Chapter III

SoFAR: An Agent Framework for Distributed Information Management

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ABSTRACT

SoFAR, the Southampton Framework for Agent Research, is a versatile multiagent framework designed for Distributed Information Management tasks. SoFAR embraces the notion of proactivity as the opportunistic reuse of the services provided by other agents, and it provides the means to enable agents to locate suitable service providers. The contribution of SoFAR is to combine ideas from the distributed computing community with the performative-based communications used in other agent systems: communications in SoFAR are based on the startpoint/endpoint paradigm, a powerful abstraction that can be mapped onto multiple communication
layers. SoFAR also adopts an XML-based declarative approach for specifying ontologies and agents, providing a clear separation with their implementation.

INTRODUCTION

The volume of information available from the World Wide Web and corporate information systems has increased dramatically over the last few years. It is now recognized that users require assistance to avoid being overwhelmed by this wealth of information; it is also essential that information suppliers be provided with tools that help them in authoring and maintaining it (De Roure et al., 1996). Distributed Information Management (DIM) is the term used to describe the set of activities that allows users to manage the entire life-cycle of information in a distributed environment. The activities, also referred to as DIM tasks, involve, among others, document creation and publication, information space navigation, information discovery, and integrity maintenance.

The large volume of highly dynamic information involved in DIM tasks is an ideal subject for agent-style processing. This has been exemplified in several research projects, such as Pattie Maes’ agents that reduce users’ overload (Maes, 1994) or the numerous agents applied to the Internet or the World Wide Web (Chen & Sycara, 1998; Lieberman, 1995).

Over the last decade, a series of projects at Southampton addressed the issue of distributed information management. This activity began with the Microcosm system (Fountain et al., 1990), which pioneered the idea of building a hypertext system out of a set of loosely-coupled communicating processes. It was an example of an open hypermedia system, in which links are regarded as first-class citizens. By managing and storing links in specific databases, called linkbases, this approach allows users to customize their information environment by selecting the appropriate linkbases. The open hypermedia philosophy was brought to the WWW by the Distributed Link Service (Carr et al., 1995). In a project called Memoir (De Roure et al., 1998), the notion of navigation trails was used to recommend documents examined by users sharing similar interests. This work was further extended by using a notion of “user context” to suggest links that are relevant to users (El-Beltagy et al., 2001).

We learned two important lessons from our practical experience with designing and building prototypes over the last decade. First, it became clear
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