Chapter 18

An Overview of Agent Technology and Its Application to Subject Management

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Agent software is an emerging technology that has its roots firmly in AI research. With the recent proliferation of ‘agent’ applications in areas such as e-commerce and Internet marketing, much of the application of agents can now said to be in the domain of Information Systems. One of the possible applications of agent technology is that of web-based courseware, and in particular, subject management software. However, there is much confusion over just exactly what an agent is. This paper provides an overview of agent software and in particular that of autonomous agents. The application of autonomous agents to educational courseware and its benefits are discussed, and a project is described which is using autonomous agents to aid in web-based subject management tasks.

INTRODUCTION

The term “agent” is being increasingly used by computer researchers, software developers and even the average computer user, yet when pressed, many would be unable to give a satisfactory explanation of just what an agent really is. This can be readily forgiven, as even the “experts” cannot agree on a definition for an agent (Nwana, 1996; Wooldridge, and Jennings, 1995). Agent software is an emerging technology which promises to be many things to many people; however, the technology is still in an embryonic stage. Despite this, the range of organizations and disciplines researching and pursuing agent technology is broad.

Previously Published in Challenges of Information Technology Management in the 21st Century edited by Mehdi Khosrow-Pour, Copyright © 2000, Idea Group Publishing.
This chapter appears in the book, Web-Based Instructional Learning by Mehdi Khosrow-Pour. Copyright © 2002, IRM Press, an imprint of Idea Group Inc.
The more recent notable applications for agents include e-commerce, Web marketing and Internet search agents. What these applications have in common of course is the Web. It seems that with the many types of Web-based software being developed, the Web is providing a good architectural framework for the development of agents. This is because the Web facilitates many of the characteristics of agent software, such as mobility and communication. With the development of web-based courseware, the way now lies open for the application of agent technology towards educational software development.

In the following sections the essence of "agency" is explored and a classification is provided. The notion of autonomous agents somewhat expands on the base idea of agency and is covered in the following section. Finally, the application of agent technology to educational software or courseware is discussed, and in particular, a current project is briefly described. This project is making use of autonomous agents by utilizing them in conjunction with web-based subject management courseware that has been previously developed.

**WHAT IS AN AGENT**

Agent technology emerged from the field of AI research, so often the term "Intelligent Agent" is heard being used. However, agents need not be intelligent; in fact, most people do not need "smart agents" (Nwana, 1996). Other adjectives often used with agents are: interface, autonomous, mobile, Internet, information, and reactive. The term ‘agent’ can be thought of as an umbrella under which many software applications may fall, but it is in danger of becoming a noise term due to overuse (Wooldridge, and Jennings, 1995).

What makes agents different from standard software are the characteristics that agents must possess in order to be termed agents. There are a number of classification schemes that can be used to typecast existing agents, for example, mobile or static, deliberative or reactive, but Nwana (1996) classifies agents according to primary attributes which agents should exhibit (see Figure 1). The

*Figure 1: Nwana's classification*
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