

Changing Patterns of Communication and Electronic Publishing

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CHANGING PATTERNS OF COMMUNICATION AND ELECTRONIC PUBLISHING

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Electronic publishing and readers

It is worth remembering at the start that communication changes have always occurred: it is simply that current changes are particularly rapid and radical. Consider, for example, a scientific lecture. At first sight, it seems difficult to think of anything more unchanging. Yet a comparison of lectures 200 years ago with those of today shows differences in at least three aspects. The presentation has changed. Nowadays, microphones, overhead projectors and computers may all be in use. Scientists and engineers have become much more specialised over this period, so the content of the lecture is likely to be both more restricted in scope and at a higher level of difficulty now. Correspondingly, today's audience is likely to be more restricted in terms of their backgrounds.

These three components - presentation, content and audience - can all be related to the basic desire to communicate. Scientists and engineers have views, often strong, on how their work should be presented and made accessible. They want their work to be seen as of high quality, and so wish it to be communicated via channels that are held in high esteem. Finally, they want it to reach as high a proportion of their target audience as possible. It is reasonable, therefore, to use these components - as in the case of the lecture - as a basis for considering the impact of change.

Taking presentation as an example, potential readers of electronic texts have pronounced opinions concerning the characteristics that are needed. As Table 1 shows, some of these expectations are not well fulfilled by current electronic capabilities. ¹ In part, this may simply indicate a long acclimatisation on the part of users to the properties of printed text. But the demand for portability, for example, actually reflects the way in which scientists and engineers use texts (e.g. for reading on a journey). Electronic provision cannot yet handle such reader demands, so leading to the somewhat paradoxical result in Table 2 that the most important characteristic for electronic text is the ability to print it out.

Table 1

Importance of different electronic text characteristics

Characteristic	Percentage saying very important
Creation of a print copy	80
Ability to browse graphics	73
Ability to browse text	66
Portability of the text	53
Flipping pages and scanning	45
Ability to underline and annotate	41
Physical comfort	37
Adequate text design and layout	30
Physical contact with material	14

Presentation, content and audience cannot be entirely separated from each other. Table 2 presents opinions on whether electronic journals should retain the same appearance as printed journals, or not. [2](#) The general feeling - that they should, at least at present - is partly a matter of convenience. Readers know their way round printed journals, so it is sensible to keep the same layout whilst they are exploring a new medium. But it is also a matter of how electronic journals are assessed by potential authors and readers. Will an electronic journal be accepted as a high-quality competitor with printed journals, if it looks entirely different? The first conclusion to be reached is that, so far as communication patterns and electronic publishing are concerned, communal expectations will place some limitation on how electronic channels are exploited.

Table 2
Style of presentation

	Necessary	Desirable	Unnecessary	Don't know
Retain style of printed journal	17%	56%	23%	4%

Trends in usage

These limitations may be labelled the 'down-side' of electronic publishing. The 'up-side' derives from trends in usage of the scientific and technological literature. In the first place, as Table 3 indicates, the growing amount of literature in existence has meant that, for some years past, researchers have required an increasing amount of source material before they can carry out their work. [3](#) Then, again, collaboration both in work and in publication has been growing rapidly in recent years. As Table 4 suggests, this appears to be a global phenomenon. [4](#) Both these developments favour electronic communication and electronic publishing. Retrieval of documents, exchanges of ideas and cooperative writing can all be carried out more readily in an electronic environment. More generally, electronic handling of information is becoming an essential part of much research, to the extent that it is sometimes no longer feasible to communicate via paper. An obvious example is the worldwide investigation of the human genome.

Table 3
Number of documents required by researchers

Approximate number of documents	Percentage of researchers	
	1960s	1980s
About five	40	28
About ten	39	38
About twenty	10	22
More than twenty	11	12

Table 4
Increase in collaborative publication

Industry	Percentage of collaborative publications	
	1980	1989
Pharmaceuticals		
Europe	38	54
Japan	21	38
Electronics		
Europe	20	44
Japan	19	28

Using electronic publications

Current trends in science and technology thus favour the employment of electronic communication. However, as has been remarked previously, one of the key questions for the communities involved is whether the information in electronic form can reach its target audience. This can be rephrased as three basic questions. To what extent can all members of the target audience actually access the relevant electronic information? Is the information technology they have available adequate for handling the information? Given affirmative answers to both these questions, do the readers have the necessary skill to handle electronic information?

In terms of access, what is basically required is a networked computer on the individual reader's desktop. To what extent does such access exist? Table 5 provides some data on biologists in the UK. ⁵ They reflect a level of access that varies from group to group. Overall access has increased since this survey was made, but it remains true that immediate access to networked computers varies with subject field and institution. (This is, of course, even truer of institutions in developing countries.) The last row of Table 5 lists usage of computers at home. In the UK, unlike the USA, many of these are not networked. A major reason is cost. Internet access in the UK is some three times more expensive than in North America: elsewhere in Europe the differential is even greater.

Table 5
Availability of computers to biological researchers in the UK

Type of access	University agricultural faculty	University biology department	Research establishment	Pharmaceutical laboratory
Computer on desk at work	66%	84%	70%	98%
Networked computer at work	33%	73%	48%	98%
Computer at home	55%	53%	48%	42%

Demands on computers are continually growing. The handling of graphics, for example, requires cutting-edge facilities. In a recent training session at Loughborough, we presented a new electronic journal in engineering to potential readers, only to find that it required additional software - which was not available - to view animated sequences. Furthermore, a considerable proportion of potential readers of electronic publications do not feel they have all the necessary skills. One large-scale study in the UK asked for comments on the statement: 'The training for users in how to access new electronic searching facilities is insufficient.' A significantly higher number of respondents agreed with this statement, than disagreed with it. [6](#)

Electronic publishing and librarians

What do these trends and reactions mean for librarians? The first answer relates to communal acceptance of electronic publishing. On the one hand, it is a new medium and, as such, lacks prestige. Consequently, information conveyed electronically is more likely to have its significance and validity questioned, than information that appears via well-established printed outlets. On the other hand, there can be no doubt that scientists and engineers increasingly like to make use of electronic information. These conflicting reactions produce a resultant uncertainty as to the acceptability of electronic publications. For example, Table 6 shows how views of electronic journals can differ. [7](#) However, the flexibility of electronic communication may already be affecting ideas of what is acceptable. Thus quality control is usually seen as an essential factor in scientific and technological publication. Yet the rapid acceptance of (unrefereed) online preprints in physics seems to be diminishing the insistence on rigorous refereeing, at least in some parts of that subject.

Table 6
Acceptance of electronic journals

	Level of acceptability			
	Yes	To some extent	No	Don't know
Same as for printed journals	35%	19%	12%	34%

Librarians, of course, are faced with the task of making available the information their customers need. The implication of current uncertainties is that they will be expected to provide both printed and electronic information for some time into the future. Willingness to use electronic publications will continue to vary from individual to individual, and from subject to subject. Correspondingly, most libraries will continue to be hybrid for some years to come, mixing electronic and printed publications according to readers' requirements. This will obviously give rise to problems of extra cost for acquisition and storage, of demands on personnel, and so on.

A related aspect is the way library customers will use new information channels and sources. The pay-off between electronic and printed text is complex: the two are sometimes in competition and sometimes complementary. For example, many readers find printed text easier for browsing, whilst electronic text is easier for searching and directed reading. In addition, relative usage of electronic and printed texts may depend on personal characteristics, such as age and seniority. The implication of these various differences is that a hybrid library will not only be more diversified in itself, but will also lead to an increasing diversity of information strategies on the part of its users. In this regard, one of the most important personal characteristics is level of computer literacy. Information has to be provided in a way that satisfies both the computer beginner and the expert.

Looked at another way, the question is who will be the library users of the future and what will they want? In particular, which aspects of information provision will they want to handle themselves, and which will involve the library? It is evident that some redistribution of effort is occurring. For example, libraries are finding that, as their expenditure on CD-ROMs increases, so the amount of online searching they do on the behalf of customers is decreasing. A significant influence on such transfer of effort in the future will be the blurring of the division between formal and informal communication. The difference between a personal letter and a published journal article is clear in a print environment. The distinction is much less obvious in an electronic environment. Scientists and engineers are becoming more inclined to access and intermix material from sources that would previously have been kept separate.

Conclusion

The main limitations on this transfer of effort from libraries to end-users appear to be money, organisation and knowledge. Although much information can be accessed via the Internet without explicit payment, access to important scientific and technological sources tends to be costly, whether they are in print or electronic form. It makes sense for such expenditure to be centralised in the library. Access to sources also needs to be organised to assist readers in finding and handling information. Last, but not least, with information sources proliferating, many readers will need help in tracking down the most appropriate for their purposes. Librarians can supply this knowledge.

It may be that the evolution towards a hybrid library environment, by emphasizing the

need for continuity, will actually provide a significant element of stability in the future development of libraries. The implementation of a purely digital library remains an uncertain process. Investment in the implementation of such a library is still a high-risk strategy. Hybrid libraries can help develop some of the necessary foundations that will reduce the level of risk as the move to electronic publications proceeds. For example, cooperation - ranging from agreement on standards to agreement on copyright - is a key factor in handling electronic information; but it will take time to reach acceptable outcomes. A transition period will also help library staff adapt to the new roles demanded of them by the shift to electronic publishing. The good news is that the functions fulfilled by traditional libraries must continue to be satisfied in the future. In fact, the need for assistance from librarians is likely to increase in the future, even if the nature of the assistance changes.

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