



"Expert Systems and KM are a Natural Team"

"Although many knowledge management efforts have incorporated artificial intelligence into their processes, the potential synergy between the two fields has not yet been achieved," states author Judith Lamont. "Expert systems are an ideal way to convert both tacit and explicit knowledge into a form that is available to many users. The implementation of expert systems involves systematic and well-established procedures for representing the knowledge of experts. As yet, knowledge management efforts have often struggled with eliciting and documented tacit knowledge. At the same time, data warehouses, a mainstay for knowledge management, are a valuable source of information that may not always be used as effectively as it could in expert systems," says Lamont.

"Many of the large, complex and expensive expert system authoring tools of the mid-1980s have fallen by the wayside. Those that remain are more modest in cost and relatively easy to use. Among them is **EXSYS**, which was introduced in 1983, has been used to develop thousands of expert systems, and their company recently introduced a new Web-enabled product called this year."

"In 1993, the **Occupational Health and Safety Administration** (OSHA) began developing Expert Advisors, a series of expert systems based on Exsys. The Advisors address health and safety issues in areas such as asbestos and fire safety. Impetus for the initial product originated from the Small Business Administration's Office of Chief Advocacy, which urged OSHA to find new ways to help small businesses in interpreting government regulations. OSHA has worked with trade associations, unions and government agencies to respond to suggestions for expert systems in a variety of fields. Users of the Advisors answer questions about their work place, practices, materials and other topics. Advisors determine the hazards that are present and the OSHA regulations that apply. In addition, the Advisors can generate legally sufficient plans of action for implementing appropriate procedures and handle administrative tasks such as preparing required letters."

"But why use an expert system tool rather than programming the decision tree?"

"A key reason," says Ed Stern, facilitator of the Advisors, "is that an expert system shell allows us to lay out the logic of the regulations so anyone can see it clearly (without a lot of programming code). When we issue an Advisor, we need to get approval from a range of people, from technical staff to lawyers. Without a clear presentation of the underlying rules on which the system is based, it would be virtually impossible to get concurrence from the various parties. In addition, an expert system tool allows the subject matter experts, rather than programmers, to control the development of the product and to change it. The series has attained the hoped-for goals by capturing the knowledge of the

most experienced staff even after they have changed positions. (This way) we have not lost their insights and understanding of the regulations." The OSHA Expert Advisors program is a finalist in the Innovations in American Government Awards.

"Selecting the right problem is essential for success" notes Dustin Huntington, president of EXSYS, "the problem must be bounded and have real-world answers. However, the answers need not be absolute. Expert systems can also handle uncertainty and this capability distinguishes them from tree diagrams. For example, an expert system designed to help consumers select a camcorder could come up with the best match based on user input, even when the request was not a perfect match to any single product. It would not have to come to a dead-end and report that no product was a fit, as a simple database search might. This produces a much better emulation of the interaction that would occur with a human salesperson. Expert systems can, however, call up information from databases, which allows new information such as price changes to be reflected in the decision without changing the (system) rules."

"A good application for large enterprises would be an expert system that advises employees on what their benefits will be when they retire. An expert system can integrate the rules for employee benefits with information from a database such as salary and length of employment. The availability of an expert system would save time for HR staff, which might be answering nearly identical questions over and over. It would improve employee access to that information and free up the staff to handle more complex questions. Product configuration is also a good application. One of the earliest uses of expert systems was in medical diagnosis and work continues in that arena."

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