

it will run on a particular processor.

The development of work stations leads naturally to the open-system approach to computer installations. According to this approach, a computer user installs a local area network and then shops around for file servers, hard copy servers, bulk data servers, and work stations to connect to it. He builds up a system to suit his needs and to take advantage of the most attractive offerings of the industry. Whether or not this becomes the standard model for the computer system of the future, there can be no doubt that the harmonious working together of equipment from different vendors will become a permanent requirement in the industry. For example, all work stations or personal computers connected to the network, whether they run UNIX or some other operating system, must be capable of accessing the same file server. Companies will sell components as well as complete systems and the components will form a major part of their business. This is already beginning to happen, and is having the consequence of making the industry much more competitive than it was in the past.

Users as well as computer manufacturers will have problems of adaptation to the changing state of affairs,

especially if they have been accustomed to rely on their chosen vendor for system support. Falling margins due to increased competition will make it hard for vendors to maintain the same standards of user support as formerly. It will be tempting for users to shop around for equipment, but problems are bound to arise from time to time when nominally compatible items are added to a system. Not all users, in the first instance at any rate; will be prepared for such problems. Hardware vendors and independent companies alike are seeing here a business opportunity in the provision of support services in system management.

The technical directions are now clear, and the industry is in the process of adapting itself as best it can to the biggest upheaval that has occurred for many years. It is unfortunate that this upheaval should come at a time when there has been a general recession in industry as a whole. I make no predictions about exactly how things will work out. There may well be some surprises, but I remain optimistic for the future health of the computer industry and the major companies in it.

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Book Review

CHRISTOPHER JOHN HOGGER, *Essentials of Logic Programming*, Oxford University Press. £15.00, ISBN 0-19-853832-4

Christopher Hogger wrote his first book on logic programming some ten years ago. This new text could be seen as an update of the earlier book but really it is not so. It is a new introduction to logic programming, which is not only up to date now but has the benefit of the author's further ten years of teaching the subject and the lessons which have been learned from that.

The book is organised as a set of 60 themes, and the treatment of the themes, compared to chapters in a conventional book, is short and swift. Within each theme only a small amount of material is treated, but each theme concludes with a set of comprehensive exercises, which are supplied with full answers. This frequent reinforcement is a substantial aid to understanding and remembering.

This book is about logic programming and not, for example, about logic-programming languages such as Prolog and Lisp. It is theoretically rather than practically based and includes *inter alia* Herbrand interpretations and an introduction to First-order Logic, the problem of Resolution and the problem of Theorem provers. It begins with a background and overview, continues with First-order and Clausal-form logic and problem solving. It goes on to consider the Herbrand and Domain resolution and concludes with the problem of program verification.

This is very much a tutorial text, but it is aimed at the higher levels of computer science courses. A mathematical background or some background in Logic is essential. For students on M.Sc. courses in Expert Systems or a B.Sc. course in Artificial Intelligence it is ideal, on the other hand the highly theoretical approach makes it quite unsuitable for vocational-orientated courses such as the BTEC HND.

The treatment is straightforward, the book

is not littered with many references and quotations which would make it difficult to read, and the short themes make for easy learning. Its 300 pages contain a wealth of information and at £15 it is particularly good value for students.

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NIGEL WOODHEAD, *Hypertext & Hypermedia: Theory and Applications*, Addison-Wesley, London, 1990. 231 pp. £19.95, ISBN 0-201-5444-3.

This book is a discursive overview of hypertext and hypermedia. It begins with an introduction to the subject together with its history. It then goes on to illustrate, by example, the potential that the technology offers. It also suggests a methodology for building applications, looking at owner, author and user issues. In addition, a listing of sources and products for various systems is given. It must be stressed that the book provides an overview, and more detail on the research mentioned in the book must be sought elsewhere. An excellent set of references is given to enable the reader to do this. Nigel Woodhead is a technical writer, with experience in hypermedia applications. This means that the book is written in an objective way and none of the products or ideas are given any special treatment.

The book is structured, like many others in this area, to be read in a nonlinear way. Due to the wide range of people it is aimed at, it is not anticipated that everyone will read the whole book. Navigation is via contents pages at both section and chapter level. Links in the text to other paragraphs are also provided; these are used sparingly, but help to give the reader a flavour of their potential. Page numbers attached to these links would be a welcome addition; this would encourage a greater number of readers to experiment with non-linear reading.

The book is divided into an introduction and three sections. The introduction provides a history of the development of hypermedia technologies and also introduces some terminology for those new to the area. Section one, 'The potential of hypermedia', relates the formal characteristics of hypermedia to those in other areas. The areas covered are databases, object-oriented approaches, text-processing approaches, artificial intelligence and electronic publishing. Section two, 'Owners, authors and users', discusses the issues relating to these three parties. The section on authoring issues is particularly comprehensive, covering tools, styles and methodology. Section three is a listing of the packages available for the IBM PC, Apple Macintosh and workstations. Accompanying each is a brief description and review, and also supplier details. There are also appendices which give details of available shareware and shellware.

The author suggests that the book is of use to software developers, technical authors and electronic publishers, as well as teachers and students. It is indeed useful for these people but it may not be of significant depth for software development professionals and they may find many redundant sections, which might make it not a worthwhile investment. Otherwise, the design of the book, both the presentation and the flexible layout, justifies the cover price.

The book is very comprehensive and easy to read. This makes it especially good for students of many disciplines, including business studies, computer science and information technology, although it is more suitable to postgraduate and research students since there are no worked examples or exercises. As an overview the book works well and it is a good initial step into this area. The numerous references allow readers to follow up the areas of interest easily.

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