Growing World Wide Social Network by Bridging Social Portals Using FOAF

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ABSTRACT

Portals providing the modeling of social relations among people became more and more popular. Although the existing FOAF (Friend of the Friend) ontology developed for modeling such social relations was introduced and enjoyed popularity, it is not used in such extent that it can be considered as World Wide Social Network. Such network can bring benefits (e.g., by providing useful analysis) only if it is sufficiently large. One problem is that no bridge exists between the social portals (often enjoying commercial popularity) and the FOAF backed by the Semantic Web projects. Our aim is to find ways to stimulate existing social networks grow to the World Wide Social Network. We propose a method for bridging the different social portals that is based on employing web page wrappers for generation the output in Semantic Web format (RDF), namely the FOAF and in such a way enable the World Wide Social Network. We believe that the FOAF might become a good basis for standard for giving the possibility to interconnect users on different portals representing the same real person. Merging of social portals might bring the users counting now millions to the Semantic Web applications.

Categories and Subject Descriptors

H.3.5 [**Information Storage and Retrieval**]: Online Information Services

1. INTRODUCTION

Social portals (such as `www.friendster.com`, `www.iwiw.net`, `www.hi5.com`) are web sites where users having accounts can classify other users of the system as friends, family members, schoolmates or other type of relatives [2]. That way the users form a social network of people often being situated on different locations. These portals enjoy popularity and provide the users a simple way how to look up friends or be contacted by old, often even forgotten relatives [4]. People interlinked through social portals are often claimed to form so called virtual communities.

Social relations can be modeled by graphs. The basic use case for adding a new relation starts by signing a user b as known by the user a. The user b receives a notification about this act from the user a. The relation becomes confirmed after the user b's acceptance. This process yields new edge in the social network of the portal.

However, by the increase of the popularity of social portals also the number of such portals increases. These portals use their own data representation invisible for other systems. Users of different portals cannot get connected as the current social sites do not offer such a possibility. Different users remain enclosed in different systems forming components of the social network. Our aim is to propose a method for interconnecting so much islands as possible and thus to support of evolving people network similar to current information network presented on the Web. We call it *World Wide Social Network*.

2. SOCIAL NETWORKS AND FOAF

Description of persons' profiles using the Semantic Web format (RDF) provides a possibility to store the user and relation definitions distributed in machine readable way over the Web space. The major difference between description by RDF and description of virtual communities on social portals lays in the possibility to distribute the content and use it for various services aimed at analysis of created network independently.

FOAF (`http://xmlns.com/foaf/0.1`, friend of a friend) is an ontology for describing information related to particular person in machine readable way. It is represented by RDF language. The FOAF description as a rule contains "see also" references, which enable to interconnect person to any document on the Web together with relations to other FOAF descriptions. FOAF ontologies are currently used mainly by the Semantic Web researchers. However, its simplicity and the feature of having the descriptions of different people distributed over the Web might encourage other users as well.

2.1 Proposal for social network growing

In order to enlarge and build the World Wide Social Network we exploit information on the personal relationships from the HTML based Web and introduce it to the Semantic Web. FOAF presents an appropriate base ontology for bridging contents of different social portals. We have pro-

posed a method using web page wrappers gathering information from social portals and returning an output in FOAF format. There are several possibilities for evolving the World Wide Social Network.

First, adopted by the FOAF project is solely based on developing tools for simplification of the FOAF description creation. It assumes highly motivated people who are able to understand advantages of publishing their FOAF on the Web. This approach is not sufficient for evolving social network that would incorporate enough users to be qualified as a world wide social network.

Second approach is to bridge existing independent social networks that resize within closed social portals with the social network evolved on the Web. This can be one way process, i.e. the social portal would publish alternative representation of its content in the form readable be the FOAF agent. We do not consider that there is currently enough motivation for social portals providers to devote effort to this particular issue (first the network should grow sufficiently to be able to show benefits of its analysis).

Another way to support of social network evolution is to incorporate the FOAF generators into information systems of organizations, which often generate templates for web pages of employees. An enrichment of these templates with the RDF description and publishing it on the organization's web server will immediately enlarge existing social network.

2.2 Wrappers for bringing social portals

As there are not enough highly motivated people who are able to understand advantages of publishing their FOAF on the Web that would incorporate enough user profiles to be qualified as a world wide social network, we propose to bridge existing independent social networks that resize within closed social portals with the social network evolved on the Web. This can be one way process, i.e. the social portal would publish alternative representation of its content in the form readable by the FOAF agent.

We place the web page wrappers on a public server addressable by an URI. The URI is formulated by a specification of the social portal and the user for wrapping. The wrapper of social network site acts as a gateway for the World Wide Social Network content represented in RDF and social portals. The architecture is depicted on Figure 1.

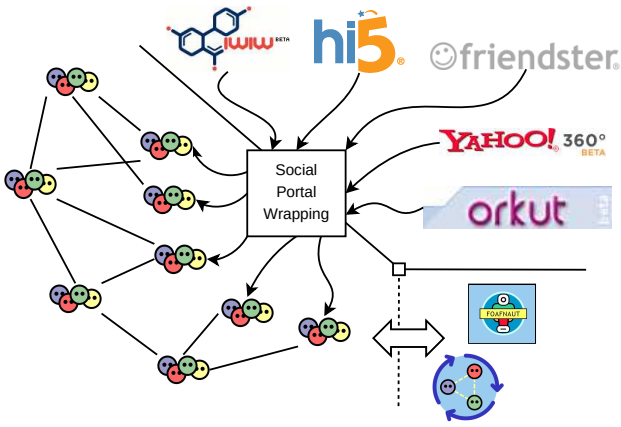

Figure 1: Using wrappers for enlargement of the World Wide Social Network.

FOAF wrapper (center of the Figure 1) provides FOAF interface for the content stored on social portals. The little faces symbolize FOAF profiles. That way it acts as a gateway from the FOAF profiles (under the solid line) to the profiles stored on social portals (above the solid line). The wrapped FOAF profiles (faces directly connected to the FOAF gateway) cannot reference each other, but they can be referenced by other FOAF profiles existing on the web. Tools for analyzing and presentation of the FOAF world (right-bottom side of the figure) can benefit from enlargement of the social network by exploit wrapped personal profiles and relationships between people.

We developed an environment for creation of wrappers [3]. The environment consists of a designer and interpreter. The created wrappers are "hard-wired" for sites they were developed for and capable for wrapping of a specific site gives higher reliability compared to generic wrappers.

The created web-page wrapper has a program which is interpreted by the wrapper interpreter. The language of the wrapper program has a tree structure. The vertices of the tree are instructions of the program. Every instruction can have several parameters depending on the type of the instruction. Instructions of the wrapper program are related to the web page loading, navigation in the web pages (tackling cookies, authentication, etc.), and extraction of data into variables or to output.

3. SUMMARY AND FUTURE WORK

Motivation to generate and publish personal profile on the Web is extremely important in the process of evolving the World Wide Social Network. It is a chicken-egg problem where in order to be enough motivated there should exists appropriate large social network together with services that would provide an analysis of the network. Our approach helps in the first step – to evolve existing social network into the World Wide Social Network.

Our developed environment for designing wrappers is supposed to help in bringing user profiles from social portals to the FOAF world and in aggregating different profiles describing the same person under one FOAF instance.

Evolution of the World Wide Social Network will bring several issues that open possibilities of further research, such as identification of different profiles that belong to the same person (e.g., transformed from several social portals), elaboration of a distributed model of social network wrapping or identification of vandalism on the World Wide Social Network, e.g. discovering profiles of non existing persons or profiles of real persons but with incorrect data.

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