An Approach for Distributed User Models with the Focus on Transparency and Ownership of User Information (Position Paper)

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1. Introduction

Use of the Internet for work and pleasure has been increasing rapidly over the past years, and now people are starting to become more concerned with issues such as whether data is acquired without their knowledge, how those data might be used, based on which data a certain product is being offered to them, etc. These issues do not only involve IT security, which is mainly an organizational aspect, but also questions of privacy, ownership, and transparency. In this position paper, the author presents ideas on how to achieve a model that takes these issues into account.

2. Aim

The aim of this work is to explore an approach for distributed user models. In this context, "distributed" means that parts of the model reside with the client and are standardized, whereas other parts reside on different servers, e.g., those owned by an eCommerce provider. The latter ones are defined by the needs of the provider. This distribution is intended to support the user in two ways: First, if he wants to provide personal information to different providers, he only has to generate this once, and second, he gains more control over privacy and ownership. A third aspect is that one user can have more than one "profile" (user model) for different types of usage, enabling him to make a quick decision on which profile to use in any given situation.

3. Approach

Elaborating on ideas first presented by Kay and Heckmann, the author proposes the following approach: First, a core of a "profile" must be defined that holds the user's most personal information. Besides the name, one could think of information concerning preferences regarding sports, reading, profession, etc. The structure of this profile has to be open so that everyone can use it and enhance it to fit his own personal needs. Heckmann (2001) therefore proposes a "User Modeling Ontology Language". In order to grant ubiquitous access to this model, it has to be stored on a server. In contrast to eCommerce applications, this server is a non-commercial system, which only allows authenticated access to information owned by the user himself (comparable to a banking system without a bank behind it). Thus, no one else, not even the administrators, has access to these data. On the user front-end, this server provides an infrastructure for maintaining the profile, such as a profile editor, profile upload and download. On the technological end, the server has to check the user's device (e.g., PDA, desktop, wearables) and transmission line (e.g., modem, DSL, UMTS) in order to adapt the profile to the limitations of the device. Before describing the provider site model, the author will first give a scenario.

When connecting to the web, the user is first asked to log in to the profile server to get his device-adapted profile, then he proceeds through the web and gets to an eCommerce provider he never visited before. This server will ask him for personal information in order to be able to adapt the advertisement of products to the user's preferences (Weibelzahl 1999). Now the user can decide on whether he wants to transfer his profile, respectively which parts

of the profile, to that server, instead of typing the requested information over and over again. Since the user's profile only keeps a core of the model needed by this specific server, the server will ask for additional information. After the end of the session, the user should be able to download or update the core profile with the information acquired by the server, at least those pieces of information that unquestionably belong to the user, for example for data privacy reasons.

Once he finishes the web session, the user is asked to synchronize the information stored on his device with the profile on the profile server. This synchronization ensures that independent of the device he will use the next time, he will have the most current profile.

We certainly do not ignore the fact that eCommerce providers have no interest in sharing profiles with competitors, nor the fact that there are as many user modeling approaches as there are adaptive systems. We therefore propose a standardized user model for the profile and a generic interface for transferring data from the user profile model to one specific model and back. The servers have to ensure that attributes that are not understood or used by the server are returned without changes.

4. Benefits

The author expects benefits not only for the user of such a system, but also for the providers. Fraunhofer IESE, for example, as a provider of knowledge repositories (Esernet/ViSEK References), will be able to sell the content of those repositories better if more information on customers' background is available, because then the information delivered will better fit the individual customer's needs. We have noted that customers do not want to give information about their background more than once. Often, they have given it somewhere else before. From the customer's or employee's point of view, an additional benefit (besides providing information only once) is the possibility of using multiple profiles. This, in turn, leads to an additional organizational benefit: the learning organization is supported by more flexible, but yet goal-oriented and less effort-consuming access to information sources.

5. Future

First, a survey of work performed in this and similar fields needs to be done. If this survey finds further investigation to be feasible, the author will enhance the existing in-house knowledge management system (Althoff et.al. 2001) by implementing a profile server and the interface to the adaptation component. Because this is a simplified context, we can focus on the technology first and think about the details of the model interface later. We may even be able to use Heckmann's "User Modeling Ontology Language" in our work.

6. References

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