The Electronic Book and Future Delights

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ABSTRACT

This is a light hearted but absolutely serious look at the fantastic changes which are going to hit the library world when the printed book is rapidly displaced by the Electronic Book. It reviews the last 30 years of developments in the computer world so as to establish trend lines. It looks at a few current realities; for example, a single chip which can contain much more information than a large book. It then projects these into the next decade and shows how they will inevitably result in the box of delights, which we are calling the Electronic Book. It will enumerate the advantages of this creation and leave it to you to realise that the 500 year era of print is drawing to a close. It will also look at the radical changes which are currently beginning in reference libraries, especially in the USA.

Printed Books

Paper is totally inadequate for handling large compendiums of information. It is staggering that this anachronistic medium is still blindly accepted. In this day and age we are still mixing woodpulp with water, turning it into a white milk, drying it into a thin crisp film and then staining it with dye.

In order to find information we need to find the right book or books which means consulting catalogues or indexes, or scanning shelves. The relevant information may cut across different disciplines and require trekking from one end of a library to another.

To read books we need to be in a well-lit place; many of us need spectacles as well. We leaf through tables of contents, find and consult indexes, locate a relevant page and, finally, read. While reading we need to scan and search, flitting through pages.

We have no choice about how the information we read is presented. We cannot change the size or organisation of a page, neither can we change the size of the print. We are at the mercy of the book designer and a technology that is hundreds of years old.

Many reference books are very heavy and cumbersome; they are not very portable. Moreover, it is difficult, time-consuming and normally illegal to copy books or parts of books. It is often not possible to obtain an extra copy of a book quickly.

In order to print books, the publishing industry has to use enormously expensive production methods. Vast amounts of paper are used.

There has to be a better way of making information available.

Today's Technology

Before considering the Electronic Book of the future let's look at how today's technology compares with the printed book.

CD-ROM allows us to make vast amounts of information available in a very convenient form. A complete set of telephone directories for the USA requires 4000 volumes, 200 feet of shelf space, and 40 trees. This is now being replaced by a slim pack of 2 CD-ROMs.

Modern user interfaces for retrieval systems allow us to access the right information quickly and simply. Information is automatically and comprehensively indexed and indexes are easily scanned and used. Where approriate, a thesaurus is available to facilitate more sophisticated searching.

A table of contents may be provided which allows users to navigate through structured information and choose a perspective on the information which is relevant to their particular needs.

When information has been retrieved it can be displayed in a variety of ways. Retrieval systems which work for the Apple Macintosh, Micrososft Windows or similar environments allow great freedom to the user. For example, windows containing different types of information can be moved and re-sized. The font size and type may be changed.

Relevant sub-sets of retrieved information may be used immediately by readers. Using multi-tasking it is easy to copy retrieved information into word processors or other applications and make instant effective use of the information.

Hypertext systems allow the linear form of a printed book to be transcended and information can be explored in ways which best suit the reader's experience and interests.

Networked access to CD-ROM information allow users to share access to CDs and to access information which, physically, is some distance away. The information comes to the user rather than the user going to the information.

All of these facilities, and more, are already available (although probably not in a single system). Today's technology based on CD-ROM and existing computer hardware has some clear advantages over printed books. This is why the technology has been so readily accepted by the library profession.

However, today's technology is not sufficiently attractive to the library profession and library users to act as the catalyst for a wholesale switch from printed to Electronic Books. To achieve such a switch we need progress in the areas of hardware, user interfaces, and the use of multimedia to add extra dimensions to information. Let's consider each in turn.

Smaller, Cheaper, More Powerful Hardware

The pace of computer hardware development over the last 30 years has been dramatic. The cost/performance ratio for computers has been halving every 20 months. There has been a similar reduction in the size/performance ratio.

We need to remember that, even as late as 1980, many people considered the idea of laptop, portable computers ridiculous. Now such machines are commonplace and improving rapidly.

At the end of 1988, we could buy the NEC Ultralite, a really powerful IBM PC compatible weighing 4.4 lbs. for $3000. Only a few weeks afterwards it was available for $2000. Other machines, such as the Poqet which weighs only 1 lb, will become available shortly.

Hard disks, and floppy disks will continue to increase in capacity and decrease in physical size. More significantly perhaps, memory chips will continue to increase in capacity and decrease in price. 4 megabit chips are now available in production quantities and will be appearing in IBM computers a few months from now.

A product called "Smart Book" has already appeared which uses ROM (Read Only Memory) chips to store book contents. One of the first books to appear in this form is the Bible.

We have already seen great improvements in the display quality of portable machines and these improvements will continue. Also, there is intense development effort devoted to providing more convenient power sources for computers than today's batteries. In the not too distant future there will be batteries which last for more than a month.

Finally, touch-screen technology is already well established and allows system designers to discard a keyboard or make it an optional extra, as in the recently announced Agilis system.

Improved User Interfaces

Progress in providing improved user interfaces has been less spectacular then hardware progress. Nevertheless, much has been achieved. Interacting with computers 20 or 30 years ago was an unpleasant and frustrating experience for most people. The best of today's user interfaces provide an environment within which many people enjoy using a computer.

Over the next few years there will be a growing shift towards the use of interfaces based on the use of windows, mice and icons. Such interfaces, typified by the Apple Macintosh and IBM Presentation Manager environments, are rapidly gaining ground in a wide variety of hardware and software environments. A recent review in "Byte" described 12 such systems. They have the great advantage that they are all based on the same basic principles. It will not be long before an understanding of these basic principles is considered a fundamental aspect of computer literacy.

Within this general paradigm there is much scope for designing systems which are tailored to the type of information being made available. There will never be a standard user interface for accessing all types of information; when we consider the vast range of information that is going to be made available in electronic form we realise that the notion of a standard method of accessing information is inappropriate.

What is needed, and what will happen, is that most user interfaces will be based on similar principles

but will provide a rich diversity of functions which mirror the rich diversity of human knowledge and the myriad ways of describing and presenting this knowledge.

The type of user interface that I have been discussing is appropriate for use in academic and specialised reference libraries. There is another stream of development which is focusing on providing very simple interfaces which are suitable for a wider range of users and are more appropriate for public libraries. These interfaces are typified by some HyperCard systems available on the Apple Macintosh. An important aspect of such systems is that for some types of information a keyboard is not needed; a pointing device (for example, a mouse) or a touchscreen is perfectly adequate.

The two types of user interface complement one another and provide the right basic tools for ensuring that a very wide range of information will be available in electronic form and presented in a way which is accessible by the vast proportion of the population.

Multimedia Developments

Multimedia refers to the mixing of text, graphics, audio and, often, video. In combination with optical storage multimedia allows the development of "information-ware" which is different from and fundamentally better than the traditional printed book. Optical storage is a fundamental part of multimedia products because of the very high storage requirements and the need for a convenient distribution mechanism.

The development of multimedia products requires expertise from three industries: computing, television and publishing. Because multimedia cuts across disciplines, it will take some time for a significant number of high quality multimedia products to be generated.

However, we are already seeing multimedia products emerging which clearly demonstrate the enormous potential of the approach. Currently available or soon to be published multimedia products include: a version of "The Magic Flute" which provides music, libretti, analysis, glossary etc.; the BBC's "Ecodisc" which deals with interactive ecosystem management; and the "Guinness Book of Records".

The Electronic Book

The Electronic Book is now just over the horizon. The most common form of the Electronic Book will be a device about the size of a fat issue of "The Economist" and will have a beautiful backlit colour screen. Its batteries will last for more than a month.

I will be able to read in dark or dimly lit situations by turning up the backlighting. If my eyesight is failing, I will not use spectacles; I will change the font size.

I will be able to navigate around the book's contents using a table of contents and indexes. I will have the option of reading sequentially or of swiftly following hypertext links to other parts of the book.

A book's contents will not be an integral part of this device; plug in chips the size of a credit card will provide book contents. These "bookcards" will hold several megabytes of information and therefore could contain several books.

Libraries will hold stocks of books on CD-ROM and will be able to make permanent or temporary copies on bookcards as demand dictates. Publishers will automatically receive royalties for each copy made.

This easily portable Electronic Book will not provide access to the more sophisticated multimedia information-ware that includes the use of video. Initially, libraries will provide sophisticated, yet not expensive, computer systems to access this information-ware. Eventually, this technology will also become easily portable.

Be clear that the rate of advance is spectacular. Project this in your mind for 5 to 10 years and it becomes obvious that the Electronic Book will be an important reality.

The Electronic Reference Library

The Electronic Book will be supplemented by the electronic reference library. SilverPlatter already has several thousand subscribers, many of whom have acquired sizable collections of CD-ROM products. These collections are often scattered around the library in relative disarray, offending the sensibilities of the library staff.

We have recently introduced a collection management system called MultiPlatter which enables the librarian to do the equivalent of shelving these in shelf number order. MultiPlatter also allows the CDs to be made available simultaneously to multiple users situated inside and outside the library. Users who do not have a terminal connected to the MultiPlatter network will shortly be able to access the CD collection by

phone. Within a year or so bridges to other networks will be supported.

It will quickly become obvious that this kind of system is more capital effective than existing reference libraries. Also, it will be obvious that such a system enables librarians to offer a better service. Inevitably the use of such systems will proliferate.

The Library Profession and Technology

Librarians are sometimes characterised as being unadventurous and reluctant to use new technology. However, looking back over the last 25 years we find that this is not true. During this period libraries have used a wide range of technology to improve many aspects of the services they provide.

The library profession has been revitalised by grasping hold of the opportunities presented by automation, enabling the profession to better fulfill its mandate of organising and making available the body of human knowledge to our society. Although lack of funds has sometimes been a hindrance, it is noticable that the profession's prosperity increases as it makes good use of new technology to serve its constituents better.

The growing use of technology such as CD-ROM and the introduction of Electronic Books will allow libraries to serve their constituents better than ever before. The next few years will provide a host of opportunites for libraries. These are exciting times for the library profession and those companies which serve libraries. ❑