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ABSTRACT

This paper presents an approach to employ experiential experiences in the learning of a major area of artificial intelligence, namely Expert Systems (ES). Learning is enhanced by requiring students to build a real world ES application using an ES shell called EXSYS.

INTRODUCTION

Several recent articles have detailed new, efficient techniques to use simulation and experiential learning to achieve better coverage of networking and computer telephony integration in the MIS course (Arbogast, 1997). Another critical area that needs to be addressed in the business curricula is artificial intelligence (AI). Employers are looking to business graduates to lead in developing AI applications that will provide a sustainable competitive edge in the marketplace. How will business programs arm graduates with the knowledge they need in AI? The purpose of this article is to discuss one approach that is being employed to address this question.

BACKGROUND

The major objective of AI is to develop computer functions that are normally associated with human intelligence, such as reasoning and problem solving (Kurszweil, 1992). Despite its recent history, AI has developed into several domains that have unique goals and objectives. A major AI area is Cognitive Science Applications. It includes technology that can create interesting applications in expert systems, fuzzy logic, and intelligent agents. All of these are “knowledge based systems” that seek to couple a knowledge base with some type of reasoning capability. ESs provide decision support advice to management

from an expert consultant in a specific, narrow domain (Osyk and Viayaraman, 1995).

DISCUSSION

In order to achieve successful applications, it is necessary that ES efforts be led by versatile, common-sense oriented individuals with business backgrounds. If ES knowledge is required in the background of business majors, the next logical question is where and how to include it in the curriculum? The MIS course has evolved over the past twenty years and normally addresses some AI topics, notably expert systems (O’Brien, 1996). The problem is that the material often fails to include any real simulation or experiential learning.

Fortunately, there are ways to accomplish the objective of engaging the business student with a simulated “real-world” experience. One approach that has been successfully employed in the graduate programs at Jacksonville University has been to require that students build expert systems as part of the course in the “Management of Information Technology”. In one extended three hour session, enough background material is covered so that students understand expert systems down to a level of detail that they will need to actually build one.

THE EXSYS EXPERT SYSTEM SHELL

EXSYS is an ES shell that can be procured and used to accomplish the goals in this area. A student EXSYS version is available at a reasonable cost from EXSYS, Inc. An ES shell is a set of software that contains the following basic building blocks to create expert systems: an inference engine, user interface, and a

Developments in Business Simulation and Experiential Learning, Volume 25, 1998

knowledge acquisition program. It comes with sufficient technical documentation to support the building of “real-world” systems. EXSYS is a Windows-based expert system shell that facilitates the rapid learning of this tool and greatly assists the student in producing a useful application. In building the application it contains user friendly screens that lead the user through the development process one step at a time. It is relatively easy to check each decision rule as it is built, and the entire process is self-documenting. When completed it is also fairly simple to run and to validate applications

STUDENT ASSIGNMENT

The student assignment is preceded by instructor demonstration to introduce the shell. This demo concerns a retiring expert that has been making procurement decisions on personal computers (PCs) in a company. She has agreed to work with a knowledge engineer so that her heuristics can be captured before she departs. The company wants an expert system that will continue to replicate her decisions. In a short period of time in the classroom, six rules *are* built which form the basis of the judgment model that she has been employing.

Students are required to design and build an ES with at least ten rules using EXSYS. Students work groups of two or three and are formed and encouraged to produce a system with relevance to their business environments. Expert systems that are useful also in their personal lives are also allowed. Students are required to document their work and to provide a software disk with the expert system. A short memorandum is also required so that the students can describe to management the purpose and justification of the system. Emphasis is placed on logic and creativity.

RESULTS

The results of this assignment have been uniformly good. In seven different graduate

classes in which this has been used, all groups have been able to produce workable, useful expert systems. After students get over the normal “up-front” requirements of loading the software and performing a tutorial, they are able to move through the exercise fairly rapidly. In some cases there were some minor problems with rules that were not properly constructed and some problems with validation. Careful evaluation and feedback by the instructor is extremely important in this area. Learning is not complete when the exercise is handed in, but only after the instructor carefully evaluates each system and provides the requisite feedback to each student team.

Student reaction to this exercise has been highly favorable. By allowing considerable flexibility in the chosen applications, students find applications that they are interested in pursuing. Typical student comments have included “I never realized that I had the ability to produce such interesting and useful applications in expert systems. My company was delighted that I was able to build such a system and we are now working to expand its utility”.

CONCLUSIONS

Building expert system applications in the MIS course is an excellent way to reinforce the teaching of artificial intelligence at the business curriculum at the graduate level. By providing a “real-world” practical experiential exercise in the classroom, business graduates will be in a much better position to participate in and lead such efforts in their companies. In keeping with “business learning in the future” theme of the conference, it is recommended that MIS instructors consider employing such an exercise in the future.

References available upon request