Chapter IV

Combating Information Overload by Means of Information Customization Systems

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Abstract

The evolution of the Internet into the global information infrastructure has led to an explosion in the amount of available information. The result is the “information overload” of the user; that is, users have too much information to make a decision or remain informed about a topic. Information customization systems are supposed to be the answer for information overload. They allow users to narrowcast what they are looking for and get information matching their needs. Information customization systems are also a bargain of consummate efficiency. The value proposition of such systems is reducing the time spent looking for information. We hold the view that information customization could be best done by combining various artificial intelligence technologies such as collaborative filtering, intelligent interfaces, agents, bots, Web mining, and intermediaries. MASACAD, the system described in this chapter, is an example of an information customization system that combines many of the technologies already mentioned and others to approach information customization and combat information overload.
Introduction

The Problem of Information Overload

Historically, more information has almost always been a good thing. However, as the ability to collect information grew, the ability to process that information did not keep up. Today, we have large amounts of available information and a high rate of new information being added, but contradictions in the available information, a low signal-to-noise ratio (proportion of useful information found to all information found), and inefficient methods for comparing and processing different kinds of information characterize the situation. The result is the “information overload” of the user, that is, users have too much information to make a decision or remain informed about a topic.

One interesting solution to this problem may be obtained by reversing the conventional ways we find information. Instead of users investing significant effort to find the right information, the right information should find the users. This approach will, of course, require the development of appropriate software. Such software is expected to do more for us today, in more situations, than we ever expected in the past. This is the challenge of complex environments. The complexity comes from many dimensions. There is a variety of users (professional/naive, techie/financial/clerical, etc.). There is a variety of systems and interactions among them (Win/Mac/Unix, Client/Server, Portable, etc.). There is a variety of resources and goals (earlier, programmers had only to trade off time versus space; now, they also have to worry about bandwidth, security, money, completeness of results, quality of information, etc.).

Information Customization Systems

To cope with such complex environments, the promise of information customization (IC) systems (Hamdi, 2006a, 2006b, 2006c, 2007a) is becoming highly attractive. IC systems customize information to the needs and interests of the user. They function proactively (take the initiative), continuously scan appropriate resources, analyze and compare content, select relevant information, and present it as visualizations or in a pruned format (Figure 1).

IC systems are different from conventional search engines or database systems. When using a search engine, for example, not all information is easy to find because it is difficult for people to articulate what they want using a limited set of keywords. The words might not match exactly and hence nothing is returned, or much more common, is that too many URLs are returned by the search engine. Even when the relevant information is easy to find, it will be perhaps boring and time-consuming