

Electronic Publishing : Status, Trends and Prospects

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抄 錄

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이 論文은 印刷物을 위한 電子出版과 非印刷物을 위한 電子出版을 區分하여 各 現況, 動向 및 展望을 특히 濠洲의 경우를 열거하여 論하였다.

ABSTRACT

Electronic publishing has been developed dramatically over the last five years like many other computer related technologies, it has also become widely available to the general public and corporations.

Electronic publishing for primarily print based publication and electronic publishing for primarily non-print based publications are discussed in sphere of current status and future prospects with enumeration of Australian case.

The term electronic publishing has exploded into the literature and into the terminology of many organizations over the last few years as the hardware and software involved in these activities becomes more accessible (1, 2). As a consequence "electronic publishing" means many things to many people. In 1983 the Working Group in Electronic Publishing (a group composed of members of varied interests) defined electronic publishing as

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“A form of publishing in which information is distributed using electronically encoded signals stored for processing on computers or other means and displayed for viewing by users either on a screen or as a printout.”

This now involves a number of activities and I prefer to use the term electronic publishing as a general description of

electronic publishing of traditional printed publications;
electronic distribution of information in both electronic and print form;
true electronic publishing in the electronic media.

Electronic publishing has matured dramatically over the last five years as, like many other computer related technologies, it has become widely available to the general public and corporations.

Electronic publishing is a classic example of how a traditional activity has developed as the computing industry has grown and matured, adapting innovations in that area to its particular application. It has developed to its present form utilizing the computational capability, the storage capability and communications capability of the computing or information technology industry. Therefore, the development of the electronic publishing industry has closely paralleled the development of the computing industry.

In this discussion I would like to divide the industry into two categories:

- 1) Electronic publishing for primarily print based publication.
- 2) Electronic publishing for primarily non-print based publications;

PRINT BASED ELECTRONIC PUBLISHING

Print based electronic publishing has evolved historically from traditional publishing activities. Most printed materials prepared electronically cannot be distinguished from those prepared by traditional methods and it is the production technology which has made the difference. Like most computer based technologies, the technological development has shown exponential growth. Where the Gutenberg Press (1450 A.D.) made printed material affordable for

the general populus, the easily accessible desktop publishing phenomenon, which developed in the 1980's, has led a similar revolution in the publication of printed materials.

The print based electronic publishing industry originated in the late 1960's when the capabilities of computing systems allowed text to be captured from the keyboard and then manipulated to give the correct format for publication. These were mainframe based systems which excluded all but the very large and specialized organizations from using this expensive technology. The development of word processing software packages and graphic packages through the 1970's prepared the software platform from which the current wave of desktop publishing systems could launch themselves. In 1985 the Apple Computer Company announced a publishing system whose hardware platform was the Macintosh SL with 152 kilobyte main memory, 10 megabyte built in hard disk, 400 kilobyte floppy disk storage and a 12 inch display unit. The major breakthrough was that this publishing system was based around the "What You See Is What You Get" (WYSIWYG) user interface. This, together with the use of a mouse, icons and pull down menus, made the system accessible to a non-expert computer user. Professionals who had traditional publishing expertise were no longer locked out of the technology of the publishing process. The result was an explosion in the demand for these systems and a resultant shortage of trained professionals.

The central computer was also supported by an impressive array of peripherals. The Apple LaserWriter was a true image setter with a resolution of 300 dots per inch (120 per centimeter). The machine did not require special paper or chemicals and was based on the well established photocopying technology. This printer was designed around the powerful 32 bit MC 68000 microprocessor and supported by the PostScript page descriptor language. This high level software language contains a comprehensive array of commands to handle line art and half tone graphics. It operates on a model of each page and can perform all image transformations on a large range of output devices using the same page description. This assured that the system would not become obsolete due to a change of output device. The language has now been greatly expanded and supports a large number of typefaces. It also handles graphics which may be scanned into the document by means of cheap scanners. Apple also marketed a

very cheap network system called the Appletalk personal network which allowed work stations to share common resources e.g. image libraries etc. The Macintosh based publication system has rapidly developed since its introduction and now boasts full colour publishing capabilities based around the Apple Macintosh. These types of systems are now supported by a vast array of visual images available on CD-ROM.

For example, the FID/CAO Regional and Committee Newsletters are published using a Macintosh desktop publishing system.

The artwork for the Newsletter banners were designed by a graphic artist (Ms Robyn Kress), tutor in visual information management at Victoria College, Australia, using the graphics package Adobe Illustrator 88. These images are stored on hard disc (and of course on a back up floppy) in an electronic graphics library.

When contributions are received from Corresponding Members worldwide, the text is word processed into machine readable form using a Macintosh Plus and the Microsoft Word 3.01 word processing package. Any graphics or visual material are either scanned using a Microtek MSF-3000 Image Scanner or reproduced using a suitable graphics package (e.g. Adobe Illustrator 88 Version 1.83).

When all contributions have been converted to machine readable form, the text and visual materials are transported into a page layout package (Aldus Pagemaker Version 3.0). The document can then be manipulated and the newsletter composed to prepare camera ready copy for publication.

The printer used to produce the camera ready copy is an Apple LaserWriter II laser printer with a resolution of 300 dots per inch (dpi). If further resolution is required (as was for the production of the FID/CAO letterhead) the machine readable copy can be sent to a commercial Linotronic printer (resolution 1200 dpi) on a floppy disc.

The camera ready copy is then sent to a commercial off-set printer (as the case of the FID/CAO Newsletter) or photocopied inhouse (as with the FID/CAO /ET and FID/CAO/II Newsletters).

The hardware and software used in this system is:

Macintosh Plus with 40 Mbyte hard disc.
Microtek MSF-3000 Scanner
LaserWriter II NTX laser printer
Microsoft Word 3.01
Aldus Pagemaker Version 3.0

having a total cost of A\$18,700. This equipment is used in the Applied Science undergraduate program in Scientific Information Management at Victoria College (3).

This flexibility and accessibility is having a significant effect on the publication industry. High quality documents can now be prepared relatively easily and economically. Also, documents and publications can be modified or customized to suit a particular application. For example, academic textbooks are now being customized (4,5), incorporating local material to suit local demands. This technology allows academics to compose textbooks for their courses, choosing published articles and excerpts at will, incorporating their own material and publishing the textbook in an extremely limited edition. Publishers are adapting to this phenomenon (4) and it is estimated that "custom publishing" constitutes 10% of the US college textbook market and is increasing rapidly.

It must be emphasized however, that desktop publishing systems are merely a tool to aid the publication process. A good hammer does not make a good carpenter. The skills of writing, graphic design, page layout etc. are still required. An unfortunate illusion is that, with the availability of very impressive images and fonts, any person can now produce a good publication very quickly. Like most computer aided tools, it enables a bad job to be done more quickly. Most certainly the skills in the area of writing and design are even more in demand now that the publication process has become accessible to many. In Australia, information professionals are now being trained in the areas of writing and information presentation as a routine part of their courses (3).

Although still in the developmental stage, the field of desktop publishing will most certainly develop further and become less costly. The software will become more sophisticated and we will see the appearance of expert systems in design

that will aid the novice publisher. The so-called "intelligent" or "active" document has arrived (8-11) which imbeds specifically written programmes in documents to allow non-technical users to modify and reconfigure them. For example, the documents could work closely with spreadsheets like Lotus 1-2-3, letting users generate charts and graphs from spreadsheet data. A document can also be written taking into account external factors. For example, engineers could automatically be warned if they enter values that are outside a certain design specification. The opportunity to repackage information for specific users will expand, especially in the corporate sector (1, 12-14).

The challenge to the information professional still remains the presentation of the message, which after all is the most important part of the information package.

Another emerging issue is the ownership of the information product or the intellectual property contained in that product (15, 16).

ELECTRONIC PUBLISHING FOR NON-PRINT BASED MATERIALS

This area has exploded over the last two decades and is showing no sign of abating. The industry grew out of the computerization of the print based electronic publishing industry in the late 1960's. The machine readable magnetic tapes that were used in the publishing process were recognized to be the basis for the value-added activity of information retrieval. This led firstly to off-line batch mode computer retrieval from a large database of material which then evolved into the proliferation of products available today.

Initially, three kinds of services were offered:

- Printed indexes;
- Selective dissemination of information (SDI);
- Retrospective searching.

All these services survive today and are the bread and butter of on-line retrieval services.

By the early to middle 1970's, telecommunication systems had reached a standard where remote computers could connect via modems and the public

telecommunication system to the very large central data storage facilities required for these types of data bases. It was possible to interrogate the data base at a distance and extract the information required which could then be downloaded to the user's terminal. A document delivery service was provided for hard copy references or text. These services were commercially introduced in the early 1970's when large capacity storage, high speed computers, terminals, telecommunication systems and software had developed to the stage of coping with the technical problems of interrogating a large data base at a distance.

On-line information retrieval services have expanded to be a multi-million dollar business world-wide. The services provided by these organizations have expanded and evolved to cater for the diverse needs of industry and business. Many data bases are full text and updated daily. The two main on-line data base vendors within Australia are Ausinet and Australis. Ferntree Computing (formerly ACI Computing Services) has been in the electronic publishing business since the early 1980's. An excellent description of the evolution of the service and a discussion of the financial, social, technological and marketing issues was given by Mr. Leigh Baker, the then Manager of the Electronic Publishing Division of ACI in 1987 (17).

ACI entered the online information industry in the late 1970's with AUSINET which initially marketed traditional bibliographic databases to the established information markets in Australian libraries and other information intermediaries operating in information-conscious organizations such as CSIRO and academic institutions.

As the decade progressed, it became obvious that a lucrative market lay with business. By the middle of the 1980's, a number of full text electronic editions of hard copy publications were introduced, (e.g. The Bulletin, Business Who's Who of Australia) and these have been further supplemented by other electronically published products.

The highly competitive economic nature of this industry was highlighted in 1986 when ACI divested itself of many of the uneconomic scientific and technical bibliographic databases. These discarded databases formed the basis of CSIRO's Australis service which has struggled to establish itself in the market place (18).

Ausinet provides online services to a moderately large number of databases which embrace:

- Full text databases
- Directory databases
- Reference (or bibliographic) databases

The full text databases are electronic editions of Australia's most respected newspapers and magazines and include:

- The Australian Financial Review (updated daily)
- Australian Business (updated weekly)
- The Bulletin (updated weekly)
- Business Review Weekly (updated weekly)
- The Sydney Morning Herald (updated daily)

The service is business orientated in response to market demands.

These services are also supplemented by other national and international information retrieval services including STATEX (Australian Stock Exchange), PROFILE INFORMATION (international media) and INVESTMENT PLUS (international business analysis).

Ferntree Computing also provide corporate electronic publishing services and prides itself in the ability to respond to industries' electronic publishing requirements. Larger organizations are turning to in-house electronic publishing to solve their documentation problems (19,20).

Traditional on-line retrieval systems were expensive and used an interface which required trained information professionals and consequently inaccessible to the general public. Vidoetext systems were developed to answer these problems. They provided a cheap and easily accessible interface into an on-line data base system which was menu driven and supported by graphics. These systems were accessible from the home via the telecommunication system using a very simple keypad and a television set. The data bases were strongly hierarchical in nature and consequently brought the problem of users becoming lost within the system. However, they have

developed to a stage where they now have gateways into the more traditional on-line data bases. Therefore, videotext gives an easy access for the non-professional into the less accessible information data bases. Videotext systems have had a mixed success world-wide. They have a wide application in France as the telephone directory is published electronically and accessed via videotex. In other countries success has been more mixed. For example, in Australia the local videotext system (initially called VIATEL) has been a limited success.

The biggest impact upon non-print based electronic publishing was the advent of the CD-ROM in the 1980's. These write-once read many optical digital disks have an exceptionally high storage capacity when compared to floppy disks and can accommodate 700 megabytes of memory.

The impact of CD-ROM on the online information industry is well documented and will not be considered here. The major impact is that it has individualized the search process and has made it available to the general user rather than via an information intermediary as in the past.

The large data storage capacity of the CD-ROM has allowed the development of what has become known as hyper-media. With this information product, electronically published data (numeric, text, visual and audio) can be accessed and manipulated using a software package that is also electronically published often on the same CD. This allows the user to develop their own information product using electronically published data as the source.

An example of this is the Australian developed product Supermap. The product has two components:

- . a set of census data (e.g. Australian 1986 census data)
- . a statistical/graphics software package

The package allows the user to access and analyze the available data as they wish and present the results in a number of graphical formats.

An inhibiting factor with these types of products at the moment is their cost of production. Costs will dramatically decline as read/write optical memory products (which are now starting to appear on the market) become more

generally available. The initial problem of lack of standards is being addressed.

The marriage of computers and the telecommunication system has transformed the early form of electronic mail (the telegraph) into the burgeoning traffic of today. Electronic mail is another term whose meaning varies depending on the context and can include FAX, teleconferencing, voice messaging, communicating word processors, computer conferencing, as well as the narrower application where a computer system with specialized communication software can send digital messages (mail) to other computers (or an actual digital mailbox) via a data communication network. Electronic mail is the electronic form of the scribbled note, memo, letter, notification, announcement, etc. that is the backbone of inter or intra organizational communication.

There are three possible modes of sender/receiver communication.

- point to point, where the message is only sent when the two terminals are connected (sometimes called the "phone mode").
- store and forward, where the message is stored until the connection is made.
- the mailbox, where the message is stored in a mailbox and this is accessed by authorized users.

The communication can be between both human and machine users.

Electronic mail systems can be incorporated into an electronic publishing system, but at the moment are merely file transfer media at best. Despite its shortcomings electronic-mail is being increasingly used in organizations to cut costs and time. For example, it is commonly used in libraries for inter-library loans communication and increasingly for documents delivery (21,22).

The trend in computing is towards integration of technologies and the future will see this develop further.

The Technology Management project in the Faculty of Applied Science at Victoria College, Australia, is utilizing all forms of electronic publishing described above. This project is developing integrated higher education programmes for students from industry who are in full-time employment (3).

The course is self-paced and distance learning materials are produced inhouse using an Apple Macintosh desktop publishing system. The materials can be easily modified, thus radically reducing the time and cost required to update the

course material or produce a course for a particular industrial client.

Mature age students in full time employment must be provide with 24 hours access to course material to allow them to adapt their educational experience to their demanding professional and private life. The courses are supported by a Computer Managed Learning (CML) software package (23). As well as administering the student's course, this package provides a large amount of electronically published course material and assessment tasks that the student can access via the telecommunication system 24 hours per day.

The system supports an electronic mail facility which provides a 24 hour communication link between the students and their tutors. Students' work in most cases is not produced in hard copy, but is prepared on the students' computer and transferred to the tutor's mail box by electronic mail. The tutor can then return the corrected material to the student electronically. This communication link facilitates communication between students and staff, who often have difficulty in contacting each other by more conventional methods.

The desktop published self-paced print materials are supported by other electronic published products such as CD-ROM, Videodisc and Computer Aided Instruction (CAI) packages.

This project is revolutionizing the delivery of higher education courses in Australia and one of the major tools used is the electronically published information product.

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