

Towards Social-based User Modeling

Michal BARLA*

*Slovak University of Technology
Faculty of Informatics and Information Technologies
Ilkovičova 3, 842 16 Bratislava, Slovakia
barla@fiit.stuba.sk*

Our work deals with enhancing the individual-based user modeling and personalization of adaptive web-based systems with knowledge encompassed within social networks. One of the problems we are aware of in the traditional user modeling is a cold-start problem, when adaptive system cannot provide any meaningful personalization to a new user, for who it does not have any information stored in his or her user model yet. However, such a new user is probably the one who deserves the most some help and guidance provided by the system, in order to get more familiar with its interface, provided functionality and the presented information space itself.

Another issue comes from the closed nature of prevailing user modeling approaches, resulting in only a few "personalized islands" within the whole Web, where majority of content and information services are provided using a failing "one-size-fits-all" paradigm. The reason why the majority of adaptive approaches is built on the top of a closed corpus domain is that every adaptive system must track user's attitudes (such as knowledge or interest) towards domain elements, often realized in the form of overlaid user model. Closed corpus domain can provide a detailed, often manually prepared and non-changing conceptualization, which is easily used for user modeling purposes. In the case of an open corpus or vast and dynamic domain, we can not track user's relations to all documents or other pieces of information which exist within the domain. The solution is to provide a metadata model and its mapping to domain items, which serves also as a bottom layer for overlaid user model.

Our goal is to contribute to the cold-start problem in an open corpus domain by leveraging social information (such as relationships between a new user and other, already present users or membership of a user in a virtual community). The approach is motivated by social behaviour, which is inherent to the most of human beings. More precisely, the initial estimate of user characteristics is acquired as a weighted combination of characteristics other users interconnected with various types of relationships, acquired from various sources as well as based on common navigational patterns of users. The advantage of such approach is that it produces the standard user

* Supervisor: prof. Mária Bielíková, PhD., Institute of Informatics and Software Engineering

model, which can be maintained by well-established approaches to the user modeling and which can be easily used by classical personalization and adaptation techniques.

We evaluate our method in a domain of information research, such as searching for documents in the open information spaces as the Web is or in closed but vast information spaces like digital libraries or electronic newspaper. We use a rather simple keyword-based (tag-based) user model representation coming from various text analysis techniques applied on web-pages visited by the user (see Fig. 1). More, we acquire various relationships between tags by analyzing folksonomies [1], considering co-occurrence and relatedness of tags within web pages, by employing linguistic knowledge from Wordnet, all in order to compare particular user characteristics or even whole user models. Our evaluation platform is an enhanced proxy server capable (apart from logging the information gained by analyzing the traffic) to personalize either user requests (e.g., disambiguate the search keywords [2]) or responses sent from particular web server (e.g., annotate or re-rank search results).

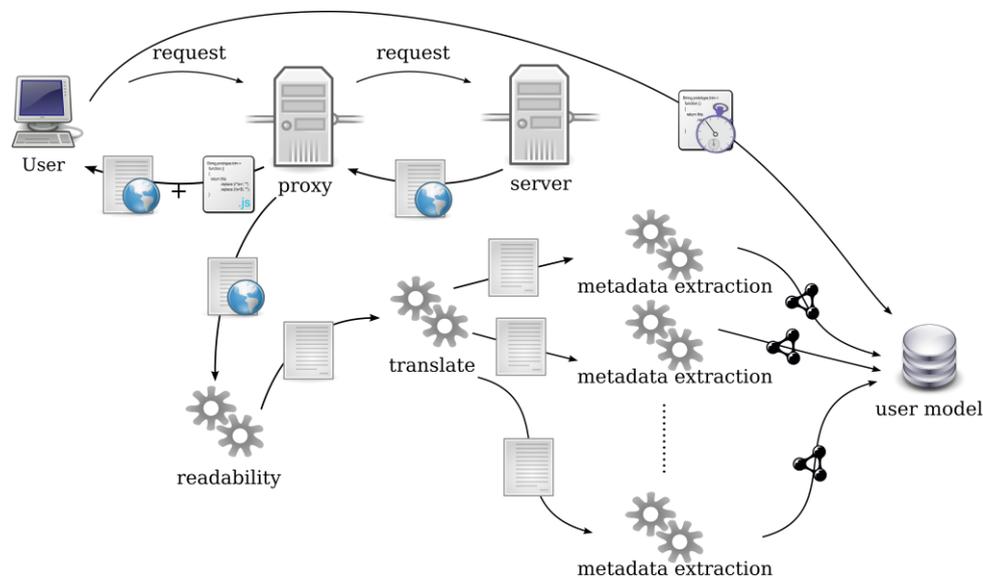


Figure 1. Keyword-based user modeling (evidence layer) in an open corpus domain (Web) through an enhanced proxy server.

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References

- [1] Michal Barla, Mária Bieliková: On Deriving Tagsonomies: Keyword Relations Coming from Crowd. In International Conference on Computational Collective Intelligence – ICCCI 2009, LNCS 5796, pp. 309-320, 2009.
- [2] Tomáš Kramár, Michal Barla and Mária Bieliková: Disambiguating Search by Leveraging the Social Network Context based on the stream of User's Activity. In User Modeling, Adaptation and Personalization – UMAP 2010, to appear.