

PROMETHEUS REVISITED: library and information science education in an age of change.

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Abstract

This paper points to the major challenges arising from the emergence of the 'Information Society': information overload; the high level of skills required to take full advantage of the new Information and Communication Technologies; convergence in the information sector, in which information professionals face increasing competition with other professions for management positions; and funding the necessary investment. It considers the need for a broader range of knowledge and skills; a higher level of skills in teaching and facilitating the use of information; a greater ability to work with other people; and a commitment to lifelong learning. It discusses some solutions adopted by British Schools of Librarianship to help students acquire the necessary knowledge, skills, and enthusiasm, and some of the obstacles to development. Finally, it points to the dangers of inertia.

Introduction

When I was in the Grammar School, I was required to read - in the original language - one of the classics of ancient Greek drama - Aeschylus' "Prometheus Bound", written at the beginning of the 5th Century BC.¹ It has often occurred to me over the last ten years that managing a School of Librarianship in the present era has many similarities to the story of Prometheus. Those of you who can recall the best known version of the story will remember that, for his sins, Prometheus stole fire from the gods to save the human race. For this 'crime', he was condemned to push a heavy stone to the top of a mountain, but once he reached the top, he was attacked by birds of prey. The stone rolled down the other side, and he had to try to push it back up to the top again.

The emergence of the 'Information Society'

As a profession, we see increasing evidence of our ability to contribute to the development of society. We can see that we need to make major efforts to change the positioning of our services and the public's perception of their relevance. But each time we seem to have taken a major step forward, new challenges appear. And all the while, we are aware that there are continuing threats to our security and well being.

There appears, however, to have been some certainty in Prometheus' existence, and there the similarity with the present role of the professional educator appears to end. It is now more than 25 years since Toffler predicted that the future would no longer be predictable on the basis of past events.² More recent writers have confirmed the accuracy of his prediction. Vaill, for example, discusses the issues of living, surviving, and developing, in "*permanent white water*", a complex, turbulent, changing environment over which we have little control.³

From the earliest years of mankind, until relatively recently in recorded history, we have lived entirely in an agrarian society. Indeed, in many parts of the world, agriculture still dominates economic and social life. During the last 200 years, parts of the world have increasingly been dominated by industrial activity. Yet, while the rest of the world struggles to take part in the 'Industrial Revolution', some nations are already entering a new era, which we are calling the 'Information Society', a society in which every aspect of our life is touched by the applications of Information and Communications Technologies, and in which we are increasingly dependent on the information which they offer us.

The transition to the 'Information Society' is not an easy one. It presents society as a whole, and information professionals in particular with a number of challenges which, in some respects, they are already familiar, and with some new ones:

- developing a high level of skills required to take advantage of new tools;
- helping people to use information efficiently and effectively;
- competing with other professions for control over the new environment;
- and
- funding the necessary investment

The aim of this paper is to examine the nature of those challenges, the knowledge and skills which information professionals will need, and the way in which education and training for library and information work in Britain is changing in response.

New challenges

I do not propose to dwell at length on the rapid changes in Information and Communication Technologies, but it may be worthwhile reminding you that students entering the Schools of Librarianship this Autumn will be practising professionals for the next 40 years. It is only 25 years since the DIALOG service became available on-line in Europe; less than 20 years since the IBM PC was launched, and a world-wide standard for microcomputers was established; and only about 10 years since CD-ROM technology was applied to databases. It is only in the last few years that improvements in networking software and graphical user interfaces have driven the expansion of the Internet and the World Wide Web. And we are only just beginning to see the emergence of ATM systems which have the capacity to transmit huge quantities of digitised data across telecommunications networks at incredible speeds. Nonetheless these are already becoming a relatively common communications technology. All the Universities in Scotland are linked by an ATM network, and a recent survey reports that ATM is now used in 13% of organisations in Great Britain, and that this figure is expected to rise to 17% by the end of 1998.⁴ For those of you not familiar with the capability of ATM systems, I should perhaps explain that to send the digitised contents of the *Encyclopaedia Britannica* (approximately 24 large volumes in its printed form) from one side of the world to the other across a telephone network supported by current ATM systems could take less than 3 seconds.⁵ ATM systems still in the experimental phase operate at even faster speeds. The processing speed of computer memory chips takes a major step forward every 6 months. Can we really forecast the future of information storage and transmission throughout the career of our new students?

Nor do I propose to dwell on the output of printed publications which has been increasing rapidly across the world. We have seen dramatic increases in book publishing. In Britain the number of titles published has grown over the last 30 years from under 10,000 each year to over 100,000.

Interestingly, for the first time, there was a small decline in the number of titles published last year, and some of this has been attributed to an increased investment in electronic publishing. Many of you will also be familiar with the ever increasing numbers of new journal titles which have been appearing and which are still appearing in printed formats, to provide an outlet for the publications of researchers in every field, and - I might add - to enable the publishers to retain or increase their total share of the market. Growth in this sector does not, so far, seem to have been affected by the emergence of parallel or independent electronic journals. Increasing affluence and improvements in education of the prospective purchasers have contributed to these world-wide phenomena just as much as a more businesslike and commercial attitude amongst publishers. This has already created the need for both librarians, booksellers and researchers to have new tools to help them identify relevant publications on a global basis, and to begin to recognise that it is no longer possible to take a narrow view of where knowledge is to be found and the formats and languages in which it is likely to be published. Can we forecast what the future trends in publishing will occur during our students' careers, and what impact they will have on our profession's traditional role as collectors and facilitators of access to the world's published output?

For the consumers of information, particularly those who need it as the basis for academic, commercial or technical research or as the basis for decisions in business or in politics, the challenge extends beyond identifying what is available. Their need is to evaluate and select the information which is valid and relevant, and to do this they increasingly will need for professional assistance. The same is true of the general public confronted by the vast amounts of information available. Nowhere is this more evident than when trying to use the Internet. Lack of precision in the Web search engines frequently results in the retrieval of thousands of "pages" alleged to meet the user's requirement. There is an urgent need to apply professional expertise to improving the search engines, and to developing web sites which provide links to "pages" which have been evaluated for their accuracy, whose relevance to the user's need has been defined, and which can be accessed quickly through a focused and organised system of guidance. The parallels between these activities and the traditional library activities of selection, acquisition, and cataloguing should be quite obvious, but all too often we see the initiative being taken not by libraries but by other organisations. The company which publishes the *Encyclopaedia Britannica*, for example, (which, despite the name, is an American company) has recently announced that it will be making available links to, initially, 65,000 web "pages", all carefully selected for their relevance and accuracy, as a supplement to the encyclopaedia.

This is just one example of the emerging competition which traditional library and information services face. Perhaps equally significant is the convergence between our activities and those of the Information Technologist. If we are to influence information provision in the electronic age, we must be able to demonstrate not only that we are technically competent, but also that we can serve the organisation or community more effectively than the Information Technology managers. Librarians are fully familiar with the information needs in the organisations and communities they serve, and with the relevant specialist information sources. Some have sufficient understanding of the new Information and Communication Technologies to identify the way forward. Nonetheless, the traditional perception of our role and status often limits our ability to influence change. However, we should take some encouragement from a study which undertaken in Aberdeen recently which confirmed that in most organisations the Information Technology managers, who have a great deal of influence based on their control of systems which others do not understand and who tend to control those parts of the organisational budget which are critical to implementing change in information service provision, in fact know relatively little about information and its uses.⁶

The new information professional

All this points to the need for information professionals to acquire a broader range of knowledge and skills. Let me suggest some of them:

- a holistic view of the information needs and provision in an organisation, encompassing not only conventional library and information services, but also the research function, records management, knowledge management, organisational communications, and the computer and telecommunications systems which underpin them
- a level of technical understanding of the new Information and Communication Technologies, sufficient to discuss them confidently in dealings with vendors and technical experts and sufficient to plan and manage changes in information provision
- the ability to identify and elicit information from non-traditional sources and organise it for effective and efficient retrieval
- the ability to evaluate, select, and in some cases re-package and present information which will assist users, rather than simply presenting them with a collection of books, bibliographic references, or documents
- a high level of skills in teaching the use of information and facilitating the use of information systems by others
- the ability to manage and lead a multi-disciplinary information service making a useful contribution towards the fulfilment of an organisation's aims
- a greater ability to work with other people, and particularly the ability to influence them to support the development of the library and information service and, above all
- the ability to define and defend the outputs of the information service in terms of the values of the organisation which it serves or which funds it.

The new curricula

The British Schools of Librarianship have carried through a continual process of revision and development to help their students acquire the necessary knowledge and skills.

This is not to say that these developments have not encountered obstacles. There have been issues which are peculiar to Britain, mainly related to government funding for institutions and for students, which have played a part in shaping change. During the early part of the 1990s, there was significant encouragement for Universities to expand their intake of students. The development of courses in higher education reflects the pull-push effect of parts of the sector recognising the need for an increasingly professional workforce to match their growth and increased significance, and the government's expansion of the higher education system to provide the work force required by a competitive economy. To achieve this expansion, the Universities have in many instances focused their efforts on developing programmes of study to meet the needs of growing industries.

The growing demand from employers in our field appears to be for graduates in other disciplines who have then completed postgraduate studies in librarianship, information science or a related area, because they can use their first discipline as a basis for evaluating information in the field. However, the number of government studentships for postgraduate study has been fixed, so far as the Universities in England and Wales are concerned, and overall student numbers have depended on the willingness and ability of some students to pay their own tuition fees. This has proved quite

significant for the development of professional education in our field. New developments have tended to be integrated within existing programmes of study, by reducing or eliminating the attention given to existing topics. In Scotland, I'm happy to say, the student support system is slightly different, and this has permitted us to experiment rather more freely with additional programmes.

We have, however, seen a number of new and innovative programmes of study emerge throughout the UK. Across the British Schools and Departments as a whole, we now see the range of courses beginning to map on to the broad paradigm which Nick Moore has used to describe the roles of the information professional - creators, collectors, consolidators and communicators.⁷ The University of Northumbria at Newcastle has established a Masters degree programme in records management. Aberystwyth and Loughborough have focused Masters degree programmes on the needs of a specific user community - the medical and healthcare information sector. In Aberdeen we have also moved to support the research function in organisations with our Masters degree in Information Analysis, and we have also begun to diversify the School's programmes to serve the needs of the publishing industry. Several Schools - Aberdeen, Sheffield, and University College London - have established programmes focused on telecommunications and computer networks. Recognising the complexity and diversity of the new environment, we have also seen a number of the Schools - Sheffield and Strathclyde, for example - beginning to teach Information Management as part of their University's MBA programmes, and Loughborough has established a MBA programme in Information Management in collaboration with the University's Business School.

This is a period of rapid change in the nature of library and information services. In circumstances demanding greater professional and technical awareness, and in the face of financial and political pressures

*"professional obsolescence becomes a real and ever present danger. Systematic continuing education provides a method of combating such obsolescences and its worrying personal consequences."*⁸

Given the pace of change in our field, we need to instil in our students and in established practitioners a commitment to lifelong learning. Increasingly governments see libraries as a service through which non-traditional, continuing learning can be delivered.⁹ It would be ironic if librarians were themselves excluded from the potential benefits of these changes. Whilst the Schools of Librarianship and Information Studies in Britain have been able to equip their recent graduates with up to date knowledge and skills, and with the ability to learn, the real dilemma is how to encourage and facilitate the development of the existing members of the profession. This is not a role which, until recently, the Schools in Britain have been encouraged to play by the government's funding mechanisms. It has largely been left to employers to provide the motivation and support for continuing education, and to the professional bodies and commercial companies to take up the challenge of providing the necessary courses.

Our Library Association has tried a number of approaches to this problem. From 1969 until 1986, it made it possible for working librarians and information specialists to qualify for admission to the Association's Register of Chartered Librarians (this is the official recognition of their professional standing in Britain) by completing certain requirements which included, rather than attending a School of Librarianship, attendance at specified number of short courses which had been approved by the Association in terms of their content and level. The Association's Code of Professional Conduct, approved in 1983, requires members "to keep abreast of developments in librarianship in

those branches of professional practice in which qualifications and experience entitle them to engage."

However, few people undertook Continuing Professional Development as a route to professional status, and eventually it was withdrawn. More recently, the Library Association decided not to pursue suggestions that continuing education should be a requirement for members wishing to retain their professional standing, but it has established a process for encouraging members to take the initiative in planning their own development programmes and seeking the support of their employers. This seems to be attracting more support, and has indeed attracted the interest of colleagues in several other countries.

Providers of continuing education have also responded to this increased interest. Short course provision for librarians has grown enormously in recent years, and there are now probably more than 1,500 events being organised each year in Britain by a wide range of professional groups, by commercial organisations, and (to a very limited extent) by the Schools of Librarianship.¹⁰ In-service training in libraries has also grown, and now accounts for perhaps 40% of all training activity.¹¹ As the government begins to become more active in encouraging continuing education,¹² it seems likely that the involvement of the Schools of Library and Information Studies will increase.

Challenges ahead

There are some areas where we have not progressed as much as we might have wished, for example in developing our students' ability to:

- contribute to the development of more effective information retrieval systems
- define the impact of information services on an organisation's activities
- improve people's expertise in use of information
- influence people to support our services.

These are not problems which are unique to Britain. They are universal, and we must seek for the solution to the first two problems through research activities.

Anyone who has attempted to search the Web knows how imprecise the search engines are. Finding information on the Web is a matter of luck, or of having the time to spend searching every one of the hundreds of references retrieved by the search engines. Of course we can overcome the problem to a certain extent by creating sites which offer links to clearly defined sources of information. But the real solution lies in developing retrieval systems which are capable of finding specific information quickly and accurately. These systems must also be user friendly. Information retrieval has often been described as the intellectual core of library studies, but we are only just beginning to understand that our users search for information in ways that are different from trained librarians. If we accept that, increasingly, the end user is likely to have direct access to electronic information services, we have to stop designing them for use solely by librarians. The research question that then arises is "what differences do we need to introduce in the retrieval systems?" Solutions to these problems are being sought in several Schools. Sheffield University is just establishing a Centre for Information Retrieval research and my own University is looking for funding for a project which we call INFOLAB, which will provide the infrastructure to focus the collective efforts of my own School and the School of Computer and Mathematical Sciences to improve information retrieval not only from text but also from collections of images. The crucial significance of this area of research can be seen in the decision by Bill Gates to invest \$50 million of Microsoft money into a

research centre at Cambridge University, to build on the expertise already there.

The second problem is perhaps even more crucial to our future. The real decisions about library and information services tend to be taken by users who can influence the funding agency to meet the information needs in the specialist field in which they are interested. Most library and information services, even those operating within the commercial sector, are not easily able to argue for the additional investment required to deliver technology based services, which tend to have a higher visible cost than the print based services which they replace or supplement. Because it is difficult to point towards tangible benefits which will be derived from introducing these new services, librarians are usually faced with the dilemma of reducing the investment in existing services or doing nothing. Reducing existing services is likely to be resisted by users, especially by those who are not familiar with the latest information tools and services. Doing nothing will, over a period of time, diminish the relevance and effectiveness of the service - and presents a threat to its future survival.

For too long we have been content to assume that our own assessment of the value of library and information services was widely held, and we have occasionally been surprised and disappointed to find that this was of no significance when hard decisions have to be taken about budgets. Most of the empirical work we have done on measuring performance has focused on technical processes rather than on identifying those things that matter to our users and measuring ourselves against their expectations.¹³ In the face of competition both from other parts of an organisation for a share of its budget, and from other information providers for a share of the users' support, we need to be able to demonstrate our relevance and impact in terms of the values of our users and funders, and on the basis of empirical evidence. In the health care field, for example, economists have established a measure for the cost benefit of medical treatment, based on what they call 'Quality Added Life Years', that is the number of years which the patient can be expected to live in good health after receiving the treatment. One of my colleagues is currently beginning a programme of work to try to establish a model for evaluating the contribution which information makes to healthcare. Eventually, it may be possible to compare the cost of a hospital library with the benefits received by patients in terms of 'Quality Added Life Years' and to contrast this with the costs and contributions of other activities in the hospital. Interestingly, even in those organisations where the outputs are more tangible - in business turnover and profit, for example - little work has been done to provide empirical evidence of the contribution of information. How do we measure the effectiveness of public, school and university libraries? This is another complex research question.

Neither of these research questions will find a quick or easy solution. The effort of resolving them requires the development - by the Schools of Librarianship, and with the encouragement and support of the practitioner community - of a greater number of practitioners with an expertise in or familiarity with research methodologies derived from the research training explicit in Doctoral and Masters degrees.

It has to be acknowledged that, even if we refine the retrieval systems, the volume of information now available is likely to be more than most people can deal with. Information overload, and information fatigue¹⁴, are becoming real problems in our society. These phenomena may, in fact, drive people from using library and information services to using the services of information brokers. Nonetheless, there appears a real reluctance to treat seriously the teaching of information skills such as not only seeking information, but also evaluating, analysing and synthesising it. Anecdotal evidence emerging from the current electronic library experiments in Britain suggests that University teachers are reluctant to allow librarians to become involved in the teaching process,

even if only to the extent of teaching about how to use the new electronic information sources. Recent research has also pointed to the reluctance of school teachers to adopt the results of earlier investigations into the need for children to develop improved information skills and into means of improving instruction in information use.¹⁵ We need to ask ourselves why we are less than successful in promoting our expertise in this area, and develop our students' skills to promote themselves as well as their expertise in teaching people how to use information.

Prometheus unbound?

To return to the legend, you will recall that, finally, Hercules killed the birds of prey and Prometheus was released from captivity. We are unlikely to find such a hero to champion our profession. So how can we overcome the challenges which face us? It seems to me that there are four things which we need to do to facilitate the development of relevant educational programmes:

- share experiences of new developments
- recognise that change is continual and the response must be evolutionary
- support continuing professional development for all our staff
- establish a clear view of our future role
- lobby employers, Universities, and governments to support and facilitate change in our role

It is, first of all, important to understand that what educators have to do is not only to reflect the changes taking place in a profession's knowledge base, but also to keep in step with changes in their local job market. This places a great responsibility on both the teachers and the practitioners to talk to each, regularly and openly, about the developments they have made, or would like to make, and the obstacles to progress.

Both practitioners and educators also need to acknowledge the imperative of keeping staff up to date. Equally, it is important that employers in both practitioner and teaching organisations recognise the value of the enthusiasm and new skills of recent graduates from the Universities, and use them as the basis for developing new services or courses. Perhaps I can remind you of an ancient Chinese saying:

*"Young people often achieve the impossible, because they do not know that it is not."*¹⁶

At the same time, as the Schools must appoint staff on the basis that their academic abilities are comparable to those of teachers in other departments in the University, we have to remember to make greater efforts to bring the experience of practitioners into the Schools, as visiting lecturers or as members of industry liaison committees. Interestingly, a recent survey of members attitudes undertaken by the British Library Association's Health Libraries Group pointed to this as something they considered to be extremely important.¹⁷ Paradoxically, however, very few of the respondents to the survey were actually willing to take part in these activities!

The reasons for this have yet to be explored, but this exchange of experience and ideas is essential to identify demand for many of the specialist skills needed in any of the emerging sectors of the information industry job market. Equally it needs to be understood that the demand for emerging, new skills is so small that, initially, a separate course could not be viable. The educators are compelled to incorporate the new subject within an existing programme. Inevitably, trying to cater for these specialist needs within a single, generalist programme which tries to prepare students for a variety of employment opportunities may fail to satisfy both students or employers - but that is what is necessary in an evolving situation. Some of the criticism the Schools of Librarianship and

Information Studies have faced in recent years, as the pace of change in the subject has accelerated, is perhaps because they have had to teach a little about each of these emerging new specialisms within the framework of a generalist programme of study. However this is preferable, as one American commentator observed, to the consequences of the alternative approach:

*"To escape criticism, do nothing, say nothing - be nothing!"*¹⁸

Despite the rapid emergence of the 'Information Society', it has to be recognised that not everything can be done at once. Occasionally, University authorities can be persuaded to employ additional staff to enable Schools of Librarianship to make strategic developments. In many cases, however, the new courses which have evolved in Britain are in many cases taught in collaboration with staff from the other departments in the same University. In some cases, students attend classes shared with students in other disciplines. But, more often, it has had to be necessary for existing staff of the Schools of Librarianship to be encouraged and supported to make the very significant effort required to extend their own knowledge base to teach new subjects.

If we are to prepare a new generation of professionals with the necessary technical and managerial knowledge, we must have a fairly clear vision of the challenges facing library and information services. But if, as a profession, we wish to have a more significant role in the Information Society, part of our strategy must also be to do more than we appear to have done in the recent past to lobby the decision makers. They are aware of the emergence of the 'Information Society'. What we need to do is to ensure that they understand that our profession can make a unique contribution to its development and encourage them to give us their support. To achieve this, we need to know and be known by the decision makers in the corporate or government environment.

Above all, we need to ensure that each new generation of practitioners fully appreciates that lobbying is an activity which is essential not only to the future development of their services, but also to the survival of the profession to which they belong, and we need to consider how best we give them the requisite knowledge, skills and motivation to succeed in this task. Information professionals in the future will not be working in large information centres where they can rely on other professionals to be politically active on their behalf. The future information professional will probably work alone, or at least as the sole specialist in a larger organisation. They will be responsible for their own survival and prosperity. Some of the responsibility for helping future generations to develop the necessary political contacts or expertise must lie with established members of the profession, but the Schools have a responsibility to make their students more aware of this role, and what it involves. I would expect to see more attention being given to this in the future, alongside the necessary emphasis on improving our technical skills.

At the end of the day, we will all benefit from the efforts we make to create a more effective workforce. As a group of consultants remarked in a recent report to the British government:

*"The final driver [of the development of the Information Society] is access to a supply of skilled ICT [Information and Communication Technology] professionals. They are an essential element in a virtuous circle where skills attract investment which stimulates growth which in turn attracts more skilled professionals."*¹⁹

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