Chapter XI

An Analysis of Using Expert Systems and Intelligent Agents for the Virtual Library Project at the Naval Surface Warfare Center — Carderock Division

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The Virtual Library Project at the Naval Surface Warfare Center/Carderock Division (NSWC/CD) is being developed to facilitate the incorporation and use of library documents via the Internet. These documents typically relate to the design and manufacture of ships for the U.S. Navy Fleet. As such, the libraries will store documents that contain not only text but also images, graphs and design configurations. Because of the dynamic nature of digital documents, particularly those related to design, rapid and effective cataloging of these documents becomes challenging. We conducted a research study to analyze the use of expert systems and intelligent agents to support the function of cataloging digital documents. This chapter provides an overview of past research in the use of expert systems and intelligent agents for cataloging digital documents and discusses our recommendations based on NSWC/CD’s requirements.

The explosion in the use of the Internet for information exchange and retrieval has significantly increased the production and distribution of digital information. This has increased our reliance on rapid
information availability and exchange for decision making. The benefits of such technology motivated trends are several. Information is available globally within seconds. Multiple users can view the same information in the same format all over the world. More importantly, this data exchange is not limited to text but extends to audio, video and pictorial data exchange.

As with any situation, the above benefits are tempered by the challenges that accompany such technological advances. The volume of digital data available is increasing rapidly. Consequently, the Internet has become a library without a catalog. Although several search and retrieval functions are increasingly becoming available, their effectiveness is dependent largely on the effectiveness with which digital documents are cataloged.

Digital documents are being generated and propagated at tremendous rates. In fact, in our daily experience, we find that our exchange of paper-based documents has been reduced to the minimal. Most of the documents are exchanged via e-mail or through the Web and are stored electronically. The challenge then is ensuring that each document being generated and exchanged digitally be effectively and rapidly cataloged and archived. How can the cataloging function be automated such that a document is cataloged as soon as it's received electronically? In this study we explore the use of Artificial Intelligence (AI) techniques for cataloging. In particular, we examine the use of Expert Systems at the Naval Surface Warfare Center/Carderock Division (NSWC/CD) which is actively exploring the storage and exchange of their books, drawings, manuscripts, documents and photographs digitally so that they can be transmitted at high speed to computer screens anywhere in their original format.

THE CATALOGING FUNCTION

According to Anderson (1990), the Head of Cataloging Services at Virginia Commonwealth University, cataloging is, arguably, among the most complex of library processes. Typically, as with NSWC/CD, a cataloger provides both the descriptive and the subject cataloging for each item handled and must also be able to use appropriate classification “schedules” and subject heading thesauri. Familiarity with the principles of uniform headings and the application of name authority control procedures are also standard aspects of the cataloger’s responsibilities (Anderson, 1990).
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