

**Book Review****Artificial Intelligence in Accounting and Auditing**

Edited by Miklos A. Vasarhelyi

New York: Markus Wiener Publishing, Inc., 1989

REVIEWED BY  
GLEN L. GRAY

CALIFORNIA STATE UNIVERSITY, NORTHRIDGE

The title somewhat overstates its coverage. The book is a collection of 19 previously published papers by academic and practitioner leaders in the domain of *expert systems* in accounting and auditing. In general, the book provides a good range of papers from the recognized researchers — this, however, is both its strength and its weakness.

The book includes five major sections. The first section, titled Foundations of Artificial Intelligence and Expert Systems in Accounting and Auditing, includes two papers. The first paper by Bailey, et al., presents a good overview of expert systems terminology and concepts. In its appendix, the paper provides a summary of the differences between expert systems and traditional decision support systems (DSS). A paper by McCarthy extrapolates current expert systems concepts (i.e., knowledge presentation techniques) into the future with an emphasis on linking expert systems with traditional database environments.

Four survey articles are included in the second section. Gangolly and Lin each survey expert systems in financial accounting and management accounting respectively; papers written by Abdolmohammadi, Messier and Hansen survey expert systems in auditing.

The book's third section includes six academic papers that address specific examples of expert systems in the auditing domain. The first paper, by Gal and Steinbart, uses the incremental development of two different expert systems to examine the effects of experience on two audit judgment tasks. They first developed the systems from textbooks and manuals to create "novice" expert systems, making suggestions which were subsequently incorporated into the expert systems; the initial and final versions were compared to identify areas where expertise had the most impact.

The third section also presents a paper by Hansen and Messier who wrote on the results of a preliminary investigation of EDP-EXPERT (an expert system they developed to help evaluate reliability of controls in advanced computer environments). In another third-section paper Boritz and Broca demonstrate a mathematical approach to planning the frequency of internal audit activities; it's not, however, an

expert systems paper per se. The fourth paper in this section — written by Meservy, Bailey, and Johnson — discusses the development and validation of an expert system for the internal control evaluation review process. First discussing the applicability of decision support systems, artificial intelligence, and expert systems to auditing, the paper goes on to discuss the development of a specific expert system, and, finally, six experienced auditors are used to validate the system's output. (Note: This paper was based on Meservy's 1985 dissertation which has an excellent discussion of alternative knowledge acquisition approaches and a more detailed discussion of his validation approach. He attempted to operationalize the Turing test of computer intelligence.) This section also includes a paper by Dillard and Mutchler in which they report on the development of a prototype expert system to make "going concern" decisions. The section's final paper (written by Hansen and Messier) addresses effective scheduling of EDP controls monitoring in online systems. As it turns out, however, they have not offered an expert systems paper. Instead, they present a variety of mathematical models balancing the costs of monitoring against the costs of dysfunction.

Three papers within the book's fourth section address specific applications in accounting: (1) O'Leary and Munakata discuss a prototype expert system to develop aggregated financial statements; (2) O'Leary and Lin present a prototype expert system for cash flow analysis based on ratio analysis and a budgetary statement of changes in cash flow; and (3) Steinbart and Gal provide a theoretical discussion of expert systems potential roles in the study of decision-making processes. Steinbart and Gal contend that an expert system is not the end product of research, but instead provides a means to conduct additional research on the decision-making process captured in the expert system.

The book's fifth major section includes four papers that discuss applications that have been developed by practitioners — instead of academicians. A paper by Shpilberg and Graham discusses ExperTAX developed by Coopers & Lybrand for determining corporate tax accruals and planning. Kelly, Ribar

and Willingham discuss the expert system developed at KPMG for evaluating loan loss reserves during an audit; Turban and mock discuss the impact of expert systems on executives. The section's final paper, written by Smith and Temple, discusses an expert system for analyzing loans — for underwriting residential mortgage loans.

For the potential reader who has attended a variety of expert systems in accounting conferences (e.g., University of

Southern California and Deloitte's Audit Judgment Symposiums, University of Southern California and KPMG's Expert Systems Symposiums, and the American Accounting Association Annual Conferences) these papers may already be in their files. On the other hand, those who are relatively new to this domain may find this book a repository of "classic" papers providing an excellent starting point for research.