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Modeling Online Presence

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ABSTRACT

In this paper, we introduce the notion of Online Presence, a concept related to user's presence on online services. We identify interoperability issues in the field of exchange of the online presence data and propose a solution in building a common model for semantic representation of online presence data. We present the Online Presence Ontology (OPO) together with benefits such an ontology could bring.

Categories and Subject Descriptors

H.3.4 [Systems and Software]: User profiles and alert services;

D.2.12 [Interoperability]: Data mapping

General Terms

Design

Keywords

Online Presence, Ontology, Social Web

1. INTRODUCTION

With the appearance of chat tools and Social Web sites, most notably Social Networks, Internet faced a proliferation of social activities among users. On a typical service that offers some form of social interactions, users present themselves to their contacts by maintaining user profiles. Services that favor direct and frequent communication tend to include descriptions of user's temporary state in the profile. By the elements of temporary state, we mean primarily custom messages on chat platforms and social networks, as well as description of availability/willingness to chat. Often, visual representations known as avatars are used to depict user's online persona.

In fact, if we look at the activity of maintaining this kind of user profiles, that activity is no more than creating an image of one self's presence in the online world, a representation how one wishes to be seen by his/her contacts.

The diversity of different purpose social applications and the fact that one's friends can be spread over various services for the same purpose motivate users to maintain their profiles on many services, often just copying custom messages and other data related to their presence online. This state of affairs demands interoperability between services that collect the online presence data.

In this paper we propose an ontology-based approach for modeling the aforementioned aspects of appearance in the online world with the final aim of enabling interoperability among services that collect and use online presence data.

2. MODELING ONLINE PRESENCE

2.1 The General Idea

Let us first consider some sources of online presence data to assure better understanding of later discussions. First of all, those are chat platforms that publish custom messages, avatars and statuses of availability for chat (we will call this kind of information Online Status). Then, there are Social Networks with custom messages and profile pictures, and services that publish short Online Statuses (like Twitter). There is also a large number of Social Web sites (e.g., Digg, Technorati, Flickr, etc.) and online communities (e.g., Web Forums) collecting similar data.

We decided to gather all that data under a common roof by introducing the notion of Online Presence which congregates all the data representing temporary aspects of a user's online presence, as opposed to more stable online profile data defined, for example, by the FOAF vocabulary [1]. The design of the Online Presence Ontology (OPO) reflects our intent to meet the requirements of the already introduced interoperability needs.

2.2 A Brief Overview of the Ontology

While designing the ontology, we had in mind the dynamic nature of social applications, and their ever increasing functionalities. Thus we favored the flexibility and extensibility in our design in order for it to be able to support further changes in the way people present themselves online.

In order to allow for extending the ontology with possible new aspects of Online Presence we have introduced the concept of Online Presence Component to represent one particular aspect of Online Presence. Relying on the current state of practice in the area of online social interactions we have defined three components of Online Presence: Online Status, Notifiability and Findability. As for the custom message, and avatar, we modeled them as properties to the OnlinePresence class since their lack of complexity does not demand the creation of new classes for them. The choice of those three main components is a result of the analysis of various statuses used on chat platforms, their differences, ways of use and determining characteristics.

First we perceived the need to distinguish the attitude towards the possibility of interaction with humans (represented with Online Status) from the attitude towards the possibility of being contacted/interrupted by a machine. By a contact from a machine we mean the practice of chat programs to pop-up notifications. Many chat programs allow users to specify whether to allow this type of disturbance or not. This particularity is modeled with the Notifiability component, by assigning one of the different Notifiability instances (e.g. AllNotificationsPass, NotificationsProhibited) to the Online Presence. The notion of Notifiability helps to distinguish the inclination towards

interaction with other users from the willingness to be notified by an application (e.g. a chat platform) when a request for interaction arrives.

Findability is a component meant to describe the possibility of other users to access a person's contact details and online presence data. In most systems this property is defined by users in some form of settings.

Finally, the Online Status represents what one may call availability for chat – the status used by chat platforms. While analyzing different status scales used by different chat platforms we concluded that the complexity created by all the differences between them could be best resolved by introducing different Online Status Components whose combination would permit all existing chat scales to be mapped into one single model – the one used in OPO.

We have defined the following components of the Online Status, that is, as subclasses of the `OnlineStatusComponent` class:

- Availability – denotes whether a user is present or away from the service;
- Disturbability – denotes whether a user wants to be contacted or declares himself/herself as busy;
- Visibility – denotes the possibility of others to view a user's actual state of presence;
- Contactability – denotes whether the possibility to contact a user is restricted.

In order to test the quality of design of the model we have created mappings from status scales used by major chat platforms, and they all proved to map unambiguously to our model. With such a uniform semantic representation the exchange of chat statuses by different platforms is enabled in a more precise way.

The OPO is implemented in OWL-DL and available at <http://ggg.milanstankovic.org/opo/ns/>.

3. BENEFITS OF THE OPO

Building of the OPO represents, at its core, a task of bringing the Social and the Semantic Web closer together. It is inspired by the idea that the future of the Web lies in the merging of those two approaches [2].

The benefits of the OPO and its flexible and extensible design are numerous. First of all, it enables interoperability between applications that collect online presence data. This interoperability could result in users being able to correctly transfer their online presence data from one service to another regardless of the type of the service, and possibly unify their appearance online over multiple services. The ontology itself is just a prerequisite for this goal, and applications would have to adopt the practice of exchange in accordance with the Data Portability initiative¹ in order for the goal to be achieved.

The favorable properties of Semantic Web technologies, allow for assembling partial semantic descriptions of Online Presence, published by various services, into one coherent description.

OPO could also be highly beneficial for applications that leverage the XMPP protocol [3] to allow for chatting over various chat platforms. Currently the interpretation of users' online statuses from the integrated platforms is done autonomously by the integrating system without the possibility for the component chat platforms to describe the meaning of their statuses. The possibility to semantically describe chat statuses through the concepts and properties defined in OPO would introduce more order in the field by permitting more exact mappings between different chat status scales.

4. FUTURE WORK

Our current and future work is primarily focused on building plug-ins enabling applications and social websites to publish Online Presence (meta)data. Scenarios of metadata exchange will also be developed, resulting possibly in building a centralized server for resolving privacy issues concerning the exchange.

In our future work we will also examine the use of policies and rules for imposing restrictions over some aspects of Online Presence to certain categories of users and other more sophisticated statements. Those extensions would be aimed at supporting functionalities not yet available in chat and social applications, but highly needed and expected soon to appear, like different statuses for different groups of contacts.

Last, but not the least, we will consider the possibilities to integrate with the XMPP protocol, widely used in cross-platform chat, in order to enrich the Online Status data being exchanged and build a ground for more meaningful mappings.

5. REFERENCES

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¹ For details about the Data Portability initiative please see <http://www.dataportability.org/>