ARTICLES

Issues in Electronic Publishing[1]

by
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Abstract

This paper contains a discussion of the principal issues related to electronic publishing. The approach taken is to describe the issues and possible impact of changes rather than to propose or advocate solutions. This approach results from the author's sense that too often positions in this area are taken without full consideration of consequences. The major issues are: (1) the creation or "writing" of works, (2) the nature of "reading," (3) the production and distribution of works, (4) the ownership of the intellectual property represented by the works, (5) the retention of published works, together with a record of origin and any changes, (6) the technical obsolescence of works, (7) the control of content, (8) the technology used, (9) the equality of access to electronically-stored information, (10) changes in culture induced by changes in media.

Introduction

The purpose of this paper is to identify and discuss the major issues of electronic publishing without arguing for any particular point of view. I believe there has been perhaps too much hasty adoption of the notion that electronic publishing is the solution to all communication and education problems.

There can be no question of the enormous *potential* of several new electronic publishing modes -- on compact disks (CD-ROMs) or the new digital video disks (DVD) or through the Internet. I agree with others who feel it is no exaggeration to say that our modern bundle of information technologies may constitute a greater revolution than that generally attributed to Gutenberg. But, is this revolution good or beneficial? And, if so, to whom?

The Gutenberg revolution did not happen all at once. His contribution was an invention beautifully suited to its times. The Renaissance and Reformation in Europe had already increased interest in books and learning. Gutenberg's invention enhanced that interest. His development of moveable type had to be converted into an industrial enterprise. For the revolution truly to take effect, people had to become involved in this industry and learn to read and have the motivation and leisure to do so.

Today, it is heresy to suggest anything other than that the spread of electronic publishing is a good thing. History, in time, will almost certainly say so, because future history will be written by people who grew up in the new electronic world. Clearly, we cannot have parallel worlds one of which adopts electronic publishing and one of which does not. Thus, we probably can never have a truly impartial evaluation of its impact. In our time, we should be trying to shape the way the future develops, not merely accepting that anything called "progress" is necessarily good.

The principal issues as I see them are those surrounding:

(1) the creation or "writing" of works for publication,
(2) the nature of "reading,"
(3) the production, distribution and commerce,
(4) the ownership of the intellectual property represented by the works,
(5) the archiving or the retention of published works,
(6) the technical obsolescence of works,
(7) the control of content,
(8) the equality of access to electronically-stored information, and
(9) other changes in culture induced by changes in media.

[1] This article is based upon a talk given at the Institute of Information Studies and Librarianship, Charles University, Prague, Czech Republic on November 28th , 1996. It was sponsored in part by the Professional Partnerships Program of the Canada Institute for Development Assistance and the Association of Universities and Colleges of Canada, whose help is much appreciated.

I use quotation marks around some quite ordinary-seeming words because I believe that their nature will change and that what we mean today by "book" or "reading" will change. I often use the term "work" instead of "book" to stress that "work" has a broader meaning, but I suspect that "book" will continue in use, regardless of form, because we are so used to it, just as we still "dial" a telephone.

Of this list of issues, numbers 2 and 7 could have profound impact on our education and information transfer in general. We could create a generation of people who always look for, find, and use the best information available, anywhere, on any topic. Or, we could create a generation who can easily find something on any topic and lose or never acquire the skills to evaluate and extend others' work. Socially, we could go along with no controls on distribution, which may cause degradation of our entire information system, or we could over-impose controls and lose much of our liberty. There are many positions in-between. The question of equality is also a serious one. Will we increase accessibility or decrease it, by requiring the use of expensive equipment and much training? These questions are discussed in the following sections.

First, what is a book, or rather, what I mean by the word. I have written elsewhere (Meadow, 1995) that to me a book is a recording of the work of a human being, be it in the form of text or photography or music, or a combination. That means I do not think of a book as a technological object, an artifact, but a representation of a work of the human imagination. Thus, generically, a book can be what we now call a book, or a magazine, or a newspaper, or a collection of pictures or of music. Changing the form of recording does not fundamentally change the nature of the work, although I do subscribe partially to McLuhan's *medium is the message*. The medium may have a profound effect on the message. Hence, reproducing a paper book in the form of a CD-ROM still leaves it a book but its effect on readers may change.

1. Writing

Electronic publishing calls for writing of text, often accompanied by lavish illustration and sound. If we also consider virtual reality, we can add feel and perhaps eventually smell to the senses an electronic publication can reach. Illustration may be in the form of full motion video. Electronic publications often allow user control over sequence of presentation, making them highly interactive. We may come to write all documents so as to require immediate user reaction.

The tradition seems to be developing of using some variation of the hypertext mode in all electronic publications. In hypertext a user is able to move about easily within the publication by following links inserted by the author or by the user creating his or her own ideas of linkage. This suggests that virtually any segment of a work should have a seamless connection to any other, quite a burden for an author, used to sequential works, to learn. A hypertext novel was reviewed on the front page of the *New York Times* book review section in Coover [1993]. This is an honour, indeed, for any author, let alone one venturing into a new medium which most readers of the *Times* probably cannot access. Yet, the medium seems almost to have disappeared already, before it had time to mature.

How will authors make the transition? How will they become trained, when there is little existing literature or criticism as guides? There is some, of course, but compare what is available to a person desiring to become a print author *vs* one wanting to become a multimedia author. Will individual authors disappear, in favour of teams, as in theatre or cinema? It seems unlikely the media can develop any other way, unless authors are trained from a young age to be versatile in all production media. The alternative would seem to be the use of production teams, as in television, theatre, or cinema. There is nothing wrong in concept with these other media and their teams, but it does clash with the hallowed tradition of the lone author hunched over a writing pad or typewriter, producing a work of a single mind.

2. Reading

Do people read text from a computer screen differently than from a printed page? There is some indication that this is so, although it is not surprising that so complex a question has not been resolved by research to date. Many believe it, whether proven or not. That is, they believe people tend to scan text on a computer, looking for specifics perhaps to be read later, rather than reading it carefully, for comprehension now. Or, as Birkerts [1996] suggests, the very offering of non- sequential reading can alter the way we understand what is being read. But, do people even read print today the same as they always did? No. In medieval times much of reading was virtually equivalent to lecturing. [Illich 1993] "Lecture," is, after all, from the Latin word for "read," not "speak." This change in the practice of reading was not bad, in fact most of us would say it was quite beneficial. But, it should be recognized that new changes in reading habits might come about and perhaps we ought to be thinking of how to bring about the change in a controlled, beneficial way.

Will differences in reading affect the way we learn or teach? Almost certainly. There is enormous potential benefit, especially for teaching science, art, or music. Is it a good way to teach text composition? Philosophy? It seems that the subjects likely to benefit most are those that use and need abundant illustration or frequent drill and testing of students. Those that require mainly abstract thinking may not benefit, in fact may suffer if readers become addicted to multimedia presentations of everything.

One aspect of the potential change is what I call the problem of excavating *vs* creating. Excavating means finding what others have written, and extracting or paraphrasing it into our own

work. Creating means, to me, reading what others have written, then adding one's own interpretation or extension to it. Many students, even today, do only excavating. Sometimes teachers insist on this. I have more than once encountered students, in graduate school no less, who have been instructed (or think they have) that "research" means finding what others have said about a subject and duly reporting it, with appropriate credit. They feel that, as students, they are not supposed to offer opinions. It can become a deadly habit if students grow up expecting that all information can be found on the Web or in the library and never learning to add their own thoughts to those of others. The problem, then is that students who concentrate too much on the mechanics of finding information may come to think (and some already do) that this, in itself, is what research is. But research means adding to knowledge, not just finding it. I know that sometimes old knowledge is so buried that it takes an act of true creativity to find it. That is not what I am criticizing here.

An appropriate example is a work by Blumberg [1995] which teaches biology by guiding students to seek out works of others, assigning projects, having them build their own mental models of biology. It does more than a conventional book by way of encouraging students to do original work on their own. This is the best way to teach agile minds. But it is not known how well it works with the less creative students.

3. Production, Distribution, and Commerce

Will the traditional concept of publication disappear as the wide open World Wide Web (WWW) expands and acquires more users, and self-publishing becomes ever easier? Can the Internet replace all of publishers' functions: selection, editing, design, marketing, and quality assurance?

Production costs for electronic publications will rise, considerably, over those of print publication. Instead of a text with a few illustrations, publishers will now have to cope with copious illustrations, background music, narration, and non-sequential ordering of pages, making copy editing and critical reviewing far more difficult. Distribution costs should come down considerably. No more printing factories or warehouses full of books, in what seems to take publishers a week or more to find any one book. No more high shipping charges. This combination of changes will force reorganization of print-related communications industries, such as the post office, book stores, and libraries. It will also affect the communication industries: telephone, radio, television. There will be some gains and some losses. What will be the change in net price to the consumer? So far, the direction has been lower, especially for reference books, such as encyclopedias. Is this temporary, because of early successes, or will we see changes in marketing modes? I am not sure anyone knows. Certainly, the lack of a good reading machine (a computer designed to be used to read text and illustrations, do some searching, and allow for annotations) has a depressive effect on the market.

We still have little experience in marketing content on the Internet. That mode of marketing is just beginning. Some magazines and newspapers are online as is the Encyclopedia Britannica. There is no generally accepted way of paying for this information. Technology for secure credit card transactions is being developed. But, not everyone has a credit card or access to a bank account. Most users of the Internet are not accustomed to paying for what they find there. Remember that a large portion of users are students. We have to see how this develops.

The tradition is growing that information on the Internet is or should be free. From this, some feel that all information ought to be free. On the Internet today, advertising is paying for much of the information, but most of the better content suppliers seem to be still experimenting, i.e. for-profit publishers are trying to find how they will fit into this new environment. The advertising is of two types, explicit and implicit. The explicit type is familiar. A miniature of the display ads in buses and subways appears at the top of the electronic page. Implicit advertising is done by providing free use of software which is really a solicitation to buy this software for customized use by your own company. The issue of fee-free information is not a debate on capitalism vs socialism. No matter what political-economic form is used, it costs something to produce and publish a work. Someone has to pay, somehow, whether by directly charging users for each use or by spreading the costs over all tax payers. It is naive to assume otherwise.

In one sense electronic documents can be better protected against theft and damage than can books in a library because they can be stored in locations remote from the point of use and, instead of multiple copies, the library would provide multiple access stations. This can virtually eliminate the theft of one-of-a-kind publications from a library or loss by fire or water. If another library has an electronic copy, the work can easily be replaced. But, access requires equipment and equipment requires money.

Given the demands made on the authors and publishers of multimedia works, it is just about inconceivable that electronic publishing will not cost more than print. I refer here to the efforts from conception to production of the first complete version, the equivalent of galley proofs or a master sound recording. We are no longer talking of a single author producing a manuscript, then copy edited by one person and only then type set, now usually by editing a disk, not keyboarding the text on a linotype machine. We are now talking about full motion video, professional actors reading lines, background music (and the royalties that can entail). Mass production, once the master exists, will become easier and cheaper, as will distribution. Disks are lighter and cheaper to mail.

4. Ownership

Copyright seems to be the best example of the impact of information technology on a social issue. When the Xerox 914 photocopier arrived on the scene in 1959, the world was not ready. It filled a need but left copyright law in shambles. It did not used to be possible for ordinary people to make serious violations. Then,

libraries, led by the U.S. National Library of Medicine, began to offer photocopying services to its constituency and then professors used the new technology to save money for students and to assemble customized teaching materials. Both activities were tested in court. (Report 1972, McDowell 1982)

Music and then motion pictures recorded on tape offered another arena for combat between performers, authors, and producers on one hand and consumers and serious pirates (not allied) with inexpensive means of making copies. Home copying of audio cassettes was easy and inexpensive. Copying of movies from video tape a little harder, but the savings are greater. Disputes between radio and television broadcasters on one hand and performers, composers, and producers on the other are almost as old as broadcasting. Conflicts over pirating of books and computer software became a major international trade issue between the United States and China. Personal computers came along and, for the first time, software was owned by individuals instead of large employers. Copying a multi-hundred dollar program became tantalizingly easy. The Internet has made copying of whatever appears there just as easy. Now, authors, performers, producers, libraries, schools, pirates, governments, and consumers are battling over how copyright laws should be rewritten.

How is it all going to be resolved? Will it be possible to maintain a market for electronic information products when copying is so easy? I have no idea. Drafting and enacting legislation is a slow process, far slower than is change in the technology of recording and copying. And new copyright laws probably need to be coordinated internationally.

5. Archival Storage

Today, when libraries buy most of their collections on paper, users can have reasonable confidence that the works will "always" be there. They are not always there, of course. Any library must sometimes weed its collection and whatever gets discarded will irritate someone. But it is also true that libraries often collaborate on such activities, assuring that some institution within a group of libraries will retain certain kinds of materials. And there are depository libraries that commit to retaining usually government materials that are given them with this understanding. So, without absolute guarantees, library users can be confident that they can find what they want, if once collected.

If, by electronic publishing we mean publishing on disks, there would not be much difference. In fact, since disks consume less space, there might not be as much pressure to discard those whose future need is questionable. If we mean publishing on the Web or any future equivalent, we might have a different story altogether. One of the great advantages of this form of publishing is precisely that there need be only one copy. What would happen if that copy were lost? The question of technological obsolescence is discussed below. But what of fire, flood, war, or accidental weeding? The solution, as usual in communications, is redundancy. More than one library has to agree to maintain copies. The more the better and the more widely spread the better.

Another aspect of archiving is that of maintaining a record of changes. With books, we retain the book as published, possibly along with future new editions. Libraries do not normally retain manuscripts with all changes noted. This is the work of very specialized archives. But, books cannot be changed after they are sold, except by issuing a new edition. WWW documents can be. So, the document we quoted on Monday might not have that quotation on Tuesday. It is possible for an archive or library to maintain a document and a record of all changes, but this adds considerably to the cost burden of archiving.

If the archival or library-stored version of a document can be easily changed, then what is the "definitive" version? Does or will this term have any meaning? What happens if a subsequent author quotes from a work and the cited work is then changed so that the quoted material is no longer in it, or is in significantly different form? This could apply to text, pictures, or numbers. The question can be resolved, but what we now deal with is long standing tradition. We are going to have to establish new rules, in a short time, and new rules, with no enforcing authority, are not likely to be universally followed.

I have no doubt that most librarians understand these problems and would willingly do their part. What I worry about is whether library boards, city councils, and legislators at higher levels would understand the need to support what could be expensive machinery whose primary function is to back up someone else's collection. Such thinking does not seem to fit with the current international tendency to squeeze all budgets.

There is much discussion about the possibility of personal computing switching to a mode whereby the personal computer would be little more than a communications terminal. Remember the old Texas Instruments terminals and that lovely thermal paper? The new ones would be smaller, with disk storage, but the computing and data storage would be centralized. There would not necessarily be just one central storage and service location, but not too many, either. We could expect America Online, Microsoft, and the telephone companies to compete in this market. Where would be our guarantees of archival safety? Caveat emptor.

6. Technical Obsolescence

We may all have had the experience of finding that our musical recordings or computer files can no longer be read by the most modern equipment. (Examples include eight-track audio recordings, eight inch computer disks, and 78-rpm phonograph records -- perhaps some celestial objection to the numeral 8.) Might this happen to large library holdings if we move more toward electronic publication?

No question -- it could. No question either, but that we *could* protect ourselves. What is open to question is whether we *will*. There is always a period when both old and new equipment is in use. It is always possible to make a machine that will convert from one form to another. In the case of music, these conversions tended to be done by the publishers producing new recordings of the old works, on a new medium, rather than retroactively converting consumers' own stock. The new versions tend to show

improvements in quality, because much noise is eliminated. Should we, then, count on publishers to reissue works in new forms? Should we convert the old forms to new, or should we demand machinery that will continue to be able to read and present to users the content of the old forms?

Most likely, the republication of old works in new forms would be very hard on library acquisition budgets, as would maintaining machinery that could handle any storage or display medium, past or present. I assume, then, that the solution would lie in locally converting the form. Today, we can do this easily, going from 5 1/2 inch floppy disks to 3 1/4 inch disks, and from either to hard disks. Very soon we will be able to add digital video disks to the output list. But, remember 8-inch computer disks? If you still have any, you will be hard pressed to find anyone who could convert them for you.

Converting paper books to another form is a far more complex process, but there are signs of hope. The University of Toronto has a book preservation program in which books are scanned and a graphic image of the pages stored electronically. The main purpose of this program is preservation. But it is only one step from this to using optical character recognition to change the stored images into character form, which would then allow for automatic indexing, searching, and mark-up for reprinting or publishing as digital electronic texts.

Decades ago, the computer industry offered little solace to the user when model changes were made. A change in model often meant reprogramming of all existing software. This seems almost incredible today. Things are better now, but hardly perfect. Changing computers or even taking a disk from one release of a word processor to another can still be a frightening experience.

The conversion process would still be expensive but the expense could be alleviated by cooperative programs among libraries. We might have to have binding agreements among libraries and publishers to do this copying and libraries and archives would have to accept that future conversion is part of the price they must pay for today's electronic publications.

7. Control of Content

This is probably the most contentious issue. There is a long history of political and religious organizations controlling content of publications. Sometimes this has been beneficial, sometimes not. It very much depends on the point of view.

Aspects controlling delivery of content include: accessibility and selectivity, quality, social acceptability, and government acceptability.

Accessibility/selectivity. There are two facets to accessibility: that which is made available and that which users know how to or are physically or economically able to access. On the Internet there is little control of what is made available except, perhaps, that imposed by the need to recover costs. There have been attempts, none really successful, to bar certain content. The V-chip of television, a device that enables a set owner to block reception of certain broadcasts, depends on a voluntary classification of programs by their producers or distributors. Such a device, either as hardware or software, could be made to work mechanically with the Internet but the chances of getting the information providers to classify reliably are slim.

Quality is clearly a subjective issue, but its maintenance is important. Not all print publications are of high quality, but those who seek quality usually know how to find it -- relying on prior experience of author, publisher, sponsor, reviews, librarian, or bookstore. It is hard to believe that any quality control system not based on peer or expert judge review can work.

Social acceptability means, to me, acceptance by the public, and informal process. It is a large part of the issue of accessibility. How do we define what should be made accessible? The problem would be difficult enough if we all shared the same attitudes on social issues, a clear impossibility. While pornography and hate get the most press coverage, in this regard we must remember that some countries limit the amount of foreign content in television broadcasting, or the language used. Others limit by political content or national origin of news. Since there is no practical way of achieving universal agreement on acceptable content we will need some form of tagging of works or of association with known publishers as a basis for selection (selection for acceptance or rejection). A few attempts have been made to base rejection on the use of certain words, but these are largely foolish. It is not usually the words that offend, but the manner and context of use.

Government acceptability. This category includes sedition (incitement of resistance to or insurrection against lawful authority), and just plain fraud. Sedition is an offense against a government, not a private person or group. It presents the same difficulties in prevention as does social unacceptability. There is clearly a large difference in how much of this governments tolerate. Criminal activity includes use of mails or e-mails to defraud, or to conspire illegally. Fraud is fraud, but when technology is used it tends to enhance the chances of the frauder beating the fraudee, hence the governments' extra penalties.

So far, no successful automatic system has been devised that can prevent unacceptable content from going out on the Internet and many feel it is impossible to do so. However, it is illegal just about everywhere to murder. While such laws do not prevent murder, they do provide severe social stigma and legal penalties for perpetrators, which provide some deterrent.

8. Equality of Access

The Internet is often called the most democratic of our institutions because anyone can have his or her say and gain access to any information on the net. It is pretty clear that not everyone can get his or her book manuscript published, except by paying for it to a vanity press, or even have a letter to the editor printed in the newspaper. You have to pass a gatekeeper in these cases. But, is the Internet all that accessible? It costs about $2000 to have the equipment at home and that is before the cost of Internet access service. Some public libraries offer their clients free use of hardware and many freenets offer free Internet access, but these do not reach the majority of the population. Many people

gain access at work or school. But, in general, as we become more addicted to multimedia, the computer and communication costs go up and in these days of government cut backs, the free services are going to be hard hit.

Will a continued move toward more electronic publication bring all these marvels of the digital age to everyone, equally? I can hardly believe it. I cannot but believe that as the simple act of reading becomes more machinery-dependent, the have-have not gap will increase.

9. Changes to Culture

Here are a few more cultural issues about which not a great deal is known or debate carried on.

Common literary experiences

One of the great advantages of electronic publication is that we give out school assignments that allow and encourage each student to have a different experience, researching a topic of individual interest. We can record radio or TV broadcasts for replay at a convenient time and now, we can find these programs on the Internet, so we do not have to record them ourselves. They are there when we want to see or hear them. All this is in contrast to the lock-step mode of education where everyone does the same thing at the same time, hence at the same pace, or the broadcast mode of radio/TV where we get the program when broadcast or not at all. How will this change our culture? Combined with a tendency for more literature to be in electronic form, it means that we will less often have the same experience at the same time, whether reading *Macbeth* or watching this week's *Seinfeld*. What difference will that make? Will we all become more interesting because of our differences? Or, will we lose a sense of cultural cohesion?

Book technology

A frequent argument presented against the spread of electronic publishing forms is the technological excellence of the printed book as a medium for storing and carrying information to its user. Will computers of current design push printed books out of the market? The one-word answer is NO. Desk top computers are not well suited to serious reading, and even laptops have their limits. The usual first words heard from almost everyone discussing the issue mention reading in bed, on the subway, or at the beach. Do we have, today, a computer-like device capable of challenging the book for its place in our culture? Again, NO. Could we develop one? I believe we could. I am continually surprised it has not been done. I suspect it is a combination of publishers being hesitant and electronics manufacturers not seeing the potential. I believe the technology exists today and that the market could exist if these two industries could find a way to develop it cooperatively.

Summary

We might see a new world of cheaper publications, even free information. Virtually all of us, including children, will be able to get the information we need and correspond with people all over the world. There is enormous research potential if there is enough good material on the Web and good software with which to find it.

We might see a world swamped with publications of questionable quality, heavily laden with what any given society might see as obscene, politically unacceptable, or actually illegal. We might see children grow up intellectually lazy, expecting everything to be there for them, but lacking inventiveness.

We might see marvellous new educational materials that stimulate inventiveness.

Which? We must all work to be sure we get what we want.

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