

university research and education, in general, is being squeezed with inadequate funding, low morale and loss of highly trained and qualified staff to industry and abroad. University researchers are being encouraged in the spirit of the market economy to compete for and to attract more non-governmental funding than ever before. They will turn to British industry where according to the authors of this book they will find "company managers are simply risk-averse. . . . They're willing to experiment with a technology, but not if it costs them too much." This approach augurs even less well for the application of information technology in the non-profit oriented social and healthcare domains. If this book is drawn to the attention of Margaret Thatcher, I wonder if she will be as enthused as many others to react in a positive and constructive manner. I have recently had a recurring nightmare of the Prime Minister addressing the gathered expert systems community where she advises in her now familiar and much controlled whisper "Watch my lips! No more rabbits!".

The rise of the expert company (4) by Edward Feigenbaum, Pamela McCorduck and H. Penny Nii, Macmillan 1988, pp 322, £14.95.

The Rise of the Expert Company, according to its jacket, is a "road map to the future of business, . . . a grand story of opportunity, a report from the frontier on new paths to competitiveness and productivity". The authors believe that those companies (and nations) that efficiently manage and automate their knowledge and expertise will gain significant competitive advantages over their competitors that do not. This book validates the authors' assertion through casebook studies of over twenty companies that took the risk of leadership in knowledge automation. Their reward has been order of magnitude productivity gains, higher profits, and acknowledged industry leadership.

This book addresses three very different audiences and works well for at least two of them. First, it is a book for the executive. It speaks the language of business goals and objectives. It recognizes that a fundamental flaw in the presentation of any new technology to executives is a focus on the technology, not the business problem the technology addresses. In contrast, Feigenbaum *et al.* start with the business case, present expert systems technology as a response to the business needs, and validate the solution in terms of measurable impact on the business objectives. The theory of expert systems technology is secondary to a description of its successful application. It is not coincidental that an important factor in each case studied is the ability of the expert system's champion to present the system in the terms and values of the company's business agenda. In this respect, *The Rise of the Expert Company* serves as a primer on how to effectively sell this important technology within the corporate hierarchy.

The authors introduce the readers to systems that are solving real problems for businesses throughout the world. They show us quality control systems—systems that help plan, design, manufacture and distribute goods and services—and decision support systems—systems that automate front office activities. The executive audience is brought to the realization that a company's knowledge (its expertise, policies and practice) is an asset, and that, through expert systems, this asset can be cost-effectively brought to bear on a significant portion of the company's business.

The second audience includes knowledge engineers and would-be knowledge engineers. *The Rise of the Expert Company* is a "hidden camera" view of the politics and psychology of expert systems implementation. It is a collection of the kind of war stories that are recounted informally at professional AI conferences but are seldom presented formally in the professional literature. The book addresses questions frequently heard in the hallways during conferences: "What did you do to get management to agree to your project?" "What issues did you need to attend to?" "What did you do to convince the users that this system would be helpful?" "What would you do differently next time?" "How can we get started, and where do we look for allies?"

Feigenbaum *et al.*, recognize that there are no time-tested methodologies for expert systems development and project management, and they do not attempt to supply one. Instead, they point toward critical success factors for the champion of expert systems technology. These include having

a relentless focus on the business problem to be solved, a consistent advocacy of the user, and a firm commitment to maintaining open channels of communication with management. It is easy to lose sight of these factors, and moreover, they carry no guarantee of success or of even getting the initial go ahead. People's understanding and expectations for expert systems range from disbelief to hostility. Often, those with the clearest appreciation of the technology's benefits are not in a position to allocate the money, manpower, or expertise necessary to (use, develop, etc.) the technology. *The Rise of the Expert Company* provides strategies for the technology champion. First, the list of companies and their current applications can be a warning shot across the bow of the corporate boardroom: "This technology is giving your competition order of magnitude increases in productivity and quality right now, and they are just learning how to apply it: our window of opportunity is shrinking fast." Second, for each case the authors focus on one or two specific tactics that were integral to selling and implementing the system. A brief list includes learning to speak the bottom line of the business, picking a visible, easily understood business application, and even the proverbial end run.

Feigenbaum et al., are also careful in their choice of examples to avoid stereotyping the champion of expert systems technology. Champions can come from any level of the organization, possess varying levels of technical and functional competence, and be more or less in step with the politics of the organization. A common theme through many of the cases is that allies can come from unexpected parts of the organization. Successful expert systems efforts accommodate and encourage such alliances.

The third audience for *The Rise of the Expert Company* consists of those knowledge engineers and executives that have seen the successful implementation of expert systems within their organization, have experienced unyielding resistance from the Management Information Systems (MIS), and wonder if there might be some way to bring them on board. This audience will find little help here. The discussion of technology transfer (or insertion) extends from the factory floor to the corporate boardroom but not into the data processing department itself.

In case after case, Feigenbaum et al., recast hard problems—corporate intransigence, user uncertainty, and uncooperative experts—as opportunities. But, the unwillingness of MIS departments to support expert systems development is simply left as a problem. This need not be the case. There are examples of MIS departments embracing expert systems; and this has occurred when the champions have treated the MIS departments as a consumer of the technology and courted it as they would the executive or the end user.

An examination of the business of data processing reveals a number of activities, ranging from test code generation to entity analysis, that are knowledge intensive and frequently become bottlenecks in a system's life cycle because the knowledge just is not available. In addition, MIS departments are usually viewed as an inconvenient business expense and as a result are constantly fighting budget cuts. If someone proposed an approach that would increase MIS visibility and acceptance within the user community while improving their productivity, MIS heads would be as enthusiastic as any executive chronicles in *The Rise of the Expert Company*. There is such an approach—the use of expert systems shells to rapidly prototype complex conventional systems—and companies such as Texas Instruments and Andersen Consulting have demonstrated significant productivity enhancements by using it. MIS departments that actively employ expert systems will stay competitive for operations funding within a business.

By taking a tack such as this, the MIS department can become an ally in the technology transfer process. This alliance will be critical as expert systems development matures and standalone systems become part of integrated business solutions. But to facilitate this, one of two conversions must take place. Either the knowledge engineer must acquire systems analysis skills or the systems analyst must acquire knowledge engineering skills. If the latter occurs, the future of MIS looks very, very bright.

In summary, *The Rise of the Expert Company* should be required reading for every corporate executive in America. It will be an enjoyable and profitable read for almost all knowledge engineers (and would-be knowledge engineers). My only complaint is a minor one dealing with the authors' superficial treatment of MIS intransigence.