

DEVELOPMENT OF EXPERT SYSTEMS SOFTWARE FOR CONSUMERS

Sherman Hanna, The Ohio State University¹

The most narrow definition of an expert system is a computer program designed to duplicate part of the decision-making expertise of a human expert. An expert system includes a knowledge base composed of facts and rules about a particular domain, and an inference engine. The user of the expert system may interact with the expert system through a computer keyboard or other device, and the expert system may have an explanation subsystem built into it. Expert systems have been used for interpretation, diagnosis, prediction, instruction, and control in fields such as manufacturing, medicine, consumer credit, and financial analysis. Expert systems can reduce the training needed by professionals or perhaps even could even be operated by consumers. Useful expert systems are very expensive to develop. A human expert may know 50,000 rules. While it is unlikely that one would need to incorporate all of an expert's knowledge into one computer program, it can take a year or more to develop an expert system, and more time to implement and evaluate such a system.

Corporate development of expert systems for commercial use is proceeding. Billions of dollars will be devoted to such efforts in the next ten years. While commercial development of software will fill some needs for some clienteles, it is unlikely to suffice in meeting most emerging personal, educational and research needs. Commercial software, by definition, must be purchased and therefore is only accessible to those who can afford to pay. Given this fact, commercial software is likely to be designed to meet the needs of a predominantly higher income audience--for example, programs designed to assist in the management of stock portfolios. In addition, commercial programs are unlikely to be research-based or to offer the possibility of modification as a result of research findings. Expert systems can be a superior tool for resource allocation decisions compared to printed materials, which can provide professionals and consumers with the information needed to make decisions but have limited potential for assisting in the actual process of decision making. In addition, the user of printed materials must be fairly literate and numerate, as well as motivated, in order to make appropriate use of the materials. Expert systems can greatly reduce these demands on the decision maker by guiding him or her step by step through a complex process. Expected future developments in computers, including declining cost and increased memory and speed, will further increase the advantages of expert systems as decision aids.

Some issues related to expert systems were

discussed the 1986 Wingspread Conference (Russo, 1988; Talarzyck, 1988). However, very little guidance has been provided for developers of expert systems software for consumers. The roundtable addressed issues such as the following:

1. What applications of expert systems for consumers will be most promising? Some simple, obvious applications involve any topic that now uses printed worksheets. The potential advantages of expert systems software includes easier development by nonprogrammers using the more powerful expert systems shells recently introduced.
2. What methods of financing expert system development are feasible? Is non-commercial development practical?
3. What level of user sophistication should be assumed, both in terms of hardware use (many people cannot use a keyboard) and cognitive limitations of many consumers.
4. Are there human experts for most consumer problems? The standard method for development of expert systems in industry is to extensively interview a human expert. Many consumer problems may involve diverse and/or poorly defined goals, which will make the development of expert systems much more difficult than in industry, where cost minimization or profit maximization may provide a clearly defined "bottom line."

Barry Reid of the Georgia Governor's Office of Consumer Affairs, suggested that expert systems could provide a resource for public sector consumer complaint handling, such as in a state attorney general's office. There is a need for expert systems software with such an application, because of the rapid growth in the volume and complexity of complaints.

REFERENCES

- Russo, J. Edward (1988). "Information Processing from the Consumer's Perspective," The Frontier of Research in the Consumer Interest, E. Scott Maynes (ed.), American Council on Consumer Interests.
- Talarzyck, W. Wayne (1988). "New Technologies in Consumer Information," The Frontier of Research in the Consumer Interest, E. Scott Maynes (ed.), American Council on Consumer Interests.

¹Director, Family Resource Management Expert Systems Laboratory