AI & ES in Accounting and Auditing: Progress, Regression and New Paradigms

Miklos A. Vasarhelyi

Two years have passed since the publication of Artificial Intelligence in Accounting and Auditing, Volume 1. In these two years, the technology and its implications have lost some of their novelty and myth. On the other hand, we are witnessing the emergence of a set of paradigms and an increased understanding of the strengths and weaknesses of particular approaches. Carol Brown[1], in her article entitled "Expert Systems in Public Accounting: Current Practices and Future Directions," explores the applications of the paradigms within the major audit firms. In her evaluation she states, "The use of expert systems is rapidly pervading the field of accounting. All of the big six international accounting firms are either using expert systems in their practices or have systems under development."

Introduction

This book is divided into three parts. In this first pat, we position the field and describe the main articles in the book. This introductory note attempts to link a set of selected articles into a vision of the current state of the art in the field. First, it describes the frame of the ensuing articles to allow the reader to navigate through the readings. Then, it draws a few conclusions on the state of the art and proposes avenues for future research.

The second part focuses on methodological issues. Wensley's article positions the evolving research issues in audit planning. Drawing on their CAPEX[2] experience, he develops an agenda of research issues and approaches for such a complex domain as auditing. Abdolmohammadi and Bazaz prepare a systematic method of identifying applicable decision aids for a comprehensive inventory of audit tasks. Forty-nine experienced auditors identified tasks as candidates for knowledge-based expert system development from a list of 332 major audit tasks. Hsu recognizes the need to evolve conceptual schemi into database systems. This evolving view of the world would facilitate the construction of knowledge-based systems and their intrinsic database. McCarthy and Rockwell examine reconstructive expertise and implementation heuristics in a design tool. They base

their considerations on the REACH systems that was designed to aid in the process of database design in general in the sub-processes of view modeling and view integration. Wensley and Boritz, still in an audit planning context, use their CAPEX[3] experience to review and examine validation issues. The last article of this session (Winkler & Massaad) introduces the evolving neural network paradigm to accountants and explores its implications.

The third part presents AI/ES in Accounting and Audit Practice. Brown surveys the field with particular concern for practices in public accounting. Vasarhelyi and Halper, as well as Vasarhelyi, Halper and Ezawa, propose a new "online auditing" paradigm and examine the implementation of the CPAS technology performed at AT&T. two additional articles are included in this section as illustrations of potential application areas. Messier and Hansen deal with bankruptcy prediction. The paper reports on the results of an experiment designed to assess the effectiveness of an inductive algorithm for discovering predictive knowledge structures in financial data. Kandelin and Lin use object-oriented programming to help in the credit decision making process.

Volume 2 of this series opens the path for Volume 3, being published simultaneously, which includes sections on Knowledge Elicitation and Representation, Belief Nets and Bayesian Revisions, Accounting Applications and the Future in AI & ES.

ENDNOTES

1. Brown, C., "Expert Systems in Public Accounting: Current Practices and Future Directions," *Expert Systems with Applications*, Vol. 3, 1991, p. 3.
2. Boritz, J.E., and Wensley, A.K.P., "CAPEX Technical Manual Version 1.0," Unpublished Manuscript, School of Accountancy, University of Waterloo, Ontario, N2L 3G1, Canada, 1989.
3. Boritz, J.E., and Wensley, A.K.P., "Structuring the Assessment of Audit Evidence: An Expert Systems Approach," *Auditing: A Journal of Practice and Theory*, 1990.

• Chart of accounts, Accounting Regulations, Regulation on documents and document management in accounting; • Instructions and guidelines for the application of certain accounting provisions. General accounting regulation is carried out by the Commercial Code, which introduced requirements for accounting and auditing. Since 1986, the Law on Balances has been in force in Germany, on the basis of which the Fundamental Provisions for Accounting and Balance Compilation are adopted. Companies present a. this new system in order to help them to finish their work within an acceptable period, in an accurate manner and at a reduced cost [3,4] argued that accountants who are dealing with rote tasks in the accounting profession will perhaps replace their human capacities with AI in order to reach a better future. ... InAI & ES in Accounting and Auditing: Progress, Regression and New Paradigms, Chapter 2. M A Vasarhelyi. Predicting the outcome following bankruptcy filing: A three-state classification using neural networks. We think AI is a great tool for controllers and internal audit departments. Controllers don't have time to look at all transactions posted by their staff, but I bet they would like to look at the high- and medium-risk transactions. Also, I am pretty sure the internal audit department wants to address the risk issues before the external auditors inquire about them. It's more of a total audit, and it's going to change the way we do auditing. The possibilities are endless, and I am excited to see what is around the corner.