presents an approach to enhance users experience through the use of recommendations and social networks for on-the-fly (at runtime) adaptation of multimedia documents. This paper presents also CSSAP, a dynamic service selection and assembly tool based on new user profiles and community profiles defined as set of semantic metadata, which context, quality of service and quality of experience parameters. The tool is based on community-aware semantic services and offer architecture, with three layers (semantic query, community management and semantic services). The most innovative characteristic of the tool is that it profits from the potential of semantic representation techniques to express context constraints and community’s interests, while they may be useful to generate and manage of complex dynamic adaptation process. This tool improves assembly of relevant adaptation services for communities inferred social influence from a Facebook as virtual P2P environment. The proposed approach has been validated through a prototype for mobiles user of multimedia contents exchanges. The goal is to improve assembly of potential adaptation services and the efficiency and effectiveness of the authors’ approach.

Keywords: Conflicts Sharing, Context-Aware, New User Profile, QoE, Services Composition, Virtual Community

INTRODUCTION

Nowadays, the mobile technology has been widely accepted by users and is still evolving very fast. Actually, mobile phones are no longer simple text or voice communication devices, PDAs are no longer planning and organization gadgets, and many handheld devices are no longer isolated from the Internet. The development and the fusion of multiple functionalities in Smartphones
yield to information systems called “pervasive”, i.e., to make information accessible at anytime, anyhow and anywhere.

Community-based Semantic Social context-aware Adaptation Platform (CSSAP) is a platform for context-aware social networking of mobile users and as such requires new semantic user profiles in order to provide personalization of multimedia content through new services and customization of service qualities. The most innovative characteristic of a platform is that it profits from the potential of semantic representation techniques to offering an unified context quality service to its users and facilitates the sharing of users experience through the use of recommendations and social networking services (e.g. Facebook, LinkedIn, Twitter) for on-the-fly (at runtime) adaptation of multimedia documents.

The main visible adaptation architectures exist for multimedia documents are: (1) server-side adaptation (Jannach and Leopold. 2007), (2) proxy-based adaptation (Lemlouma and Layaida. 2005), (3) client-side adaptation (Ahmadi and Kong. 2008) and (4) Peer-to-Peer (P2P) adaptation (Dromzée and al. 2013). These approaches suppose that adaptation services are already available on each mobile platform. Such approaches own the following characteristics:

- **Predefined quality of Service**: Adaptation approaches have defined different quality of service (QoS) properties. For instance, some of them minimize the computation cost for producing an adapted document, while others may maximize the proximity between the original and the adapted content. Usually, the quality of service of an adaptation framework is not customizable, in other words the quality of the adaptation process is usually predefined on a fixed set of properties;

- **Specific type of context**: Current approaches often focus on a specific type of context. It is clear that the other users (in the mean of the personality and relationships) influence users that experience the services within a group. Thanks to user communities, proposed approach can adapt to several application domains (e.g. Conference, Sport Event, Festival, Education, museum etc.), where various users’ context information is available.

Diversity of languages, protocols, and hardware platforms lead to major incompatibility issues. Moreover, multimedia services adaption guided by user and community requirements and preferences are not easy to be performed in this context. Our contribution is to extend community’s network (e.g. group of individual having a common interest or purpose to a specific situation and relative to a specific geo-location) through the access to other communities interested in joint dynamic and complex adaptation process. We propose to exploit the community social networks about an increasing number of skills, competencies and provide efficient services to every community member.

Our platform follows a virtual environment that supports services, conflicts and multimedia contents sharing and management among multiple social networks. It is based on Kalimucho (Dalmau and Roose. 2013), to implement the deployment strategy of services. Kalimucho is a platform that allows dynamic deployment and dynamic reconfiguration of application on desktops laptops and mobile devices. The deployment of CSSAP services is performed at run time and can be modified while the application is running without any user actions. Our platform is developed using ontology-based approach. This ontology captures a shared conceptual schema common in the location in specific application domains such as tourism, healthcare, transport, sport, etc. and maintains semantic quality information in heterogeneous service providers for service model. It provides also a dynamic adaptation of selection services based on shared social experiences for the better flexibility, adaptation and customization of mobile client application.
Identifying Opinion Leaders for Marketing by Analyzing Online Social Networks

Social Media Usage and Adoption: Are People Ready?