

Chapter 2.9

Adaptation and Recommendation in Modern Web 2.0 Portals

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ABSTRACT

In this paper, we propose a generic recommender framework that allows transparently integrating different recommender engines into a Portal. The framework comes with a number of preinstalled recommender engines and can be extended by adding further such components. Recommendations are computed by each engine and then transparently merged. This ensures that neither the Portal vendor, nor the Portal operator, nor the user is burdened with choosing an appropriate engine and still high quality recommendations can be made. Furthermore we present means to automatically adapt the Portal system to better suit users needs.

INTRODUCTION

In recent years Enterprise Information Portals have gained importance in many companies. As a single point of access they integrate various applications and processes into one homogeneous user interface. Today, typical Portals contain thousands of pages. They are no longer exclusively maintained by an IT department, instead, Web 2.0 techniques are used increasingly, allowing user generated content to be added to Portal pages. This tremendous popularity and success of Portals, has its downsides: Their continuous growth makes access to relevant information increasingly difficult. Users need to find task- and role-specific information quickly, but face information overload and feel lost in hyperspace. The huge amount of

content results in complex structures designed to satisfy the majority of users. However, those superimposed structures, defined by Portal authors and administrators are not necessarily compliant to the users' mental models and therefore result in long navigation paths and significant effort to find the information needed. The likelihood of a mismatch between a user's mental model and the administrator's mental model increases as more users access the Portal. This becomes even worse, once user generated content is added, where the structure may not follow the design the administrator had in mind. In addition, the more content a Portal offers, the more likely it becomes that users are no longer aware of all the resources available within it. They might thus miss out on resources that are potentially relevant to their tasks, simply because they never come across them. Thus, on the one hand, users obtain too much information that is not relevant to their current task, on the other hand, it becomes cumbersome to find the right information and they do not obtain all the information that would be relevant. Users therefore need the Portal to assist them in finding relevant information in an efficient manner.

Generally this type of problem falls in the domain of recommender systems and numerous such systems have been proposed in recent years. Each of these can recommend relevant items for specific applications or when certain data characteristics are met, but none meet the breadth needed to address assisting a Portal user. In this paper we will outline a generic recommender framework into which specific recommendation engines can be installed. The framework decides which engines are likely to produce relevant recommendations for any particular situation and how multiple results sets are combined when multiple engines are invoked. The framework comes with a number of preinstalled engines and basic configuration for using them. This alleviates the burden on the Portal administrator relative to the initial configuration and transparently leverages the best engines for assisting the user in accomplishing their task.

In addition to providing users with recommendations we also adapt the Portal's structure automatically to better satisfy users needs.

Most of our solutions for adapting and recommending content are based on user and context models that reflect users' interest and preferences and on annotations of resources provided by users. For instance, we adapt a Portal's structure (e.g. navigation) and provide recommendations to be able to reach content being of interest easier. We recommend background information, experts and users with similar interests.

In the following we will first give an overview of related work. Next, we outline which information is needed to achieve our goals, and, more importantly, how to obtain the necessary information. Here the focus lies on collecting information about users (and their interests, preferences and thus needs) and the resources they interact with. We will show that a mixture of automated information extraction and user provided information is currently the most realistic approach. Afterwards we demonstrate how this information can be exploited to either adapt the Portal or to issue reasonable recommendations.

RELATED WORK

The explosive growth of information on the Web has led to the development of recommender systems [Resnick and Varian, 1997]. Recommender systems are a personalized information filtering technology used to either predict whether a particular user will like a particular item (prediction problem) or to identify a set of N items that will be of interest to a certain user (top- N recommendation problem). In recent years, recommender systems have been used in a number of different applications such as recommending products a customer will most likely buy; movies, TV programs, or music a user will find enjoyable. An excellent survey of different recommender systems for various applications can be found in [Schafer et al., 1999].

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