

# Reviews

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*Reviews by Philip Barker, University of Teesside*

*In the future, ALT-J's policy will be to offer books and other products for review to members of ALT or appropriate external experts. For this first issue of the journal, however, Philip Barker (Associate Editor in charge of reviews) has taken most of the burden on himself.*

## A trilogy of books on CD-I

Compact Disc Interactive (CD-I) is a new electronic publishing medium for multimedia information. Unlike conventional publishing media such as paper and film, CD-I provides an interactive method of accessing stored information and controlling its subsequent display on a TV screen. CD-I revolutionizes the publishing of all sorts of material such as music, text, images, computer graphics, film and video. It also adds many capabilities not possible with traditional publication media. Until recently, however, the only widely available textbook on CD-I was Preston's *Compact Disc-Interactive: A Designer's Overview*, published in 1988 by Kluwer Technical Books. Now, with the recent release of CD-I in Europe, three new books on the technology have become available. They form part of *The CD-I Series* produced by Philips Interactive Media Systems (UK) and published by the Addison-Wesley. All three have 1992 imprints.

## *Introducing CD-I* (ISBN: 0-201-627-48-5)

Given its non-technical approach, this book is ideally suited to newcomers to CD-I technology. It is aimed at a broad audience from interactive producers and designers to

all those who might be interested in the applications of CD-I as a communication and entertainment medium. The aim of the book is to provide an overview of CD-I and how this new standard for electronic publishing is likely to influence information provision and access in offices, schools, universities and home environments. The book is organized into four basic sections, plus a case study and a glossary.

The first section deals primarily with some of the many potential uses of CD-I in a number of different contexts ranging from training, education and entertainment to corporate presentations and information provision for point-of-sale applications. This section also explains the basic nature of interactivity and how CD-I relates to interactive television.

In the second section, the multimedia nature of CD-I is the focus: the medium allows text, sound, static pictures, animations and motion video to be incorporated and integrated into an interactive presentation. Two of the most important features of CD-I are also emphasized here: the digital nature of each of the constituent media components, and the existence of a universal world standard (the Green Book) for CD-I publication and delivery platforms. The limitations of the finite capacity (650 megabytes) of a CD-I disc are discussed, and different ways of using the available storage are then outlined.

The third section covers the basic steps involved in designing a CD-I product. Each aspect of the design process, from product conception through to design specification, is introduced and described. Producing a CD-I title usually requires a multi-disciplinary team with a range of different design and

development skills, and this section concludes with a discussion of the importance of teamwork and project management.

The fourth section describes how a design specification is taken through the various phases of development to final production. Topics discussed in this section include copyright issues, authoring materials, production libraries, disc building, and development-team structure and responsibilities.

The case study presented at the end of the book takes the reader through the steps involved in creating an actual CD-I publication (*Great British Golf*). It describes the roles of the different people involved in making the disc, its basic structure and content, and all the individual development and production processes (authoring, testing, mastering, and so on) needed to bring a commercial product to the market.

The book provides a very readable introduction to CD-I and its applications for those who are still uninitiated into the technology. Like the other two books in this series reviewed here, it is produced to a high standard (apart from one or two minor typographical errors) and is copiously illustrated.

***The CD-I Design Handbook* (ISBN: 0-201-627-49-3)**

Designing products for delivery on CD-I is in many ways different from designing for other publishing media. This design handbook therefore deals with a range of issues relating specifically to the CD-I design process – from initial concept through to the beginning of production. It is aimed at designers who need to understand what they can do with CD-I technology rather than the detailed technical aspects of how CD-I works.

There are ten chapters, an appendix, a reading list, a glossary and an index. The ten chapters are organized into three broad theme areas covering general introductory issues,

technical perspectives, and detailed design considerations. None of the issues associated with asset or disc production is considered since these form the topic of a companion book (*The CD-I Production Handbook* – see below).

General introductory issues are dealt with in the first three chapters. The topics presented include an introduction to the features, facilities and potential of CD-I, a description of CD-I as an information storage and delivery medium, and a detailed exposition on how to design for interactivity.

The technical perspectives (chapters 4 to 7) provide a more detailed description of the nature of CD-I's interactive interface, the use of video, image formats and image compression. This section also contains an outline of the various audio formats available, and gives examples of the different ways of using them. The section ends with more details about the overall CD-I delivery system, and how it works.

The final section of the book (chapters 8 to 10) deals with various issues relating to the design stages involved in producing a CD-I title. The topics covered include a detailed description of the design process, design analysis, prototyping, copyright and legal issues, teamwork and management techniques such as developing the production plan, production scheduling, and budgeting.

Although the further reading section is rather sparse (containing only six references) both the appendix and the glossary are very useful. The appendix, for example, provides a valuable ready reckoner which enables designers to check that their design will fit within the storage and bandwidth requirements of CD-I.

***The CD-I Production Handbook* (ISBN: 0-201-627-50-7)**

This book is intended as a sequel to the *Design Handbook* reviewed above. It is

aimed at those working on the production of CD-I titles (whatever their level of involvement) and those who are interested in commissioning CD-I material but are not sure about what to expect.

There are eleven chapters, logically arranged into five theme areas: the pre-production phase of a project (chapters 1 to 3), CD-I facilities (4 and 5), gathering and producing CD-I resources (6 to 9), disc building (10), and follow-on projects (11). The reading list and glossary are essentially the same as those of the *CD-I Design Handbook*.

The three chapters that make up the section dealing with the pre-production phase are of an introductory nature and are concerned with the infra-structure that must be created in order to undertake successful CD-I development. The first chapter covers issues such as the relationship between the producer and the client of a product, a description of the production process itself, and tools for CD-I production. The second chapter describes in detail the steps involved in setting up a CD-I studio and equipping it, and the nature of the hardware, software and human resources required. The final chapter in this section deals with project management issues such as setting up milestones, defining deliverables, scheduling, elapsed time, budgeting and copyright.

The first chapter of the second section provides detailed descriptions of CD-I technology including the nature of the CD-ROMs on which interactive materials are published. There are descriptions of the parts of the CD-I player, the structure of discs (tracks and sectors), seek time, channels and data rate. Synchronization, interleaving and real-time operation are also discussed. The second chapter in this section deals with CD-I effects. Beginning with a discussion of picture planes and image types (such as FMV, RGB, DYUV, CLUT, etc.) it proceeds

to a description of broadcasting conventions, resolution and aspect ratios. Subscreens, partial updates and CLUT animation are then outlined, and there are descriptions of the various types of video plane effects such as cuts, wipes, fades, dissolves and mosaics. This section concludes with a short description of audio types and the use of sound-maps.

The largest section of the book is the third, and it deals with the theme of gathering and producing CD-I resources. The first chapter of the section covers four important issues: the coding methods underlying the storage of materials in digital form on CD-I discs, how to generate the right sort of materials from scratch, how to convert existing materials from non-CD-I format, and how to manipulate and edit materials at different levels of authoring sophistication. The next two chapters deal with authoring and the creation of prototypes, authoring software such as MediaMogul, and choosing an authoring system. The section concludes with a particularly informative description of programming, concentrating on Philips's CD-I Author (a programming environment for developing CD-I titles), the IMS Programmer's Toolkit, the Balboa Runtime Environment, CD-RTOS and the OS-9 real-time multitasking operating system.

Chapter 10 (which makes up the fourth section of the book) covers the disc-building to disc-pressing stages of CD-I production. Consideration is given to a number of important issues such as the structure and creation of real-time files and the generation of CD-I disc images for testing purposes. There is then a discussion of the role of emulation (and how it works), followed by a description of WORM discs and how they can be used for testing and validation. The final part of this section is concerned with the processes that take place at the CD-I production plant when the WORM or tape

streamer is used to create a master which is then used for replication purposes.

The last section of the book consists of a single short chapter covering the various factors to be taken into account in anticipation of follow-up projects. It discusses issues such as creating sequels, house style and software efficiency through the design of re-usable code segments.

This book really does contain lots of useful information for those wishing to find out more about CD-I production: of the three books in the series reviewed here, I found it the most interesting and instructive.

At present there are four planned books in the series – at the time of writing *The CD-I Programmer's Handbook* has not been released but is scheduled for publication later this year. Undoubtedly, as CD-I takes off there will be scope for extending the series, perhaps with titles such as *CD-I in the Classroom* or *CD-I and Higher Education*.

*The Hutchinson Electronic Encyclopedia*, First Electronic Version, Oxford, Random Century and Attica Cybernetics, 1991. ISBN: 1-873472-00-5. Price £99.

Attaching a CD player to a personal computer is now a relatively simple process. So, as the cost of such players falls, the use of CD-ROM for distributing large volumes of computer-based multimedia information becomes increasingly attractive, and electronic encyclopedias based on CD-ROM are now becoming popular. Compton's *Multimedia Encyclopedia* and the *Grolier Electronic Encyclopedia* are two examples of this new type of information resource; the *Hutchinson Electronic Encyclopedia* is another.

The package consists of a standard ISO 9660 CD-ROM, a printed manual, and floppy disks (3.5 and 5.25 inch) containing the

installation software. Installation is relatively easy, taking only a few minutes. The system runs within Microsoft Windows.

On start-up you are presented with a Contents Page designed to give easy access to the various categories of information available. The Contents Page is framed within a standard Windows setting of a horizontal menu bar, scroll bars, dialogue boxes and reactive buttons. It is organized into three major areas: an eight-option iconic menu area, a window for the display of title and word indexes, and a horizontal array of 13 icons.

The information within the encyclopedia is organized in the form of 'articles', each consisting of just one 'page' of information, so pages are of varying length. There are 25,147 articles listed in the General Index, and they are sub-divided into seven basic subject categories: Places (5,040), Science and Technology (3,378), History (1,937), Biographies (6,068), Aspects of Society (4,279), Life Sciences (3,396) and The Arts (1,049). A particular information category is made the current one by clicking on the screen area associated with it, and once one of the categories has been selected it can be browsed through or searched.

The icons in the icon array enable you to access the Contents Page from anywhere in the encyclopedia, display any page, examine the next and previous pages, perform word searches, examine the next and previous records retrieved by a search operation, create a backtrack list and actually backtrack, access a Notepad facility, print out information in hard copy, and obtain online help. All these facilities are of course augmented by those provided in the standard Windows environment.

There are two basic ways of retrieving information. The first involves directly accessing articles using one of the two

alphabetical indexes (Title and Word). The second method is based on full-text retrieval mechanisms using either a simple or complex keyword search facility. For a simple search strategy, you type in a string of characters that defines a descriptor representing your information requirement. All the articles indexed under this descriptor are then made available for display. If too many articles are retrieved, the search can be refined in order to reduce the number of hits. For example, a search for *computer* retrieves 220 articles; refining the search by also specifying *digital* reduces the number of hits to 20. Complex searches are similar to simple searches except that up to nine keywords can be used simultaneously, each one linked to another by means of a logical operator (AND, OR, NOT). Examples of complex searches are: *comput\* AND Babbage AND Turing* (retrieves one article on the history of computing); and *computer AND digital AND NOT optical* (retrieves 18 articles about computers). Unfortunately, many of the complex queries I tried resulted in that dreaded Windows message: 'UNRECOVERABLE APPLICATION ERROR - Terminating Current Application'.

That, however, is not my only complaint about this product. It performs too slowly, there are other bugs and errors, and the user-interface is of poor quality. I was also very disappointed by the quality of the printed manual. This is scanty with respect to both size and content. Worse, it fails to reflect accurately what happens on-screen while the encyclopedia is being used.

The slowness of the system is apparent in three important areas - initialization, search time and retrieval time. In this context the *Grolier Encyclopedia* outperforms it by a long way. For example, once the *Hutchinson* system has been activated by double clicking on the *Hutchinson* icon, there is a wait of about 95 seconds before everything is ready

to go. In comparison, *Grolier* - running on the same machine (a Viglen 386) and using the same Hitachi CD-ROM drive - takes less than 12 seconds to get going. *Grolier's* search and retrieval times are also much faster: the *Hutchinson* search takes over 27 seconds to locate a mere 452 references to the term 'Paris'; to perform the same search, *Grolier* takes less than four seconds to locate 1,425 references.

Equally irritating are the bugs and inconsistencies in the *Hutchinson* package. Examples include colour smudging on the opening page of the encyclopedia and in the photograph of John Major (Biographies Section), angstrom being spelled 'a3b3ngstrom' in both the word index and in the article defining the term 'lumen' (in other places it is spelled correctly), picric acid being retrieved by the string 'c6h2' and not by its correct molecular formula C<sub>6</sub>H<sub>3</sub>N<sub>3</sub>O<sub>7</sub> (which retrieves 'pyrogallol'), and entries in the title index appearing to be correctly capitalized whereas those in the word index are all in lower case - something which makes chemical formulae and abbreviations appear unfamiliar.

There are many other such little mistakes, but one of the most unforgivable limitations of the package is the lack of error checking in the underlying control software. For example, I started up *Hutchinson* having inadvertently left my *Grolier* disc in the CD-ROM drive. The control software gave me no indication that I had an incorrect disc present and it took me a good while to determine why I could not get *Hutchinson* to work. In comparison, *Grolier* checks for the presence of the correct disc in the CD-ROM drive and issues a warning if it is not there.

In all, then, I hardly feel I can recommend *Hutchinson* to anyone who requires fast and accurate access to encyclopedic information when at least one better alternative is available.

*Rewritable Optical Storage Technology*, edited by J. Paris Roth, Meckler, Westport CT, USA, 1991. ISBN: 0-88736-534-5.

Because of its reliability, robustness and high storage capacity, read-only optical storage technology has become an important and well-established component of interactive-multimedia systems. Although potentially as important, rewritable optical storage is not as well-established, but its use is growing. This book, produced by a group of authors, provides an introduction to the development and application of this relatively new approach to data and information storage and retrieval.

There are seven chapters. The first provides an overview of rewritable optical storage technologies: magneto-optical (MO), dye-polymer, and phase-change. The merits and current de-merits of the most popular of these technologies – MO – are then described and a number of commercial products are compared. The need for inter-changeability and standards is discussed, and the chapter concludes with an annotated list of over 170 names and addresses of organisations currently undertaking active research into the development and/or application of rewritable optical storage technology. The second chapter describes how MO storage works and the advantages of this type of technology for storage-intensive applications such as CAD (Computer-Aided Design) and CAE (Computer-Aided Engineering). The benefits and uses of MO rewritable, WORM and CD-ROM storage technologies are then compared, and the chapter ends with a description of a multifunction (hybrid) optical disc drive that could prove an attractive development for future computer systems.

Following the hardware descriptions given in the early part of the book, Chapter 3 deals with some of the important software consid-

erations relevant to rewritable and multifunctional optical drives. Issues covered include the software requirements for WORM and rewritable media, the need for a universal logical file format for rewritable media, and the Small Computer Systems Interface (SCSI). Chapter 4 describes the development of a new flexible rewritable storage technology suitable for use in tape and disc drives. The technology is based on the use of dyed polymer films for information storage, and a web-coating process for fabrication. The attractiveness of this latter process (compared with stamping processes) is that it can lead to substantial reductions in production costs.

The last three chapters of the book deal with applications. Chapter 5 covers the end-user requirements for networking an integrated rewritable optical disc workstation in order to support communication, storage and writing activities within a professional workgroup. Similarly, the author of Chapter 6 outlines the requirements of a workstation to support foreign-language instruction and how rewritable optical media could provide many of the required facilities. The final chapter deals with 'surrogate manipulations', describing how a high-speed workstation fitted with a rewritable optical disc could be used to provide a multimedia workstation for the creation and storage of contemporary art material using images, text and sound.

As well as a subject index, the book contains two appendices: a list of recommended readings relating to rewritable optical storage, and a glossary of terms and acronyms.

The style and quality of the presentations varies from chapter to chapter. There are also a number of spelling mistakes and some important omissions. But the book is in general quite interesting, and will undoubtedly serve as a useful introduction for those wishing to find out more about the current

state of the art in the area of rewritable optical storage and its applications.

*Hypertext: State of the Art*, edited by R. McAleese and C. Green, Oxford, Intellect, 1990. ISBN 1-871516-08-0.

There has been growing interest over the last few years in hypertext and hypermedia, and a large number of commercial products have become available. These have included applications which deliver hypermedia information (for example, electronic books based on CD-ROM), and hypermedia creation software (for example, authoring systems). This growing interest has developed from academic research which started back in the 1940s with Vannevar Bush and his memex concept. More recently, a great deal of research has been conducted into hypertext and hypermedia, and the book reviewed here aims to disseminate some of the findings of this research.

It consists of 29 papers selected from those submitted to the 2nd UK Human Interface Interactive Learning Systems SIG conference on hypertext held in 1989 at the University of York. The principle keynote speaker was Ted Nelson, and although his speeches are not included in this book, a brief description of his contributions is provided in the preface.

The papers are divided into four basic sections: Navigation and Browsing, Hypertext and Learning, Prototypes, and Designing Hypertext and Hypertext and Design, each preceded by a short description of underlying issues.

The first section, consisting of nine papers, addresses topics such as the use of metaphors, the effects that the underlying structure can have on navigation tools, and the

relationship between navigational aids and control structures. Section 2 contains seven papers covering the use of hypertext and hypermedia within learning applications. The reader is led to consider concepts such as learning styles, the degree of learner control, user models, and designing for precise learning outcomes. Section 3 also has seven papers and deals with concepts associated with the creation of hypermedia applications. A number of languages and environments are discussed (for example, HyperCard and Prolog) along with software maintenance and document processing. The last section has six papers, all dealing with design issues. Two basic approaches emerge: a top-down approach, concentrating on the way knowledge or information should be represented, and a bottom-up approach concentrating on the system and user requirements.

In addition to the theoretical treatment of the concepts and ideas relevant to hypertext and hypermedia, the papers presented in this book also generally provide the results of experimental work, allowing some quantification of the ideas discussed so that a clearer picture of the actual impact of a variety of hypermedia features can be assessed.

This is not an introductory book. It is aimed at people who already have some knowledge of both hypertext and research techniques. It offers no overall conclusions, and it has the feel of conference proceedings rather than that of a textbook. Nevertheless, the papers are of high quality, and the range of topics discussed makes this an extremely useful text for undergraduates, industry professionals, and anyone conducting research and/or development of hypermedia applications.

A hypertext version of a previous book edited by Ray McAleese, *Hypertext: Theory into Practice* (Oxford, Intellect, 1988) is provided free as a Guide Envelope application for the Apple Macintosh.

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