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Libraries in an information society: online databases and access to information

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LIBRARIES IN AN INFORMATION SOCIETY:
ONLINE DATABASES AND ACCESS TO INFORMATION

A thesis submitted in fulfilment of the requirements for the award of the degree

DOCTOR OF PHILOSOPHY

from

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by

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DEPARTMENT OF INFORMATION & COMMUNICATION TECHNOLOGY
1996
I certify that the work embodied in this thesis is the result of original research and has not been submitted for a higher degree at any other university or institution.

(Signed)
## CONTENTS

<table>
<thead>
<tr>
<th>Acknowledgements</th>
<th>v</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>vi</td>
</tr>
<tr>
<td>Thesis Overview</td>
<td>vii</td>
</tr>
</tbody>
</table>

### Chapter One: Libraries in an information society

1.0 Introduction  
1.1 Responding to the needs of library patrons  
1.2 The new Alexandria  
1.3 Re-inventing libraries  
1.4 Libraries in an Information Society  
1.5 Historical background  
1.6 Methodology  
1.7 Conclusion

Page: 1

### Chapter Two: Library Technology

2.0 Introduction  
2.1 COM catalogues  
2.2 Online catalogues and automated loans systems  
2.3 Co-operative catalogues  
2.4 Computer networks  
2.4.1 Local Area Networks  
2.4.2 Wide Area Networks  
2.5 Online databases  
2.5.1 Online database technology  
2.5.2 Online database sources  
2.6 Shared databases  
2.7 Gateway services  
2.8 CD-ROMs  
2.9 Electronic journals  
2.10 Electronic texts  
2.11 Floppy disc publications  
2.12 Inter-active video discs  
2.13 CAL programs  
2.14 Publishers and suppliers online  
2.15 Other computerised information  
2.16 Training implications  
2.17 Conclusion

Page: 30

### Chapter Three: Literature review: the fee-vs-free debate

3.0 Introduction  
3.1 To charge or not to charge: a review of the literature  
3.2 The Public Library debate: late 1970s to early 1980s  
3.3 The Public Library debate: late 1980s to early 1990s  
3.4 The Academic Library debate  
3.5 The library in the market place  
3.6 CD-ROM databases and access  
3.6.1 CD-ROM vs online searching: fee vs free  
3.6.2 End user searching: training implications  
3.6.3 Implications for library collections  
3.6.4 Document delivery and image databases  
3.6.5 The potential of CD-ROM  
3.7 Predicting the future  
3.8 Conclusion

Page: 55
Chapter Four: Libraries in Australia on the Information Superhighway

4.0 Introduction 91
4.1 Who was surveyed? 92
4.1.1 Which Libraries? 93
4.1.2 The Questions 95
4.1.3 The Analysis 95
4.2 Library environment 96
4.3 Online Database Services in Australian Libraries 98
4.3.1 Australian and New Zealand Database Services 98
4.3.2 International Database Services 101
4.4 Charging 105
4.4.1 Budgeting 108
4.4.2 Online Search Statistics 111
4.5 Brokerages 118
4.6 CD-ROMs 122
4.7 Network access 123
4.7.1 Services available 125
4.7.2 Databases 130
4.7.3 Charging for network use 132
4.8 The Future 133
4.8.1 Electronic publishing 134
4.8.2 Electronic document delivery 142
4.8.3 Charging / Card systems, etc 151
4.8.4 Libraries / Librarians / ITS Units 155
4.9 Trend towards wholly electronic information 159
4.9.1 Newspapers and web pages 159
4.9.2 Government publications on the world wide web 159
4.10 Conclusion 160

Chapter Five: Vendors and producers

5.0 Introduction 164
5.1 The online information sector 165
5.2 Online vendor ownership changes 166
5.2.1 Dialog/Knight-Ridder 167
5.2.2 Maxwell Online/InfoPro Technology 168
5.2.3 Mead-Data Central/Lexis-Nexis/Reed Elsevier 170
5.2.4 Other international vendors 171
5.2.5 Australian online services: Ausinet, Ozline, etc. 172
5.3 Growth and value of the industry 173
5.4 Globalisation of the online database industry 178
5.5 Conclusion 181

Chapter Six: Government and online information

6.0 Introduction 185
6.1 Depository obligations of governments 186
6.2 Database content: profit vs public interest 190
6.3 Information policy 193
6.4 Private vs public ownership of databases 194
6.5 Privacy concerns 197
6.6 Access issues 198
6.7 Conclusion 203
Chapter Seven: *Access to information: the technology, the library and the end-user: preparing for the electronic library*

7.0 Introduction 205
7.1 Significance of networks 206
7.2 Network access to databases and other information resources 208
7.3 Network = Library? 212
7.4 Survey of IT students 214
7.4.1 Online information services training: an example 214
7.4.2 Meeting students' needs 218
7.5 Conclusion 221

Chapter Eight: *Conclusion*

8.0 Introduction 224
8.1 Libraries for an information society 225
8.2 Australian libraries: a digital future? 229
8.3 Conclusion 230

Bibliography 232

Glossary 256

Appendices:

1. *Questionnaire: Australian Library Survey*
2. *List of Australian Libraries Surveyed*
3. *Tabulated Results of Australian Library Survey*
4. *Student Questionnaire*
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Abstract

During the past fifteen years, library technology has been transformed. Where paper-based technologies once ruled, computers now provide the major form of access to information resources both within and without the library walls. Once bastions of print, libraries now actively promote electronic information tools, whether simply via online catalogues or through the more sophisticated CD-ROMs or international networks. Not only are the hardcopy indexing and abstracting services being displaced by electronic services, but, increasingly, librarians will be able to choose whether they subscribe to an expensive journal, or provide access to it via the equivalent fulltext database online, possibly charging the requestor for this service. The combined attractions of the market place and the new technology are hard to resist, but it is essential that the needs of ordinary clients continue to be met both by providing the access to the technology and resources in a central, public location, and making available the necessary instruction to use these media, just as reader assistance has been provided for traditional, print based media in the past. It is also essential that the services provided be examined closely and that policy decisions be taken that ensure appropriate dissemination of information resources, independent of ability to pay. This is particularly important in areas such as education and research upon which a country's economic well-being rests. Whether the technology continues to reside in a specific location such as a library is irrelevant. Facilitating access is the issue of greatest importance.
Library technology has been transformed. Where paper based technologies once ruled, computers now provide the major form of access to information resources both within and without the library walls. Once bastions of print, libraries now actively promote electronic information tools, whether simply via online catalogues or through the more sophisticated CD-ROMs or international networks. Certainly, for many librarians, the idea that their book and journal collections will some day be supplanted by online or other electronic services, is anathema. But for others, this fits neatly into the politics of managing collections, not in spite of, but because of the existing economic imperatives. Serials collections are an interesting case in point. Not only are the hardcopy indexing and abstracting services being displaced by electronic services, but, increasingly, librarians will be able to choose whether they subscribe to an expensive journal, or provide access to it via the equivalent fulltext database online, possibly charging the requestor for this service. Such choices are already being made. In attempting to defend their economic position, however, librarians may lose their way, soon finding that their traditional role in providing equitable access to information to the community they serve is no longer an option.
In examining these issues, this thesis looks not only at the changes occurring in libraries, but also at the role of online vendors and producers. The role of the online information vendor is shown to be not unlike that of the book or journal seller, providing a marketable, if intangible, commodity to both individuals and libraries. Governments have played a major part both as producers of databases and in the development and spread of online technology. Indeed, government funding has been essential to the development of this industry and it will continue to have a role in assuring broadly based access to electronic information resources.

Governments in Australia and the US are proposing policies which indicate a concern that access to information resources be an important priority. It is not yet clear how this is to be achieved and, while the emphasis remains on "user pays", it is important that provision for equitable access, as has been the case for text based resources, be maintained in some measure. Indeed, it has been suggested that "serving the public interest through broad access should eventually serve private interests, by expanding markets and values associated with the infrastructure." The role of libraries can be an important one here: not conflicting with the interests of the private sector, but providing part of the information infrastructure which will serve both the public and private sector interests.

The combined attractions of the market place and the new technology are hard to resist, but it is essential that the needs of ordinary clients continue to be met both by providing the access to the technology and resources in a central, public location, and making available the necessary instruction to use these media, just as reader assistance has been provided for traditional, print based media in the past. Library budgets have been geared to the provision of physical resources, mainly print based media such as books and serial

publications. If other forms of delivery are to be employed, some method of funding these is needed: either traditional media must be displaced, or extra funds, either through increased allocation to the library or through charging for some services, as has been done in the past, must be provided to cover the cost of delivery. However, as is shown in the survey of Australian libraries presented in Chapter Four, traditional "charged for" services are underutilised. The rationale for charging for traditional online information was that the client was receiving a "value-added" service. But the new electronic services require the user to search for themselves. In this sense, they are little different from books and journals with indexes or tables of contents provided. Some form of charging for electronic delivery of networked databases is an issue which will undoubtedly receive close attention as more resources are provided in this way.

The direction of the New Library is decidedly electronic. Digital library projects are appearing in Europe and the US with the blessing and financial support of governments. While these are exciting developments, it is important that the role of libraries as a source of information for the whole community is not forgotten. Libraries have been valued as places for the curious and inquisitive wishing to extend their knowledge, sometimes in a haphazard manner, but nevertheless with the desire for a measure of self improvement. While their benefit to society is difficult to establish in any quantifiable way, it has been argued that an informed society, is an essential element in a successful democracy. Libraries which are open to all, independent of ability to pay, provide a resource which is essential to achieving this. As more services are provided electronically, many of the hardcopy resources may disappear. Some library clients will welcome this and require access to be provided to their homes and offices rather than through a central location. For them, the library will be truly digital. Others will be able to afford neither the equipment nor the access to these information resources. For them, it is essential that a central location, well equipped and staffed, should be maintained to ensure opportunities for all within society, independent of means.
Networking of databases held the promise of easy access to online databases without the expensive charges and telecommunications costs of the traditional system. It seems likely, however, that charging for these services will be instituted. If this occurs, an opportunity to provide greater equity of access will be lost. Nevertheless, it can also be argued that if online vendors can provide information directly to the end user, an intermediary is an added expense. As more high quality material once lodged in libraries is provided in this way, albeit for a fee and the "user pays" philosophy gains general acceptance, it may be argued that there is no need for a library in the physical sense. Online information vendors will provide an adequate facility.

What are the implications of such a change and how will this affect access to resources for those lacking either the physical or the financial capacity to take advantage of this technology? For almost certainly, individual charging and the consequent inequity of access, will be a feature of these changes. It is essential that the services provided be examined closely and that policy decisions be taken that ensure appropriate dissemination of information resources, independent of ability to pay. This is particularly important in areas such as education and research upon which a country's economic well-being rests.

The prospect of an ever expanding information resource available via the telecommunications network and independent of place, is exciting. As elsewhere in the world, there is an explosion in the development of world wide web sites in libraries, each providing some new link in the information chain. The constant stream of articles appearing in the news media reflects the general level of enthusiasm for what is commonly referred to as the "information superhighway", as does the emphasis on the importance of putting in place a national, information infrastructure. Whether the technology continues to reside in a specific location such as a library is irrelevant. Facilitating access is the issue of greatest importance.
Chapter One

Libraries in an information society

1.0 Introduction

Libraries in the late twentieth century are "high-tech" information centres. Their staff are far removed from that unattractive stereotype, the fearsome guardian of the library's book collection, depicted in film and on television. They operate in a system which requires a knowledge of the latest developments in information technology and an ability to adapt a variety of computer software to their library's special needs. To this, many have added entrepreneurial skills and a flair for selling which promises a lucrative income for their organisation. But is this an appropriate pursuit for libraries, particularly those in the public and academic domains?

Librarians have been among the first to adapt the new information technology to their industry. First there was the development of computerised catalogues, to which were added automated borrowing systems. Later, with the convergence of telecommunications and computing during the 1970s and '80s, access to remote database services became possible. Today, it is not unusual for libraries to provide a variety of electronic services, including access to information stored in remote databases and to on site information such as that stored in the library's catalogues or on CD-ROM disc. Where the service is regarded as having a value above what might normally be expected, a fee may be charged. This is especially the case with remote, online information services.

Heated debates have ensued regarding the justification or otherwise of charging fees of any kind in libraries. In Australia, such debates are considered passe. Katie Blake, an independent information professional and publisher (until December 1992) of the popular and informative newsletter Online Currents, makes her position clear in a review of a
rather out of date book on the topic. She says that she left such concerns behind when she left University of Sydney Library and refers condescendingly to "those few who remain uncertain about whether or how to charge for online bibliographic services ...". This sentiment was equally evident at a meeting (April 1991) in Sydney where the topic of "value added" services in Academic libraries was discussed. It was generally agreed that charging for such services was a good thing and assumed that there would be no dissent from this view. However, as electronic storage of information begins to displace that available in more traditional forms such as journals and books, this debate is likely to be revived, particularly when charging for individually requested articles from journals not locally available becomes a regular feature of library service. As librarians respond to the demands of their most vocal and affluent users, the needs of many of their poorer and equally deserving clientele may go unmet.

1.1 Responding to Needs of Library Patrons

"What I want is to be able to sit at my desk and to have all the information I need, including recent journal articles, accessible to me through my own computer terminal. I don't want to (have time to) go to the library, or to have a librarian do a database search for me. I want to do this myself. I know best what I need."

This comment was made recently by a busy and energetic engineering professor, already familiar with online databases in his own field, and aware of their potential for fulfilling all his foreseeable information needs. In the long term, he saw little need for librarian mediated online searching. Hints of this same attitude are to be heard throughout university campuses among those with only slight knowledge of what online databases provide. Such attitudes are significant since individual direct access will undoubtedly

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incurs a fee. This indicates a move away from the accepted notion of libraries as an essential free resource, a public good available to all levels of society.

Librarians themselves seem ambivalent as regards this issue. Some have joined the entrepreneurial push, attempting to provide self-financing services centring around database searches. Others refuse to consider that there will ever be a time when books will not be a central part of the service they provide. All but a few consider that libraries must charge for some of their services, in particular those services linked to the new electronic technologies. The debate over the latter point has been deemed closed by many. This may be the case in Australia, but in the US articles on this theme have continued to appear, with a resurgence of interest over the past few years.

What are the visions of the future library presented to us by those who should know (the experts)? And how realistic are they? What implications do these predictions have for ordinary library users, and for the public generally? Will access to information be enhanced or will the majority of people find that the services libraries provide are increasingly out of their reach, either because of a lack of familiarity (skills) with the new technology, or in basic economic terms: because they cannot afford them?

Numerous articles and books have appeared which attempt to address this theme. Before providing an outline of the issues to be dealt with in relation to the fees for service debate, this chapter seeks to isolate and critically assess some of the common viewpoints expressed on the future of libraries. In this way, the climate in which the debate over charging has emerged will become evident.
1.2 The New Alexandria

Much is made of the "Alexandrian" comparison today: the idea of having all one's information needs accessible at one point or from any point, in the "electronically linked" world, at least. However, the attitude of librarians is in many senses the reverse of that embodied in the collection philosophy in the Ptolemaic era when the Alexandrian collection was being assembled. The Ptolemies' collection policy was not in any sense a 'just in time' approach! It may have had something to do with power. Amassing a collection of all the world's acquired knowledge was undoubtedly a powerful and impressive (if romantic) objective. Access was to the privileged few and included visiting scholars. Copying, exchanging and borrowing were regular activities. However, there was no consideration given to whether a book was actually needed either in the immediate or distant future. "Just in time" approaches, distributed collections, conspectus and similar modern day solutions to information provision were irrelevant. The main focus was on acquisition.

Today's equivalent of this emphasis is "access". Providing that access is available, by whatever means, acquisition is unnecessary. Who pays, however, depends on how quickly an article is required and by what method it is delivered. Inter-library loans are often paid for by academic libraries as part of their service. Document delivery services like those attached to databases such as UNCOVER, on the other hand, are charged to the individual requesting the item and are usually transmitted by fax machine. Budgetary implications of this trend need to be thought through. Researchers will undoubtedly demand immediate delivery of material they know to be relevant and instantly available. Will libraries expand their budgets to provide this service or should research departments cover the costs? If the latter, there is little incentive for libraries to put more money into new subscriptions although their inter-library loan budgets may be able to be reduced. Nevertheless, it is unlikely that any serials budget which is in excess of the sixty-five per
cent of the total annual bookvote\(^2\), which is favoured in some Australian academic libraries, will benefit from funds retrieved in this way unless the overall budget for books and serials is increased and the proportion maintained (i.e.: a maximum of sixty-five per cent should continue to be allocated for serial subscriptions).

Where CD-ROM databases, which are essentially electronic serials, fit within library budgets varies from library to library. However, their ability to store large amounts of information is a source of great fascination and enthusiasm for many librarians who eagerly promote their virtues. The potential of new data storage media like CD-ROM, has led Nancy Melin Nelson to suggest that the Alexandrian ideal of a library containing all important, available, published material, already mentioned above, is now within our grasp.\(^3\) She describes the potential of this new technology as "dazzling", noting its ability not only to store large quantities of information of the kind formerly contained in bulky printed media, but also to replace fee-based online searching in libraries.\(^4\)

In a later article\(^5\), (Melin) Nelson discusses the efforts of one organisation to put the power of CD-ROM technology into effect. The Alexandria Institute, a tax-exempt, non-profit foundation in the US (incorporated in 1984, but first set up in 1978), sees a future where scholars and researchers will no longer visit libraries. Libraries will come to them. The Institute sees itself, as the name implies, as a modern version of great Alexandrian library established by the Ptolemies in 290 B.C.\(^6\) Whereas its namesake contained

\(^2\) Bookvote: the funds available for additions to the library collection.


\(^4\) Melin (1986) *ibid.*


\(^6\) The Alexandrian analogy is an interesting one. As well as collecting and copying as many original books as they could persuade owners to part with, the Ptolemys also had these manuscripts translated into Greek to provide easier access for those unfamiliar with the language of origin (See Luciano
information stored on papyrus scrolls, here, the vast stores of knowledge will be kept on compact discs. The vision for the future is that all this information will be fully indexed and made accessible from workstations anywhere in the world, where it can be browsed online, or even printed out.\footnote{Canfora's \textit{The vanished library}. London: Vintage, 1991, for an entertaining look at the politics and problems of book collecting in ancient times.)}

The director of operations at the Institute, Robert C. Kerr, is promoting the concept of a Knowledge Research Center (KRC), which will contain "electronic versions of books, journal articles, tabular data, images, and other information" and will provide users with the tools to search and browse this information quickly and easily. A number of mechanisms will be utilised to this end including optical discs, local networks, and online systems.\footnote{\textit{op.cit.}, 44.} At present, there are seemingly insurmountable problems with copyright. As Kerr points out, "A copyright system based on the publication, distribution and compensation for a printed copy of a book may not be viable for the protection of intellectual property rights when the 'copy' is a single disc with the full text of 500 books representing more than 1000 different proprietary interests." The system envisaged by Kerr is a "pay-for-use" model, dependent on the actual use of data. An electronic copy, for example, would command a higher price than would simply viewing the information on the screen.\footnote{\textit{ibid.}, 45.}

The vision of the future library as expressed above, has had a varying reception among librarians. Some consider the necessary developments to make such a system either practical or economically viable are too far in the future for the issues at stake to be of serious concern to them. In many of our libraries, however, decisions which will influence the future make up of our collections are already being made, and the issues

\footnote{\textit{ibid.}, 46.}
involved must be confronted. If electronic collections are to displace print on paper, it is essential that "opportunity" for access to resources be safeguarded. The technology has the potential to expand access through greater storage capacity, extended reach and improved subject search mechanisms. Limiting access to those who can afford to pay will counteract these promised advantages.

1.3 Re-inventing libraries

During the 1990s, it is likely that library collections will continue to consist of books and periodicals in paper format as at present. However, the conversion of periodicals to electronic format will undoubtedly continue. It was predicted in 1988 that, by the mid '90s, 15 to 20 percent of scientific periodicals might be available in electronic format, fulltext and online. This may well have been achieved. Already, many of the major newspapers are available in this way, either through one of the familiar database providers such as Dialog, or Mead Data Central, or independently. Business, medical and legal fulltext databases are also appearing. In 1990, UMI made available for subscription its Business Periodicals Ondisc CD-ROM, which contains in fulltext, more than 300 of the journals indexed on the popular business online database, ABI Inform. Soon after this release, they announced the production of IEEE/IEE Publications Ondisc containing full text conference proceedings, standards and magazines commencing with 1988 publications. As well, they are producing Wilsonline's Social Sciences Index/Fulltext (1989+). They have also commenced production of some newspapers fulltext on CD-ROM. The number of image databases of this type continues to grow. ADONIS, a CD-ROM project set up by several European publishers, made available, initially only at central locations, a regularly updated collection of CD-ROMs containing

10 Mary A. Keeler, Washington State University, has stressed that it is "equal opportunity" rather than "equal actuality" on which democracies are based (1996).

the fulltext of over 200 biomedical journals. This is now a commercial product. Government materials including legislation are being produced in this format, often through joint projects involving both government and private ventures (eg. Diskrom Australia, and Info One - formerly CLIRS). As improvements in networking capabilities take place and copyright problems are overcome, the availability of fulltext sources such as these will influence which journals libraries choose to purchase for their collections, and which they decide can be obtained more cheaply and equally effectively from some central electronic repository. Economic issues, related to budgetary constraints, will undoubtedly continue to be a primary consideration.

Unfortunately, as Pat Molholt points out, there is little to be found in library literature which focuses on the economics of information. Molholt, who expresses strong views regarding the fee-vs-free issue, believes that "If libraries were funded to provide adequate access to the new forms of information, the fee/free argument would never have surfaced." This may seem self evident. However charging for services in libraries, has hardly been restricted to online database access. Pete Giacoma emphasises this point at the commencement of his book: The fee or free decision: "Many librarians favoring user fees accurately dispute the notion that fees are a late 20th century contagion into the previously uninfected public library. They are not. Surveys conducted in the 1920s, 1940s, and 1950s found that an almost constant 50 percent of responding libraries offered rental collections, which provided rapid access to duplicate copies of popular titles for a minimal charge." Nevertheless, distribution of library spending is being affected by changing technology and increased access to information resources. Molholt states

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that, "Research on new economic models is critical if libraries are to assume a more active role in the information marketplace." This is clearly important if informed decisions are to be made on issues relating to charging for service.

The majority of writers attempting to predict the future of libraries, side-step these economic issues. They focus more on the role of librarians and the future for libraries. It will be necessary therefore, to go outside the library debate when discussing the economics of information and to attempt to draw together material which is relevant to the library sphere. A later chapter will be devoted to this theme. For the moment, it is necessary to look further into what the forecasters have to say.

In discussing the changes occurring in libraries with the introduction of new technologies, Molholt says that the library is becoming disembodied, disappearing, like the Cheshire Cat, slowly but relentlessly. All that will be left is the librarian's understanding of information content and structure, and of user needs. It is this which is the Cheshire Cat's smile. Librarians, Molholt believes, have a continuing role to play in the development of information products, if they are prepared to participate.

As might be anticipated, this preoccupation with the changing role of librarians appears in the work of a number of authors, as if they are seeking reassurance that they will not be made redundant by the new technology. Philip Young, for example, when discussing the future of library research as more and more material becomes directly accessible electronically to the searcher, states that the librarian's mission will remain the same: "to collect, organise, and make available the information needed by researchers; to provide

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15 Molholt, op.cit.: 104.


17 ibid., 41.
appropriate equipment to access, service, and to train patrons to use information sources efficiently and effectively." Richard Hacken asks whether librarians' jobs might not be threatened by increasing the automations budget. He attempts to reassure however, with a quote from a 1982 article by Richard De Genarro: "Online searching is not putting libraries out of business; libraries have helped put online searching into business and constitute its principal market. The online services will, in turn, generate new business for themselves and for libraries." He believes that librarians and the new information entrepreneurs are, for the present at least, mutually dependent on each other's services and products if they are to prosper. De Gennaro was, until 1990, the director of the New York Public Library which, he says, is one of the two or three great libraries in the US. Its research library, is perhaps the last, along with the Library of Congress, to allow free and open access to any member of the public. Most private and public university libraries now have conditions for entry, some even charging fees to outsiders. De Gennaro does not mention whether his library's commitment to free and open public service extends to material stored in electronic databases. In formulating a "realistic vision for the twenty-first century" for the New York Public Library, his stated aim, this will surely be one area which will require close scrutiny.

If we think in terms of providing public access to library services as De Gennaro does, it is clear that we must look closely at the needs and potential needs of our users. Rather than focusing on the employment prospects for librarians, surely it is more important to investigate what is being done now. Some have emphasised that it is important that


20 ibid.487.

librarians do not just sit and wait to be noticed. They should establish contacts with key actors in the industry, including: academics involved in information research, computing centre staff, publishers, information producers and vendors, those involved in telecommunications networks, and state and government librarians.\textsuperscript{22}

However, it is difficult not to become mesmerised by the new technology, to be swept along by a fascination with the power of the new tools, and to lose sight of the essential purpose of the library as a centre for the storage of information serving a community's needs. This has always been the purpose of the library, independent of whether the storage medium was a book, a microfilm copy or even a clay tablet. The electronic storage of information should not change this. Certainly, it does not change society's need for a central repository of information to which the majority of its citizens have free and easy access. Nevertheless, it is evident that the increasing acceptance of electronic databases as an essential library tool has implications for the kinds of collections which are maintained in libraries, and hence also for access to information which is now freely available.

1.4 Libraries in an Information Society

The terms "Information Society" or "Information Age" have become catch-phrases among information technology enthusiasts in the last decades of the twentieth century. Such notions have been fostered by writers like Yoneji Masuda, who forecasts a society based on an information infrastructure which will allow quick and inexpensive access to information wherever, whenever and by whomever it is required.\textsuperscript{23} Masuda was writing


in 1978. Since then a large body of literature has developed around that theme. Governments talk about the importance of developing a National Information Infrastructure Agenda. Writers like William Martin\(^2^4\), Herbert Schiller\(^2^5\), Vincent Mosco\(^2^6\), Herbert Dordick\(^2^7\) and David Lyon\(^2^8\), present a theoretical perspective on the "information society" which includes both discussion of the impact of new technology, whether positive or negative, and a concern for "public good" issues. It is this approach which has been adopted in this thesis.

The significance of "information" has also been explored in some depth, and a set of concepts known as "information theory" has been developed.\(^2^9\) Theodore Roszak notes however, that in much of the contemporary discussion of information, rarely is the library mentioned.\(^3^0\) He suggests that this may be because the library is, at least in the minds of computer enthusiasts, too closely linked with print on paper. And yet a large proportion of the material which makes up the major databases is exactly that material which has

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\(^2^7\) Herbert S. Dordick. The emerging information societies. In: Schement and Lievrouw, op. cit.: 13-22.


been available in library reference books: the librarian's major tools.\textsuperscript{31} Clearly too, libraries are buying into the new technology, and there is a distinct eagerness to try out every new development, in spite of the considerable expense.

Roszak points to a number of reasons why libraries have been overlooked. He says that: "The major commercial thrust of the cult of information is to sell computers." Compared to the potential home market, he suggests that the library market would be insignificant.\textsuperscript{32} It would be interesting to look into just how valid this point of Roszak's is. Already, almost all library personnel involved in the maintenance of library collections (in particular, that large proportion of library staff who work behind the scenes and are, for the most part, invisible to the public) have a terminal on their desk. The potential market within libraries continues to expand, not only to add to the banks of online catalogues, but also to meet the increasing demand for extra PCs with CD-ROM readers attached and to update existing machines. Remote access to online searching, and the imminence of local area and wide area networks (LANs and WANs) extend the demand for computers beyond the library walls. As will be shown later, it is not just the market for PCs that is responsible for the library's low profile among "enthusiasts", but what this technology can deliver: the lucrative electronic database services. By providing a free service in this domain, libraries may be seen as a threat to independent information entrepreneurs. Inadvertently, perhaps, libraries are ignored where entrepreneurial ventures are the focus of constant media reports.

Roszak further notes that the target group for computer sales is the affluent middle class, whereas the library clientele is much more democratically based, and "may even include the genuinely poor, whom the data merchants do not regard as any sort of market at

\textsuperscript{31} \textit{ibid.}

\textsuperscript{32} \textit{ibid.}, p.198.
Finally, he remarks on the stereotypical view of the library as "associated with a prim and mannerly feminine subservience that is bound up with the age old culture of books" contrasted with the more aggressive, masculine "high tech deals with powerful machines that represent billion dollar investments." Outside library circles, this sexual stereotyping is given no attention whatever.  

While Roszak has noted the lack of attention which libraries have received in the access to information debate outside libraries, his own contribution is more token than providing anything of substance. Librarians themselves seem unable to demonstrate their importance in this debate to the community as a whole. Articles on the theme of the future of libraries are largely aimed at the profession, and anything more substantial has not achieved the degree of notice one might anticipate. Bruce Shuman, in his book on this subject, states that the most recent book length treatment of the future of libraries was published in 1965, and that was written by a psychologist. His own treatment of the subject may not, however be to everyone's taste, although his collection of anecdotes, quotations and clippings are sure to amuse. He presents nine different scenarios for the future of libraries which he categorises as either utopian, dystopian or incrementalist, all of which he considers plausible. Of particular relevance here is the incrementalist scenario, which Shuman summarises as follows:

---The library is a place where only the poorer sectors of the community may enter free of charge. Others pay admission charges.

---The library becomes a place where only a certain type of information or a certain type of service is available

33 ibid.

34 ibid.


36 ibid. p.117
The library is replaced by home access to information and entertainment.

In the dystopian view, the library disappears altogether or is subject to strict government controls over both access and content, while the utopian scenario presents a completely automated and robotized system with little or no human intervention. With the increase in availability and promotion of videotex services and the promise of multimedia online delivery, cable television and an improved information infrastructure, it is the incrementalist view in the above scenarios which seems most likely. What information is available will clearly be dependent on how much the individual can afford. In this scenario, the free library as an information resource will become an anachronism. To see how this has come about, it is necessary to look briefly at the history of the online information industry.

1.5 Historical Background

The Alexandrian analogy has already been mentioned and it is evident from the history of that time that sale of and trade in text-based information (and the online database industry is still largely text-based, although this is changing) is not new. Trade in information is not new. States have always needed information in some form to allow them to compete successfully with their neighbours. Information on strategies of war and on cultural and religious beliefs are just two subjects on which even the most ancient civilisation needed information to help them either dominate or coexist successfully with those with whom they traded. The Ptolemies in Alexandria during the third century BC and later certainly recognised the value of information. As is well known, they planned to collect all the

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37 ibid.
books of the known world -- no mean feat. To achieve this, they employed copyists to copy all the books they could obtain, sending out emissaries to all the nations known to them. As well, they employed groups of translators from many nations to translate texts into Greek. Depending on which reports are to be believed, the Alexandrian Library had from 500,000 to 700,000 scrolls, representing 54,800 or 70,000 volumes. It is uncertain how accurate these figures were, but in a time before printing presses, this represents no small collection. Books were actively sought. Indeed all the books on visiting ships to Alexandria's port were copied. The originals were kept and the copies returned to their owners! This was common practice in Alexandria apparently, even when books were officially borrowed from neighbouring countries.

That the trade in books was an active one is evidenced by a report of accidental destruction by fire of 40,000 scrolls in transit, stored in a warehouse in the adjacent port at Alexandria. The Ptolemies were not always successful in their attempts at acquisition, and were occasionally duped themselves. A most notable example was in their attempt to acquire Aristotle's collection of books. In the event, only part of his collection was acquired when they thought they had paid for the full collection. Illegal trade in poor quality copies was also a problem in this period, this again showing the value placed on the trade in information during this era. Information anxiety was not unknown apparently even in those days:

'Of what use are whole collections of books, asked one Stoic philosopher, 'when their owners barely find time in the course of their lives to read their titles? Devote yourself to a few books, and do not wander here and there amongst a multitude of them.'

Large collections of books have come and gone, great conflagrations destroying some. Those that survived to recent times often only did so through smaller collections. This is

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an interesting thought to ponder in the trend towards centralised database storage and monopoly control of large sections of the online database industry by giant corporations.

In more recent times the value of information is no less recognised as an important item of trade. Access to computerised information sources has made this even more apparent. The online information industry has developed, to a large extent, only over the past 25 years. It was made possible by the convergence of computer and telecommunications technologies, and, as both these fields have advanced, so has the online information industry. Indeed, the changes in the telecommunications industry have been influenced by the need to transmit large amounts of data across phone lines (modem links).

Developments in telecommunications which have been (and are) important to the online information industry include: the change from analog to digital transmission, satellite technology, and optical fibres. The speed of transmission continues to improve. When services are charged according to time spent online, this is an important consideration. Methods of charging for services are changing and increasingly include factors other than time spent online: eg.: number of queries, quantity of information or type of information retrieved, etc. Standard subscription charges may now be offered, some even including telecommunications charges.

Improvements in computer technology have made capturing information from remote databases much more efficient. Dumb terminals are being replaced by sophisticated PCs which has made the whole process of going online much less painful. Passwords and phone numbers can be programmed in, and search strategies pre-typed, before connecting to an expensive database.
A useful timeline of developments in the computerised database industry has been prepared by Charles Meadow.\footnote{MEADOW, Charles T. \textit{Back to the future: making and interpreting the database industry timeline}. In: \textit{Database}. October 1988: v.11(5):14-22; MEADOW, Charles T. \textit{Online database industry timeline}. In: \textit{Database}. October 1988: v.11(5):23-31.} He commences with the famous Vannever Bush, 1945, article "As we may think" which appeared in the \textit{Atlantic Monthly} and concerned information processing in the future. This article is said to have inspired or at least predicted, many of today's online interactive information retrieval systems. He also draws attention to Arthur C. Clarke's article "Extra-Terrestrial Relays: can rocket stations give worldwide radio coverage?" which appeared in \textit{Wireless World} in the same year.\footnote{A copy of this article is included in the Appendix of Arthur C. Clarke's \textit{How the World was one: the turbulent history of global communications}. London: Victor Gollancz, 1992.} Here, Clarke proposed the communications satellite. These developments first appeared in 1958.

Meadow also outlines various computer developments (commencing with ENIAC the first electronic computer developed at the University of Pennsylvania in 1946 for the US Army and UNIVAC (at Remington Rand) in 1951 for the US Census) and the various technical and programming language developments which followed. Many of the significant developments were promoted by needs of the US government, particularly the military. For example the original ORBIT software was developed in 1965 by Carlos Cuadra at SDC (System Development Corporation) for the US Air Force. The precursor of DIALOG was developed at NASA (also in 1965) as an off-shoot of the space industry. This was the remote terminal online system (RECON) begun at Lockheed's Palo Alto Research Lab under Roger Summit. Lockheed employed Roger Summit in 1962 to develop this database system which has been pre-eminent in its field and is still one of the major database providers. The use of electronic information sources rapidly spread to other fields, although such services were not widely used. Other significant events include the commencement of development in 1967 of a service by Data
Corporation under Dick Gering to provide Ohio statutes as a fulltext file for the Ohio Bar Association. This lead to the development of the LEXIS service.

The first machine readable database to be used extensively to provide an information service was the US National Library of Medicine's *Index Medicus* service: MEDLARS (Medline). This on-demand, computer based information retrieval service to the medical profession was initiated in 1964 and in 1968 was offered directly online using dedicated lines, one of the first such systems.

**The 1970s**

By the 1970s, telecommunications developments allowed access to computerised databases by a wider audience. Information stored on these databases was limited mainly to bibliographic information, with, in some cases, abstracts also being provided. In 1971 MEDLINE, as the online version of MEDLARS became known, was the first major dial-up service. Also in 1971, OCLC under Frederick Kiligour, initiated the first shared library catalogue.

The first overseas access to an online database occurred in 1970, from Paris to DIALOG. By 1972, DIALOG was able to offer the first public online commercial database service. In the same year, ORBIT under Carlos Cuadra, offered its service commercially also.

Home user oriented online services: The Source and CompuServe, commenced operation of their services in 1979. (CompuServe has only recently (1991-92) offered its services in Australia.)

**The 1980s**

However, it was during the 1980s that the real expansion in online services occurred. With improvements in storage capacity of computers, much more varied information
could be stored and retrieved. Customised services could be provided to meet more closely the needs of individual users. Even the full text of many publications could be stored. Networks and gateways to provide easier access to some databases began to appear as did CD-ROMs, the more sophisticated of these providing photocopy quality, fulltext images of journal articles. These were thought to promise libraries a way around the expensive online services. Methods of charging for online services began to change.

By 1980, 600 public access databases were now available and the term 'end-user' began to appear in the literature. The 1980s were a period of rapid expansion: online news services (Dow Jones in 1981), electronic networks (ETHERNET in 1981), improved baud rate (9600 by 1987) for faster online delivery, and the appearance on the market by the mid 80s of CD-ROM products (1985 LC MARC and Grolier's Academic American Encyclopedia). By 1986, 3,000 public access databases were available and Roger Summit reported that 80 percent of sign-ups were 'end-users'.

An interesting example of the way information access had changed during this period was pointed out in an article by F.W. Lancaster (1986). In 1940, a chemist could afford a subscription of US$12 ($6 for members) for Chemical Abstracts. Today, even libraries find it difficult to meet the subscription costs for what has become a multi-volume work costing many thousands of dollars. Lancaster says that online technology has reversed the trend, so that today's chemist would have better access to relevant literature for a similar cost via the online service.

DIALOG continued to be an important force in online developments. It was the first to offer image searching and retrieval (from its TradeScan database) as a commercial service (1988). When it was sold to Knight Ridder in 1988, its market value was US$353 million. By that year, the number of online databases commercially available had reached

3,893 from 1,723 database producers and 576 online services. If more end-users do enter the market through videotex type services like CompuServe, as a recent article suggests, these numbers may well increase, at least where numbers of databases are concerned. Company takeovers like those by Maxwell Online, may limit the number of vendors however. One of the most recent acquisitions by one of the larger vendors (1993) has been that of DataStar by DIALOG. It remains to be seen whether these changes will mean more common search capabilities or whether the diversity of systems will remain.

The 1990s and beyond

The traditional online services still do not provide image reproduction, although this will undoubtedly come. One of the difficulties is in providing indexing for facsimile images. Text files use ASCII format and are apparently not compatible with image databases. This situation will undoubtedly alter. Charging for services continues to change. With promised reduction in telecommunication transmission times, and the pressure of competition from CD-ROMs, it is hoped that single rate subscriptions will eventually be negotiable.

Alternatives to direct online links which make more sense than CD-ROMs (which are sometimes difficult, and expensive, to network), have been tried in the US. Groups of institutions purchase tapes and load these on to their local computer, providing access via their library catalogues. An annual subscription is charged and free access is then available to all institutional members.

During the past five years, attitudes have changed, at least on Australian University campuses. As more people have access to networks such as AARNet (Telstra Internet), they demand more / expect more from the systems they use. One academic stated that he
would prefer never to have to come to the library. He wanted all his information needs to be met via his computer, in his office. This is almost possible / fast becoming possible.

1.6 Methodology

The subject matter of this thesis while focusing on the present, has its roots in the past and its sights on the future. Striking a balance between traditional practice and the ubiquitous pressure to be "forward looking" is the librarian's dilemma. In seeking to represent the changes which librarians and their clients are experiencing and the effects these changes are having on access to information in libraries, the research for this thesis required several approaches. These included: (i) a literature review; (ii) attendance at and participation in major conferences; (iii) interviews with key information professionals; (iv) a survey of major Australian libraries; and (v) developing a practical knowledge of the new services and technologies.

(i) A literature review

An initial review of the literature helped to establish the basis for the research giving both an insight into the arguments relating to fee-for-use and to other issues regarding access provision in libraries. A continuing review provided a wealth of discussion on the notion of an "information society" and also on the important role of government in the development of online information services. The voice of the private sector has been insistent in demanding a place in the lucrative field of information delivery, and this too, was revealed throughout the literature. Tension between competing interests is the strongest impression that this review provided, and perhaps also, a (sometimes begrudging) accommodation among interest groups that each has a place in the developing information society.
(ii) Attendance at and participation in major conferences

During the several years of this research, conference attendance was an important adjunct to both developing ideas and keeping up to date with new technologies in the library and information delivery fields. Among the conferences attended, the following were most useful to this research: Information Online and OnDisc (Sydney); Victorian VALA Conference (Melbourne); Australian Library and Information Association (ALIA) Conference (Varying venues); National Preservation Office (NPO) Conference (Brisbane 1995); Pacific Telecommunication Conference (PTC) (Honolulu); Special Libraries Conference (Pittsburg, US); and the American Library Association Conference (Chicago). Papers drawn from the research in this thesis have been presented at four of the above conferences: (ALIA; VALA; NPO; and PTC). This provided useful feedback during the progress of the research. The conferences also presented the opportunity to speak informally with many library professionals and with the online information vendors who were represented in the trade exhibitions that invariably accompany these events.

(iii) Interviews with key information professionals

In the early stages of the research (1990), interviews were undertaken with key information professionals in the US. Australian libraries have tended to follow the American experience during the past two decades. Hence, it was important to gain an understanding of the direction libraries there were taking as regards online information provision. Indeed, one of the innovations then available to libraries in the US: group networking of databases through agreements among several campuses, has since been

43 Information professionals interviewed included: Jean Tyan, Dialog; Prof. Dan Schiller, UCLA; Arthur Curley, Boston Public Library; Patricia Glass Schuman, ALA President, 1990; Richard DeGenarro, former Director of the New York Public Library; John Berry, Editor, Library Journal; John Lorenz at the NCLIS office in Washington; Mary Pensyl, Head, CLSS, MIT Libraries; Alice Sizer Warner, Information Consultant; Bernard Margolis, Librarian; Pete Giacoma, Librarian; and many other librarians, online vendors, information brokers and independent information professionals.
made available here. These interviews were complemented with visits to several major libraries and discussions with staff gave an insight into the realities of public information provision at these establishments. As well, a visit was made to Dialog (now Knight-Ridder) in Palo Alto, where interviews with staff and a tour of the facilities was arranged.

(iv) A survey of major Australian libraries

While a knowledge of what was happening in libraries in Australia had been gained through contact with libraries and having worked as a professional librarian for many years there was a need for more specific information to demonstrate both quantitatively and qualitatively, what was happening in libraries and the directions they were taking in relation to providing access to online information resources. Some information had been available, for example, through the annual CAUL (Council of Australian University Librarians) statistics, although these had not been produced for a number of years at the time this survey was completed. As well, its focus was less broad, than that required for this research. Hence, it was decided that a comprehensive survey should be completed, including all the major libraries, Academic, State, the National and the major city libraries where appropriate. More detail on the methods used in this survey are provided in Chapter Four, which presents the results in detail. Focus was on those libraries using online information services and the online information services librarian was targeted as the likely respondent, although in a few instances, the head of the library completed the information. This was a highly successful survey both in terms of the high response rate (forty-eight responses out of fifty-four requests), and in the information it provided regarding the role and direction of libraries in Australia at that point.
(v) Developing a practical knowledge of the new services and technologies.

It is important when conducting research into online information delivery, that some knowledge of the technology be gained in order to understand fully the practicalities of the changes that are being proposed and their likely effect on access to information resources. Use of networked information sources, including the traditional online database services like Dialog and the newer networked databases and Internet resources have helped inform the discussion presented in these pages. It is clear from this experience that exciting changes are ahead, but that there is still some way to go before the quality of information retrieved from many of the new services can be assured. Even stepping outside the librarian's need for organisation, it is clear that much work will need to be done before the "information society" theorists' ideal of full library access independent of location will be achieved.

1.7 Conclusion

The debate over whether to charge fees for online information services in libraries will soon be dead. Many believe it is already so. "User pays" is one of the legacies of the eighties. Proponents say that where a cost can be identified it should be passed on to the person benefiting from the service. For those concerned with providing broad access to information in all its forms, the issue can still stir strong feelings. The same arguments appear in defence of free access to online information as occurred with the establishment of public libraries. With the development of networks like the Internet, the analogy is becoming even stronger. Indeed, perhaps it is the question which is wrong. What needs to be done, is to find some way of organising electronic services, so they can serve an equivalent, and perhaps superior, role to that played by public and academic libraries during the last century. How to achieve this will be the main focus during the next decade. Already, software has been developed which appears to offer a solution. WAIS, gopher and mosaic are three of the more popular, if unsatisfactory, attempts to
achieve some control over the immense resource available through the international academic and research network (the Internet). Logical structures and sequences which once guided researchers through library stacks no longer suffice in an environment where random links are commonly applied. While some information of value can be retrieved, ensuring the delivery of high quality information free from "noise" is not yet possible. During World War Two, Norbert Wiener developed a mathematical theory of how best to filter noise in electronic communications. Radar, radio and telephone communications benefited from his work. What is needed is a linguistic equivalent of this theory which would assist the rapid and efficient sorting of text. The rigid structures of information organisation which have served researchers well during the past century may need to be discarded before the full benefit of the new technologies can be realised. As networks expand and gateways and access software improve "end-users" will become 'the norm'. Problems relating to satisfactory image transmission linked to text will undoubtedly be solved. The Library, as we know it, may disappear. In its place what will remain: an online public utility equivalent to provide all our information needs?

This thesis evaluates the arguments presented for and against charging for online information services provided by libraries. It investigates whether levying charges for these services gives weight to the view that libraries are redundant: no longer needed in an age where most researchers and many households have easy access to the necessary technology to fulfil their information needs. As well, it assesses what impact charging for services once available free, is likely to have on those lacking access to the technology or unable to pay.

Each of the chapters builds on and develops the theme of equitable access to information resources. Commencing with a description of the technology and an outline of the debate, the thesis continues through an analysis of the effect of the changes that are

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occurring in libraries on the various interest groups: libraries, governments, publishers and end-users. It concludes that whether the library continues to exist in its present form is irrelevant. What is essential is that access to online information resources be extended to all, independent of ability to pay. This theme is taken up throughout the thesis as indicated below.

Chapter Two provides a description of the library technology encountered in ensuing chapters. All forms of electronic delivery of information are discussed including: online catalogues, shared databases, electronic texts, CD-ROMs, and computer networks. As a complement to this, a glossary of terms is provided at the end of the thesis.

Chapter Three summarises the debate regarding libraries' charging for access to electronic databases as it has progressed over the past two decades. The debate has been strongest in the United States, were powerful lobby groups in the private sector have argued for a more profitable place in the market for online information services. They have been countered by equally vocal opposing groups within the library profession, although not all librarians are of the same view, some arguing for more involvement from industry.

Chapter Four presents the results of the survey of major Australian libraries conducted mentioned earlier in this chapter. This chapter gives a clear picture of the extent to which libraries are adopting the new technologies and how librarians working with this technology view their future. The image is a positive one, with a strong sense of the importance of making the best use of existing and developing technologies to improve information access for all library patrons.

Chapter Five investigates the role of the online information vendors in relation to libraries. Chapter Four shows that the spending on traditional, mediated online searching in the libraries surveyed is not particularly high. Discussions with vendors suggest that public and academic libraries are not their main client base. Expansion of access to
database resources could be achieved at reasonable cost to these libraries through joint agreements with other libraries and with the vendors, as has been done for some databases already. This would be profitable for both libraries and vendors.

Chapter Six assesses the extent of government involvement in the online information industry. Government funding has supported the development of the online information industry and governments produce many electronic databases. As well, they have funded the recent network developments which have made possible remote access to libraries. It is pointed out that taxes have paid for these resources, and argued that just as paper-based publications from government are freely available in libraries, electronic resources should also be provided, especially where these have displaced the paper version.

Chapter Seven examines the relationship between the library, the technology and the end-user and evaluates the extent to which access to information has been expanded. As more information is only accessible electronically, librarians will increasingly have a consulting and teaching role. If the "value-added" definition is extended to such services, (which are likely to be tailored to individual needs as, it is argued by those advocating fees, are online services), will fees be charged for these services too? It is suggested that changes in budgeting for information provision (particularly document delivery) will be needed if some measure of equitable access is to be retained.

Chapter Eight summarises some of the main arguments presented in the thesis. It is difficult to assess what the value to the economy of free access to electronic databases might be. Will charging for online services in libraries have an economic effect outside the strictly dollars and cents / "bottom-line" terms so much favoured by Australia's "economic rationalist"? The form that libraries will take and who has access to their services will depend on the social, cultural, and economic values which predominate. Database vendors appear to have the ear of governments, and with privatisation high on most political agendas, are likely to receive favourable treatment where savings in public
expenditure are being considered. They also enlist librarians in their eagerness to extend their market. Governments in their turn, may exert pressure on vendors and librarians in their desire to control the information to which citizens have access. It requires an extraordinary leap of logic to assert that merely because the medium in which information is made available has changed, then also, the philosophical principles on which the library profession is based should change. No matter how clear the philosophical argument, however, in the current climate, it is only the "economic" imperative which is considered. If Australia is to continue to prosper, it is important that the electronic library take its place as a vital link in the information infrastructure, providing equitable access to all its citizens. Charging for online information services limits such access.
Chapter Two

Library Technology

2.0 Introduction

During the past fifteen years, library technology has been transformed. Where paper based technologies once ruled, computers now provide the major form of access to information resources both within and without the library walls. Once bastions of print, libraries now actively promote electronic information tools, whether simply via online catalogues or through the more sophisticated CD-ROMs or international networks. What changes can we anticipate in the next fifteen years? Will the library exist at all as we know it? It is certain that the changes will be as equally marked as is apparent in the changes noted in the following pages. Libraries without walls, information super highways, instant information access to home offices, interactivity, high quality graphics with audio and video complementing text, three-dimensional / holograms, high speed transmission independent of location and physical connection, portable/pocketable(!) notebook style access tools: already, these are far from the realms of fantasy. Indeed, they are closer than the current library technology appeared to be ten or fifteen years ago.

Until the early eighties, the card catalogue was the most common tool for locating material in library collections in Australia. Prior to that, some use was being made of microfilm, particularly for the National Union Catalogues, and also for recording borrowings by photographing book and borrower record cards. Microfilm was also used for preserving a photo record of fragile material, and for making available large collections of bulky printed publications in a compact form, an important attribute where space is at a premium. Microfilm is still used for this later, most valuable purpose, but
it is no longer seen as the ultimate storage medium, neither for its compactness, nor its accessibility. Developments in computing and communications technology, particularly during the 1980s and early 1990s, have raised expectations. The researcher demands information instantly, preferably at her desk, and in facsimile. Long waits for interlibrary loans, or time consuming visits to larger centres, are seen as unnecessary inconveniences. The technology has expanded the research community's horizons, and libraries have been an important factor in this revolution in information access. Indeed, in most research communities, it was through libraries that much of the new technology now available at the researcher's desk, first appeared. This chapter will describe some of the most commonly available computer dependent, library technology, commencing with the COM (Computer Output Microfiche) catalogues (still provided in some libraries as a backup to the Online catalogue), and continuing through to the technology of the 1990s, with the appearance of computer networks. A slight emphasis on historical aspects will be apparent, however, the main focus is to provide a description of the technology currently in use in libraries. As the twenty-first century approaches, this technology (much of which is already obsolete) will become irrelevant as more site-independent technologies proliferate. COM catalogues, discussed first below, may be the earliest to disappear.

2.1 Computer Output Microfiche (COM) Catalogues

COM catalogues are computer generated catalogues produced on microfiche. They provide a portable compact and effective access tool, which is relatively easy to use and has many of the attributes of the card catalogue, including browsability and equivalent indexing. The equipment required to peruse the catalogue: a microfiche reader, is relatively inexpensive and requires little maintenance. Among its limitations is the fact that it is not possible to update the catalogue as frequently or easily as the card catalogue. As well, like the card catalogue, microfiche does not allow keyword searching. As these catalogues were produced by translating cataloguing information into computerised
form, some libraries saw them as a logical first step to providing a fully automated catalogue. Many libraries, like those of the Queensland University of Technology (QUT) and the University of Wollongong (UOW), had COM catalogues before implementing their online catalogue. Some libraries continued to produce these catalogues as a backup to the online system for use during down time. As confidence in the online catalogues grew, COM catalogues were viewed as an unnecessary expense. When the University of Southern Queensland made its online catalogue available to students and staff in 1983-84, for example, the COM catalogue step was omitted. However, in 1991, Warwick Cathro, the National Library's Director of Network Services, reported that microfiche catalogues continued to be delivered to ABN clients at the rate of about 45 per month. Even at that stage, many libraries were still dependent on this medium.

2.2 Online Catalogues, Borrowing and Check-in Systems

Online catalogues, or OPACs (Online Public Access Catalogues) as they were often referred to in the literature of the 1980s, provide computerised access to information regarding library collections. In the early 1980s, it was quite common for libraries, in conjunction with computer personnel, to develop their own in-house system, designed specifically to meet their needs. The University of Wollongong at one stage developed such a system in conjunction with Macquarie University. However, as the industry progressed, it became uneconomic to invest large amounts of staff time on such projects, especially as many well tested and comprehensive systems began to appear on the market. Not only did these systems list the libraries' collections and provide searching capabilities not previously available using paper based and microform catalogues, they also allowed links to be made to other computerised library operations

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such as library borrowing records, library acquisition systems which record orders and purchases, and serials check-in systems. Examples of popular systems which offer all these facilities, and in which a number of libraries in Australia have expressed interest recently, are DYNIX and Inopac. However, very few libraries have totally integrated systems. Most still use a mixture of automated and manual procedures, being deterred by both the cost and the complexity of the task, especially where serials and acquisitions records are concerned.

One of the problems of this multiplicity of online cataloguing systems is that the command structure can vary from one library to another. Systems are improving. PALS, an American system which was used at the University of Wollongong (until the change to Innopac in 1995), offers both a command driven search facility and a menu search option. The design of the systems may influence the speed with which a catalogue is updated. The University of Wollongong's PALS system was dependent on the loading of cataloguing updates from the Australian Bibliographic Network (ABN), to which the University Library contributes cataloguing records. Occasional delays of some months in downloading catalogue records could occur if problems arose with new software upgrades. Consequently, newly catalogued items might only be retrievable through a search of the ABN catalogue, a considerable inconvenience for ordinary library patrons who did not have direct access to that service.

Other catalogue systems allow both direct entry of catalogue records, and the loading of purchased tape files. The VTLS (Virginia Tech Library System) used at the University of Southern Queensland (USQ) during the 1980s, provided these options. When the system was implemented, new material was catalogued directly onto the Library database. Where tape records could be purchased quickly, this was done, particularly for retrospective material. Thus all material was recorded in the catalogue and fully searchable before it was placed on the Library shelves.
Some regional differences occur in the coding of cataloguing information. This is of more concern to the cataloguer moving from one library to another than it is to the library patron to whom the standard MARC record is quite transparent. The most commonly used standard is the US or LC MARC record, which provides specific codes to ensure that all cataloguing information is entered into the computer in a standardised way, thus providing consistency of records, independent of which library has created them. An Australian version of this system: AusMARC, was developed and promoted by ABN, but many libraries (including the USQ and the UOW) chose to use the US format, since it was assumed that the availability of records in this format would more than likely dominate in years to come.

Online catalogues continue to expand and improve. On the PALS and Innopac systems, patrons can identify if a particular item is on loan, place a hold on that item upon which an automatic recall is generated. The PALS Serials Subsystem allowed patrons to check (via the catalogue) whether the latest edition of a particular journal had arrived. Innopac has this facility also. The provision of information other than that relating to the collection has also been attempted. Access to databases such as ERIC (a broadly based education database) using PALS search software, identical to that used on the catalogue, is an option provided by school libraries in the Chicago area (discussed further in a later chapter). Improvements of this kind are promising, although there is considerable variation in what such systems offer. No one system provides all that a library could want. If there were more standardisation among systems, for example, making optional modules from different systems compatible, libraries could purchase modules that suited their needs from a variety of sources. They would not be committed to just one, highly expensive system, which may prove too costly to replace in total as the needs of the library change.
2.3 Cooperative Catalogues

The first online shared cataloguing system was established in 1971 when OCLC (Online Computer Library Center) commenced operation. Initially, this was to serve a consortium of college and university libraries in Ohio, but is now used widely throughout the US and elsewhere\(^2\) and the services offered have expanded. Other systems followed, among them: the Washington Library Network (WLN) in 1976; and the Research Libraries Information Network (RLIN) established by the US Research Libraries Group following a merger of RLG and the Stanford BALLOTS system, in 1978.\(^3\) As early as 1975 in Australia, the National Library was showing an interest in developing a system equivalent to OCLC, and a study was undertaken, the results of which were published in 1976.\(^4\) After considering a number of options including the British Library's BLAISE system, the Washington Library's WLN system was chosen, and in 1980, ABN was launched.\(^5\) Elsewhere in Australia, further cooperative initiatives were underway: CLANN in New South Wales, and CAVAL in Victoria.

Cooperative links have been further enhanced with the expansion of networks throughout Australia, access now being possible to a number of large library catalogues via AARNet. Liblink, for example, provides access to most of the university libraries in New South Wales. Among the libraries allowing international access are: the Massachusetts Institute of Technology; Oxford University; Boston University; Harvard

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\(^3\)Ibid.: 83-85.

\(^4\)Cathro, *op.cit.*: 37.

\(^5\)Ibid.: 37-38.
University; Columbia University; Princeton University; and many, many more. Where earlier cooperation focused on shared cataloguing, these new computer network links extend access to holdings information which can help researchers locate a publication no matter where in the world it is held.

2.4 Computer Networks

The spread of computer networks is, without doubt, the most exciting development to have occurred in the library field since the first online information services were developed during the 1960s and 1970s. In ten years time, it will be hard to imagine how efficient information delivery was achieved without them. When the most up to date resources are available through an electronic system and are easily accessible through site-independent access tools, will anyone consider seriously the need for a physical location for such a purpose. At present, the reach of these systems is insufficient to allow this to a satisfactory degree. Indeed, computer networks are often classified according to their geographic reach. Local Area Networks (LANs) usually exist within a single building or site. Metropolitan Area Networks (MANs) provide access to a somewhat larger community, but are still restricted in the area they serve. Wide Area Networks (WANs) as the name suggests, have the widest reach, sometimes extending across national boundaries. Nevertheless, already the increasing use of computer networks is changing radically the way libraries deliver information and the expectations of library clients.

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6 Billy Barron. UNT's Accessing online bibliographic databases. [Electronic document] billy@unt.edu: University of North Texas, 1989-93.

2.4.1 Local Area Networks and Libraries

Local Area Networks have commonly been used to provide access to library catalogues, initially, throughout library buildings. This access was then extended to remote clients, as occurs on University and College campuses. In addition to catalogues, libraries may also provide access to popular databases such as ERIC, to which they may subscribe, or have loaded on their system, and may be made accessible using the same command software as on the library catalogue. Many CD-ROM discs can now be networked, although the search interface varies according to vendor. At the University of Wollongong, only the most popular CD-ROMs are networked and, initially, access was restricted to within the Library. However, this has now been extended across campus with academic staff able to download appropriate software to facilitate their use. Local Area Networks often have links into larger networks, and some of the services provided initially for a small community, such as catalogues and directories, may be accessible by remote users. From the users point of view the boundary where one network ends and another begins is often transparent.

2.4.2 Wide Area Networks and Libraries

Links with Wide Area Networks such as Telstra Internet (formerly AARNet) and through AARNet, other international networks linked to the Internet, have the potential to expand the resources available in libraries in ways hardly imaginable five years ago. Catalogues have already been mentioned. E-mail links with other libraries, electronic forums and discussion groups like PACS-L, bulletin board services, electronic journals, inter-library loan requests and deliveries, computer archives of fulltext documents, and a variety of database services, are just some of the facilities available to

8AARNet: Australian Academic and Research Network.

libraries linked to the Internet. Because a standard fee is charged for access to the network, using the network for communications where once direct telephone links were used (as with facsimiles or for online database searching) avoids expensive telecommunication charges, especially where international links are involved. Not only are networks expanding the resources available to libraries, as software improves, they may also provide a more efficient and cost effective means of delivering these resources. Certainly, they will do so in the near future.

2.5 Online Databases

As mentioned above, access to some\textsuperscript{10} traditional online database services (like those provided by DIALOG or BRS) can be attained using the network links provided through AARNet (Telstra Internet) and the Internet. Telecommunication charges can be avoided in this way, since they are incorporated in the annual, institutional fee for using the network which provides for "unlimited" use.\textsuperscript{11} However, congestion on the network can be a problem, and time spent on the database may not be as efficiently used as when using more direct links, like those described below.

\textsuperscript{10}While DIALOG and BRS are available through the network, many are not. AUSINET is not directly available in this way. However, according to one of the company's representatives, this may change in the near future. Access is provided indirectly via ILANET, an enterprise of the State Library of New South Wales.

\textsuperscript{11}One Australian provider, CSIRO'S AUSTRALIS, included telecommunications in its standard fee. While access via the network would have little affect on the cost of searching, it may have made access more convenient for many researchers. AUSTRALIS is now available as part of the Ozline service which does provide network access as an option. Prior to its integration with Ozline, AUSTRALIS was not available via AARNet (Telstra Internet).
2.5.1 Traditional Online Database Technology

Online databases are database resources linked to the library or other access points through the telecommunications network. Access is provided via a computer terminal, usually a personal computer, linked through a modem to the telecommunications system. The modem converts the digital computer message to an analog signal so that it can be transmitted via the telecommunications network. The reverse occurs at the computer centre where the data is stored and then it is converted to analog again when the information is returned. The progressive introduction of ISDN, employing solely digital communication links will remove the need for digital-analog-digital conversions. A packet-switching mechanism, such as that provided by Telecom's AUSTPAC, is used, and requires a Network User Identifier (NUI), which is issued by the provider. This is a shared service which allows data to be transmitted efficiently, in "packets", over long distances. For international and remote connections, satellite links are generally used, although the extension of undersea, fibre-optic cable may change this. (AARNet / Telstra Internet for example, now uses an undersea link via Pacific East-Rim.)

Once the technology is in place, linking in to an online database vendor is similar to making any telephone connection. In addition to the NUI number mentioned above, the user requires a dial-in number for the vendor's database service, and a pre-arranged log-in and password. Entering this information each time a connection is required is tedious and prone to error. Fortunately, software packages have been developed which make this process less cumbersome. Two examples are DIALOGLink and Crossworld. DIALOGLink, also allows searches to be typed before the connection to Dialog is made, thus saving expensive online time. While methods of charging vary, most online vendors charge for the amount of time linked to a specific database. Telecommunications links are sometimes included in the vendors charges (eg.: This was the case for CSIRO's AUSTRALIS before it merged with the NLA's Ozline service
in 1995). More usually, these are charged separately. The increased speed of modems (now, commonly, 14,400 or 28,800 baud) during recent years has meant faster searching and response time. This has reduced the costs somewhat, but vendors have responded by changing the way they charge for online services. As already noted, ISDN will remove the need for modem links\textsuperscript{12} and will dramatically increase the speed of transmission (up to 200 times that of pre-existing networks).\textsuperscript{13} Optic fibre links will provide more than 30 times the carrying capacity of analog systems, and offer high levels of data integrity and transmission security.\textsuperscript{14} These developments will undoubtedly make online delivery of information more efficient and, it is anticipated, more cost effective.

**2.5.2 Online Database Sources**

The sources provided by online vendors are varied. The most common are the bibliographic databases which give information on books and journals, and are usually sourced on library catalogues. The more complex bibliographic sources give details of journal articles, often including descriptive abstracts. Lists of articles on specific subjects, by specific authors, sourced in specific journals may be retrieved from these databases very quickly. The information may be printed out or down-loaded to disc immediately following the search, or requested to be printed offline, and mailed. If the material retrieved is for on-going research, updates can be generated on a regular basis so that the researcher is alerted to any new material available in that field.


\textsuperscript{14}\textit{Ibid.} : p.327.
However, database resources are not limited to the purely bibliographic and indexing and abstracting services. The accompanying pie chart shows that in 1989, less than a quarter of the existing online databases were solely bibliographic. Statistical, chemical, medical, financial, legal, company, and other business and industry related databases are now also widely available. Fulltext journals and newspapers are progressively being added to vendor lists and are a valuable source of current information, even though they lack the graphics included in the hardcopy editions. Fulltext databases formed the largest group in the 1989 statistics. Some online vendors like DIALOG provide document delivery to complement some of their database services.

![Online Databases by Type](1989)

In an effort to provide wider access to online databases among the research community some organisations are joining together to make a selection of resources available via computer networks. Joint subscriptions which allow all members of the group to have

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15Lists of some of the services provided by DIALOG, Ferntree's AUSINET, and the CSIRO's AUSTRALIS are included in the "Attachments".


17Ibid.

18Tenopir, *op.cit.*
access to a number of database services, including some in the medical and scientific fields, are being trialed by a group of universities and research organisations in the UK via the JANET network. ISI has leased all their databases to the Information Systems Committee of the Universities Funding Council in Britain to provide access via the network to students and staff involved in higher education. There are now 3,000 users accessing these databases through the network each day.19 Derek Law spoke of these developments when discussing SuperJANET (the planned expansion of the JANET network in the UK and the proposed equivalent of NREN in the US) at the Information Online & On Disc Conference in Sydney early in 1993. On a smaller scale, ISI Current Contents databases are being made available in a similar way to participating university libraries from the National Library of Australia through AARNet. Initial trials were conducted in August 1993 and the service was officially launched on the 27th September in that year.

2.6 Shared Databases

Reduced funding for library resources and pressure to ensure spending is kept strictly within budgets has stimulated interest in finding ways to meet the information needs of library clients. This is perhaps one reason why the CARL Uncover database is so popular. The Uncover service was set up by the Colorado Alliance of Research Libraries (CARL).20 It provides access to contents information of over 10,000 journals, all of which are held by one or more of the participating libraries in Colorado. Document delivery is also available. Credit card payments are accepted, or deposit accounts can be set up. Once the request has been lodged and payment arranged the document can be faxed to any nominated facsimile machine. Requests are processed within twenty-four hours and charges usually range from US$6.50 to US$26.50 per article. This compares with A$6-A$12 for interlibrary loans within Australia, which can

20 Uncover is now available through Knight Ridder. Changes are noted later in the thesis.
take a fortnight to arrive by mail, and can take longer since accurate holdings information (because of missing issues, gaps in collections and the like) for other libraries is generally not available. The success of this system is evident in the response of journal publishers and suppliers. Blackwells has bought into the service; Gordon & Breach has vetoed the listing of its publications; and Kluwers is offering access to its database of journal contents, for anyone interested in purchasing back issues of its journals. Moves like these demonstrate the concern of publishers that these new online database facilities are likely to have a strong impact on their markets. It is also an indicator of the success and potential of shared network services.

2.7 Gateway Services

Some special interest electronic services provide access to online database vendors in addition to other services that they provide. One example of this is Westlaw, a large, north American legal database vendor. In conjunction with Dialog, this vendor has developed an “intelligent” gateway which allows Westlaw subscribers to search Dialog databases using Westlaw commands and search logic. Knowledge of Dialog commands is unnecessary and users are charged for these services on their Westlaw accounts. There is no need to have a separate account with Dialog. In Australia, the State Library of New South Wales' ILANET electronic network, in addition to several other library oriented services, provides access to a Dialog, Ausinet, and a number of other national and international database vendors. The ILANET gateway allows researchers to move

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22 Email communication, [...] 1992


from one service to another without having to log on and off repeatedly to each host.\textsuperscript{25} However, separate accounts and passwords may be required with some of the international vendors. OTC's IntelNet\textsuperscript{26} provided a one stop search service across a range of database hosts, including Dialog, BRS, Orbit, Data-Star, and many more. The system was menu driven, the user being guided at each step.\textsuperscript{27} Twenty-four hour online help was available if difficulties were encountered. A single invoice in Australian dollars was provided. While these kinds of services promise to make vast database resources more widely available, the variation in indexing terminology used in databases, even within the same field, can make successful searching difficult. Researchers may be left with a false impression of the breadth of information available in their chosen field. Nevertheless, improvements are surely inevitable but may only be achieved as shortcomings become apparent to an increasing audience.

2.8 CD-ROMs

CD-ROM databases have been welcomed with enthusiasm by both librarians and library patrons. Librarians have viewed them as a means of providing computerised searching of the most popular indexing and abstracting databases without the unpredictable expense of the equivalent online service. Subscription costs could be included in the budget in the same way as those for journals and books. Charges might be considered where substantial printing of results was involved but generally they could be provided free to all library users.

\textsuperscript{25}ILANET Information sheet.

\textsuperscript{26}OTC was the overseas arm of Australia's Telecom before the Telstra change.

\textsuperscript{27}OTC IntelNet Information brochure.
CD-ROMs (the acronym stand for "Compact Disc - Read Only Memory"), as hinted above, provide a compact storage medium for large databases of information. They are capable of storing both images and text. While, in some cases, these databases are similar to or even identical with databases available through major online database vendors, it is the potential of image databases like UMI's Business Periodicals OnDisc (BPO) and the ADONIS CD-ROMs which is most significant. CD-ROMs of online databases expand access to indexes to journal literature. Fulltext and especially image databases actually expand collections of current journals.

One of the irritating problems with CD-ROMs has been the need to change discs whenever a different database source was required. Networking is now possible for most CD-ROMs, although an additional subscription charge, related to the number of access points, is usually incurred. Image databases have presented a slightly different problem. A CD-ROM collection like BPO or ADONIS may contain a hundred or more discs which are manually inserted once the appropriate disc is located using an indexing database (ABI Inform in the case of BPO). With the development of "juke-box" systems which can hold large collections of CD-ROM discs including both image and indexing databases, this problem appears to have been overcome. A number of "jukeboxes" can be linked in series and networking is possible. In theory, a copy of a requested article should be deliverable to a local office laser printer, of an appropriate kind. Marketing of these systems began in Australia during 1992, so it is yet to be seen how successful they are.

CD-ROMs tend to complement online information services. They are popular, easy to use research resources, but are not as up-to-date as their online equivalent (where these

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28See "Attachments" for information on contents and examples of printed product.

29Conversations with Susan Orchard from UMI in October 1992 at the ALIA Conference where the new systems were launched.
exist). They may require some level of training for those unfamiliar with computer technology, although most are either menu driven, or provide considerable on-screen help, so that individuals can teach themselves to some degree. It should be emphasised, however, that this is not the case with all systems, there being great variation in levels of difficulty.

While fulltext CD-ROMs and image databases like BPO\textsuperscript{30} promise to expand collections enormously, licensing agreements are such that libraries may only "own" CD-ROMs for the period of the subscription. Even where purchase is outright, changing software and hardware can pose problems. The implications of these difficulties will be explored in a later chapter. Many larger libraries have invested heavily in CD-ROMs, some cancelling the hardcopy equivalents. For smaller libraries, the subscription costs for most CD-ROMs is still too great. However, their popularity is such that demand will almost certainly increase. As archival media for newsprint and other bulky and fragile materials it would seem that they have an assured future. Nevertheless, it is possible that CD-ROMs are only a transition technology. Once any stored repository can be reached through portable computers / communications systems delivery tools with high quality graphics with audio and video, they may well disappear.

2.9 Electronic Journals

At a library conference devoted to the electronic journal held at Bond University (on the Gold Coast in Queensland) in May 1992, the range of media covered all formats including CD-ROM as described above. Here, the expression "electronic journal" (or "e-journal") is restricted to those publications which are delivered electronically via a computer network, and which include articles or review items similar to what might be

\textsuperscript{30}IEE/IEEE is another example. This CD-ROM subscription includes the full-text images of all IEE and IEEE conference proceedings and journals. The University of Wollongong commenced a subscription to this service at the end of 1993.
expected in a paper journal equivalent. They do not include the electronic forums and discussion groups, which are much less formal in nature. On the network, subscriptions to electronic journals are usually obtained by sending an appropriate e-mail message to the designated network address. An electronic response confirms the request and issues are then received via the subscriber's e-mail address until the subscription is cancelled. Archives of back issues are also maintained. Occasionally, e-journals are distributed within electronic forums like PACS-L (Public-Access Computer Systems Forum) which includes: PACS News, PACS Review, and Current Cites. Attempts at emulating the more serious, refereed research publications are evident. Psycoloquy, in the fields of Psychology, Neuroscience, and Cognitive Science, is one example.31

Electronic Journals are beginning to appear in many subject areas. Their immediacy makes them a valuable vehicle for exchange of ideas among researchers. While it is unlikely that they will displace traditional journals for some time to come, they do have a place as a research resource and as such, some libraries are looking at ways in which they can be made available to the wider library community, not only to those who have access to the Internet. Issues can be loaded on the local network as they are received with access being provided using software such as gopher. This was done on a trial basis at the University of Wollongong with Current Cites. However, this is a cumbersome method of providing access, merely imitating the way resources have always been made available at individual sites. As more people have access to the Internet and organisation and access are improved, such methods will become redundant.

2.10 Electronic Texts

Electronic texts provide a similar challenge for libraries. Among the publications that can be found available at various computer archive sites on the international networks are: reports, theses, government statements, discussion papers on draft legislation from special interest groups, religious texts, lyrics, and much more. Transferring large files across networks and storing these on many individual files at local sites can be a burden on already heavily taxed systems. More popular works can be made available in the same way as electronic journals. The CIA World Factbook is one of several texts originally retrieved from a remote archive site and which was made available via gopher at the University of Wollongong. The widespread use of World Wide Web browsers like Netscape has seen the disappearance of many gopher sites however, with many transferring information once delivered through gopher, to web sites.

The number of sites allowing documents to be retrieved from their computer archives will undoubtedly increase, as will the amount of traffic on the network transferring these files. Where texts are of interest to several members of a community, libraries may still have a role to play ensuring that such texts are provided centrally, without the necessity of transferring and storing files repeatedly to meet individual needs. As communications channels improve such issues will be less a problem. Will there be any need for more than one or two locations (except, of course, for back-up) when congestion ceases to be of concern?
2.11 Floppy-disk Publications

Another form of electronic publication appearing in library collections is the floppy-disk. These may accompany or replace hardcopy journals and books. Some databases, such as Current Contents, are available in this format. (For a brief period, the University of Wollongong Library had a subscription to the Life Sciences version of this product. Now, all Current Contents are available online as mentioned above.) The floppy-disc is an extremely vulnerable medium and it is not practical to provide material stored in this way on open access to library patrons. Consequently, they are usually found either loaded on to a public access computer or held in a closed access section of the library and provided on request. As availability of CD-ROM technology becomes more common (and, even more to the point, as network availability of such resources is extended), it seems likely that floppy-disc products will become less so, except perhaps for the most ephemeral information.

2.12 Inter-active Videodiscs

A variety of optical storage media, similar to CD-ROM but with different capabilities for storing information, are currently available. Videodiscs are able to combine still images, including photos, drawings and text, with sound and motion. They have been commercially available since 1978 but have not had the same success in libraries as CD-ROMs or music CDs. The University of Wollongong, for example, has only one videodisc at present: Deltalia: an encyclopedia of Italian civilisation, and that was a donation. This is hard to explain, since, in demonstrations at least, the potential of interactive videodiscs as educational tools is quite apparent. Some larger libraries (the Library of Congress and the National Library of Canada to name two) have shown

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interest in the use of videodiscs and have undertaken projects which demonstrate their usefulness. Magazine articles extol their virtues. The CD-ROM's growth in popularity with librarians and their clients has paralleled that of audio CDs. If the videodisc displaces the videocassette as a vehicle for movies, interactive videodiscs may similarly become more popular and then be seen more commonly in libraries. There appears to be some overlap in the capabilities (or potential capabilities) of a variety of technologies of this type: CD-I, DV-I, and Inter-Active Video all seem to have the potential to provide similar facility with information resources. The literature is not always clear in this regard.Competing markets and standards are again at issue as they were with the development of beta and VHS videocassettes and recorders. It is not always the best technology that survives. Investment is wasted in the purchase of technology which later becomes redundant, as was the case with beta. It may only be through large companies like Sony and Philips working together for mutual self-interest that the best of these versatile technologies can be developed to greatest advantage.

2.13 CAL Programs

As pressure on library staff to provide more instruction in the use of electronic media in libraries has increased, ways to assist library patrons which are less staff intensive have been sought. In most libraries extra assistance is provided through the production of printed maps and leaflets. In addition, some libraries have produced Computer-Aided Learning (CAL) programs which provide an interactive guide to library resources and can be used independently. They may be limited in scope however, providing only basic descriptive information such as how to locate specific types of material on the shelves in a step by step approach. (A CAL program of this type was made available in

33Ibid. p.222.
the University of Wollongong Library in 1990.) One problem with these programs is that they must be updated constantly as information frequently changes.

2.14 Publishers and Suppliers Online

Many of the major library suppliers now provide online information regarding the availability of serial subscriptions. Ebsconet (Ebsco, US), Blackwells' Connect (Blackwells, UK), DA/Direct (DA Books and Journals, Aust.) are three such online services provided free to customers having subscription accounts of substantial value with the respective companies. Not only do these services provide up to the minute reports on costs and availability of journal subscriptions, they also allow ordering and cancellations to be performed online. Some services are compatible with online library systems, but there is little standardisation and many developments will be necessary before a fully integrated system of incorporating the ordering, supplying and cataloguing of library resources will be available.

2.15 Other Computerised Information
(Ordering, Budgeting, Expenditure, etc.)

As suggested above, computerised library operations are by no means integrated. The receiving, cataloguing and loans procedures may operate on one system, the ordering of monographs on another, the invoice records for serials on yet another, with the central Finance Office records system compatible with none of these. This is not an unusual scenario. Systems are being developed which can deal with most of these functions and provide better reporting facilities for those most concerned with library budgets.
2.16 Training Implications: Staff and Patrons

It is clear from the range of technology described above that library staff will require constant training as each new computerised system is introduced. The promise is always that this next system will solve certain problems, but each brings with it new challenges. Change, it would appear, is the only constant. Allocation of substantial blocks of time to training and retraining of staff is a feature of good management practice in libraries today and is indeed essential if staff are to cope with the variety of computerised systems with which they are confronted each day. Library patrons, too, may find the technology daunting without some assistance from staff. It may be that the concept of library patron and indeed library staff and the relationship they have to one another may change quite dramatically. If libraries as a repository of information become transparent not to mention all encompassing where information resources are concerned, either the meaning of the term library will have changed, or the library patron will be thought of less as a patron of a particular physical resource and more as a seeker of information independent of its location. Librarians may disappear, their role being subsumed into that of teacher and or information consultant, guiding information seekers or researchers through the maze of resources or advising them on software and hardware needs. These issues will be discussed in Chapter Seven.

Conclusion

The full spectrum of computer technology may be encountered in the contemporary library. Perhaps no other industry outside banks has so comprehensively incorporated computerised systems into its working environment. From the early COM catalogues, through the online public access systems, to CD-ROMs and more lately, the explosion of networked resources, libraries have remained open to the changing technology, to the extent that librarians might sometimes be accused of being technology driven. For a time, the attractiveness of one technology (CD-ROM) may overshadow the usefulness
of another (online databases), especially where the logistics of budgeting (as opposed to the real costs involved) strongly favour the former. Refinements in library systems and the continuing network developments with their many applications will undoubtedly change the emphasis yet again. Indeed, the new, networked databases and electronic archives provide a constant challenge, with each service presenting some variation in the protocol required to gain access to its resources. The prospect of an ever expanding information resource available via the telecommunications network and independent of place, is exciting. The constant stream of articles appearing in the news media reflect the general level of enthusiasm for what is commonly referred to as the "information superhighway", as does the emphasis on the importance of putting in place a national, information infrastructure. Is this vision of ever broadening "free" access realisable in fact, however?

The developments outlined in this chapter indicate two aspects which relate to the issue of access. First, the amount and quality of information that can be provided (given access to appropriate computer technology and telecommunications links or CD-ROM technology) has expanded enormously. Second, it is evident that there is a degree of concern on the part of the book and journal publishers who are consequently seeking greater involvement in the area of electronic delivery of information in order that they may safeguard their income. (That powerful news media and telecommunications organisations also have interests in this further complicates the problem.) With the easy access provided by these services, charging for delivery of the type of information they provide (e.g.: journal articles and conference papers) has become accepted in libraries to a degree not seen before. Certainly, online information delivery has been charged back to the recipient of the service, but CD-ROM allowed individual free searching, if at some cost to the library. With improved document delivery services like Uncover, charges are directed without hesitation to the person requesting the service. At present, information retrieved from remote electronic archives via the Internet does not incur any individual charge. The strength of the move towards the privatisation of networks like
AARNet (now Telstra Internet) in Australia, and of Internet access in general, may well mean that the prospect of an expanded free library service, direct to individual desk tops is unlikely to eventuate. It is essential that the services provided be examined closely and that policy decisions be taken that ensure appropriate dissemination of information resources, independent of ability to pay. This is particularly important in areas such as education and research upon which a country's economic well-being rests. Whether the technology continues to reside in a specific location such as a library is irrelevant. Facilitating access is the issue of greatest importance.

At the commencement of this chapter, it was suggested that the technology described here would soon be obsolete. Why would anyone who could easily efficiently and cheaply retrieve high quality information, whether graphic, text, audio or visual in form and from any location, even consider that a physical site was necessary? If site independent access to all information resources does become a reality, as it is almost certain that it will, will libraries survive? What are the implications of such a change and how will this affect access to resources for those lacking either the physical or the financial capacity to take advantage of this technology? For almost certainly, individual charging and the consequent inequity of access, will be a feature of these changes. This is an issue which will be taken up continually throughout this thesis.
Chapter Three

The Fee-vs-Free Debate

3.0 Introduction

Many changes have occurred in the decade since the charging for online information services first became an issue for debate. These changes have not been limited to advances in online technology. As pointed out in the introduction, some consider the debate to be over: irrelevant in a time when "economic pragmatism" is the approach most generally adopted by librarians operating within the severe budgetary constraints of the '90s. The advent of CD-ROMs appeared to offer the ultimate solution (unlimited free searching for library patrons) but not all libraries can afford such luxuries, and, as will be shown in a later chapter, CD-ROMs have their own problems. In spite of this, the debate does continue, and in this chapter, the main arguments will be presented, commencing with a general discussion of the issues most commonly raised in the literature. This will be followed first by opinions relating to the Public Library sector and then to the Academic (and Special) Library sphere. While there are some obvious differences between these two areas (e.g.: which databases they use, the relative expense of these, and the access to funds available to some Academic Library clientele), many of the issues raised are common to both spheres.

3.1 To charge or not to charge: a review of the literature

In a 1988 article, Barbara Quint provided statistics indicating the proportion of libraries throughout the US offering database searching. The percentages were as follows: a little over 35% of public libraries serving populations over 25,000; less than 80% of University libraries; and under 20% of junior college libraries.¹ These statistics were

taken from Mary Jo Lynch's report: Libraries in an information society: a statistical summary, which was published in 1987. By 1988, the figure for public libraries had increased to 41%. Quint expresses shock that the percentages should be so low and asks why this should be the case. Quint believes librarians should not be squeamish about charging their wealthier clients so that they can extend what she sees as essential services to those less able to pay. However she also believes that the information industry must bear some of the blame. The industry had not (at that stage), for example, offered a flat-fee option so that libraries could budget effectively for these services. Nevertheless, librarians have taken the line of least resistance. They have neither demanded from the online industry what they need, nor ensured that they have an income available to provide database searching for their clientele. (Since 1988, some online vendors do offer flat-fee options. This has come about partly because of competition from CD-ROMs.)

Like Quint, Tina Roose (1988) was also concerned by the statistics on the proportion of libraries offering online searching throughout the US. Roose notes that many of the libraries that provide online searching, do not fully use these facilities. She believes that online databases should be used to answer ready reference queries at the reference desk. Roose notes that millions of dollars of taxpayers money have assisted the development of the major online databases, both in software and indexing materials. The early development of Dialog was made possible in this way. Federal tax revenue continues to pay for many government databases such as ERIC, and MEDLINE. Roose expresses outrage that libraries nevertheless charge for access to these databases.

2 Ibid.
3 Ibid.: 69.
5 Ibid.
Values have shifted from informing the public by providing greater access to information resources, to narrowly defined economic considerations. James Govan (1988) refers to Adam Smith's concept of the "invisible hand" of capitalism which seems increasingly to be regaining acceptance. He points to the US government's policy of cutting costs by eliminating some publications while consigning others to the private sector. There have been many critics of the Office of Management and Budget's publishing policies. One critic has pointed out that "the new policies restrict the information disseminated to the public while elevating the private sector's profits far above public access". The areas of concern include access to electronic databases and the storage of information formerly freely available, solely on electronic databases. (The issue of Government information stored electronically and the implications of this for free public access will be explored in a later chapter.) He expresses concern over the proposal to privatise the National Technical Information Service (NTIS). Govan notes that some librarians are, for the first time, actually advocating privatisation. Not since the 19th century has the pay-as-you-go principle been applied to services which, traditionally, have been seen as a public good.

Michael Cullen (1988) was also perturbed by the issues facing governments in establishing policies relating to the provision of information. Most specifically, he asked if charging for information drawn from costly online systems "threaten(s) the philosophical concept of equal access to information for individuals regardless of their economic circumstances?" Cullen avoided any political commitment one way or the other, commenting that he was looking forward to the debate! However, the title of his paper: Learning to live with cost recovery, expresses a sense of resignation.

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7 Ibid.: 36.

8 Ibid.

9 Ibid.: 37.

Peter Gorringe indicates no such ambivalence when considering the prospect of charging for library services. When speaking at an AACOBS seminar in 1987, he considered and rejected three arguments for free library service: an "externalities" argument, an income redistribution argument and a merit goods argument.\(^\text{11}\) In the first instance, under the economic heading "externalities" are included benefits accruing from self education such as higher income, or greater personal satisfaction in being better informed. Gorringe believes that for anything above the compulsory free education system already provided, a charge may legitimately be levied. He overlooks the fact that many students at all levels of the "free" education system are heavily dependent on public library services. This is certainly the case in country areas where school libraries may be inadequate. As more is demanded of students in a constantly changing education system, electronic resources will be among the services they will need. In this area too, public libraries will undoubtedly continue to supplement the resources provided by the schools.

Gorringe's second argument relates to income redistribution: Libraries are "predominantly" used by middle and high income earners who can afford to pay, therefore the funds used to support free access to information would be better used supporting housing or income supplementation.\(^\text{12}\) As Gorringe stated himself, one of the benefits of providing free access to information through public libraries is the potential for individuals to raise their income earning ability, not to mention their self-esteem. On both points, his remedy would have the reverse effect. A similar criticism can be lodged against his third argument, relating to the invalidity of the "merit-goods" position. His argument is not clear here. He uses the term "merit-goods" to cover services provided to those too poor to pay for them: for example, pensioners or students because "many


\(^{12}\)Ibid.
people would feel unhappy" otherwise.\textsuperscript{13} This is a poorly expressed argument which threatens ridicule of those who disagree. Again, he proposes concessions to the poor. Concessions can be argued against on several counts: firstly, the cost of implementation may be greater than providing the free service, secondly, the stigma attached to being categorised as poor may discourage some from applying, and thirdly, it is difficult to establish cut-off points which will not discriminate unfairly.

Another information specialist concerned with the Australian experience is Diane Killen. She has examined the notion of information as a public good. Killen is concerned by the economic issues relating to information, particularly the government involvement in the information sector, and the question of charging for service.\textsuperscript{14} Killen quotes Patricia Breivik, an American librarian: "The dilemma facing libraries in the decade ahead is whether they are useful enough to survive." (Planning the library instruction program. ALA: Chicago, 1982.)\textsuperscript{15} Clearly they have survived and their services have been extended, but focus on recouping costs and charging for 'value-added' services has, if anything, become more accepted.

As librarians have become more aware of the pressures to sell their services, some have taken up the challenge with entrepreneurial enthusiasm. This has not been without some soul searching, as Alice Sizer Warner has pointed out in her book: \textit{Making money}.\textsuperscript{16} Before providing an introduction to fee charging within libraries and describing what is happening within North American libraries regarding charging for library services, she devotes one chapter entirely to the controversy over charging. Warner is aware of the

\textsuperscript{13}Ibid.


\textsuperscript{15}Patricia Breivik. \textit{Planning the library instruction program.} Chicago: ALA, 1982. Quoted in: Killen, \textit{op.cit.}

premise held by many "traditional" librarians that free access to information is the right of all tax payers. For this group, fees are not ethical, since they create barriers to free access. However, as economies become increasingly information based, the speed at which information is obtained may be crucial. Since much timely information is only available via online sources, on a "pay-as-you-go" basis, the option of providing free access to all library patrons in this instance becomes less tenable. Library budgets are rarely sufficiently flexible to allow such luxuries. Warner points to the usual examples of photocopying and telephones in libraries, which incur a fee, but she avoids value judgements. According to Warner, there is a place for both free and fee-based services, both within and without libraries. Indeed, their role could be complementary. However, the decision to accept or reject charging is clearly one for the organisation to make. She sees her role as one of assisting those who wish to set-up fee-based services, by providing appropriate guidelines and advice. Much of her time is spent presenting seminars to interested groups across the US, both within and outside the library community, to do just that.

3.2 The Public Library Debate: Late 70s to Early 80s

In May 1981, a survey was conducted by the ALA on the practical issues relating to financing online search services in publicly supported libraries. The survey presented information from 985 publicly supported subscribers to online services. Questions asked included: Should charges be made? If so, what costs should be considered when calculating the fee? How many searches can be expected in a year? What total direct

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17Ibid.


19Ibid.

costs can be expected in a year? What factors should be considered when deciding how to finance online services?21

This ALA survey indicated that charging for online searching was increasing. Most libraries were recovering only direct costs. It was suggested that the critics of fee charging should consider what is covered by the fee and what is, in fact, still provided free before condemning fee charging all together.22 As a concession to those opposed to charging, the following quote from one of the respondents who defended free searching was provided:

"... Online searching is just one of the ways we provide access to information. We also do not charge for use of the card catalogue, encyclopedias, dictionaries, microforms records, tapes, slides, etc. Further, online searching is by far the most cost-effective source of information in the library. All other forms must be bought and paid for whether or not anybody ever uses them... What a blessing it is to have a service like online searching, that only has to be paid for upon actual use. Would that we could acquire books that way."23

The view expressed in the ALA report was not one shared by all US librarians working in, or concerned with public libraries at that time. Patricia Glass Schumann, a publisher and recent past president of the American Library Association who worked in the public sphere during the 1970s, expressed concern that the "heady goal of free access (was) slipping away...". While Schumann asserts that it is a myth that libraries have ever been

21Ibid.: 15  
22Ibid.: p.  
23Ibid.: p.
totally free, that libraries should provide free access to information was a goal to strive towards.24

A number of researchers looking into the fees issue during this period while not based in Public Libraries, presented results which were relevant to that sphere. Among them were Michael Cooper and Nancy DeWath, who undertook a comparative analysis of online search costs.25 Their study compared the costs of online searching during a period when free searches were offered, with a period when regular charges were levied. Staff time and vendor charges were included in both instances. While database charges decreased during the period when a fee was levied, time spent in preparation and follow-up increased. Library staff spent less time at the terminal as they were better prepared. They were substituting offline time for online time.26 This represents a shift in library resources. Even though the searches themselves appeared to be more efficient, with reduced online costs, in real terms, total costs had gone up. [It could be argued however that as the library was recouping some of the costs, and the searches were more efficient, it is better to charge. However, efficiency can be achieved in other ways. For example, limiting the amount available for a search within the library budget, and having this linked to organisational (e.g.: Department or Faculty) allocations can be quite effective in promoting efficient searching techniques. This has been done at the University of Southern Queensland where searches are provided for research students and staff (with the approval of the head of the School) up to a limit of A$60 per search (1987).] Cooper and Dewath concluded that, in spite of the statistical evidence, the results do not strongly support the argument that it is more efficient to charge for online searches. The efficiency of a search, they point out, can not solely be evaluated in terms of cost. This analysis


26Ibid.: 311.
focused solely on cost. Cost-effectiveness would require further research. Evaluating the effectiveness of online searching would require significant participation on the part of the clients for whom the searching is carried out. Some libraries have a policy of requesting that clients answer a questionnaire on the relevance or otherwise of search results. Collecting this kind of information poses problems, not the least of which is achieving a satisfactory return rate on questionnaires.

3.3 The Public Library Debate: Late 80s to Early 90s

Strong support for the provision of free services continued to be expressed from a number of influential members of the US library community during the mid to late eighties and early nineties. Among the most visible were Patricia Glass Schuman, ALA president 1990-91, John Berry, editor of the influential Library Journal, and Arthur Curley, Director of the Boston Public Library. In his introduction to a special edition of the journal Collection Building, Arthur Curley highlighted the main features of the debate as it was presented in the mid 1980s. In the article which followed, both sides of the debate were discussed. Arthur Curley's own position is a strong view that fees for any library service should be opposed. At the Boston Public Library the policy in 1990 was that no fees be charged for online searches. Whether this stance can be maintained in a library with a large clientele (including researchers) as budget constraints continue remains to be seen.

On examining the user fees issue in public libraries, Barbara Smith, a company analyst from Houston, proposed that a library's mission should drive its policy decisions in the

27Ibid.: 317-318.


29 Interview with Arthur Curley, June 1990.
same way that a corporation's goals and objectives drive its strategy. She emphasises the historical and ethical perspectives, stating that online services can no longer be regarded as an add-on service for which fees can be charged. She further states that the imposition of user fees for online searches is in conflict with the historical role of the public library: that of providing free and equal access to information to all. Smith quotes a 1977 ALA resolution stating that: "The charging of fees and levies for information services, including those services utilising the latest information technology, is discriminatory in publicly supported institutions." While initially online services were merely substitutes for existing printed services, and hence arguably an add-on service, this is no longer the case. Online databases are now important reference tools in their own right. Some no longer possess a printed equivalent. In this regard, Smith quotes Maurice Line, from the British Library, who suggests that with more and more information being transmitted but not recorded, our attitude to recorded knowledge will have to change. "It will take us some time to adjust to the concept of recorded information as fluid and changeable." (Does this mean that there will not be any archival records in some instances: only up-dated information?) Smith further points out that unless librarians play an active role in an "information economy", information brokers may fill the gap, thus further increasing the divide between information rich and information poor.

Smith outlines methods of charging, and the main arguments in the free vs fee controversy. The contentions of the pro-fee lobby are divided into three broad


31 Ibid.

32 Ibid.: 34.


34 Barbara Smith, *op. cit.*: 34.
categories: "free market theory, personalised information, and limited funds logic." Even if it is agreed that market forces lead to efficient allocation of funds (though this is contestable), "efficiency is not equity and violates the main premise on which libraries are supported." Smith points out that waste and over consumption will not be avoided by charging for services. It will merely be limited to those who can afford to pay, while those who have a legitimate use for the service, but for whom the fees are prohibitive, will be excluded.35

To the argument that the online search is a premium service, providing an individualised product for the requestor (Smith refers to the online search as a product, and the bibliographic information as a commodity) Smith points out that no one would consider charging for the individual attention of the reference librarian in assisting a patron with research. Why do it for online searches? Clearly, where there are no alternatives, search fees are discriminatory.36

The advent of information brokerages which sell customised information to business (like the well known Find-SVP) has added to the pressure to charge for online search services. Often these services make heavy use of publicly funded libraries, including online search facilities. However, when similar, charged for, services are set up in libraries, the independent brokerages often complain of unfair competition. Undoubtedly there are valid complaints on both sides. Find-SVP, for example was reportedly making use of a free online search service at the New York Public Library which is funded by private bequests but available for public use.37

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35Ibid.

36Ibid.: 35.

In publicly funded libraries in Australia and New Zealand, where they do provide online database searching, usually charge for this service, just as they always have done for photocopies. Where libraries are too small to provide such services, access is provided via the State Libraries. Some libraries have set up small businesses within their precincts to provide an efficient, and profit making database service, largely targeting the business sector. One reportedly successful example is the service set up by the State Library of New South Wales. The Wollongong City Council Library has offered a similar facility to its business community. However, this service may be withdrawn because interest has been insufficient to ensure the project's viability. Where the public is concerned requested searches are usually charged for, although some ready reference queries may be answered using online services without incurring a charge if this is deemed the most efficient means of providing the requested information. This is done at the discretion of the Reference Librarian.

In a response to the Price Waterhouse Report which investigated the operations of New Zealand's National Library, J.W. Blackwood questions the demand that the National Library should become "more commercially oriented ... and promote its commercial responsiveness throughout the organisation".38 Blackwood says that: "The National Library is not a commercial enterprise; it is an essential component in a network of organisations and units with a uniquely important function in our society" He emphasises the importance of recognising the educational and social role which libraries play when attempting to achieve efficiency and accountability.39

An Australian librarian, Ross Gibbs acknowledges the public interest reason for retaining a free public library service. However, he points out that there are equally good economic


reasons against this. Gibbs attempts to address both issues pointing to problems with lack of funding for extra services. He remarks on the contradictions inherent in having access to the latest online technology but being unable to provide access to it because of a reluctance on the part of public librarians to countenance charging for online searches. Nevertheless he is not without hope for maintaining some degree of free public library service, citing CD-ROMs as the hope of the future. Gibbs suggests that support for the provision of free library services reached a peak during the 70s in the US and ended with the Carter era when funding was reduced. Certainly it is true that information brokerages have become commonplace both within libraries and outside. (The significance of information brokerages is discussed in a later chapter.) However it is untrue that support has diminished given the level of debate that has continued in the literature, particularly in relation to government funded electronic resources. Some of the influential participants in that debate have been mentioned at the commencement of this section. That support continues is evident in the discussions currently appearing over the threatened commercialisation of government (tax payer) funded computer networks. While the arguments for and against free access differ, the issue remains the same.

The Information Industry Association (IIA) in the US through its president Paul Zurkowski, made its position clear in the early 1980s. With the advent of computer technology information could be stored, manipulated and measured as never before. Potential customers could be targeted and niche markets established. Libraries would

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41 Ibid.


either become retail outlets or be displaced by independent information brokerages (like Find-SVP already mentioned above). According to IIA supporters, the market was the most clearly efficient means of providing access to the wealth of information now available via electronic sources.

3.4 The Academic Library Debate

Online database searching is an accepted part of the academic library reference service. As in the public sphere, the debate over charging for online services has been strongly contested. John Budd writing in the *Journal of Academic Librarianship*, argued that little economic benefit is to be gained by charging for online searching, since it constitutes only a very small portion of a libraries' expenditure. He quotes a survey of 1,577 US colleges and universities in 1985 which showed that online database searching represented on average only 1.85 percent of materials expenditure, and only .56 percent of total operating costs. Budd also discussed Weinland's and McClure's use of a micro-economic model when considering similar issues. His main criticism of this was that it assumed no effects of fees on library patron satisfaction. The economic impact of fees for online services is not restricted to within the library walls but extends to their effect on library users as well.

The effect on the Governors State University Library one year after a decision was made to abolish online searching fees to the University community was discussed in an article

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47 Budd, *op.cit.:* 220,222.
by Virgil Diodato.\textsuperscript{48} While costs per search increased, there was little change in connect
time owing to increasing expertise of searchers. More multi-database searching had been
introduced, as had non bibliographic searching and experimentation by searchers. Online
ready reference had become generally accepted. Increased online searching resulted in
increased demand for interlibrary loans, document delivery then proving a weak link in
the information service process. Nevertheless, library staff were convinced that benefits
exist. The number of patrons served by online searching had at least doubled at costs
which are quite reasonable.\textsuperscript{49}

An example of a small college library which has successfully provided free online
searches is described in an article by Scott Smith and Janet B. Smith (1991).\textsuperscript{50} They
detail the experience of the Lorette Wilmot Library of Nazareth College of Rochester,
which adopted the policy of providing free online searches for its students 10 years ago
and still remains "afloat". That the issue is far from resolved is made clear in an article
by an academic librarian Brian Nielsen. He examines both the factors contributing to the
debate, and the choices facing the library profession. As well, he provides arguments
which counter the notion that information is just another commodity.\textsuperscript{51}

In Australia, the policies of academic libraries to charging for online services is varied.
Of the 26 libraries surveyed in the CAUL Annual Survey of Electronic Retrieval Systems
in 1989, 17 provided a budget allocation to cover all or part of the cost of online

\textsuperscript{48}Virgil Diodato. Eliminating fees for online search services in a university library. In: End
users: public access. (Reprints from the best of Online and Database) Weston, 1988:
139-145 (Article originally published in Online, November 1986:44-50).

\textsuperscript{49}Ibid.

\textsuperscript{50}Scott Smith; Janet Smith. Online searching in the small college library: ten years later. In:

\textsuperscript{51}Brian Nielsen. Allocating costs, thinking about values: the fee or free debate revisited. In: Journal
searching.\textsuperscript{52} In some cases, the funding may only cover the telecommunications costs, which are more difficult to accurately identify when billing patrons. Some tertiary institutions offer one free search to a limited value to each of their students. The University of Newcastle introduced such a free service in 1990.\textsuperscript{53} At the University of Wollongong, most online searching is provided strictly on a user pays principal, with search costs being charged back to the Departments or individuals incurring the expense. Searches on Australis and CARL Uncover are provided free, however, as is the use of the Libraries large collection of CD-ROMs. One institution, the University of Southern Queensland (mentioned earlier), offered free searches to all third year undergraduates when they were researching their major reports. This institution also allowed free searches on \textit{Chemical Abstracts} through STN, following its cancellation of the hardcopy subscription of this expensive, but essential reference tool. Outside users from the local business community were charged on a full cost recovery basis, including staff time. CD-ROMs, which, for some libraries, absorb a much larger proportion of funds than was ever available for online searching, are said to be displacing online searching in some instances. The relationship between CD-ROMs and online search services will be discussed latter. (E.g.: One of the reasons that online services are not used to a greater degree may well be lack of publicity regarding their potential.)

The trend towards setting up information businesses or brokerages within academic libraries is well established in the US and is being entertained as a possible source of income by some academic librarians in Australia. RMIT Informit service is one example of such an undertaking. In the US, the fee-based information services group, FISCAL, is an extremely active association which organises regular, stimulating discussions and seminars for its members. Judging by the high proportion of academic and public sector

\textsuperscript{52}Michael Evans. \textit{CAUL Annual Survey of Electronic Retrieval Systems 1989} (ANU 20.6.90): Letter from ANU Library: 16th November 1990. (This collection of statistics was, until the post 1987 Australian university and college amalgamations occurred, published regularly by Margaret Henty in the \textit{AARL Journal}.)

\textsuperscript{53}Ibid.: 4.
librarians attending Sue Rugge's Information Brokerage course in Sydney following the
Online Conference in January, 1993, Australian academic libraries may well follow the
US example. Such services may increase the demand for online services, although it is
likely that they will further entrench the user pays philosophy.

Changes are taking place in the online industry which will undoubtedly affect the fee for
use debate. At a UNISYS PALS User Group meeting in Chicago in June, 1990, a
system was described which provided access the ERIC database to all Chicago schools
via the school library catalogues, and using the same PALS search software. Database
tapes were loaded onto a central computer facility and networked to all the participating
schools. Other databases, were to be made available in the future. The Information
Access Company was planning to make its database tapes available in a similar way.54

National and International network developments have opened the possibility of greater
cooperation among organisations with common interests. Academic libraries are
negotiating for rights to provide access to major databases from individual users on their
campuses. In Britain, ISI databases (including Science Citation Index and Social Science
Citation Index) are about to be provided via JANET/SuperJANET, and negotiations are
continuing over the provision of a number of other databases, including EMBASE a
major medical index.55 Similar negotiations are taking place in Australia regarding
provision of the ISI databases and others via AARNET.56 Already, many academics and
students have direct access to the CARL Uncover service at their desks. As well as
providing an index to the articles in over 10,000 current journal titles, speedy (within
twenty-four hours) document delivery service is available. The fee for this service is

54Discussions with Information Access personnel at the ALA Conference in Chicago, June 1990.

55Interview with Derek Law (Librarian, Kings College, London) at the ANU, Canberra, January 27, 1993.

56Discussions with John Shipp, President of CAUL, 1993. Many universities in Australia now have
access to this service an others. See Chapter Four.
approximately US$24. The requestor may pay by credit card and have the article directed to a local fax machine.

As more databases become available in this way with funding provided by a central body, the fees issue in the library context, will no longer arise. However, charging for individual network use has been suggested. As early as 1991, improvements to the AARNET infrastructure were reported to be urgently need and under-funded.\textsuperscript{57} The prospects for British and European infrastructure improvements on the other hand are good. According to Derek Law (Kings College, London), infrastructure improvements for SuperJanet have been reasonably well funded with 80 million pounds promised over three years.\textsuperscript{58} In Australia changes relating to AARNet have meant that substantial increases in charges to the universities have occurred. It seems likely that these extra costs will be passed on to individuals making greatest use of the network.

**Fee-vs-Free: the argument**

**The free argument**

- Public good/Informed society
- Right to know
- Theory of Justice
- Libraries role
- Ethics
- Equality of access
- Reference work is specialised but free
- Borrowing books
- Historical/Tradition of free service
- Collection development bias
- Budget options
- Internal and external economic issues
- CD-ROMs expensive c.f. online
- Benefits to Small Business


\textsuperscript{58}Interview with Derek Law, ANU, Canberra, January 27, 1993.
The fee argument

User pays philosophy
Value-added services
Costs identifiable
Photocopy analogy
Equality a myth
Subsidise the poor
Entrepreneurial approach efficient
Intrapreneurial approach efficient
Profitability
Funds for other resources
Library is a business
Access to more information
Access to more timely information
Access to more expensive data files
Broadens the library "collection"
Avoids Budgeting difficulties
CD-ROMs provide free access

Some fee and free options

Public free: Business pays
Only poor free: means tested
Academic staff free: others pay
Limited free searching for students,
rate payers, other legitimate clientele
Information Brokerages charged
CD-ROMs free/Online fee
Online ready reference free if efficient
Fulltext/Document delivery charged

3.5 The Library in the Market Place

James Govan has expressed concern that library services may become "market driven", with potentially adverse affects on the more specialised research fields. Service to unprofitable "markets" will be lost.59 If librarians are to be "seduced into the marketplace", Govan believes they should use their skills to monitor the firms and consortia who charge them, in order to protect both their own interests and those of their patrons. "Librarians' proper role in this exchange would appear to be safeguarding

access against economic pressures, not adding their own charges to public costs of information and learning".\textsuperscript{60}

To those familiar with Herbert White's stimulating(stirring?) articles, it comes as no surprise that he favours the marketing approach where new library services are concerned.\textsuperscript{61} He is critical of Govan's stance (outlined above), saying that the "free or not at all" approach is "a good way to edge us towards irrelevancy". He affirms that "there is money around for whatever is important enough to do". He warns of the danger of abdicating our responsibilities where fulfilling the online bibliographic and document needs of our users is concerned. "...we become simply bookkeepers, and academics don't like keepers. They remind them of jailers."

If the fees issue is to be fully understood, it must be considered within the context of the larger information market. Harry Kibirige's \textit{The information dilemma: a critical analysis of information pricing and the fees controversy}, provides a useful starting point.\textsuperscript{62} Kibirige includes chapters on the information industry and market, as well as on user access to information. He states that the Information Industry Association (IIA) which was formed in Washington, D.C. in 1968, is one of the indices of the growing importance of information to business. Kibirige quotes a Publisher's Weekly report which said that, "It was formed to represent business firms which create, supply and distribute information services, particularly those using the more advanced forms of information technology."\textsuperscript{63} A subsequent Publisher's Weekly article describes its objectives as: (i) making customers aware of member's services; (ii) causing "a change in the way people react to the industry"; and (iii) promoting the industry in a manner that would avoid

\textsuperscript{60}Ibid.: 38.


\textsuperscript{63}Publisher's Weekly. November 18, 1968:60. Quoted in: Kibirige, \textit{op.cit.}
"oversell". Kibirige describes its services as comparable to a trade association. He predicts that with the increase in independent database searches being performed for a fee, libraries and information centres will face a challenge as sources of information. Kibirige questions whether librarians are really seeking to meet user needs, or whether they are merely "satisfying their own egos as masters of modern technology". Chapter 5 explores this issue further. Here, he again takes up the point that much information business is being eroded away from libraries and makes a parallel between "fast food" chains vs elite restaurants and "fast information" banks vs libraries. "The fees issue," states Kibirige, "is essentially how to make computer-based data banks accessible to the library clientele and who should pick up the tab?" He asserts that, in some respects, information has become a commercial commodity.

The arguments for and against charging for online services are presented. Kibirige notes that without government support and funding in the initial development phase, the development of databases and online systems would not have advanced so quickly. Legal problems as regards user access to information are outlined: copyright, freedom of information, and privacy are important issues here. In conclusion, Kibirige emphasises that society has an obligation to provide information to those who need it, but who are unable to pay.

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65Kibirige, op.cit.: 79-80.

66Ibid.: 94.


68Ibid.: 98.


70Ibid.: 101-102.
In a paper presented at the 1988 New Zealand Library Association Conference, Michael Kirby outlined some of the arguments for and against charging from an Australian Legal perspective. He concluded that, while it is important for librarians to maintain their tradition of providing basic information freely to the public, and believes that 'user pays' for 'super services' is an idea whose time has come.\textsuperscript{71} (It could be argued, that what may have been considered "super-services" in the '70s and '80s are fast becoming basic services in the '90s.) Among his arguments against charging was the implication that librarians may be liable in law as advisers: "Charges for services may sometimes raise legitimate expectations of what is returned."\textsuperscript{72}

3.6 CD-ROM Databases and access

CD-ROM databases have been enthusiastically received by both staff and student users in academic libraries. Librarians have viewed them as a means of providing the equivalent of an online search facility to all their clientele, independent of their ability to pay. Certainly, they have provided this in some libraries. But to what extent have they improved access to information? In addressing this issue, it is necessary first to consider the differences between providing CD-ROM and online services, looking initially at budgetary issues and the fee-vs-free debate (an issue which predates the advent of CD-ROMs), then noting the complementary nature of the products provided. The problems with the technology will then be considered: the students familiarity with computer technology, level of training, knowledge of the particular database, and familiarity with the vagaries of searching a variety of database sources, where standards are still to be established, will all undoubtedly affect the success of end-user searching. Thirdly, the implications for the library collections will be explored. The dangers of cancelling hardcopy subscriptions to indexing and abstracting services while restrictive licensing


\textsuperscript{72}Ibid.: 186.
agreements for some CD-ROMs are still in place, are only too obvious. Increased pressure on the existing collections and a demand for more titles to be made available, has already become evident. Fulltext databases are appearing which, while offering a means of extending access to journal literature, are generally too expensive for most established libraries to consider at present. While CD-ROM has the potential to enhance access to information, academic libraries need to consider carefully whether they provide the most effective use of library funds, or whether, in a future more competitive market, online services present a superior option, particularly where individuals have direct access to online information resources.

3.6.1 CD-ROM vs Online Searching: Free vs Fee?

In an Australian survey conducted by Jenny Stocks, the verdict on CD-ROMs was summed up in a quote from one of her subjects: "For databases used infrequently, online searching will continue to be more cost effective, especially, with systems such as Dialog and Orbit, where there is no subscription charge." Nancy Melin Nelson noted in 1991 that there were over 600 CD-ROM titles commercially available, a large percentage of which were reference works. However, given the high subscription price of most discs, it is doubtful that even the most heavily used database will prove cost effective, at least initially. In a 1987 article, Dennis Warren pointed out that cost justification for the purchase of CD-ROM databases is unlikely to be convincing on its own. He gives the example of ERIC, their most used online database. Annual expenditure for ERIC searches did not amount to the cost of the CD-ROM product, excluding set-up costs. (The argument which he suggests is most convincing is that of improvements to


service.) Nevertheless, market studies in both the US and Europe predict a strong future for these products. Nelson concurs, saying that "there is an optical disc in everyone's future" with "bigger and better products designed specifically for the library market". Comparing the CD-ROM and online media, Nelson states that "CD-ROMs edge out online as per search charges decline with each use of the optical database but increase with each search of the online." (In many libraries in Australia this would not be an argument for providing CD-ROMs, since online services have rarely been freely available. Hence from a strictly budgetary point of view, a comparison cannot be made.) Prices for CD-ROMs are falling. In the US, the medium price in 1987 was US$1300 per annum, but had decreased to US$1000 by the end of 1989. Nevertheless, many of the most popular discs are still very expensive.

Silverman observes that Librarians faced with the quandary of continuing to fund CD-ROM services are again debating whether to charge fees. While most libraries are staunchly opposed to charging for CD-ROM services given that they were originally proposed as a means of avoiding fees for online searches, in some cases, suggests Paula Watson, it has been seen as the only way to maintain a popular service. The University of California at Berkley was quoted as an example. In order to maintain their Infotrac

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77 *ibid.*: p.46.

78 *ibid.*: p.47.

service, they charged a levy of eight cents per minute for searching and twelve cents per minute for printing. It was doubtful that this would result in full cost recovery.

One of the reasons CD-ROM appeared so attractive to librarians was that it offered a fixed annual fee, and could be budgeted for more easily than could online systems. Some database providers are now moving to offer an annual fixed fee (e.g., BRS and DIALOG are two of the major international vendors offering fixed annual fees for a specified amount of access, and Australis and Ozline provide similar options in Australia). If all database vendors move in this direction, and as CD-ROM subscriptions increasingly make inroads into their market they may well do so, it may prove cheaper for libraries to provide free online searches for its patrons. Dick Kollin has argued strongly for this, pointing out the advantages of both currency and range of databases provided through online services. Licensing is an issue which, Nelson assures us, will not go away. Why should we pay large sums of money, thousands of dollars annually in most cases, for data that we merely lease for the term of the agreement? Not to mention all the other legal ceding of responsibility requirements that have appeared in some agreements! In his discussion of the new CD-Plus MEDLINE, a product which shares the power and capabilities of online, Kesselman makes a further point regarding the fees issue. Some libraries using this product are charging for searches just as they would for the online equivalent. How can they justify charging for online searching if they do not charge for these services? Kesselman notes the philosophical dilemma here, drawing attention to the fact that libraries have traditionally not charged for items purchased for the collection. He suggests that as online services begin to look at fixed cost delivery in the more

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competitive "second generation" CD-ROM marketplace, the argument for charging may become a moot point.84

Barbara Smith believes that CD-ROM will not supplant online searching. "Online will maintain its advantage of currency and in some instances will be more cost effective, where the database is used infrequently and the CD-ROM version is expensive."85 Many libraries will purchase CD-ROM products regardless of the fact that they would save money by searching online databases. As Tina Roose has pointed out, it would take a large number of searches before the cost of an annual subscription is justified. She believes that "for many applications CD-ROM doesn't make sense. It's more expensive to begin than online. You get less for your money. It's slower."86 Nevertheless, she does see CD-ROM as a wonderful archival storage medium, and suggests that some multi-volume reference sets may eventually even be cheaper in this format than in their print equivalent. Each library will undoubtedly choose whether to adopt CD-ROM technologies according to its own needs and priorities. It is interesting however, that the fee-for-use issue is re-emerging in some libraries (in the US if not in Australia). The debate almost seems to have come full circle. CD-ROM databases expand the library users' access to sources. A limited access to free online services would extend it further.

3.6.2 End User Searching: Training implications

As Dennis Warren points out, "CD-ROM opens up the world of computerised literature searching to a new audience - the student library user."87 Indeed, CD-ROMs were seen by some as an effective training tool for introducing end users to online searching. In

85 Barbara Smith. op. cit., 36.
87 Warren, op. cit., p.59.
academic libraries for example, Martin Kesselman saw them as "just a stop-gap measure to bringing online searching into the hands of end users", although he later revised this view. They also, he noted, have great public relations impact. Certainly, these are not the benefits most librarians would emphasise today. Their value as a compact resource, especially of fulltext materials, is increasingly appreciated. Training users to use the discs themselves is however, of considerable concern and presents special problems. Perhaps chief among these is that of differing retrieval software.

A study of CD-ROM products conducted in late 1989 found that as many as 195 different retrieval software packages were in use. In 1987 the number was 50. Of those 195, 80 percent were used on only one or two products. However, 21 software programs are used on about 50 percent of CD-ROM products. This presents a problem for librarians attempting to design training programmes which will effectively cover all the variations. Hardware, too, can vary, and this adds to the difficulty. For the nineteen discs in use at the University of Wollongong in 1990 (including those used only in Technical Services), the library has eleven different software packages. Another three discs were reviewed during that year, none of which had search software in common with those already held. Indeed, one had different hardware specifications from the existing systems. Any future purchase clearly has implications for library training programs. Ideally, software for database searching should be the same as that used for the Library's online catalogue. (e.g.: the MPALS project uses the PALS software to search the ERIC database.)

That training sessions are necessary is obvious. Zink draws attention to this need pointing out that requests for assistance can cause problems especially during busy times at the reference desk. Even when the disks are reasonably simple to use, students


89 Melin, op.cit., p.47.

90 Discussion at the UNYSIS PALS meeting in Chicago, June 21, 1990.
unfamiliar with the technology will undoubtedly require some initial instruction or advice. A system of training sessions will need to be set up, either by appointment on an individual basis, or in small groups. As Zink points out, such instruction could alleviate the problem of searchers using the products to search for material beyond their scope.\(^9^1\)

Whether training sessions will achieve their aims is viewed with pessimism by some. Beth Juhl and Anita Lowry express doubt that CD-ROMs will ever be a labour saving devices. Users will always demand assistance, most not taking advantage of training classes. "As always, librarians are called upon by students and scholars for help in negotiating this plethora of information sources, and CD-ROMs require a renewed commitment on the part of reference librarians to their role as instructor and consultant."\(^9^2\)

[Juhl and Lowry\(^9^3\) report the loss of two discs when readers put them into the floppy disc drive, emphasising the need for appropriate computer training, although even this doesn't guarantee avoiding such problems!] Nevertheless, it is important that training sessions are made available. When deciding what training is appropriate however, it is important that the needs of the users are established.

With this as one of its objectives, a survey conducted at Oakland University, Michigan investigated how students were responding to CD-ROM. The aims of the survey were to evaluate the CD-ROMs currently being used; to assist with decisions regarding future purchases; and to modify the kinds of assistance available at that time.\(^9^4\) They found that students have a quite different approach to librarians when using these databases: The students' approach is less planned, often not using thesauri or other available search

\(^{91}\) Zink, op.cit., p.54.


\(^{93}\) Ibid.: 35.

aides. For many students, a "few good articles" were sufficient to satisfy their needs. However, for those undertaking more substantial research, such as for a thesis or dissertation, a more thorough, "librarian-type" search is required.\textsuperscript{95} While such surveys are of considerable assistance in targeting groups requiring more specialised instruction, their results also have implications for collection, whether this be in terms of which journals provided or which CD-ROM subscriptions are retained.

3.6.3 **Implications for Library Collections**

Many factors have to be considered when selecting appropriate CD-ROMs for addition to the collection. User needs, whether they complement or supplement existing material, availability of hardware, and, of course, cost effectiveness are just a few. Once a decision is made, possibly backed by appropriate reviews, or word of mouth communications from other users, a further problem arises: several versions of the same database may be available, adding to the list of issues to be considered before purchases can be approved: retrieval software and functions, update frequency, associated products and services, vendor reliability and subscription price comparisons.\textsuperscript{96} Given the training problems that arise from a multiplicity of software and hardware configurations already alluded to above, the first of these should undoubtedly be given prominence in any future CD-ROM purchases.

One of the problems with CD-ROMs, especially given the high demand which has been encountered once people are aware of their existence, is that only one person can use a disk on a stand alone system at any given time. The establishment of Local Area Networks (LANs) on University campuses has the potential to extend access to CD-ROM databases both within the library and to faculty. Networking is already available with

\textsuperscript{95} Schultz and Salomon, *op. cit.*, p.57.

\textsuperscript{96} Nelson, *op.cit.*: p.47.
some systems, notably MultiPlatter from SilverPlatter Information, Inc. Carol Tenopir has drawn attention to a number of options including Meridian Data's CD NET, which allows networking between two and 75 workstations and will work with nearly 100 CD-ROM databases, including some of the most popular. In spite of the costliness of CD-ROM subscriptions, networking rights are not usually included. A site licence is required and an extra charge levied. This seems a little unfair given the already large subscription fee. When networking is only to provide greater ease of access within the institution holding the subscription, it is to be hoped vendors will reconsider such levies as the industry becomes more competitive. Apart from cost, that they only allow one user per disc is by far the greatest drawback in introducing CD-ROMs. Although LANs offer some hope in this regard, at present, more readers can simultaneously use the print version. Columbia has been reluctant to introduce limits to searching time or a booking schedule. At the University of Wollongong, it is possible to book specific discs and time slots, and a record of use is kept through sign-in and out requirements.

Once CD-ROM subscriptions to indexing and abstracting services are taken up, the decision to cancel hardcopy versions is an obvious option where funds are limited. Silverman questions the way in which libraries are funding CD-ROM purchases. While many libraries use special funds or grants for the initial subscriptions, funding renewals may have to be achieved through cuts to other areas, allowing these subscriptions to merge into the serials budget. The expense is justified, says Silverman, "through an argument based on good programs." Staff, however, are often reluctant to cut hardcopy subscriptions. Among the arguments against cancelling print subscriptions are that: print subscriptions allow you to retain all items purchased (this is not necessarily the case with CD-ROMs); and that print subscriptions allow multi-user access. Online


98 Juhl and Lowry, op. cit., p.77.

99 Silverman, op. cit., 57.
access to current information is also important before cancellation of print subscriptions is agreed upon.

As students awareness of and ability to use CD-ROMS increases, the demands that they make on the library collection will undoubtedly increase. Joseph Michalak reports that libraries have already become aware of increased pressure on serials collections, inter-library loan services and microfiche collections, all related to CD-ROM availability. Demands to expand collections can certainly be anticipated.

### 3.6.4 Document Delivery and Image Databases

As Michalak has observed, the introduction of technical innovations like CD-ROM has raised patron expectations. As a consequence, libraries must now find solutions to the problem of document delivery which will satisfy an increasing demand. It would be surprising if some affect was not noticed in the provision of inter-library loans. However, where the impact of CD-ROM on inter-library loans in Australian libraries is concerned, Jenny Stocks concluded from her study that it is "too difficult to predict distinct trends at this stage." Fulltext CD-ROMs are being proposed as another solution, albeit an expensive one.

The UMI fulltext CD-ROM product, Business Periodicals OnDisc was launched in January 1989. The system used by UMI has been described as acting like "electronic

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microfilm" because of the facsimile images it produces. This system was demonstrated in Australia on several occasions since its launch. It provides the fulltext over 300 of the most popular journals indexed on ABI Inform and operates in conjunction with this CD-ROM database. At the beginning of 1990, the system consisted of around 160 discs, with holdings dating back to 1987. It was expected that it would increase in size to more than 200 discs by the end of that year, although improvements in storage capacity were anticipated, and discs and software would then be completely replaced. When the product was first launched, manual insertion of the appropriate disc was required after a search on ABI Inform indicated where the item is to be found. A juke box system has now been trialed, and is being marketed. These machines can be linked in sequence to extend capacity, and in addition, networking appears to be a real possibility, although at an extra charge on top of an already expensive system: $25,000 per annum ($30,000 with ABI Inform) plus hardware costs of $30,000 (1990-91 figures). On top of this, there was a charge of 12 cents levy per page printed, although this was dropped in Australia in 1992. The system is attached to a laser printer (included in the hardware), and produces exact copies of the journal articles, much like a very good photocopy. The system is impressive, but even if a charge were levied above the mandatory charge, it is doubtful that most academic libraries could afford this purchase without an injection of funds from an outside source: perhaps from the department most likely to benefit from its introduction. UMI is not proposing to convert all the companies fulltext holdings onto CD-ROM. The decision is an economic one: the cost of converting one year alone of the companies periodical titles is estimated to be in excess of $9 million. According to UMI's marketing manager, Carol Bamford, the product would have to be priced above the reach of most libraries for the company just to break even.


Another fulltext storage system utilising CD-ROM is ADONIS. This system resulted from a project involving a number of publishers who were looking for a method whereby they might gain copyright revenue whenever reproductions of journal articles were made. The publishers felt that libraries were cancelling subscriptions because they could easily obtain photocopies on inter-library loan. The ADONIS discs initially stored over 200 biomedical journals, covering the period from 1987 to 1988. During the trial period, a number of centres were established world wide including the National Library in Australia. The discs are used to fulfil requests for articles that appeared in the journals stored on the ADONIS discs. The product is now available with a continually updated journal selection, and advanced hardware and software capabilities. A system equivalent to the UMI juke box, although operating on a different principle, is available. Both "juke box" systems were demonstrated for the first time in Australia at the ALIA Conference in Albury, September 27 to October 2, 1992. In spite of the interest generated by the appearance CD-ROMs, they have been slower to move into the range of document delivery services than originally anticipated. Some of the reasons for this are high costs and the lack of standards already discussed. However, Susan Martin suggests that users are not yet ready to move exclusively to electronic data.

3.6.5 The Potential of CD-ROM:

CD-ROMs have been greeted with considerable enthusiasm by academic users. Comments made by a number of authors reflect that this impression is not restricted to Australian libraries. Silverman remarks that "once CD-ROM products are introduced in the library, patrons cannot bear the thought of living without them." Juhl and Lowry comment that "while CD-ROMs have caused some sweeping changes in services and

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109Silverman, op. cit., p.58.
resources at Columbia, we are in the middle of an ongoing evolution, not a revolution. And the only revolt I foresee is that of the readers if we should try to take the CD-ROMs away.\textsuperscript{110} Certainly, CD-ROMs have been greeted with enthusiasm by academic library users providing wonderful PR, something academic libraries can find difficult to achieve. However they do present difficulties, among them the funding and training issues alluded to above. As well, they have implications regarding just what library collections will be like in years to come. Should libraries opt for the electronic versions of serial publications instead of the hardcopy? This is a question many academic librarians will be confronting in the near future, and not only for indexing and abstracting services. Clearly, CD-ROMs have the potential to greatly enhance students' access to information, first, through providing free access to electronic database sources, second, by making them more aware of the potential of online services for up to the minute information, and third, for improving document delivery. Their potential is inhibited by current licensing agreements which deny ownership to the purchasing library and require return of discs once subscriptions lapse. This is an issue which must be resolved.

It is a measure of the success of CD-ROMs that libraries are permitted to commit a modest proportion of their budget for such expensive purchases. For example, the University of Wollongong Library's budget for CD-ROMs in the period 1990-1992 was approximately $60,000 per annum. While this is small as a proportion of the overall Library bookvote, it is unlikely that such an amount could ever be put aside for the provision of free online search services. However, as indicated earlier in this chapter, some online search services are beginning to be provided "free" via networks like JANET, through the combined efforts of a number of interest groups, including universities and research centres. Whether this trend continues will depend largely on funding, not only for database services, but also for network infrastructure improvements.

\textsuperscript{110}Juhl and Lowry, \textit{op.cit.}, p.78.
3.7 Predicting the Future?

In the debate on the future of libraries and the directions they are taking, network infrastructure is inevitably a consideration. Paul Evans Peters asks "Is the library a "place" in the age of networks?" The United States government has established a task force to investigate the need for a national information infrastructure and this is being discussed widely in the Library community both in the US and elsewhere. To judge by the literature, the transition to an electronic library is inevitable and, indeed, some degree of access is already possible where journal literature is concerned. However, funding of such resources, both in terms of the establishment of the infrastructure and access to electronic information are still the main concern. Charging the end user is the most likely outcome.

3.8 Conclusion

This chapter has provided an overview of the basic arguments presented by both the proponents and opponents of fees for online database services (see table on pages 72 and 73 for a summary). Those opposing fees point to the notion of public-good and the tradition of free library service as significant issues not to be discounted. Those favouring fees stress the importance of market forces and suggest that it is legitimate to charge for 'value-added' services particularly in times of severe budgetary constraints. These issues and others relating to access to information and the role of libraries are


addressed in the following chapters, first in Chapter Four, which discusses the situation in Australian libraries and includes a detailed survey of information delivery and attitudes of Australian librarians working in this field.
Chapter Four
Libraries in Australia on the Information Superhighway

4.0 Introduction

Libraries have eagerly adopted the new technologies at a rate which must call into question the staid and conservative image with which librarians are portrayed by the popular media. Certainly, for many librarians, the idea that their book and journal collections will some day be supplanted by online or other electronic services, is anathema. But for others, this fits neatly into the politics of managing collections, not in spite of, but because of the existing economic imperatives. Serials collections are an interesting case in point. Not only are the hardcopy indexing and abstracting services being displaced by electronic services, but, increasingly, librarians will be able to choose whether they subscribe to an expensive journal, or provide access to it via the equivalent fulltext database online, possibly charging the requestor for this service. Such choices are already being made. In attempting to defend their economic position, however, librarians may lose their way, soon finding that their traditional role in providing equitable access to information to the community they serve is no longer an option. Much publicity has been given to the information superhighway. Are its promised resources being made available through libraries and if so, at what cost to the library user?

This chapter\(^1\) investigates the extent to which libraries in Australia are providing access to these new resources as well as to the traditional online search services. It is based on a survey of major Australian libraries in both the Academic and Public sector, conducted in July/August 1994. The results are significant as a very high response rate was achieved, with forty-eight of the fifty-four libraries approached providing comprehensive details.

\(^1\) A number of papers have originated from the material presented in this chapter including one at the 1996 Pacific Telecommunications Conference in Honolulu and another at the Australian National Preservation Office Multimedia Conference in Brisbane, in December 1995. A book chapter has also been accepted. Details of these and related publications are provided in the bibliography.
The purpose of the survey was to ascertain what access to online information services is available to individuals using Academic libraries and the national, state and larger Public libraries throughout Australia. Fee based services were an important element of this study, as was access to networked resources including use of the Internet. Whether charges were being levied or proposed for the latter services was also queried. Of the forty-eight libraries responding twenty-two gave an unequivocal "Yes" to the question on charging, while a further eighteen answered that they charge some of the time. Only eight libraries stated that they did not levy a charge for searching. The extent of entrepreneurial undertakings such as the establishment of information brokerages, either integrated with or as an adjunct to traditional library services, was also gauged. The final section of the questionnaire dealt with the future of libraries and asked individual respondents to indicate their assessment of current trends where electronic delivery of information is concerned. The results of this survey provide insight into the current situation in Australian libraries and into their approaches to electronic information provision. It demonstrates that library budgets for online searching are extremely small and in most cases, have shown no real increase in the past four years. As library budgets become tighter and more electronic services are made available through networks, charging for individual access to such services may be inevitable. This survey indicates that charging individual users for electronic delivery of information has, to a large extent, been accepted in Australian libraries. It also indicates an anticipation of a trend towards wholly electronic information publication, delivery and storage. What will this mean for the future of libraries, the role of librarians and hence also for equity of access to information?

4.1 Who was surveyed?

To ensure that the questionnaire was completed by library staff familiar with the subject matter, librarians responsible for online information services at each library were first contacted by phone and the questionnaire then faxed to them. Follow up phone calls
were made to check if there were any difficulties with questions. In most cases the questionnaire was answered by the original contact person. In all cases, information was provided by the person with appropriate knowledge of the respective library's online activities. Of the fifty-four surveys sent, forty eight were returned. Of the remaining six, one was completed but went missing in the mail, four were promised but did not arrive and only one was definitely refused. Much depended on the kind cooperation of those targeted. Nevertheless, by targeting appropriate personnel as outlined above and making follow-up calls, a very high response rate was achieved. This was essential to the success of the survey.

4.1.1 Which Libraries?

Public access to online information in Australia is provided by the large State and Academic libraries, by the National Library and by some of the larger Public libraries in major cities. These were the libraries targeted although not all Australian libraries in these categories have been covered. A list of libraries included in the survey responses appears in Appendix 2. The table below indicates the number of libraries approached in each category and the number of responses received.

<table>
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<th>Libraries included by category</th>
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<td>Libraries</td>
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<tr>
<td>Academic</td>
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<tr>
<td>National</td>
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<tr>
<td>State</td>
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<tr>
<td>Public</td>
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<tr>
<td>Total</td>
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</table>
Not all campuses of Academic institutions were surveyed but the sample does cover the majority\(^2\) of major Universities. The National and all the State Libraries responded as did all but one of the capital city libraries who were approached. Hobart and Adelaide Public Libraries are under the umbrella of the State Library in their respective States. Consequently, they were not included as they were covered in the State libraries' responses. Responses from the large Public libraries indicate much less activity in the delivery of online information services than in the State and Academic libraries. For example, two of the seven responding Public libraries had no access to international databases and only three indicated access to AARNet.\(^3\) It is evident from these responses that little would have been gained by extending this study to smaller Public libraries at this stage. One area that has not been covered here is that of TAFE\(^4\) libraries.

\(^2\)All major Universities were approached. Thirty-three responses were received from a possible thirty-seven at that time. Appendix 2 contains the list of Universities asked to complete questionnaires.

\(^3\)AARNet (Australian Academic and Research Network) was initially set up by the Australian Vice-Chancellors Committee and CSIRO to provide access to the Internet for the University and research communities but access has been extended to other groups within the community, including business. Telstra, Australia's Telecom, has recently (1995) purchased AARNet (Telstra Internet Services). Hence, access is likely to be extended further. [Geoff Huston. *The future of online services*. In: *Online Services*: a conference held at Sheraton Wentworth, Sydney, 26-27 July, 1995]

\(^4\)TAFE: Technical and Further Education Colleges
4.1.2 The Questions:

Since this survey was undertaken to provide up to date information regarding access to online information in Australian libraries and the extent to which charging for information is a feature of this provision, the questions relate either directly or indirectly to this theme. Hence, topics covered include the kinds of database services available, who has access, what funds are available, what records are kept, the number of searches conducted, whether an information "brokerage" has been established, what resources (if any) are being provided over AARNet and if charges are being or are likely to be levied for network access. Such information is essential to provide both a background to and evidence for the thesis proposition that charging for electronic information limits access to those who can afford to pay. While online information services promised to extend library access to information resources, the limited budgets provided and small number of searches conducted (see survey results for figures on both) clearly indicate that this is far from the case. Indeed, a limited or non-existent budget provides little incentive for library staff to promote electronic services. This is especially so given the established culture of free service which applies to the majority of library activities.

4.1.3 The Analysis:

While a good response rate was received from the libraries asked to participate in this survey (especially given that the number represents almost all the libraries in these categories), complex statistical testing would be inappropriate for such a small group. Consequently, descriptive statistical analysis has been used in most cases. To collate the information collected, data was entered into the JMP statistical package. While the level of sophistication provided by this package was significantly greater than that required for the study, it did allow all the information to be set out in easy to read tables. It also facilitated the combination and recombination of a variety of data sets which would have been difficult to do manually. For some of the data, Excel has been used although
figures were originally extracted from the JMP tables. In many instances, Excel appears to provide better graphical presentation and hence it was chosen. The detailed analysis is presented below.

4.2 Library environment

Australia Library Environment

The number and type of library surveyed have been indicated above. Libraries were asked to estimate the number of patrons using their services. Many found this difficult to answer as, for example, Academic libraries may serve not only their students and staff but also members of the local community. The way university campuses have been set up since amalgamations\(^5\) have occurred also produced difficulties with some providing statistics across several locations and others for only one within the larger group. Three of the campuses reported under 2,000 patrons. The remainder ranged from 8,000 to 20,000 although estimates were not provided for some large universities.

Public libraries, in theory, serve all the patrons in their Council area, although not all avail themselves of the service and if they do use the library, are not necessarily registered as borrowers. There is a similar problem with the State and National libraries. Those using their services include not only regular patrons but also other libraries throughout Australia and possibly also overseas.

The following table shows the type of computer environment used by libraries at present. All libraries used Personal Computers (IBM compatible and similar) with some using a combination of Personal Computers and Macintoshes or Terminals. None used solely Macintoshes, although seventeen of the total forty-eight said that they used some

\(^5\)Following an Australian government decision in 1987, many universities were amalgamated to form larger entities although sometimes consisting of several campuses. The rationalisations which followed affected their libraries.
Macintoshes. While changes are taking place in all environments, Macintoshes have always provided a more intuitive approach for end users. If more enduser searching of online databases is to be encouraged (and it appears from the survey results that this is inevitable), it is important that standardised, simple to use software be provided regardless of the computer environment.

<table>
<thead>
<tr>
<th>Libraries</th>
<th>No.</th>
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<th>PCs &amp; Terminals</th>
</tr>
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<td>0</td>
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<td>1</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>State</td>
<td>7</td>
<td>2</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td>17</td>
<td>25</td>
<td>5</td>
</tr>
</tbody>
</table>
4.3 Online Database Services in Australian Libraries

4.3.1 Australian and New Zealand Database Services

At the time this survey was conducted, some changes were occurring in the Australian online database industry as regards ownership and control and changes continue to occur. In the table above, Ozline and Australis are listed separately. Australis databases have been taken up by the National Library of Australia (NLA) and are now offered through the NLA's Ozline service. Ausinet\(^6\) has been sold by its owners, Ferntree, and is now owned by an Australian newspaper company, John Fairfax Holdings Limited, perhaps following the trends seen internationally of newspaper and other publishing organisations purchasing large online database companies: for example: Knight-Ridder and Dialog; Reed Elsevier and MeadData Central.\(^7\) This is a trend which will be discussed further in Chapter Five.

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\(^{6}\)The Ausinet database service was developed in 1977 through the National Library with the cooperation of other libraries in Australia. It moved to the private sector in 1980. [Sarah Henderson. *Online information networks.* In: Peter Biskup and Margaret Henty (eds). *Library for the Nation.* Belconnen, ACT: AARL and the NLA, 1991.]

Of the nineteen services used, three had a high percentage of support. The tables and graphs below show that Ausinet and Australis/Ozline are the dominant, online information providers with 42 of the 48 libraries using Ozline, 40 using Australis and 39 using Ausinet. Hence, it can be seen that most libraries use all three. What was surprising was that not all Academic libraries had access to any one of these. Indeed, one library did not use them at all, although that library was in the process of reviewing its electronic information provision. Ozline (and Australis) databases are now available via AARNet and many Academic libraries provide access to them in this way (Statistics on this provision are given later). It is only a matter of time before Ausinet is similarly accessible. Ausinet staff have advised that this is planned and will proceed once security measures have been resolved. The NLA's proposed National Document and Information Service (NDIS)\(^8\) service which will combine many existing online database services (Australia's ABN and New Zealand's NZBN) making them more easily accessible via the network, will also, more than likely, expand demand.\(^9\) Sherry Quinn, in her 1993 summary of Australian database resources anticipated that within two or three years, the old systems might have disappeared.\(^{10}\) Clearly, the systems are changing, but many of these database resources still have an assured future where libraries are concerned.

Among the other Australian and New Zealand database providers, Presscom was used by 13 libraries, InfoOne by 6 and KiwiNet (from New Zealand) by 5. The remaining providers were used by 3 or fewer than 3 of the libraries in this study. Most were more narrowly based or specialist, than the three major vendors. This pattern of favouring the

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more broadly based vendors is also evident for international service providers as survey results presented in the following section show.

<table>
<thead>
<tr>
<th>Table of Australian and New Zealand Database Services</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Academic</strong></td>
</tr>
<tr>
<td>-------------</td>
</tr>
<tr>
<td>Academic</td>
</tr>
<tr>
<td>Public</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Academic</strong></th>
<th><strong>AMI</strong></th>
<th><strong>ASCOT</strong></th>
<th><strong>D&amp;B</strong></th>
<th><strong>LawNet</strong></th>
<th><strong>LawPoint</strong></th>
<th><strong>LegalRetriever</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>33</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Public</td>
<td>15</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Academic</strong></th>
<th><strong>LINK</strong></th>
<th><strong>MonInfo</strong></th>
<th><strong>NEXUS</strong></th>
<th><strong>QL</strong></th>
<th><strong>QNIS</strong></th>
<th><strong>SCALE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>33</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Public</td>
<td>15</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>
Australian Database Services in Libraries

![Bar chart showing the number of libraries using different database services. The chart compares 'Other' with 'Academic' services. Common services include AAP, AMI, ASCOT, Ausinet, Australis, D&B, InfoOne, KiwiNet, LawNet, LawPoint, LegalRetriever, LINK, MonInfo, NEXUS, Ozline, PressCom, QL, QNIS, and SCALE.](chart.png)
Number of libraries* using Australian database services

<table>
<thead>
<tr>
<th>Library</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ozline</td>
<td>42</td>
</tr>
<tr>
<td>Australis</td>
<td>40</td>
</tr>
<tr>
<td>Ausinet</td>
<td>39</td>
</tr>
<tr>
<td>Presscom</td>
<td>13</td>
</tr>
<tr>
<td>InfoOne</td>
<td>6</td>
</tr>
<tr>
<td>Kiwinet</td>
<td>5</td>
</tr>
<tr>
<td>Others</td>
<td>3 or fewer</td>
</tr>
</tbody>
</table>

*Of the 48 libraries responding to the survey.

Total number of Australian and New Zealand services reported being used was 19.

4.3.2 International Database Services

As mentioned in the preceding section, changes in ownership and control continue to occur. Most recently, Lexis/Nexis, formerly owned by Mead Data Central, a US company, has been purchased by the European publisher, Reed Elsevier. The once European owned, DataStar, although listed separately below, is now included as part of
Dialog. The 11 libraries which mentioned DataStar specifically also have Dialog access (See graphs and tables below). Indeed, only two libraries (both Public libraries) had no access to any of the international database services. The remaining 46 all had access, at least to Dialog. Orbit and BRS were the next most commonly used with 30 and 28 libraries, respectively, using their services. These were followed by Lexis/Nexis, with 20 and STN with 18. As was the case with the more narrowly based Australian database services, few libraries provided access to the more specialist database hosts. However, many libraries are now making use of a number of new, combined database services via the Internet. This is expanding their access to many specialist databases some of which may be provided via such services. Statistics on access to these services will be provided in a later section.

<table>
<thead>
<tr>
<th>Table of International Database Services.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No.</strong></td>
</tr>
<tr>
<td>Academic</td>
</tr>
<tr>
<td>Public</td>
</tr>
<tr>
<td><strong>No.</strong></td>
</tr>
<tr>
<td>Academic</td>
</tr>
<tr>
<td>Public</td>
</tr>
</tbody>
</table>
International Database Services in Libraries

![Bar chart showing the number of libraries using various database services. The services include BRS, D&B, Datastar, Dialog, ESA, Lexis/Nexis, Medline, NIKKEI, Orbit, Reuters, Signature, STN, Waterlow, WestLaw, and WilsonLine. The chart uses two colors: gray for other services and black for academic services.]
Number of libraries* using international database services

<table>
<thead>
<tr>
<th>Database Service</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dialog</td>
<td>46</td>
</tr>
<tr>
<td>Orbit</td>
<td>30</td>
</tr>
<tr>
<td>BRS</td>
<td>28</td>
</tr>
<tr>
<td>Lexis/Nexis</td>
<td>20</td>
</tr>
<tr>
<td>STN</td>
<td>18</td>
</tr>
<tr>
<td>DataStar</td>
<td>11</td>
</tr>
<tr>
<td>ESA</td>
<td>10</td>
</tr>
<tr>
<td>WilsonLine</td>
<td>6</td>
</tr>
<tr>
<td>Others</td>
<td>2 or fewer</td>
</tr>
</tbody>
</table>

* Of the 48 libraries responding to the survey.

Total number of International services reported being used was 15.
4.4 Charging

Where Australian libraries are concerned, there appears to be no real agreement on the approach to charging for online information. Most do charge sometimes, for some of the costs involved. As indicated in the introduction to this chapter, of the 48 libraries responding 22 gave an unequivocal "Yes" to the question on charging, while a further 18 charge some of the time (See tables and graphs below.). Only 8 libraries stated that they did not levy a charge for searching.

<table>
<thead>
<tr>
<th>Libraries</th>
<th>Number</th>
<th>No</th>
<th>Sometimes</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic</td>
<td>33</td>
<td>4</td>
<td>10</td>
<td>19</td>
</tr>
<tr>
<td>National</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Public</td>
<td>7</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>State</td>
<td>7</td>
<td>2</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td>8</td>
<td>18</td>
<td>22</td>
</tr>
</tbody>
</table>

**Charging in Academic Libraries**

- Never: 12%
- Sometimes: 30%
- Always: 58%
Charging in State, National and Major Public Libraries

- Never: 27%
- Always: 20%
- Sometimes: 53%

Charging in all libraries surveyed

- Never: 17%
- Always: 45%
- Sometimes: 38%

<table>
<thead>
<tr>
<th>Libraries</th>
<th>Number</th>
<th>UG only</th>
<th>UGPGS</th>
<th>Public Limited</th>
<th>Search</th>
<th>Sample Search</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Charge</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sometimes</td>
<td>18</td>
<td>1</td>
<td>7</td>
<td>1</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Charge</td>
<td>22</td>
<td>1</td>
<td>7</td>
<td>1</td>
<td>6</td>
<td>1</td>
</tr>
</tbody>
</table>

(UG= UnderGraduates; UGPGS = UnderGraduates, Post Graduates and Staff)

Of the 18 libraries that said that they sometimes charged, those not charged were some or all of their main clientele [For example: students or staff (in Academic institutions) or the public (in Public libraries) requesting information which was not easily available in other ways]. Seven libraries (including one library that answered "no" to the question on charging) stated that they placed limits on the amount of free searching. One of the
libraries which charged did, however, provide a sample search free of charge to its patrons. A number of libraries (seven, in all) did not indicate who received free searches indicating, perhaps, that clear guidelines had not been established. Decisions as to when a free search may be provided appears to be at the discretion of the Reference Librarian or Information Services Librarian. However, only eight respondents indicated where discretion lay.

Similar variations exist in what libraries include when charges are calculated. Some require full cost recovery including staff time. Others only charge for database costs, or database and telecommunications costs. Still others charge a flat fee or offer a subsidy of some kind. The table below gives an overview of the variations which occur. As can be seen, some libraries provided a subsidy which was subtracted from the total cost of the search, while only three indicated that they sought to make a profit. These three were Academic libraries and all indicated that they were among the growing number of libraries, both Academic and Public, which are setting up information brokerages to cater to business and outside requests. This subject will be dealt with in more detail in a later section. It should be noted that only 11 libraries indicated that they attempted to achieve full cost recovery from their internal clients (See Internal: DbTel=9; DbTelSt=2). Hence it can be assumed that most libraries provide some subsidy for online searching.

<table>
<thead>
<tr>
<th></th>
<th>Subsidy</th>
<th>Db</th>
<th>Db+</th>
<th>DbTel</th>
<th>DbTelSt</th>
<th>Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal</td>
<td>9</td>
<td>7</td>
<td>1</td>
<td>9</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>External/Business</td>
<td>2</td>
<td>3</td>
<td>9</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Db= Database charge; Db+= Additional amount added to Db; DbTel= Db plus telecommunications charges; DbTelSt= DbTel plus Staff time)
It is clear from the above that little consistency exists in approaches to charging for online information. Most libraries are attempting to do the best that they can utilising existing resources and surviving within their budgets. The following section provides some indication of the extent of funding available for online searching.

4.4.1 Budgeting

Budgeting for online services, as in other areas, requires some means of estimating what costs are likely to be incurred in a given period. This is particularly difficult where online databases are concerned because of the many variables involved. What services are required? Who will be using them and for how long? What will the database vendor charges be and how are these calculated (they may vary from vendor to vendor)? How are libraries to predict telecommunications costs sometimes over international lines? Will
library staff need significant retraining if new services are required? These are just some
of the considerations confronting library managers attempting to budget for these
services. The tables and graphs in this section provide an indication of the level of
budgeting provided for traditional online searching in major Australian libraries.

<table>
<thead>
<tr>
<th>Libraries</th>
<th>Online Number</th>
<th>Budget Allocated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Academic</td>
<td>33</td>
<td>11</td>
</tr>
<tr>
<td>National</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Public</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>State</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td>13</td>
</tr>
</tbody>
</table>

The table above indicates that thirty-five of the forty-eight libraries responding to this
survey stated that they had a designated budget for online searching. Of the remaining
thirteen, two indicated that they do not charge, three that they sometimes charge, one
charged for database costs only and another provided a subsidy to some clients. Only six
attempt to recoup at least the database and telecommunications costs. Clearly, an
allocation is available to the seven libraries which provide some level of support but
stated that they had no budget. Even if billing is handled by a separate department and
funding is provided from a general account, it seems strange that the persons most
closely involved with constraining costs and avoiding over-spending are not provided
with information on the limitations within which they must work. No library has
unlimited funds for any aspect of its work. It would surely be an advantage to the library when a report on the viability and affordability (or otherwise) of a service is required, that clear records of accounts are available and that all limitations are known, particularly by those most closely involved.

As shown below, twenty-nine of the thirty-five libraries stating that a budget was allocated were able to provide approximate figures on the amount available. The amount varied considerably depending on the size and type of library concerned. Hence little can be seen from presenting mean results as no absolute statistics were available on numbers of patrons using the services. An indication of the funding available within the various types of libraries can be seen, however in the maximum and minimum figures given below.

<table>
<thead>
<tr>
<th>Libraries</th>
<th>Number Responses</th>
<th>Max. $</th>
<th>Min. $</th>
<th>Mean $</th>
<th>Total for these libraries only $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic</td>
<td>33</td>
<td>60000</td>
<td>1000</td>
<td>19375</td>
<td>310000</td>
</tr>
<tr>
<td>National</td>
<td>1</td>
<td>25000</td>
<td></td>
<td>25000</td>
<td>25000</td>
</tr>
<tr>
<td>Public</td>
<td>7</td>
<td>12000</td>
<td>500</td>
<td>5460</td>
<td>27300</td>
</tr>
<tr>
<td>State</td>
<td>7</td>
<td>48000</td>
<td>7000</td>
<td>32571</td>
<td>228000</td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td>48000</td>
<td>7000</td>
<td>32571</td>
<td>619100</td>
</tr>
</tbody>
</table>

It can be seen from the above figures that online searching is not particularly significant as an expenditure item in libraries when compared with the overall budget. In even moderately sized Academic libraries (e.g.: the University of Wollongong), for example, the serials budget may be approaching $1 million. The total budget allocation for online searching for 29 of the libraries responding to this survey was $619,100. As will be seen later, the amounts recorded in actual spending (where these figures were available) did not appear to vary greatly from the budget figure. While libraries obviously think it essential to provide these services, including maintaining trained staff and up to the minute equipment, it seems curious that spending on the actual service is so low. Indeed, CD-ROM expenditure may well eclipse that for online services. The maximum budget of any of the above twenty-nine libraries was $60,000. The University of
Wollongong's CD-ROM spending was maintained at approximately that level in 1991-92. It now exceeds that. In a report on the Australian online industry published in 1992, Elizabeth Oley suggested that the easy access to information which CD-ROMs provide for all library patrons may have resulted in a decline in online searching.\textsuperscript{11} The growth of the Internet services will be looked at later. However it is doubtful that these have as yet had an impact on traditional online services although they may well supplant them in the near future.

### 4.4.2 Online Search Statistics

Achieving results which are in any way significant where online searching statistics are concerned is difficult. First, there is a huge difference from one organisation to another in the extent to which online searching is made available. Even within the same types of organisation, the number of searches done may depend on who has access to the service, how much support is given by the library and how strongly the service is publicised. As well (and this was pointed out by one of the questionnaire recipients who supported her comments with a reference to an article on the subject) the way searches are recorded may vary with some counting every search in every database used while others merely record individual consultations with clients which may have involved a number of searches. Only twenty-nine of the forty-eight libraries provided statistics on the number of searches and not all were able to give numbers for the full three year period.

<table>
<thead>
<tr>
<th>Libraries</th>
<th>Number</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic</td>
<td>33</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>National</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Public</td>
<td>7</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>State</td>
<td>7</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Library</td>
<td>48</td>
<td>7</td>
<td>41</td>
</tr>
</tbody>
</table>

**Online Searching Statistics**

(Average Number of Searches)

The results do contain some useful information, however, although more can be seen by looking at individual library patterns than at overall averages. Where the averages above are concerned, there is a significant difference between the number of searches done by the five state libraries providing statistics for 1993 and that by the three responding major city libraries. Indeed it would appear that the State libraries have taken on the role of providing this type of service to the public, at least in the capital cities. The Public library figures were, in fact, inflated by the results from just one of the three libraries, a non-capital city library which recorded 549 searches in 1993 (22 and 88 were recorded by the remaining two). As indicated earlier, some capital city libraries are part of the state
service, so individual statistics were not sought. Within the ranks of the Academic libraries, a considerable range in online search statistics also appeared. The average given above for 1993 was 315 for 21 of the 33 libraries. However, individual statistics for that year ranged from as few as 21 to as many as 1,045.

These figures indicate a considerable variation in use of online searches. While no clear pattern has emerged, what can be said is that there are extreme differences which do not necessarily relate to the size of the campuses involved. Looking at individual campuses where statistics have been supplied over a number of years does reveal a trend downwards in numbers of searches conducted among the heavier users, although this is not consistent. The averages above only indicate a slight overall trend downwards among Academic libraries and little or no change in that direction for State and Public libraries. It may be useful to look at specific results even if individual organisations are not identified. The table below shows some of the trends.
Looking at the tables above, there does not seem to be the same drop off in searching in the State and City libraries as appears in the University libraries. In fact the demand seems to have been maintained in most cases. Number of searches conducted does not appear to have a relationship to the size of the population served. Promotion of the service, availability of staff, special research needs of particular organisations, and availability of other information resources are just some of the possible variables here. Even where funds are available, no consistent relationship can be seen between the number of searches and funding or charging policies. Again, the manner in which searches are counted at each institution may be significant.
While twenty-nine respondents stated that a budget was available and forty-one were able to provide some records of online searches undertaken, only twenty-two libraries provided information on actual expenditure. The charts below show again how small the commitment to traditional online database delivery is when compared to expenditure on information resources in libraries.

<table>
<thead>
<tr>
<th>Libraries</th>
<th>Number</th>
<th>No</th>
<th>Some</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic</td>
<td>33</td>
<td>17</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>National</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>State</td>
<td>7</td>
<td>2</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Public</td>
<td>7</td>
<td>4</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>All</td>
<td>48</td>
<td>24</td>
<td>1</td>
<td>21</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
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<tbody>
<tr>
<td>Academic</td>
<td>33</td>
<td>7</td>
<td>25748</td>
<td>10</td>
<td>22441</td>
<td>12</td>
</tr>
<tr>
<td>National</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>State</td>
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<td>3</td>
<td>24489</td>
<td>3</td>
<td>25847</td>
<td>3</td>
</tr>
<tr>
<td>Public</td>
<td>7</td>
<td>1</td>
<td>4365</td>
<td>1</td>
<td>3964</td>
<td>1</td>
</tr>
<tr>
<td>All</td>
<td>48</td>
<td>11</td>
<td>23460</td>
<td>14</td>
<td>21851</td>
<td>16</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Libraries</th>
<th>Number</th>
<th>No</th>
<th>Some</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic</td>
<td>33</td>
<td>17</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>National</td>
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<td>1</td>
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<td>0</td>
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<td>State</td>
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<td>5</td>
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<td>Public</td>
<td>7</td>
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</tr>
<tr>
<td>All</td>
<td>48</td>
<td>24</td>
<td>1</td>
<td>21</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
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### Trends in Individual Academic Libraries: Search Expenditure

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(A.L. = Academic Library)
Some Trends in Other Libraries: Search Expenditure

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</tr>
</tbody>
</table>

(S.L.= State Library; C.L.= City Library) [1993 Total=$78,835 for four libraries.]

The above graphs and tables show that there is very little rise in actual expenditure. In some cases, figures provided are obviously the upper limit for expenditure and match the budget figure given almost exactly. With the limited rise in expenditure in this area and real increases in searching charges, a drop in number of searches is to be expected. This is evident in many of the examples in the preceding tables.
### Profits?

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<th>Number</th>
<th>External Only</th>
<th>No Profit</th>
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<tr>
<td>Academic</td>
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<td>30</td>
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<tr>
<td>Other</td>
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<td>0</td>
<td>15</td>
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</tbody>
</table>

(State Library of New South Wales' Information Edge not included here. Information Edge operates "for profit" only.)

### 4.5 Brokerages

Information brokerages are services similar to those provided by libraries but tailored to the needs of individual clients. Charges are levied according to the level of service provided. Online searching can be an integral part of this service. Information brokerages have been set up by information professionals operating outside libraries. However, many libraries are also experimenting with this type of service. The following section shows that twenty-two of the forty-eight libraries responding to the questionnaire have set up some form of information brokerage.

### Table

<table>
<thead>
<tr>
<th>Libraries</th>
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<td>3</td>
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<tr>
<td>State</td>
<td>7</td>
<td>3</td>
<td>4</td>
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</tbody>
</table>
Brokerages in Major Australian Libraries

- Academic: 29%
- No Brokerage: 54%
- Other: 17%

Brokerages (2)

<table>
<thead>
<tr>
<th>Libraries</th>
<th>Number</th>
<th>Min Years</th>
<th>Max Years</th>
<th>Mean</th>
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<td>15</td>
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<tr>
<td>Public</td>
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<td>3</td>
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<td>3.6</td>
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<td>4 of 7</td>
<td>3</td>
<td>6</td>
<td>4.5</td>
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<tr>
<td>All</td>
<td>22 of 48</td>
<td>0.5</td>
<td>15</td>
<td>4.4</td>
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</table>

Brokerages

Period of Operation 1

- Minimum
- Maximum
- Mean
Brokerages
Period of Operation 2

Searching by Brokerage

<table>
<thead>
<tr>
<th>Libraries with Brokerages</th>
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<th>Total</th>
<th>All</th>
<th>Some</th>
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<tbody>
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<td>22</td>
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</table>

Searching Outside Brokerage

<table>
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<th>Total</th>
<th>ABS</th>
<th>Library</th>
<th>Brokerage</th>
<th>Not stated</th>
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</thead>
<tbody>
<tr>
<td>22</td>
<td>48</td>
<td>1</td>
<td>6</td>
<td>13</td>
<td>2</td>
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</tbody>
</table>

Searching by Brokerage

- Brokerage: 59%
- Library: 27%
- Not Stated: 9%
- ABS: 5%
While libraries have experimented with the "information brokerage" approach to information delivery, the aim has largely been to recoup costs or partial costs involved. As can be seen from the results in the preceding section, making a profit has not been the main objective in libraries. In only three cases (excluding Information Edge which may be considered a special case) were profits indicated (See Table: Profits? above) and in all three, this approach was aimed at "external users".

While operating within the library, the twenty-two brokerages noted above do all or some of their own searching. Nine of the twenty-two indicated that some of their searches were done by library staff outside the brokerage. One stated that some specialised searches were requested from an outside body (ABS). Some attempt has been made to separate the role of such services from the rest of the library, although this has not always been complete even in terms of tasks undertaken. All these brokerages are operating with access to the basic library infrastructure, both in terms of technology and reference resources. Consequently, they have not had the kinds of cost involved in setting up their "business" which would have been incurred by independent brokers. One example where the break has been distinct is that of Information Edge which operates in conjunction with the State Library of New South Wales. No figures were supplied on profitability or otherwise for this service. It would be useful to investigate the operation of this service further in the context of this thesis.
Of the forty-eight libraries surveyed, all had invested in CD-ROM technology. The larger State libraries were the most heavily committed in this area with one providing access to 101 CD-ROM titles. As the graph shows, Academic libraries, too, were investing considerable funds in this area. CD-ROMs are expensive, many costing several thousands of dollars for a subscription. Networking incurs an extra fee and, in some instances, the library may only have a licence to use the discs. They may not own them. Even libraries with small collections are committing a sizeable proportion of their budgets to maintain their collection. It is significant that libraries are prepared to allocate funding for this technology to an extent which was never possible with online databases. A modest collection of around twenty titles may cost a library about $60,000 annually, excluding costs of equipment. This was true for one library in 1993 which, in the same year allocated under $5,000 for online searching. Why is this the case? As we saw
above, online searching has declined in some Academic libraries but not in the larger State libraries. Many have suggested that the easy access to information which CD-ROMs provide for all library patrons has resulted in a decline in online searching.\textsuperscript{12} It will be interesting to see whether access to networked database resources has any impact on library commitment to CD-ROM technology.

### 4.7 Network access

Forty-four of the forty-eight libraries surveyed had access to AARNet. The four which did not were large Public libraries. Doubtless this will change and network access will be extended to even the most remote Public libraries. Indeed, since this survey was conducted, publicity has been given to at least two local council areas which are promoting access to the Internet via AARNet. This will greatly increase the services (including database resources) available to Public libraries and to their clientele.

<table>
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<td>33</td>
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<tr>
<td>National</td>
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<td>1</td>
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<tr>
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<td>7</td>
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<tr>
<td>All</td>
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<td>44</td>
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</tbody>
</table>

\textsuperscript{12}Oley, \textit{op.cit.}
Although libraries themselves had access to AARNet, not all provided access to library patrons. Only twenty-seven, in all, allowed patrons to use this facility. Even where Academic libraries were concerned, ten of the thirty-three were unable to extend access to the network to include their patrons. Some Academic campuses provide universal Internet/AARNet access to students and staff. Others provide limited access to some members of the campus. This survey suggests that there are at least ten campuses where no access is available to students, even through their libraries. This is disappointing as the network provides a real opportunity to improve access to powerful research tools that in the past most students were denied. The variety of network tools and the extent of database access through the network are detailed in the following sections.

<table>
<thead>
<tr>
<th>Libraries</th>
<th>Number</th>
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<tbody>
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<td>Public</td>
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<tr>
<td>State</td>
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<table>
<thead>
<tr>
<th>Patron Access to AARNet</th>
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<tr>
<td>State</td>
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<tr>
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</table>
4.7.1 Services available

Libraries were asked what services they made available through the network. Focus was placed on basic tools such as gopher, the various World Wide Web browsers and whether they maintained some form of local electronic archive. Only six answered positively to the last: maintaining an electronic archive (ftp site), although one other respondent said that they used gopher for this purpose. Gopher is a popular and relatively easy to use tool with more than sixty per cent of Academic libraries and almost forty percent of other libraries making use of this service. Seventy percent of Academic and forty percent of other libraries used some form of access tool (gopher or mosaic, etc.). There are many World Wide Web browsers, Mosaic being the most popular at the time of this survey. (Netscape was not yet widely available.) Respondents were asked to indicate whether they used one of the Web browsers and, in particular, if they had access to Mosaic. Seventeen libraries either had access or planned access to Mosaic. It was surprising that less than fifty percent of the libraries surveyed had access to some form of Web browser. Another network research tool is WAIS. This software had received some publicity at library conferences so it was again surprising that only three libraries indicated that they used this system. Perhaps the time involved in setting these systems up and their unpredictability may have been one reason that they were not generally made available. Their impreciseness in the way they access information may have been another. There is no guarantee with any of these services that the result will provide high quality information.

Since this survey was completed the availability of Web browsers, in particular Netscape, has expanded. Not only are more libraries gaining access to the World Wide Web, many are now establishing Web homepages which provide access to library information resources and links to useful services. Of the libraries surveyed, twenty-seven now have Web addresses. Some State Libraries are encouraging participation by the smaller city
and town council libraries. Through Victoria's Vicnet,\textsuperscript{13} twenty-three Victorian Public libraries now have Internet access with eleven providing public access terminals. Home pages are also being set up for these community based libraries. In New South Wales, ILANET at the State Library provides network access for a fee to a variety of information services "to over 1,000 libraries and information agencies throughout Australasia." \textsuperscript{14} Some city councils, like Ipswich in Queensland, are providing Internet access independently.\textsuperscript{15} Ipswich plans to provide an electronic library. Setting an example for the library community, the Australian Library and Information Association (ALIA) which originally provided its Web page through the National Library, now has its own address.\textsuperscript{16} Links to libraries throughout Australia and world wide are to be found through the Web pages of educational organisations, general net directories and other libraries. Clearly, the adoption of this new access tool has demonstrated a high degree of energy and enthusiasm on the part of the Australian library community.

<table>
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</table>

\textsuperscript{13}"Vicnet is a joint enterprise of the Victorian State Library and RMIT to bring electronic networking to the people of Victoria." Vicnet's homepage address is: http://www.vicnet.net.au/

\textsuperscript{14}See ILANET's web page at http://www.ilanet.slnsw.gov.au/. The fee listed is (Aus) 20c per minute with no charge by volume of data. This may change now with the changes in AARNet charging policy.

\textsuperscript{15}Ipswich City Council's homepage address is: http://iccu6.ipswichcity.qld.gov.au/

\textsuperscript{16}ALIA's home page address is: http://www.alia.org.au/
Electronic Archive Maintained

Network Tools (gopher, Mosaic, WAIS, etc.)

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<td>6</td>
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Network Tools (gopher, Mosaic, etc.)
### Libraries

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<tr>
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</tbody>
</table>

### Gopher

![Gopher Chart]

- **Academic**
  - Not Stated: 40%
  - No: 20%
  - Yes: 40%

- **Other**
  - Not Stated: 40%
  - No: 20%
  - Yes: 40%

### Gopher in Major Australian Libraries

- Not Stated: 38%
- Yes: 54%
- No: 8%
<table>
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</tr>
<tr>
<td>National</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Public</td>
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<td>1</td>
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</tr>
<tr>
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</table>

**WWW Access (including MOSAIC) and WAIS**

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<td>2</td>
<td>18</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>11</td>
</tr>
</tbody>
</table>

**WWW Access and WAIS**

- None
- WWW Planned
- WAIS only
- WWW&WAIS
- WWW only
4.7.2 Databases

Unlike the network search tools mentioned in the last section, databases provided through the network present a more structured environment for obtaining information. While tools like gopher, WWW browsers and WAIS aim to help users make sense of the many options for obtaining access to network resources, they are still more dependent on luck than skill. Most of the database services on the other hand have some kind of controlled subject search option, often having as their base a well established database resource that existed prior to the expanded network access we have today. They have not been put together in the same ad hoc manner that has attended the provision of much of the material available through other resources on the Internet. Libraries worldwide have been active in both their production and their provision. Hence they are a valued addition to many libraries repertoire of services to their clients. This is demonstrated clearly below, Uncover, ISI Current Contents and OCLC First Search being well supported by twenty-eight or more libraries and the National Libraries Ozline/SOFI, by nineteen. Other library catalogues were also used through the network, by thirty seven of the forty-eight respondents. Many of these services provide valuable information to assist in locating and gaining access to material both within Australia and beyond. They also provide
access to database information formerly only available through charged for online
information services like those provided through Dialog (Knight-Ridder). Whether they
remain free remains to be seen.

<table>
<thead>
<tr>
<th>Libraries</th>
<th>Number</th>
<th>ISI</th>
<th>Uncover</th>
<th>Ozline/SOFI</th>
<th>OCLC/FS</th>
<th>Other Libs</th>
<th>OtherDBs</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic</td>
<td>33</td>
<td>30</td>
<td>25</td>
<td>12</td>
<td>26</td>
<td>29</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Public</td>
<td>7</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>State</td>
<td>7</td>
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<td>5</td>
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<td>All</td>
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<td>19</td>
<td>28</td>
<td>37</td>
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<td>7</td>
</tr>
</tbody>
</table>

Database Resources Through the Internet

Database Resources Through the Internet

Number of Libraries

<table>
<thead>
<tr>
<th>Databases</th>
<th>None</th>
<th>Other Libraries</th>
<th>Other DBs</th>
<th>Ozline/SOFI</th>
<th>OCLC/FS</th>
<th>Uncover</th>
<th>ISI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Public</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State &amp; Nation</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
4.7.3 Charging for network use

At the time of the survey charges for network use were not generally made. Only one library said that it charged for network use and that was limited to database searching using Ozline. Where the future was concerned, however, fourteen said they were unsure, one stated that they would charge and one that they would charge for OCLC searches on the network. The remaining twenty-three indicated that there were no plans to charge in the near future. This may of course, no longer be the case, given the changes which are occurring with Telstra's purchase of AARNet and the certainty that charges to all institutions will increase. Whether libraries are able to budget to maintain some level of free access will no doubt depend on the level to which charges rise.

<table>
<thead>
<tr>
<th>Libraries</th>
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<th>Some</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>33</td>
<td>31</td>
<td>1 (Ozline)</td>
</tr>
<tr>
<td>National</td>
<td></td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Public</td>
<td></td>
<td>7</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>State</td>
<td></td>
<td>7</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>All</td>
<td></td>
<td>48</td>
<td>39</td>
<td>1 (Ozline)</td>
</tr>
</tbody>
</table>
4.8 The Future

Are libraries ready for the changes in access to resources that are occurring? In preceding sections, librarians were asked questions relating to both the current level of electronic
resources available in each library and the direction anticipated (within five and ten years) as regards electronic information provision. This final section of the questionnaire looks at the attitudes of Australian information professionals to the future of electronic information storage and delivery in libraries. Academic and State libraries are taking up the challenge of the new information media. Public libraries will undoubtedly follow. While many have reservations about the demise of the library as we know it, most agree that the role of the librarian is likely to continue to change in line with the introduction of new electronic resources.

4.8.1 Electronic publishing

Major international database vendors like Lexis/Nexis have provided fulltext, electronic resources in Australia for over a decade. Locally, Ausinet, InfoOne and PressCom are among the vendors making Australian fulltext resources available to libraries. Where newspapers are concerned, there are twenty Australian papers available electronically and five New Zealand titles. Fulltext resources appearing on the World Wide Web like government reports and legislation are among the more interesting recent developments. As well, some Australian electronic journals are being produced. A list of these (along with electronic newsletters and discussion groups) is available through the National Library's homepage. These services are still being developed. It is uncertain whether a charge will attach in the future although where overlap occurs with private sector interests it seems likely that some charging will be inevitable. Responses in this section indicate a continuing commitment on the part of libraries to electronic delivery of information where this is the most effective means of delivery.

---

19 See Appendix 1 for a copy of the complete Questionnaire.
**Paper based books and journals still the main source of information within five years.** [Q.16 (a)]

**Table 1**

<table>
<thead>
<tr>
<th>Type/Scale</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Replies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic</td>
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<td>13</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>33</td>
</tr>
<tr>
<td>Nat.&amp;State</td>
<td>5</td>
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<td>0</td>
<td>0</td>
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<td>5</td>
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<td>0</td>
<td>0</td>
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<td>0</td>
<td>48</td>
</tr>
</tbody>
</table>

**Paper based books and journals still the main source of information within ten years.** [Q.16 (a)]

**Table 2**

<table>
<thead>
<tr>
<th>Type/Scale</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Replies</th>
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<td>33</td>
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<tr>
<td>Nat.&amp;State</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Public</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
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<td>17</td>
<td>16</td>
<td>11</td>
<td>2</td>
<td>48</td>
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</tbody>
</table>

While libraries are making use of electronic information sources, whether on CD-ROM or via traditional online information services or through the new networked databases, paper is clearly still the predominant medium. Online information librarians were asked if they saw this situation changing and, if so, how quickly. While most saw little change within five years many indicated that a shift within ten years was likely. This is graphically illustrated below (see graphs drawn from tables for Q16a to Q16d).
Will paper-based books and journals still be the main source of information within 5 years?

Respondents' Estimation:
1=Most likely; 5=Unlikely

Will paper-based books and journals still be the main source of information within 10 years?

Respondents' Estimation:
1=Most likely; 5=Unlikely
Where journals and newspapers are concerned, the trend towards electronic delivery of newspapers was considered more likely than for journals. Journals have traditionally provided a means for not only communicating the latest research findings but also for providing recognition for research undertaken. Hence, they have also played an important role in providing evidence of academic worth. Promotion and tenure at most Academic institutions is dependent on such evidence. Concern has been expressed that the electronic medium will not provide the same validity as the traditional refereed journals, partly because of the speed with which publication can occur and transmission take place. Experiments are underway with the electronic equivalent of some refereed journals. Continuity of publication and provision of access are two other areas of concern for librarians. Consequently, some ambivalence on the part of librarians for the electronic product might be anticipated. The graphs below indicate this.

**All journals available electronically within five years** [Q.16 (b)].

**Table 3**

<table>
<thead>
<tr>
<th>Type/Scale</th>
<th>1</th>
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<th>3</th>
<th>4</th>
<th>5</th>
<th>Replies</th>
</tr>
</thead>
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<td>1</td>
<td>4</td>
<td>13</td>
<td>29</td>
<td>48</td>
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</tbody>
</table>

**All journals available electronically within ten years.**

**Table 4**

<table>
<thead>
<tr>
<th>Type/Scale</th>
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<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Replies</th>
</tr>
</thead>
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<td>1</td>
<td>3</td>
<td>2</td>
<td>8</td>
</tr>
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<td>Public</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>7</td>
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<td>Total</td>
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<td>16</td>
<td>13</td>
<td>10</td>
<td>48</td>
</tr>
</tbody>
</table>
Q16(b)

Will all journals be available electronically within 5 years?

Respondents' Estimation:
1=Most likely; 5=Unlikely

Will all journals be available electronically within 10 years?

Respondents' Estimation:
1=Most likely; 5=Unlikely
Newspapers published electronically within five years [Q.16 (c)]

Table 5

<table>
<thead>
<tr>
<th>Type/Scale</th>
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<th>Replies</th>
</tr>
</thead>
<tbody>
<tr>
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<td>1</td>
<td>7</td>
<td>10</td>
<td>9</td>
<td>5</td>
<td>32</td>
</tr>
<tr>
<td>Nat.&amp;State</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Public</td>
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<td>1</td>
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<td>12</td>
<td>13</td>
<td>12</td>
<td>47</td>
</tr>
</tbody>
</table>

Newspapers published electronically within ten years.

Table 6

<table>
<thead>
<tr>
<th>Type/Scale</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Replies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic</td>
<td>5</td>
<td>13</td>
<td>9</td>
<td>4</td>
<td>1</td>
<td>32</td>
</tr>
<tr>
<td>Nat.&amp;State</td>
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<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Public</td>
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<td>Total</td>
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<td>14</td>
<td>15</td>
<td>7</td>
<td>3</td>
<td>47</td>
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</tbody>
</table>

Where once newspapers published online were purely text based, the new World Wide Web browsers, in particular Netscape and Mosaic, are providing a medium whereby newspapers can be presented in a pleasing format, often including pictures. A good example of this is the British paper, *The Daily Telegraph*. While such media can be slow to access and it may seem tedious to move from one part of the "paper" to another by clicking buttons and waiting for the next screen to appear, they do have appeal, being pleasing to the eye, with the ability to be tailored to one's interests, no matter how mundane or esoteric, and providing instant access to exactly the same news as is available on the newsstands, television or radio on the opposite side of the globe. This is an area which will change rapidly, and while access may be limited because of excessive bandwidth demands, as well as access to the necessary technology, it seems inevitable that there will be considerable expansion through this medium. Whether it will fully displace the paper medium is another matter. According to this survey, librarians in Australia believe that there will be some degree of movement towards the electronic delivery of newspapers within the next ten years.
Will all newspapers be published electronically within 5 years?

Respondents' Estimation:
1=Most likely; 5=Unlikely

Will all newspapers be published electronically within 10 years?

Respondents' Estimation:
1=Most likely; 5=Unlikely
All newspapers archived on CD-ROM within five years. [Q.16 (d)]

Table 7

<table>
<thead>
<tr>
<th>Type/Scale</th>
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<th>4</th>
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<th>Replies</th>
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<td>8</td>
<td>13</td>
<td>12</td>
<td>48</td>
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</tbody>
</table>

All newspapers archived on CD-ROM within ten years.

Table 8

<table>
<thead>
<tr>
<th>Type/Scale</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Replies</th>
</tr>
</thead>
<tbody>
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<td>10</td>
<td>7</td>
<td>8</td>
<td>5</td>
<td>3</td>
<td>33</td>
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<td>0</td>
<td>2</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>8</td>
<td>9</td>
<td>9</td>
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<td>48</td>
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</tbody>
</table>

The archiving of newspapers on CD-ROM is already happening and the majority saw this as continuing and expanding. The shift in opinion between five and ten years was not as marked as for full electronic delivery, however. Many consider CD-ROM to be an intermediate technology and that easy and cheap access to news media online may obviate the need for large CD-ROM archives. Nevertheless, CD-ROM, with its ability to store both text and image, does provide a compact and convenient means of storing bulky print publications. Indeed, it is doubtful that large back runs of all newspapers, particularly the more parochial, will ever be available online. Companies like Philips and Sony are continuing to develop and promote improved CD-ROM technology. As CD-ROM production technology becomes standardised and more widely available, it seems likely that its usefulness, particularly for newsprint storage, will continue to be recognised.
4.8.2 Electronic document delivery

A problem for libraries has been the provision of up to date scientific and technical literature. Lengthy procedures involved in the publication of books and refereed journal articles can mean that this type of resource can be several years out of date by the time it reaches the library shelves. As well, the process of hard copy provision can be very costly. Reasonable profit margins for publishers may inflate the price of technical
literature for which there is only a small, specialist demand. If technical literature can be provided in both a more timely and cost efficient manner through electronic delivery, it is in the interests of library clientele that this be achieved. Publishers, too, may be relieved of the obligation to publish material where profitability is uncertain. Indeed, the involvement of technical publishers in the electronic information industry (e.g. Elseviers) would indicate a belief on their part that this is the direction they will be forced to take in the near future if they are to survive. Librarians involved in the delivery of electronic information (as also in other areas: e.g.: library acquisitions) are well aware of the changes occurring in this area. Responses indicated a widely held view that online delivery of this type of literature was imminent. Indeed, the graphs indicate a stronger response than was the case for either newspapers or journals.

Technical literature available electronically (reports, journals, books, articles, conference papers) within five years. [Q.16 (e)]

Table 9

<table>
<thead>
<tr>
<th>Type/Scale</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Replies</th>
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</thead>
<tbody>
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<td>8</td>
<td>5</td>
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</tbody>
</table>

Technical literature available electronically (reports, journals, books, articles, conference papers) within ten years.

Table 10

<table>
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<th>Type/Scale</th>
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<th>3</th>
<th>4</th>
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<th>Replies</th>
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</thead>
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<td>33</td>
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<td>Total</td>
<td>15</td>
<td>19</td>
<td>7</td>
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</tbody>
</table>
Q16(e)

Will all technical literature be available electronically within 5 years?

Respondents' Estimation:
1 = Most likely; 5 = Unlikely

Will all technical literature be available electronically within 10 years?

Respondents' Estimation:
1 = Most likely; 5 = Unlikely
**Ready reference largely electronic within five years.**  [Q.16 (f)]

Table 11

<table>
<thead>
<tr>
<th>Type/Scale</th>
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<th>3</th>
<th>4</th>
<th>5</th>
<th>Replies</th>
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<tr>
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</table>

**Ready reference largely electronic within ten years.**

Table 12

<table>
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<th>Type/Scale</th>
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<th>3</th>
<th>4</th>
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</tbody>
</table>

Anyone who has worked on a busy library reference desk will understand the desire for a tool which can provide quick responses to at least some of the numerous and varied incidental/general queries which library patrons present. Achieving patron satisfaction may be high on one's list of priorities but difficult to achieve in fact when confronted with competing and often insistent, patron demands. Leaving the reference desk to search special reference tools located elsewhere is not always convenient and can cause unwelcome delays to other patrons. It is not surprising therefore, that librarians perceive electronic media as providing some measure of assistance. Networked resources, be they locally provided CD-ROMs or globally shared databases, which are accessible at the reference desk, are a welcome addition to reference desk resources. While it is unlikely that responses to library reference queries will ever be fully achievable through electronic means, there is a strong indication that this will be largely the case.
Q16(f)

Will ready reference be largely electronic within 5 years?

Respondents' Estimation:
1=Most likely; 5=Unlikely

Will ready reference be largely electronic within 10 years?

Respondents' Estimation:
1=Most likely; 5=Unlikely
All document delivery services available at clients desktop / workstation within five years. [Q.16 (g)]

Table 13

<table>
<thead>
<tr>
<th>Type/Scale</th>
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<th>4</th>
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</tbody>
</table>

All document delivery services available at clients desktop / workstation within ten years. [Q.16 (g)]

Table 14

<table>
<thead>
<tr>
<th>Type/Scale</th>
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<th>4</th>
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<th>Replies</th>
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</tbody>
</table>

It has been the expressed desire of some researchers that all their text-based information needs be met without their having to leave their offices. In the age of computer networks where many researchers do have appropriate access to the tools, this may well be achievable. One respondent to the questionnaire indicated that this was already happening at their institution. However, charges are usually attached to requests for electronic document delivery whether these be standard, photocopied articles faxed to the requestor or fulltext (ASCII format) papers provided through services like DIALOG (Knight-Ridder). As well, copyright restrictions on reproduction of documents obtained through Inter-Library Loans services require a signed agreement regarding the use of the material. Until electronic signatures are secure and in general use, and charging arrangements are equally resolved, a fully electronic document delivery service cannot be achieved. Nevertheless, it can be presumed that this development will be strongly supported by at least one sector of the library profession if the responses below are an
indication. Thirty-five of the forty-seven respondents stated that it was more than likely that all document delivery would be available in this manner within the next ten years. Only seven said that this was unlikely.

Q16(g)

**Will all document delivery be available at the desktop within 5 years?**

**Will all document delivery be available at the desktop within 10 years?**
Multi-media generally available at workstations in the Library (pictures, video, audio) within five years. [Q.16 (h)]

Table 15

<table>
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<tr>
<th>Type/Scale</th>
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</tbody>
</table>

Multi-media generally available at workstations in the Library (pictures, video, audio) within ten years. [Q.16 (h)]

Table 16

<table>
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<tr>
<th>Type/Scale</th>
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<th>4</th>
<th>5</th>
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</table>

The provision of multi-media (the combination of a variety of media: pictures, video, audio, text) in libraries is clearly accepted within both Academic and Public sectors. Twenty-two of forty-six respondents thought it likely that multi-media would be generally available at workstations in the library within five years. Within ten years the response was even more positive: thirty-six stressing its likelihood with only three considering it unlikely. Among the difficulties which libraries will face if multi-media is made widely available at library work stations is the obvious expense of providing not only equipment but also a suitable environment, containment of noise (using headphones or sound proof enclosures), supervision and adequate training of staff and users. Such demands on library budgets will mean either that libraries must limit this service, charge for its use, extend remote access or, most likely, perhaps, a combination of all three. However, it is clear that support for multi-media within the library environment is strong.
Q16(h)

Will multi-media be generally available at workstations in the Library within 5 years?

Respondents' Estimation:
1=Most likely; 5=Unlikely

Will multi-media be generally available at workstations in the Library within 10 years?

Respondents' Estimation: 1=Most likely; 5=Unlikely
4.8.3 Charging / Card systems, etc.

Coin or card operated machines providing network access for all resources (including Bulletin Board Services, e-mail, databases, gopher, ftp and telnet ..etc. within five years. [Q.16 (i)]

Table 17

<table>
<thead>
<tr>
<th>Type/Scale</th>
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Coin or card operated machines providing network access for all resources (including Bulletin Board Services, e-mail, databases, gopher, ftp and telnet ..etc. within ten years.

Table 18

<table>
<thead>
<tr>
<th>Type/Scale</th>
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</table>

"Internet cafes" appear to have gained popularity worldwide. The idea is to provide a drop in place for anyone wanting to use Internet facilities without the expense of purchasing equipment. Such services are now appearing in cities in Australia. In Sydney there is Remo's in George Street and Melbourne has the Netcafe at St Kilda. Even the National Library has joined the trend, providing Netscape access on two PCs in the Brindabella Bistro, with positive responses from patrons. It is assumed that an increasing number of libraries will provide some form of access to networked information services to their patrons, either within their walls or remotely as many now do. As indicated in earlier sections of this chapter, many database services are already

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being provided through the library. Network access to databases once only available through expensive, mediated online searches seemed to be a breakthrough in providing equitable access to all library patrons. However, there are now moves to charge end users for their use of the Internet. Only ten of the forty-five librarians who responded to this question thought it was unlikely that such a service would incur a charge. Eighteen thought it likely within five years and twenty-four, within ten. Since this questionnaire was undertaken, it seems certain that charges for network use will be passed on to the end user, whether within libraries or independently.

Q16(i)
All researchers conducting their own online searches via the network within five years. [Q.16 (j)]

Table 19

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<tr>
<th>Type/Scale</th>
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All researchers conducting their own online searches via the network within ten years.

Table 20

<table>
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</table>

Many researchers are now able to do their own online searches through databases provided over the network. Only some databases are available in this way at present. Many of the more comprehensive and expensive databases are either not available through the network or are only available to those with appropriate accounts and who are able to be billed for the service. Intermediaries are still necessary for such services. Librarians were asked if they saw a trend towards more searching being done by the "end user", the person requiring the information. While the initial response was that this was unlikely within the next five years, within ten it was more probable according to twenty-seven of the forty-seven respondents. Only nine thought it was still unlikely within ten years.
Q16(j)

Will all researchers conduct their own online searches within 5 years?

Respondents' estimation:
1=Most likely; 5=Unlikely

Will all researchers conduct their own online searches within 10 years?

Respondents' estimation:
1=Most likely; 5=Unlikely
4.8.4 Libraries / Librarians / ITS Units

The library as a physical entity no longer needed within five years.

[Q.16(k)]

Table 21

<table>
<thead>
<tr>
<th>Type/Scale</th>
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</table>

The library as a physical entity no longer needed within ten years.

Table 22

<table>
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<tr>
<th>Type/Scale</th>
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There has been much discussion both in print and elsewhere regarding the need for the continuing existence of the library as a physical entity. Most librarians are familiar with the main arguments for and against such a proposition: equity of access for the less affluent on the one hand; ease of access for the technologically privileged on the other. As might be anticipated, when asked for an opinion on this proposition, librarians expressed the view that it was extremely unlikely that libraries would no longer be needed within five years (forty-four respondents) with only a slight movement in opinion on this proposition 'within ten years' (thirty-six respondents still stating that such a change was unlikely). Libraries have existed as physical sites (if with varying purposes) for more than two thousand years. It seems reasonable to assume that they will continue to do so.
Q16(k)

Will the Library as a physical entity no longer be needed within 5 years?

Respondents' Estimation:
1=Most likely;  5=Unlikely

- 7 Major Public Libraries
- National & State Libraries
- Academic Libraries

Will the Library as a physical entity no longer be needed within 10 years?

Respondents' Estimation:
1=Most likely;  5=Unlikely

- 7 Major Public Libraries
- National & State Libraries
- Academic Libraries
Librarian's role becomes that of information consultant advising end users within five years. [Q.16 (1)]

Table 23

<table>
<thead>
<tr>
<th>Type/Scale</th>
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Librarian's role becomes that of information consultant advising end users within ten years. [Q.16 (1)]

Table 24

<table>
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<th>Type/Scale</th>
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</table>

While the perspective expressed as regards the survival of libraries may have seemed conservative, where the role of librarians is concerned, this was certainly not the case. The library profession was one of the earliest to be confronted with the introduction of computer technology. Computerised databases of bibliographic resources were first developed in the late 1960s and libraries have progressively automated most of their operations since then. Consequently, librarians, by the nature of their profession, have had to be open to change. New computer systems, new software packages, online information delivery, CD-ROM technology, multi-media, computer networks: the changes continue and often it has been in libraries where these technologies have first appeared or been adopted. Librarians view themselves as information professionals which is quite a different image from that portrayed by outsiders, particularly the mass media. Many would say their role is already that of information consultant to end users and their responses when questioned on their future role confirm that if they do not see
themselves in this way now, that this is the direction in which they will be heading within the next five to ten years. It is a highly motivated and confident view of their role, one which projects a positive image of a profession in transition.

Q16(l)

Will the Librarian's role become that of an information consultant advising end-users within 5 years?

Respondents' Estimation:
1=Most likely; 5=Unlikely

Will the Librarian's role become that of an information consultant advising end users within 10 years?

Respondents' Estimation:
1=Most likely; 5=Unlikely
4.9 Trend towards wholly electronic information publication, delivery and storage?

4.9.1 Newspapers and Web pages

In Australia as elsewhere, newspapers are beginning to appear on the World Wide Web. Browsers like Netscape allow easy, if slow, access to such resources and are becoming popular. *The Sydney Morning Herald*, *Melbourne's Age* and *The Australian Financial Review* all provide access to their computer pages via the Web. Access to overseas papers is also an area of interest. The British *Daily Telegraph* and the *New York Times* are two examples. Speed of access when using these services is a major drawback at present, but the potential of these developments is exciting.

4.9.2 Government publications on the World Wide Web

The Australian Federal Government and some of the State governments have begun making available their publications, including legislation, through Web pages. The National Library of Australia is an important link to these resources providing access nodes through its Web page. As more Public libraries come online through State networks like Vicnet, public access to government information will be greatly expanded. This is in contrast to recent moves by governments to limit distribution of many print publications to all but a few deposit libraries (discussed in Chapter Six). It will be interesting to see whether charges will attach to these services once they become more well established.

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21 Australian Federal Legislation direct web address is: http://austlii.law.uts.edu.au/
4.10 Conclusion

Libraries in Australia do not aim to make a profit through charging for online information services. They do, however, attempt to recover some of the costs involved in providing these services. In the few instances where profits are sought, these are aimed at outside users, clients who are not the main library patrons. Budgets for online information services are small. Indeed, they are significantly smaller than those for CD-ROMs. Nevertheless, libraries provide access to a good range of online services, both local and international. As well, they have entered into the new area of networked provision of databases with services like Uncover, OCLC First Search, ISI Current Contents and the Australian Ozline/SOFI databases being widely available to library patrons. In many instances, these are available remote to the library, end user searching being encouraged. It will be interesting to see what impact this has on other electronic services, not only on the traditional online searching provided by librarians but also on CD-ROM.

During the three year period preceding this survey, there appears to have been a slight drop in online searching through library intermediaries. This is more evident in Academic libraries than in the State libraries. However, the trend is by no means consistent, nor has the change been very marked. The significant point is that while library patronage has undoubtedly grown, there has been no real increase in library use of these services. The fact that such a service incurs a fee and services like CD-ROM and networks do not, is one factor. This is certainly supported by the enormous popularity of CD-ROM. Another reason may be lack of knowledge about the services which are available. Because these services are charged to the user, some promotion is necessary to 'sell' the service. If the full potential of the media available within and through libraries is to be achieved, librarians need to be proactive rather than reactive. They also need to be sure that the service they are offering will deliver a high quality product which justifies the fee. With so many new services available, attention will inevitably be focused on providing for information needs in the cheapest (for the client) and most effective or
efficient way possible. Online searching is both costly and requires a measure of skill on the part of the searcher which takes time and practice to achieve. Charging for the service only discourages use by those who might benefit from the expanded information resource these services provide. While no significant budget is provided for online services they are likely to continue to languish. A valuable resource, with significant infrastructure cost in terms of equipment and staff training, is under utilised and largely wasted.

Indeed, rather than continuing to maintain expensive facilities for these services, libraries would do better to "out-source" the least useful and most costly services on an "as needed" basis. At the same time, they should seek ways of making all essential database services directly available to end users via the network. This is already happening with services like Ozline, as was seen above. Joint library approaches to vendors like Ausinet and Dialog negotiating full access to their databases for an agreed annual charge would benefit both the library community and the database vendors. Librarians could then focus on facilitating access through training end users to do their own searching. This would prove a satisfactory result for all concerned: increased income for the vendors, improved information resources available to library clientele and affordable access for libraries as a group.

The final section of the survey dealt with the attitudes and expectations of librarians working within the present, changing environment of information delivery systems. It is anticipated that electronic information provision will become the norm and that end users will do more of their own information searching. In spite of suggestions to the contrary, librarians still see a place for libraries and for their profession. Networking of databases held the promise of easy access to online databases without the expensive charges and telecommunications costs of the traditional system. It seems likely, however, that charging for these services will be instituted. In a later chapter it is argued that if this occurs, an opportunity to provide greater equity of access will be lost. Nevertheless, it can also be argued that if online vendors can provide information directly to the end user,
an intermediary is an added expense. As more, high quality material once lodged in libraries is provided in this way, albeit for a fee and the "user pays" philosophy gains general acceptance, there will be no need for a library in the physical sense. Online vendors will provide an adequate facility.

The next chapter examines the role of vendors and producers of electronic information and the changes in ownership which are occurring in the online information industry. It investigates the way these changes are affecting the provision of and charges for online information services in libraries.
Chapter Five

Vendors and Producers: the Australian perspective

5.0 Introduction

Online information services within Australia have had a varied history. Many databases have originated within the public sector and their provision as publicly accessible databases has had a long connection with libraries. Ausinet, for example, had its origins within the library community. Chapter Four investigated the use of online information services in Australian Public and Academic libraries. This chapter looks at some of the changes which have occurred and examines the present situation asking what impact providing free database services would have on these industries. As was seen in Chapter Four, many libraries are under-utilising the services provided by online vendors. It is suggested that it is in their interests and that of the online producers to encourage libraries to provide their services to the public in the same way as they now provide text based services: without a charge.

The past decade has witnessed many changes in ownership within the online information industry, both internationally and in Australia. One of the most interesting changes has been the movement of print publishers into the field, perhaps fearing the loss of future markets as the predictions of electronic delivery displacing print become fact. As with many industries, the trend is towards a more international market. While the US has generally been seen as the power-base where the online industry is concerned, having the greatest concentration of ownership, and having more database producers than other countries, outsiders like Robert Maxwell have altered the balance of ownership somewhat. Prior to Maxwell's death, his company was reported to be the largest online database vendor. There are also active online information industries in Japan and other Pacific Rim countries like Australia. Publishers and mass media
conglomerates are investing heavily in the industry, and, with the growth of a strong information marketplace, active industry associations have been formed. After investigating the various online sectors: where online vendors and producers fit in the delivery of online information to libraries, this chapter looks at the ownership and size of the industry and the changes that are occurring. Estimates of the industry's value, both here and worldwide are discussed and the significance of "globalisation" of this market is explored. The Australian market is small by world standards. Within this, the market for online services within the Public and Academic library sectors in Australia, as was shown in Chapter Four, is smaller still. It is argued that measures might be taken, with limited allocation of funds to provide free access to online services in these libraries, and that this would benefit both the library patrons and the online service providers.

5.1 Online Information Sectors

John Convey\(^1\) lists five main sectors of the online information industry:

1) **the database producers**
2) **the online service 'hosts' or 'vendors' or 'suppliers'**
3) **the users: libraries, information brokers, end-users**
4) **the telecommunications sectors: providing networks and gateways between sectors**
5) **the hardware and software suppliers**

Added to this, there are companies that provide links between a number of online vendors and their users, which do not fit exactly into the above groups, although they may also be vendors. As Convey points out, these sectors are not mutually exclusive. When a database resource is first developed, the producer may be the vendor of their

own service, at least initially. Indeed, they may continue to be, even when a vendor like Dialog also supplies their service. Medline is an example of this.

Online vendors do not necessarily own the information they sell. Convey’s use of the term "host" is probably a better indicator of their role, although the term "vendor" is more commonly used in US and Australian literature, and is the one favoured throughout this text. It is the producers who license the vendors to provide access to their information and who place restrictions, such as copyright, on the use of this information. The vendor companies build up their business through accumulating the rights to distribute a number of marketable databases using software they have developed, or lease or have purchased from a software development company. As well, they target specific groups to whom they can successfully market their services, the third group in Convey’s list: the users. Importantly, Convey includes the telecommunications sectors and the hardware and software suppliers. However, a sixth sector could also be added: that of major conglomerates, particularly those involved in traditional publishing. Indeed, the success of the online service sector is evident from the active participation of such groups in the company ownership changes that have occurred in the past eight years, and the amounts paid for these companies. It is doubly so when it is remembered that it is not the information that is being sold here, but the means of gaining access to it, and the established market base.

5.2 Online Vendor Ownership: Changes

In discussing the changes in ownership that are occurring, this section focuses on those service providers which were shown to be important to the library sector in Australia in the preceding chapter. Within the international sphere: Dialog, BRS, Orbit and Lexis-Nexis are among those vendors considered, and, within Australia: Ausinet, Ozline and
Australis. As mentioned earlier, similar changes to those taking place within the industry worldwide are occurring in Australia. It seems that what happens elsewhere may have both direct and indirect effects on services locally, an example being the entry of publishing concerns into the database industry. The Dialog/Knight-Ridder connection was one of the first major changes in ownership that presaged the continuing convergence of these two industries.

5.2.1 Dialog/Knight-Ridder

In 1966, Lockheed Missile and Space Company introduced the Dialog system internally for its 300,000 NASA reports. It was launched as a commercial venture in 1972 with only a few databases and was valued at US$500,000. By 1981, the value of the company was estimated at US$70 million. Dialog was sold to Knight-Ridder in 1988 for US$353 million, the number and breadth of databases provided having increased commensurately. Convey states that the company's target markets at that time were the business and financial communities.

When asked about this in June 1990, however, the company representative was reluctant to name exactly what the companies target group was, fearing perhaps bad publicity in the information services sector which includes libraries (public and private sector) and information brokers: a large part of the company's established market. More recent discussions indicate a shift towards the end user market, although, as is clear from the literature, the business and financial sector are likely to remain the main

\[2\text{Ibid.}: \text{p.16.}\]
\[3\text{Ibid.}: \text{p.17.}\]
\[4\text{Ibid.}\]
\[5\text{Ibid.}\]
\[6\text{The current catalogue (1996) lists more then 450 database services.}\]
\[7\text{Interview with Jean Tyan at Dialog's main office in Palo Alto, June 1990.}\]
income producing areas as they have been for online service delivery in general, in the past.

The range of Dialog services continues to increase. The acquisition of the European service, DataStar, in February 1993, added to the range of services available, just as the acquisition of Dialog by Knight-Ridder itself had extended the fulltext and other services available through Dialog. Indeed, the name by which this group of databases is known changed officially at the beginning of 1995. Knight-Ridder Information (KRI) now appears uppermost on communications with the company, with Dialog and DataStar listed as two of its products. Among the most recent additions to KRI's resources is the CARL Corporation from the Colorado Alliance of Research Libraries.10 The latter group had provided the Uncover document index and supply service via the Internet since 1992 and had entered into a partnership with Blackwell Ltd to market this service in 1993. Uncover provides access to the contents pages of in excess of 17,000 journals, from the collections of the CARL group of libraries. Documents can be delivered by fax and account or credit card facilities are available. While this represents only a small percentage of the 147,000 serials listed in Ulrichs,11 the collection continues to expand. The success of this service is indicated by the reluctance of some journal publishers to have their journals listed on this service for fear of losing subscriptions.12 Blackwells will continue to market this service but it is now a valuable asset among the KRI group of database services.13

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9 Based in Berne, Switzerland. At the time of acquisition, Knight-Ridder proposed to develop Datastar separately from Dialog and maintain the strengths of both (Sherry Quinn. (ed.) Recipe Book of Online Searching. 13th ed. Doncaster, Vic.: Online Information Resources, 1994: Section on DataStar p.1).
12 For example: Gordon and Breach have refused permission for the contents of their expensive range of academic publications to be listed here. [Reported 4 Dec. 1992 on Library Collection development list COLLDEV-L]
The Australian agent for Knight-Ridder Information is Insearch Ltd, based at Haymarket in central Sydney.\textsuperscript{14} While training and contracts for the provision of services is undertaken by this company, records relating to use of services, particularly as regards the extent of Public and Academic library use, were not held.\textsuperscript{15} Billing for services has generally been through the main KRI office in California, where records are kept. As mentioned earlier in this section, a request for this kind of information from that company (then Dialog) was refused. While some corroborating evidence from vendors to support the findings in Chapter Four would have been a benefit, discussions with this and other vendors\textsuperscript{16} indicate that the findings were correct: that the usage from the Public and Academic library sectors is low in comparison with that of the "Special Libraries."\textsuperscript{17}

Knight-Ridder is now one of the largest online information providers in the world. Ownership changes occur daily and events other than those concerned with the business operations of the company, can affect the industry, as witnessed in the fortunes of the next vendor of online information services to be considered, the once influential Maxwell Online.

5.2.2 Maxwell Online: InfoPro Technologies

At its peak, Maxwell Online was reported to be the world's largest online information service, governing, as it did, two well established database vendors: BRS and Orbit. The Systems Development Corporation (SDC) developed ORBIT (Online Retrieval of Bibliographic Information Time-shared) retrieval software in the mid 1960s, and in 1967 cooperated with the National Library of Medicine in making Medline (MEDLARS) available. ORBIT was bought by Pergamon Infoline in 1986 and became

\textsuperscript{14}Quinn, op.cit.: Section on Dialog: p.[1].
\textsuperscript{15}Phone interview with Robin Kench, Insearch, Nov. 1995.
\textsuperscript{16}For example: Ausinet. This is discussed later.
\textsuperscript{17}Libraries set up for specific purposes like those within business, the legal profession, the banking sector, the medical profession, government departments and the like are often referred to as "Special Libraries".
Pergamon ORBIT Infoline (a combination of the two services). The company was renamed Maxwell Online in 1989. BRS (Bibliographic Retrieval Service) was established in 1977 when it had only 10 databases. It was bought by Maxwell in 1988, becoming part of Maxwell Online. ORBIT now has over 100 databases and BRS over 150. In October 1992, following speculation about the company being resold, the company announced that it was "refocussing" its online information services in order that it might "take advantage of their inherent strengths and ultimately achieve...their greatest market potentials." Along with this refocussing came a change of name to InfoPro Technologies.

Further changes have occurred. InfoPro has since sold both BRS and ORBIT. BRS was acquired by CDP Technologies in March 1994. At the same time, ORBIT was purchased by Questel (France Telecom Group). While Maxwell Online is now defunct, the two database resource providers: BRS and ORBIT survive and continue to be among the most popular and valued information services provided in libraries.

5.2.3 Mead Data Central: Lexis/Nexis: Reed Elsevier

Among the more surprising ownership changes reported in 1995 was that of the US based Mead Data Central's Lexis/Nexis service. LEXIS, Mead's legal fulltext service, was launched in 1974. The service originated from a resource developed by the Ohio Bar Association around 1960 to keep track of State legal records, and was purchased by Mead Corporation in 1970. The NEXIS service (largely newspapers, and wire services) was made available in 1983. LEXIS/NEXIS provides the world's largest legal and fulltext online service receiving around 85,000 calls (1993 report) to its computers.

20Ibid. Section on: ORBIT: p.[1].
21Ibid. Section on: LEXIS/NEXIS: P.[1].
each day.\textsuperscript{22} In 1986, the estimated number of users was 170,000.\textsuperscript{23} Its popularity was established because of the unequalled range of fulltext services it provides and in spite of a system which was difficult to use for the uninitiated. However, the search software has recently been upgraded to provide easier access for end users. The purchase by Reed Elsevier, the European based publisher, in 1994 of the Lexis/Nexis Service \textsuperscript{24} was a surprise to observers of this industry. Even given the obvious convergence of publishing and electronic information delivery systems which has gained momentum in the past three years, that such a strongly US based service should no longer be owned by a US company is a reversal of the accepted North American hegemony in this industry.

\textbf{5.24 Other International Vendors}

There are many other companies providing valuable online database services some of which are used, although to a lesser extent than those discussed above, in Australian libraries. Reuters is one. It commenced as a news service back in the 19th century (UK). In 1989 it had an estimated 90,000 customers.\textsuperscript{25} Among the companies it has acquired in the past few years are Finsbury and IP Sharp. Finsbury, which provides financial information (1964+), was purchased for £11 million in 1987; and I.P. Sharp, a Canadian company whose databases include those from the IMF, the OECD, and some covering US, Canadian and Australian economics, was purchased in 1987, for US$48 million.\textsuperscript{26}

A well known North American news media company, the Canadian based, Thomson Corporation has also seen the potential of the emerging online markets. It has significantly reduced its newspaper holdings in favour of the lucrative online market

\begin{footnotes}
\item[22] Convey, op.cit. p.19
\item[23] ibid.
\item[25] Convey, op.cit. p.22.
\item[26] ibid.
\end{footnotes}
from which approximately half its income is now derived. Among the electronic
database services it provides, and to which Australian libraries subscribe are Derwent
and Information Access Company, the latter providing a range of CD-ROM databases
including Academic Index. These shifts in focus of large companies like Thomson's are
likely to continue, especially with the increasing access to networked information
services now so popular, not only with research and educational institutions but also
with business in every field. These shifts are not restricted to North America. They are
occurring throughout the world, as has been shown.

5.2.5 Australian Online Services: Ausinet, Ozline and Australis

In the Australian online database industry, many changes have occurred as regards
ownership and control and continue to occur. In the survey conducted in mid 1994 and
dealt with in Chapter Four, Ozline and Australis were listed separately. At about that
time, Australis databases were taken up by the National Library of Australia (NLA) and
are now offered through the NLA's Ozline service. This movement of database
offerings is not new in Australia. The now privately run, Ausinet database service for
example, was developed in 1977 through the National Library with the cooperation of
other libraries in Australia. It moved to the private sector in 1980. Some of the
database services it offered at different stages of its evolution included those later
offered either by Australis or through Ozline. Over the years, Ausinet has retained
services which it can operate at a profit. Those which are unprofitable but important
from a research or socio-economic perspective have been maintained and provided
through the support of public sector organisations like the National Library and the
CSIRO and hence offered through their respective services, Ozline and Australis.

27 Global Online Power Brokers on the move. op.cit.
28 Sarah Henderson. Online information networks. In: Peter Biskup and Margaret Henty (eds). Library for the
Ausinet still provides an important range of databases, including some fulltext news and business sources, and is a highly valued service among online service librarians (It rated highly along side Ozline and Australis in the survey results). Its perceived value is not limited to the library profession, however. On February 1, 1995, Ausinet was sold by its owners, Ferntree Computer Corporation, having been purchased by the Australian newspaper company, John Fairfax Holdings Limited, mirroring the trends seen internationally of newspaper and other publishing organisations purchasing large online database companies (For example: Knight-Ridder and Dialog; Reed Elsevier and LEXIS/NEXIS mentioned above).

While Ausinet is an important Australian library resource, the Public and Academic library sectors do not appear to be that company's major source of income. Indeed, in discussions with Ausinet's Gay Walsh, the question was put as to whether these libraries were indeed only minor users of their services, as the figures provided in Chapter Four suggest. While no firm statistics were available, it was indicated that the figures gleaned from the survey were consistent with Ausinet usage patterns, and that the majority of their income was derived from "Special Libraries", such as those in the business, legal, medical and government department areas. Again, it must be restated that while libraries have invested heavily in equipment and in staff training to provide these services the number of searches conducted and the amount actually spent on searches is quite small. Resources are under-utilised and largely wasted.

5.3 Growth and value of the industry

The growth of the international industry can be seen in the graphs, and can be summarised in the table and graphs which follow:

30 Phone Interview with Gay Walsh, Ausinet, Nov. 1995.
Number of Vendors, Producers and Databases (See Figs. 1 and 2)³²

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<tbody>
<tr>
<td>Databases</td>
<td>301</td>
<td>528</td>
<td>773</td>
<td>3010</td>
<td>4200</td>
<td>5578</td>
<td>6750</td>
<td>7637</td>
<td>7907</td>
<td>8261</td>
<td>8776</td>
</tr>
<tr>
<td>Producers</td>
<td>200</td>
<td>316</td>
<td>422</td>
<td>1210</td>
<td>1733</td>
<td>1950</td>
<td>2224</td>
<td>2372</td>
<td>3007</td>
<td>2744</td>
<td>2778</td>
</tr>
<tr>
<td>Vendors</td>
<td>105</td>
<td>263</td>
<td>311</td>
<td>614</td>
<td>750</td>
<td>770</td>
<td>850</td>
<td>933</td>
<td>1438</td>
<td>1629</td>
<td>1691</td>
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³²*ibid.*
In Australia, the industry is quite small, but similar trends in growth can be observed. The table and graph below indicate the changes that occurred between 1984 and 1990. The level of increase is less marked between 1988 and 1990 than is the change internationally. Much use is made of US based services in Australia. This may have a similar influence on database production to that experienced in other sectors (for example: television programmes). It obviates the need for parallel developments. However, the jump between 1990 and 1992 indicates much more activity in this two year period.

**Number of Australian Databases**

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<tr>
<td>Public</td>
<td>65</td>
<td>141</td>
<td>193</td>
<td>203</td>
<td>340</td>
</tr>
<tr>
<td>Planned</td>
<td>31</td>
<td>21</td>
<td>6</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>162</td>
<td>199</td>
<td>204</td>
<td>350</td>
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</tbody>
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It is difficult to obtain figures on the online industry that are consistent. The Information Industry Factbook,\textsuperscript{34} provides some information and was published annually until 1991. Convey\textsuperscript{35} gives some figures on the online industry revenues, but it is difficult to make comparisons over a number of years as statistics do not always include the same companies and other factors may have changed. The OECD 1993 report on the database market\textsuperscript{36} and Martha Williams annual update\textsuperscript{37} give useful overviews. The later is probably one of the best sources of data for US and international figures as it is regularly maintained. Australian statistics have been published in the Australian Database Development Associations Directory\textsuperscript{38} which is published irregularly and provides a summary of the Australian database industry similar to that provided by Martha Williams (mentioned above) for the international market. Delays in publication have made this source considerably out of date. More recent information has been obtained from data provided in articles by Sherry Quinn\textsuperscript{39} and Elizabeth Oley\textsuperscript{40}. Differences in interpretation and collection make comparisons

\textsuperscript{35}Convey, op.cit.
\textsuperscript{36}OECD, op.cit.
\textsuperscript{37}Williams, op.cit.
\textsuperscript{39}Quinn. op.cit.: 49-69.
\textsuperscript{40}Oley. op.cit.: 369-378.
difficult. Statistics for particular sectors may be included in some reports and excluded in others. With these difficulties in mind, the following gives some indication of the size of the market.\textsuperscript{41}

The North American market according to a 1989 report was estimated at US$6.3 billion.\textsuperscript{42} (In 1988, DIALOG on its own, had been reported to have had sales of US$100 million, and, in the same year, was bought by Knight-Ridder for US$353 million.\textsuperscript{43}) In a 1987 report, the Western European market was said to be between US$600-700 million with an annual growth rate of 28\% to 32\%, and expected to be around US$2,000 million by 1990.\textsuperscript{44} At that stage, the UK figure was estimated at US$245 million.\textsuperscript{45} By 1990 the UK market was between £500 and £600 million (excluding Reuters, whose turnover alone was £1,000 million).\textsuperscript{46} According to the OECD Report, Western Europe, including the UK (US$867) was estimated at US$2,800 in 1990.\textsuperscript{47} It is difficult to obtain precise and up to date statistics, as has been pointed out in the documents referred to here.\textsuperscript{48} This is equally the case in Australia where the market is much smaller. A recent ABS document on the Information Technology was unable to give adequate figures for online information services. The same was true of the Bureau of Transport and Communications Economics (BTCE) report \textit{Communications Futures}\textsuperscript{49} which while indicating that online database statistics were not available estimated that the current value of information and communications services in Australia was $30 billion. Income figures were available for the majority of areas and amounted to $22 billion. Again, the difficulties in making any realistic estimate are apparent. Figures on the online industry are inconsistent.

\textsuperscript{41}Drawn from Convey, \textit{op.cit.} p.33ff.
\textsuperscript{43}Convey, \textit{op.cit.}: p.34
\textsuperscript{45}\textit{Ibid.}
\textsuperscript{47}OECD, \textit{op.cit.}. p.49.
\textsuperscript{48}A comparison of the figures quoted in Convey with those appearing in the charts in the OECD report illustrates some of the problems and differences in reporting.
Reports do not all include the same companies and other factors may change. Some sectors of the industry may be included by some and excluded by others. However, the considered opinion is that these resources are not insignificant.

While the income of this industry, and of individual vendors seems large, as a percentage of that earned by the parent company, it may be quite small. For example, Pergamon ORBIT Infoline's income in 1988 was only 0.2% of that of Maxwell Communications Corporation. As in other industries, the online industry is subject to takeovers, mergers, and the usual reactions to market forces. Some vendors aim for a particular market niche, rather than compete with other vendors in the wider market, trying to cover all areas. Uneconomic databases will be withdrawn. This is clearly seen on a small scale in the Australian industry, where the less economic databases have been dropped by Ausinet, some being taken up by government supported organisations such as the National Library or CSIRO. Where industry ownership is continually changing, and rationalisations are required to ensure profitability, some socially valuable database services may well disappear.

5.4 Globalisation of the Online Database Industry

"... the flow and demand for information is truly global."\textsuperscript{50}

"As our world shrinks, our concern for the genealogy of the products and services we use decreases and single national powers in any individual field disappear."\textsuperscript{51}

In her article on the changing patterns of ownership within the information industry, Hlava\textsuperscript{52} expresses concern that not enough thought is being given to the implications of these changes. Decisions within the US are being made with short term gains the only

\textsuperscript{50}Hlava. \textit{op.cit.} : p.12.
\textsuperscript{51}\textit{ibid.}
\textsuperscript{52}\textit{ibid.}
concern. Her chart\textsuperscript{53} shows some interesting relationships, many indicating the extent of outside ownership of what might be expected to be strictly US concerns. Charts like this, change very quickly. Maxwell, Mead, Murdoch, Elsevier are listed and have all experienced changes since 1993, as indicated earlier in this chapter. Some have suggested that the power and influence of these groups on individual access to resources may be over estimated. The power of people like Rupert Murdoch, according to his biographer, Michael Shawcross,\textsuperscript{54} may diminish as technology makes it easier to cater to smaller interest groups. Balancing the interests of the online vendors and the consumers may not be a simple task in an industry which now crosses international boundaries.

Where the industry is concerned, powerful lobby groups have been formed to ensure their rights are protected. Some examples include: the Information Industry Association (IIA) in the US; the Australian Database Development Association (ADDA); and the Global Alliance of Information Industry Associations (GAIJA). The IIA has been particularly active in the US, defending vendor interests well although often contesting public access provisions. Arguments for public access to information where public funding is involved and overlap occurs with private sector markets is an area of continuing concern and one which raises protests from the library profession, particularly in the US (This is taken up in Chapter Six). The involvement of international participants who may own the rights to market resources produced within the US is one of the concerns raised by Hlava in the article mentioned above. Where even public utilities (libraries and library resources among them) may be sold to interests outside the country in which they reside, her concern is understandable.

However, it is not a recent suggestion that industries are becoming if not global than at least international. Tom Stonier stated in 1983 that: “Productive processes are no

\textsuperscript{53}ibid, pp.14-15.

\textsuperscript{54}Interview on ABC television, 1994.
longer confined to a single nation but rather have become transnational."\textsuperscript{55} This is evident in the distribution of ownership of online information companies. Whether it is global may be a matter for dispute:

"At the moment, the expression 'global information market place' effectively means Europe, North America and Japan trading information with themselves. Whatever this marketplace is, it is not 'global'."\textsuperscript{56}

Hlava supports this view considering only the following as truly "global players":

- Reuters Holdings
- Dow Jones & Co
- Telerate Inc.
- Quotro Systems Inc.
- Automotive Data Processing (ADP)
- Knight-Ridder
- Dun & Bradstreet

All but one (Dun & Bradstreet) are leading financial providers. All but one (Reuters) have their headquarters in the US. (Recall that while their headquarters and major point of operation may be in the US, ownership may rest elsewhere.) Where bibliographic databases about Science and Technology are concerned, DIALOG is seen as the only financially "solid" company in this area.\textsuperscript{57} Global databases in the business field have difficulties because of limited standardisation across areas such as accounting and law. Dun & Bradstreet is one of the few global players in this field.

"Financial services represent the information segment that is driving the growth of the market where six out of seven of the global players are mostly active."\textsuperscript{58}

\textsuperscript{56}OECD. \textit{op.cit.} p.113.
\textsuperscript{57}ibid. p.114
\textsuperscript{58}ibid.
Networked financial information services along with the provision of market news and market data and the immediacy of transactions, generate a high level of competition among participants in this industry. However, there are many problems to be confronted before effective global trading can be established. Among them: technical standardisation, standards for access software, legal and regulatory standardisation, extending knowledge of the resources which are available, timeliness or value of the resources, language barriers59 and access to the technology. The General Agreement on Tariffs and Trade (GATT) Uruguay round of talks which concluded in December 1993, attempted to address a number issues relating to trade in 'services'. Such agreements are limited in their global affect by the extent to which the signatories are able to accommodate the requirements within their own country's regulatory system.

5.5 Conclusion

Mergers of companies are occurring across what were once quite distinct areas of interest: telecommunications; news media (print and broadcast); entertainment media (film and TV); publishers of books and journals; and hardware and software companies. Many recent agreements have been struck between telecommunications companies like MCI and news and broadcast owners like Murdoch; book and journal publishers with online service providers: Reed Elsevier and Lexis/Nexis; newspaper corporations and online services: Knight-Ridder and Dialog (or John Fairfax and Ausinet in Australia); software and hardware companies such as Microsoft and Apple entering the online market with their new services; telecommunications companies like Telstra purchasing AARNet, giving them a stake in the Internet market and further entering agreements with Microsoft and Murdoch, and also IBM; and finally, Delphi's imminent entry into the Australian online market, a competitor with services such as the Fujitsu owned Compuserve, which itself is attempting to increase its market through

59In a survey of 500 users in EEC countries conducted in 1988, seventy per cent conducted online database searches in a foreign language, forty-two per cent said language was a key factor in their selection of a database host, and fifty-three percent though language important in selection of databases. In English speaking countries, language is not seen as a barrier as the majority of resources are in English. [OECD. op.cit. p.98.]
providing Internet access along with its traditional services. The situation is nothing if not complex and growing more so every day. What does all this mean for the ordinary library user wanting reasonable access to information resources?

There is an opportunity in Australia to improve access to online information delivery which will benefit both the library user and the information vendor, while ensuring that expensive investment in library personnel and equipment are not wasted through under-utilisation. As indicated in this chapter, vendors have confirmed that the library sectors under consideration in this thesis, the Academic and Public sphere, are not the largest users of online services. What is being proposed could be achieved through cooperation among libraries, as already occurs with some database provision, and through modified contracts between libraries and vendors for reduced fee structures when broadly based access is provided. Many international vendors already offer this. Ausinet plans to introduce more flexible fee structures and an improved user interface, as well as providing access via the Internet, in the near future. Any increase in use would be an advantage to vendors.

One thing is clear, there are large profits to be made in this industry. While this may be good for the world economy and in terms of the breadth of what is available through electronic services, it is important that not all value be seen in terms of dollars and cents alone. However, it must also be said the transition from text or print based services to electronic information delivery appears to some degree to be irreversible and it might be suggested that the interests of corporations like those listed above is a good indicator that this is indeed the direction that this industry will take. What is at stake here is the ordinary, everyday access to information resources which provide a basis for the educational and economic well being of society. If this movement from print to electronic information delivery is indeed irreversible, and current developments relating to the Internet would suggest that it is, there is a danger that all material stored

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60 Interview with Gay Walsh, Nov. 1995. 1997 was mentioned as the likely date for Internet access.
electronically will be controlled by the market. Whether electronic or print, library provision of electronic information is essential if equitable access is to be maintained. The medium of delivery should be irrelevant.

A further argument for equitable access to electronically produced information is that much of its production has relied on the support of governments both in terms of content and for the development of the delivery mechanisms. This theme is taken up in Chapter Six.
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61 Hlava, op.cit.: 14-15.
Chapter Six

Government and Online Information Delivery

6.0 Introduction

What is the role of government in maintaining equitable access to online information resources? In the last chapter, the role of the online information vendor was shown to be not unlike that of a book or journal seller. Online vendors provide a marketable, if intangible, commodity which is more easily distributed than its paperbased equivalent. Some have suggested that the spread of information technology, and through it, the creation of a more informed society through greater access to information, promises a true, participatory democracy, and that such a form of government might provide the ultimate in individual freedom.¹ This point of view assumes that society is "technology driven", and that the technology has human attributes: is innately moral and ethical: unaffected by the values and needs of its developers or by those who manipulate it. Nevertheless, the potential of the technology to provide a more informed society, although not inevitable, cannot be denied.

In his book: *The Information Society*, David Lyon remarks that governments, while emphasising the 'rolling back of the state', as witnessed in the privatisation debate, have, at the same time, strengthened state control over social and economic life. He also points out that government policies have an important bearing on information technology.² These issues are of particular concern when considering the role of the state as provider of information. Part of the states role in this sphere includes both the establishment of publicly accessible libraries, and the various deposit schemes which make available the documentation of the work of government, which is produced by the

official printing agencies and other government offices. With the increasing electronic storage of information, information available in print publications, once freely accessible, is likely, in some cases, to disappear. Debates surrounding these issues, include: the depository obligations of government as regards electronic information storage; database content and the issue or profit vs the public interest; private vs public ownership of databases; science and technology information policy issues; privacy; and access to information even when provision is free. These issues will be discussed in the following chapter. In conclusion, areas relating to the role of the state to be further investigated within this thesis will be noted, particularly those relating to legislation and to the likely affect of network developments in the US and Britain, and in Australia.

6.1 Depository obligations of government

To date, there has been little debate in Australia over the issue of library deposit of government information in electronic format. However, this has not been the case in the US. A report from the Task Force on Government Information in Electronic format which was published in October, 1987 by the US Association of Research libraries, stated that "political decisions about meeting Government's obligations to provide information should not be contingent on format". Indeed, it went on to suggest that information should not be excluded from the Depository Library Program on the basis of format, and that information provided by Federal agencies through the Depository Library program should include those in electronic format. More recently (late 1992), the GPO Gateway/WINDO legislation sponsored by Senator (now Vice-President) Al Gore, promised to guarantee some degree of public access. Since then, much experimentation has occurred via World Wide Web sites, for example, through the Library of Congress. This will be discussed later.

The custom of providing access to government publications through central deposit libraries is one which is well established in most western democracies. Not only does this promote, at least in theory, the ideal of an informed society, able to participate actively in the decision making process, it also provides a record of the activities of government.4 Such records are a valuable resource given the variety and depth of research undertaken by the many government departments. While library deposit is generally accepted, and in many cases enshrined in legislation, this arrangement is largely restricted to printed (i.e. paper based) publications. Where electronic media is concerned, no such provision has existed.

In the US, the Federal government's policy has been to reduce costs by eliminating some publications, while transferring the production of others to the private sector. "The prevailing values have shifted perceptibly from informing the public, to economic considerations."5 Some librarians appear to support this view,6 and speak of "the utter folly of trying to supply depositories with electronic government data".7 Others, however, including the American Library Association, express concern that moves towards privatisation of government publications, should not limit access to this information, which has been compiled at tax payers expense.8 One interesting development in Australia, which may help expand access here, was the announcement (August, 1993)9 that the New South Wales (NSW) government would remove copyright from all Acts and subordinate legislation to remove impediments to electronic dissemination of this public resource. This is a move in a direction similar to that applying in the US to all government publication.

9Online Currents. v.8(10):10.
Attempts have been made in the US, to extend the definitions of "printing" and "publication" as represented in the depository legislation, to incorporate all formats, including electronic automated databases. This initially failed because of constitutional problems. Further attempts were mooted however, and an Ad Hoc Committee on Depository Library Access to Federal Automated Databases was formed, which would report on the extent of Federal information in electronic form, whether depository libraries had the facilities to access this information, and what the cost and benefits of providing information in electronic form would be. This committee's report unanimously supported the principle of providing access to Federal information in electronic form through the depository libraries system, and pilot projects were proposed. However, these projects were deferred temporarily because of funding difficulties. By late summer 1988, some "test" deposit libraries had been supplied with US Census data on CD-ROM, but other projects were reported as still being in development stage in Spring 1989. In a paper presented at the 1987 Information Online conference in Sydney, Joseph Price was optimistic about the US Federal government's intentions as regards public access to information. While there is likely to be more government intervention where government information is concerned, Price considered this desirable if the rights and needs of both citizens and the private sector are to be fairly balanced.

In Australia, as in the US, cutbacks in the provision of government publications have been suggested, and in the future, fewer publications are likely to be available to

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11Morehead, :170.
12Joseph W. Price "Issues in government information delivery." In: Information online 87: preprints...
15Price, :267.
libraries. Indeed, in 1992, the NSW government withdrew depository status from the majority of University libraries throughout the State, at the same time privatising the GPO. Universities will have to continue purchasing some of this material to support teaching, but many publications will no longer be available outside the capital cities. The Australian Federal Government continues to provide publications to the National and State libraries and to twenty-seven University libraries throughout the country. Government information in electronic form is not included as part of the depository scheme. For example, while Australian Bureau of Statistics print and microfiche publications are supplied as deposit copies, the CData compact disk of Census information must be purchased. As network access expands, provision of some government reports is being provided through World Wide Web pages (as mentioned in Chapter Four). The Federal government has been active here, particularly through the National Library. State governments too, are supporting programmes which extend access to information to ordinary citizens, as witnessed in the Vicnet project within Victorian Public libraries. Governments in Australia have an important role to fulfil in maintaining and facilitating access to information for all their constituents.

There has been much discussion over the role of government in the information industry, notably in the debate over a national information policy for Australia. In relation to this debate, a workshop on scientific and technological information was conducted in 1986, and subsequently, in 1987, a study on this topic was set up by the Department of Science. While the latter study emphasised the fact that the Australian government has an interest in ensuring that the best value for money is obtained from publicly funded information services, it seems doubtful that, given the current climate, depository rights will be extended to include electronic databases, although, as mentioned above, the text of many government reports are being provided. However, this is an issue which will be of increasing importance if governments are to fulfil their role of informing the

18 Canberra: Dept. of Science, Scientific Development Division, 1987: 3.
public. It is one which deserves close consideration both from librarians and the wider library community, including the people they serve. In more recent reports relating to information policy (one from the Bureau of Transport Economics\(^{19}\) and another from the National Information Services Council\(^{20}\)), the emphasis is on technical infrastructure, the telecommunications networks, rather than on information services in terms of content.

6.2 Database content: profit vs public interest

One of the main questions of concern here is: will the for-profit motive mean that only certain information is collected and maintained? Geoff Holland's report\(^{21}\) on *The development of government online information services* found that government department databases were often compiled on an *ad hoc* basis, without clear guidelines, following the needs of the department. Many have made their databases available to the public for general access. The decision to provide access was often taken without a clear understanding of the information needs of the users. Sometimes the initiative to produce a database was at the behest of a database vendor, the department library inputting the information and receiving a small royalty in exchange. There may be little interest in improving the service, many managers taking a *laissez faire* approach.\(^{22}\) This is not surprising in an industry which, by international standards, is quite small.

In the US by contrast, the industry is an active and lucrative one. Fierce court battles have ensued over data ownership and control. The Information Industry Association (IIA), the powerful private sector lobby group, emphasises the importance of achieving a public/private partnership, pointing to the success of the Security's Exchange


\(^{22}\) *ibid.*
Commission's EDGAR project. Other, less powerful groups protest that the public is paying twice. Agricultural databases are one area where privatisation has meant markedly increased charges, as well as concern that some information may no longer be available at all.

It is important to remember that the database industry in Australia as elsewhere was initially developed within the public sector with government funds. This has been noted in earlier chapters of this thesis. The graphs shown below indicate the changes which have occurred as the online industry has developed in Australia. The major database producers are now within the private sector. While this may be the case, the graphs do not make clear the extent to which these private resources make use of publicly collected data. As mentioned in Chapter Five, databases have moved to and from the private or public sector dependent on profitability. Where economic viability is not possible, but content is valued, as in the case of some CSIRO databases for example, it is important that these resources continue to be supported.

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24 Frances Seghers. "Computerizing Uncle Sam's data: Oh, how the public is paying: giving the private sector the job has led to higher fees for the information." In: Business Week. Dec.15, 1989:102-103.
25 CSIRO: Commonwealth Scientific and Industrial Research Organisation (Australia).
6.3 Information Policy

Information Policy has had a varied history. Anne Whitehead, the Senior Executive Officer of the Information Exchange Steering Committee of the Department of Finance in her 1990 report on Government Computerisation Policy in Australia, provides an outline of the history of IT and Information Policy as part of an international study of government computerisation policy and information technology in the Asia-Pacific countries. Whitehead commented that, at that stage, there was no body with an overall focus for the development of a National Information Policy. A number of reports had been published in the 1980s: e.g.: the 1985 documents from the Department of Science in 1985. More recently in 1991, Barry Jones' Australian House of Representatives Standing Committee for Long Term Strategies investigated Australia as an Information Society, and has produced a series of reports relating to that theme. It remains to be seen whether the discussion these reports have engendered will in fact produce anything more than lip service to the ideals. One report has commented that while attention is being paid to IT policy across the governments (both State and Federal), little attention is directed at information delivery outside government. One has the feeling that many think the problem too large to tackle. There is clearly a need for public interest to be considered. A 1988 report: Informing the Nation: Federal information in an electronic age, stressed the need to resolve dissemination issues. That the problem has yet to be resolved was indicated in a proposal for a policy framework to ensure public access to government electronic information summarised by Sarah Kadec in the October/November

26Holland, op.cit.: 14.
29Holland, op.cit.: p.22.
1992 issue of the ASIS Bulletin.\textsuperscript{31} Most seem interested only in their own special area and are not prepared to encompass the wider issues.

### 6.4 Private vs Public Ownership of databases

The main complaint from the private sector regarding database access is that of unfair competition. This concern is made evident in one section of the Library Amendment Bill, presented to the NSW Parliament early in 1992 which emphasises that where "value-added" services (which often include online database access) are provided and charged for, these should not unfairly compete with the private sector. Such complaints overlook the fact that, in Australia, as overseas, government has had an important role in developing the online information industry. However, as noted earlier, the major concern of government database development has been to serve the needs of government. Departments have been less concerned with meeting the public needs. In some cases, especially in the US, private companies may have been contracted to develop software to provide access to computer files: e.g.: the trademark database in the US: the software developers maintained that they had the right to market the resulting product which included the data provide by the government department.\textsuperscript{32}

One of several arguments presented by the private sector lobby groups is that the government can operate in a way that makes it impossible for commercial vendors to operate profitably. As Diane Sherwood\textsuperscript{33} points out, "The government could turn into a monopoly because it controls the source of information and can control whatever prices it wishes, even subsidising the cost of distribution."

On the other hand, some companies may be employed by the government to provide a means of improving access to its publicly collected data, but may then be able to sell that


\textsuperscript{33}Ibid.
information for its own profit. One instance where conflict arose related to the provision of trademark data by Thompson and Thompson. This company's control of trademark data was challenged by another company on the grounds that the information belonged to the public.

The inefficiency of the public sector is also pointed to as a drawback. However, this was challenged by at least one public sector department, the US Department of Defence. They wanted to generate their own CD-ROM asserting that they could do it more cheaply than the private sector. This they did, although not without strong criticism from the private sector apparently outraged that the government should not consult the industry. As Sherwood points out, there is a presumption that the government is less efficient "because it operates by directive rather than incentive." To strengthen the industry's argument against government involvement, the Information Industry Association (IIA) commissioned a Price Waterhouse survey which found that the private sector products were superior to those of the government. For the IIA, quality, efficiency and fairer competition are the main points around which its opposition to government intrusions into the market for information services, particularly those delivered electronically. Indeed, the IIA called for a policy which would "keep private enterprise from being unduly inhibited in its incentive to produce new products and services."

Apart from the public good arguments relating to ownership of information put forward by Herbert Schiller and others, one problem for the government is that of having to buy back its own information. During the Gulf War, it was reported that the US

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34 Ibid.
36 Ibid.
37 Ibid. (Reported in Sherwood).
38 Ibid.
government had to buy back its own Landsat information. With the current shift in ownership of major US online information vendors to international conglomerates, some based outside the country,41 concern regarding the US government's control of and the public's access to its own information is likely to grow.

Copyright is another area of dispute. A ruling was made in 1992, in the US that the contents of lists like the Yellow Pages could not be copyrighted.42 All government documents in the US, in fact are without copyright. This is not the case in Australia, and may prove a problem where public access to government information is challenged. Some changes are occurring here, however, as mentioned elsewhere, if only to allow private companies to provide government information (such as legislation) online. One concern here is that if this is the only source, access in privately maintained databases can be hampered. For example, Dun & Bradstreet in the US refused Union access to their files during a dispute.43 If government files become the preserve of private database vendors, the possibilities for abuse are obvious and safeguards are essential.

Herbert Schiller44 regards information access as central to a democratic society. He has expressed concern about what he sees as the corporatisation of American life whereby information, produced at taxpayers expense, is withheld from the public and treated as proprietary by its corporate owners.45 "In the information sector, deregulation has contributed significantly to further erosion of the national information base. Business ... has been relieved of making basic data available to the public."46 Schiller suggests that commercialisation is affecting the quality of information. Social information is being overwhelmed by a deluge of commercial messages.

42Information Hotline. 1992...?
44Herbert Schiller, op.cit. 42-45.
45Ibid. : 44.
46Ibid.
In the US, the national government is the largest generator, collector and disseminator of information. Privatisation is adversely affecting this function of government. Schiller stresses that the public right of access to government information should not be restricted. However, ability to pay increasingly determines access. State and local governments are being forced into profit-seeking ventures within the information market. According to Schiller, the notion of information as a commodity is incompatible with the idea of information as a social good.\textsuperscript{47} Today, it is commonly accepted that some research should be guided by commercial objectives. If commercial information activities were the sole focus, however, only data that have a commercial value would be collected and retrieved. A balance needs to be retained. Information is important in the national economy but it is essential that the economy responds to the needs of the citizens and not just to corporate interests.

6.5 Privacy concerns

Concern over privacy of and free access to personal files have been constant issues for debate in Australia, particularly so when the Australia Card was proposed. Public disquiet over the introduction of this card focused on the fact that this card would provide a link to all government files on each citizen, including tax, social security and medical records. It was claimed that individual privacy would be threatened as it was feared that the information might be used for purposes for which it was not intended, and without the knowledge and consent of the individual concerned. Where personal files are involved, privacy provisions are obviously essential. Network access to resources requires that appropriate security measures be put in place. The combining of data from varying sources to build up personal profiles, which, when considered separately, is of little interest, has raised concerns over privacy. As one source notes, individuals will

\textsuperscript{47}\textit{Ibid.} : 44-45.
sometimes give up privacy in exchange for a service (medical, insurance, credit) without understanding the ramifications.\textsuperscript{48}

Information collected may be provided to others without the explicit permission of the individual. "A central issue with regard to protecting privacy is the balancing of legitimate business opportunities against individual rights, which need to be more clearly defined in this context."\textsuperscript{49} One example is given in the report on Australia’s "Communications Futures" from the Bureau of Transport and Communications Economics.\textsuperscript{50} This report mentions the accumulation of vast stores of data relating to purchasing habits, facilitated by home shopping through online services. Privacy laws in Australia at present protect information within the government preserve (i.e.: collected and maintained by governments). No such protection exists at present in the private sector. It is important, therefore, that government data resources which may include personal information, however insignificant, should remain within the government preserve and that appropriate security measures be implemented to protect them. Nevertheless, there is a wealth of data to which the public should have free and open access, and for which privacy is not an issue.

6.6 Access issues

Even when government information is freely available, as in deposit libraries, many will still find access difficult. If optimum access to government information is to become a reality, it is essential that the government develop a comprehensive Information Policy which recognises the right of public access to government information and includes access to information in electronic form. In Geoff Holland’s study, he suggests

\textsuperscript{49}Ibid.
"affordable access". However, it is clear that any fee would discriminate against some community members.

The most recent developments in the US relating to access to government information are heartening to say the least, although it remains to be seen if the most positive result is achieved. Bills passed through the US Senate and House of Representatives in 1992 concerned the GPO Gateway to Government and the GPO Wide Information Network (WINDO). (The primary sponsor of the Senate bill was Senator Al Gore, now Vice-President.) These bills promised to revolutionise public access to publicly funded and owned information sources. "The Gateway/WINDO proposals would use modern computer technology to allow citizens from every community in America to obtain timely and low cost information about every aspect of government." They would provide public access to the taxpayer funded databases and information systems. These bills would ensure that the important role of Federal depository libraries in providing universal access to government information would not be eroded by the introduction of new technologies. The bills also recognised that the price of publicly owned information resources should be no more than the costs of disseminating the information, a principle that is increasingly being challenged by those who do not appreciate the importance of a well informed citizenry to the US economy and democratic institutions. The public is paying billions of dollars to create these government information resources in the first place.

Indeed the GPO/WINDO proposal promised potential government savings. Delivery of press releases and other important public information is far cheaper for some agencies than via the more conventional, paper based methods (and faster, no doubt). Government agencies also consume information from other agencies, sometimes having

51Holland, _op.cit._: p.93.
52GPO Gateway to Government: S.2813; GPO Wide Information Network for Data Online (WINDO): HR2772.
53Email communication on PACS-L: August 17, 1992: GPO Gateway/Windo.
54Statement from the Taxpayers Assets Project, 5/8/92, obtained via Email communication.
55_Ibid._
to purchase this from commercial vendors. (The OMB, which is responsible for the government's budget, opposed these moves on costs grounds, but failed to notice cost savings: eg: during the Gulf War, the US government had to purchase back its own LandSat information.) The public pays twice! The bill would change this. A sales program was part of the proposal, but the 1,400 member Federal depository libraries would provide free access. Telecommunications costs might still prove a barrier to some. However, it was further proposed that the NREN (Another Gore bill: National High-Performance Computer Technology Act 1989, urged the establishment of the NREN.) and other computer networks will eventually be used to disseminate the GPO/WINDO services. Budgetary problems in the US have since forced changes to the original proposals. The private sector will now have a much larger role to play, although initially with the use of public funds. Public utilities have often been developed at public expense so that the interests of all citizens are served, independent of ability to pay. Steven Miller gives the example of the French (Minitel) experiment, where the government run telephone company gave away computer terminals linked to a central computer. Gore's original concept proposed a central role for government in the development of NREN and the encompassing National Information Infrastructure (NII). The focus now is on the "market context" with the NII being built by the private sector. The government still has an important role, although limited to (i) funding research; (ii) removing regulatory barriers to market competition; (iii) contracting for its own services; and (iv) subsidising access for those unable to afford commercial rates. "Unlike the Internet's former NSFnet backbone, which buffered market-forces through several layers of nonprofit organisations, the NII will be openly run by the private sector on a commercial basis." Nevertheless, the US government is still committed to ensuring access to government information in electronic form through funding to various

56 Online. Sept. 1990: p.20
58 ibid.: 68.
59 ibid.: 107.
60 ibid.
61 ibid.
62 ibid.
nonprofit organisations, including libraries. Depository libraries will have free access to online data files from the Federal government including the **Federal Register** and the **Congressional Record**. This is a positive development.

In Australia, the user pays principle is still firmly entrenched. The idea that free access to electronic government databases might be provided on the same principle that we deposit copies of ordinary government documents is scoffed at. Indeed, the hardcopy deposit service is being wound down. Most government librarians and departments are continuing to focus only on the bottom line. The spirit of economic rationalism is still very strong. Making money to support existing services and to appear entreprenurially adept seems to be the main focus! We need to take economic thinking a step further. Economics is not just about the bottom line. It's about providing a sound knowledge base for our industries and our community, if we are to prosper and grow in any real and worthwhile sense. In its information policy considerations, the government must address this issue. If we don't, we may find, given the improvements in network access that many of us are experiencing, that we are better able to retrieve information on the finer points of US government undertakings than we are on those of our own governments.

Government involvement in network developments promises a new information age. NREN in the US and SuperJANET in the UK are likely to expand the information base for not only academics and researchers, but eventually also for the individual information seeker. Australia is not far behind. The interest is there, even if the funding is not. What is interesting about these networks is that they may eventually provide relatively cheap access to large database resources originally only available through expensive database vendors. That network access is, at present, slower and less efficient than the online vendors can provide, is not something which will deter most researchers. In the time versus funding balance sheet, weight is definitely with the former. A research assistant

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63 ibid.: 109.
enquiring about how best to obtain the latest news and business related information was not interested in what was available via the major business databases and wire services. She had no funds for that. What she did have was time to search the net. While much current information is available on the net, locating specific information is not easy, in spite of network software developments like Netscape, Mosaic, gopher and veronica, etc., which help researchers find their way through the network maze. If information (search terms, for example) are embedded in a document, and not indexed in some way, the searcher has little hope of success in finding what she wants.

The potential of the net is apparent in the recent moves by vendors and book and journal suppliers and publishers. Dialog indicated in 1992-93 a shift in its focus away from the end user and to providing a search service performed for the client, perhaps tapping in to the success of information brokerages in the US. However, they have since provided Internet access to their databases and a Web page which includes details of the resources available through their system. (An account is required to access the databases.) In late 1992, Blackwells bought into the CARL Uncover document delivery service (available on subscription via the Internet). Gordon and Breach, on the other hand, has vetoed the listing of any of its expensive titles, or the articles they contain, on services like Uncover. The move by Dialog away from the end-user focus, may seem strange at a time when individuals are eager for, and are gaining access to a greater diversity of information services, unless it is viewed in the context of what is happening on the net.

Changes now underway [ISDN, standards (Z39.50, Text encoding, etc.), transparent search software, hardware improvements, increased sophistication of services, potential of multimedia access] will provide easier, more efficient and higher quality database and other information resources. They will also ensure that demand will increase. Tom

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65 Conversation with Jean Tyan, of Dialog Information Services, January 21, 1993.
66 Discussion with Philip Bull, Blackwells, January 20, 1993. Uncover has since been purchased by Knight-Ridder which also owns Dialog and DataStar.
Grunder's article "Whose Internet is it, anyway?" which first appeared in Online, but was later widely circulated on the Internet, hinted at a mood supporting broad public access, that may not be limited to the US. Derek Law (Kings College, London), when discussing the development of SuperJANET, suggested that there were similar attitudes apparent in Britain, and that this sentiment would more than likely grow. The network discussion groups ensure that ideas that once took months awaiting publication and distribution of scholarly, or special interest journals, now flash around the world in seconds.

6.7 Conclusion

Whether the "mood" of the Internet community will influence the politics of network access remains to be seen. As online information delivery mechanisms like the Internet have extended access, the important role of governments is again becoming obvious. In a report on developments leading to the wide spread use of the Internet, John Quarterman states that, in hindsight, "Government funding of network protocol development and network deployment is very useful." This, he claims, is why much of the private sector industry now centred around the Internet is largely US based. As shown in Chapter Four, the use of the Internet to provide access to library resources is increasing. Governments in Australia and the US are proposing policies which indicate a concern that access to information resources should be an important priority. It is not yet clear how this is to be achieved and, while the emphasis is on user pays, it is important that provision for equitable access, as has been the case for text based resources, be maintained in some measure. Indeed, it has been suggested that "serving the public interest through broad access should eventually serve private interests, by expanding

69 Interview with Derek Law conducted in Canberra, at the ANU, January 27, 1993.
markets and values associated with the infrastructure." The role of libraries can be an important one here - not conflicting with the interests of the private sector, but providing part of the information infrastructure which will serve both the public and private sector interests.

In Australia, as elsewhere, funding for the necessary technical improvements just to maintain the status quo, is a problem, although a number of reports mentioned in this chapter have highlighted their importance. The potential of the Internet to provide a basic information infrastructure is obvious. What is needed is the support of all its potential beneficiaries to persuade governments to invest more funds in its development. The network is potentially an international deposit library providing access to all the world's intellectual and creative resources. The Alexandrian ideal is within reach. All that is needed is the will to achieve it.

Chapter Seven examines the relationship between the library, the technology and the end-user and considers the extent to which access to information has been expanded.

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72 NRENAISSANCE Committee. *op.cit.* : 150.
Chapter Seven

Access to information: the technology, the library and the end-user: preparing for the Electronic Library:

7.0 Introduction

"Information professionals are living through a revolution - not because of the quantity of information available and not even because of the growing prevalence of information in electronic format, although these are contributing factors. It is the revolution in information access that affects the everyday work world of information professionals."¹

As more information is accessible only electronically, librarians will increasingly have a consulting and teaching role. Network technology provides instant access to literature which once took months to arrive on Australian library shelves. The choice can now be made as to the form in which a library provides access to such literature. If the "value-added" definition is extended to these services, (which are likely to be tailored to individual needs as, it is argued by those advocating fees, are online services), will fees be charged for these services too? This chapter first looks at some of the network developments directly affecting libraries and suggests that changes in budgeting for information provision (particularly document delivery) will be needed if some measure of equitable access is to be retained. It then reports on responses of students to the new information resources. Finally it emphasises the importance of reader education programmes to ensure library patrons are not disadvantaged by the introduction of these new resources. Ideally, they should significantly expand access with minimal cost to the end user.

7.1 Significance of Networks

The August 1993 edition of Frey and Adams *Directory of electronic mail* listed over 180 major electronic networks throughout the world. Many of these are linked to smaller networks within their area of operation. Many are also linked to networks outside their preserve. AARNet (now Telstra Internet), for example, is connected to the Internet in the US and, through that, to other major networks. Providing the appropriate address protocols are used, contacts can be made to any of the networks with gateways into the Internet and to other linked networks. Networks which librarians in Australia will be aware of include:

**AARNet (now Telstra Internet):** The major network in Australia, originally developed to link all Australian Universities and many major research organisations. Until its purchase by Telstra in 1995, this network was managed by the Australian Vice-Chancellors' Committee in conjunction with CSIROnet.

**BITNET:** The "Because It's Time Network", which began in 1981 as a small network of IBM computers at the City University of New York. It connected over 1,300 sites in 38 countries including the US, Europe, Canada, Japan, Mexico, Israel, Chile, Taiwan and Singapore. It was run by EDUCOM in Washington, DC, and was part of CREN, the Corporation for Research and Education Networking, a membership organisation.

**Internet:** The Internet began in 1982 when ARPANET (Advanced Research Projects Agency Network, an experimental, packet-switched, host-to-host network commenced by the US Defense Advanced Research Projects Agency: DARPA, in 1969), MILNET

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4 *ibid.*
(Military Network), and other US government unclassified networks were interconnected. The Internet included the ARPANET, MILNET, and NSFNET (National Science Foundation Network). The Internet, in 1993, was connected to over 40 countries and links are expanding. NSFNet became the backbone of the Internet in the US, although changes continue to occur, first with the proposal for the NREN (National Research Education Network) and now with a call for a greater private sector role.

**JANET/SuperJANET:** The Joint Academic Network is the major academic network in the United Kingdom, connecting all British universities and research organisations, and the British, Scottish and Welsh national libraries.

**USENET:** is a worldwide network of computer users which was started in 1979 as a bulletin board between two universities in North Carolina, and became larger as other universities joined the network. It is now a network for news groups on hundreds of subjects and is available worldwide having an estimated one million readers in 1993.

Although initially the Internet was the collective name for all interconnected TCP/IP networks, the generic use of the term to describe all networks linked globally to each other and to the original Internet, has become widespread. In the last chapter, the government funding of this network was mentioned, and the changes that are now occurring in terms of both funding and control of the proposed National Information Infrastructure (NII) and the National Research Education Network (NREN). Libraries feature in these proposals. A visit to some of the library World Wide Web sites in

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6Frey and Adams (2nd ed.) op.cit.: 144,40.
8Ibid.: 158. Scotland and Wales have "National" libraries independent of the British Library.
10Ibid.
Australia\textsuperscript{12} and the US\textsuperscript{13} will show the extent to which libraries are already assuming a place in networked information delivery. Indeed, it is essential that libraries become involved in network developments, where both policy and implementation are concerned, if they are to retain their place as information providers. As one author has pointed out, "Libraries and networking are approaching a watershed that will radically change the way we get information, and the way we approach education, research and business."\textsuperscript{14} Perhaps, the watershed is here. As will be shown later in this chapter, in the results of a survey of students about to embark on careers in the business world, their preference is for electronically provided information. Libraries may be left behind if they do not actively cater to the needs of all their clients.

7.2 Network access to databases and other information resources

Some activity is, however, evident, especially in Australian libraries. An examination of the resources available through academic libraries reveals a move towards greater access to information resources, at least in the form of databases, at the desktop. The beginnings of this move were evident in the survey results provided in Chapter Four. This is an area which has expanded and will no doubt continue to do so. Library coalitions like CAUL (Council of Australian University Libraries) have allowed groups of libraries to purchase access to databases as a block, and to provide these to staff and students through their campus networks. An example of this is the Current Contents databases provided through Ovid (formerly CD-Plus).\textsuperscript{15} Other databases provided include ABI/Inform, Ozline and CSIRO databases through the National Library and the OCLC First Search databases. Staff and students do require a password to access these, which makes them less accessible than is the ordinary Library catalogue through the network. Nevertheless, this is a step forward.

\textsuperscript{12}National Library of Australia's web site: \url{http://www.nla.gov.au/}
\textsuperscript{13}Library of Congress' web site: \url{http://www.loc.gov}
The popularity of the Internet and the wide adoption of the Web software like Netscape\textsuperscript{16} to deliver and retrieve information has prompted most major vendors to provide access either directly through telnet from an Internet account, or via their newly established homepage. In an April 1995 article\textsuperscript{17}, Larry Krumenaker points to the growing number of information providers which now have home pages on the World Wide Web, LEXIS/NEXIS, Dialog and Dun & Bradstreet among them. Dun & Bradstreet has experimented with allowing free searches of some of its databases for short periods of time.\textsuperscript{18} This provides them with feedback on potential customers' information needs. OCLC FirstSearch,\textsuperscript{19} mentioned above, has a homepage through which direct access to its databases can be obtained providing a legal password is used. Dialog, one of the oldest and largest database vendors, provides not only access via its homepage,\textsuperscript{20} but comprehensive information on all its search services including the essential "bluesheets" which detail the idiosyncrasies of each database service. The complexity of systems like Dialog, a rich and valuable information resource for researchers in any field, makes it difficult to believe that the problems of current Web search engines like Lycos\textsuperscript{21} or Yahoo\textsuperscript{22} will be easily resolved.\textsuperscript{23} "Intelligent agents"\textsuperscript{24} are not yet available! The organisational skills of librarians may still be needed, albeit with a considerable shift in perspective from that required for traditional, physical media.

\textsuperscript{18}\textit{Ibid.}: 14
\textsuperscript{19}OCLC FirstSearch web address: http://
\textsuperscript{20}Dialog web address: http://www.dialog.com
\textsuperscript{21}Lycos web address: http://www.lycos.com/
\textsuperscript{23}While using these search engines is less than satisfactory, some companies are already preparing to launch themselves on the market in an attempt to repeat the success of Netscape. See: Glyn Moody. \textit{Searching the web for gigabucks}. In: \textit{New Scientist}. 6 April, 1996: 37-40.
The problems arising from this kind of disorganisation were noted before the Web became a factor. The demand for and consequent provision of full-text resources through online systems during the 1980s saw problems arise when attempts were made to provide effective retrieval mechanisms. Even today, this is still recognised as a problem. Apart from those whose professions require a detailed knowledge of varying database structure and operation, it is likely that most searchers use "free term" searching to find what they require. Even when subject searching is offered and used, the searcher may be unfamiliar with the subject terms used and consequently may be unsuccessful in locating appropriate material whether it is there or not. A glance at the Library of Congress Subject Headings or any database thesaurus of terms will provide evidence of just how difficult providing adequate indexing can be. It is not surprising therefore, that there is some disquiet about the quality and relevance of much of the information retrieved through networked resources like Web browsers.

There had been some proposals put forward regarding the need for standards even before the appearance of the Web browsers. Differing computer operating systems and search interfaces have been a cause for concern since the mid 1980s. This resulted in the recognition by NISO (National Information Standards Organization) in 1988, of the Z39.50 protocol as a standard. The adoption of this standard, it was hoped, would make remote searching easier. It would allow searching on remote machines without having to know the precise commands. An author search on one catalogue could be transparently translated to an author search on a catalogue at a remote location. Although developed for OPACs (Online Public Access Catalogues), this standard has been used for other applications, for example: WAIS. Added to this, there has been a call for a major revision of cataloguing standards, away from AACR2 and towards an

object-oriented approach.\textsuperscript{29} Here the focus is on the entity rather than its relationships (as in relational databases).\textsuperscript{30} It is an approach now used in many computer applications and programming tools, and will be important in facilitating high speed exchanges of data across the Internet.\textsuperscript{31} As more online database vendors provide access through the Internet, the need for standards will become more apparent. A balance will have to be achieved between ease of access and effective organisation of information. One Web based service which appears to be attempting this is NLIGHTN.\textsuperscript{32} It allows both simple searching and more complex methods and combines a mix of Internet resources and traditional database access.\textsuperscript{33} Charges are made for actual information units requested. There are no subscription or "per-minute" fees.\textsuperscript{34} The approach taken to information delivery by this service is one which is likely to be favourably received by the library community. Services like this may provide strong competition for the traditional vendors like Knight-Ridder Information and LEXIS-NEXIS. Already it has been suggested that these companies may face difficulties as content providers move focus away from broad markets to those where premium prices may be maintained.\textsuperscript{35} At present, content and quality\textsuperscript{36} of content tend to be assumed with the main focus being on organisation of information and the related access problems.

Database services currently offered by libraries are usually well organised, and, providing the user is familiar with the system, the required information can be retrieved with reasonable efficiency. The networking of library databases through local and wide area networks (LANs and WANs) to the desktop, while extending the reach of the researcher, has added a greater level of complexity. Each system has its own

\textsuperscript{30}Ibid.: 138.
\textsuperscript{31}Ibid.: 138,151.
\textsuperscript{33}Ibid.: 88-90. Web address: http://www.nlightn.com/
\textsuperscript{34}Ibid.: 88.
\textsuperscript{36}The issue of quality is important and is the subject of a collection of essays edited by Reva Bach: \textit{Electronic Information delivery: ensuring quality and value}. Brookfield, Ver.: Gower, 1995.
idosyncrasies and may take some patience to master. Often, extra passwords are needed for each new system, adding further frustration. If CD-ROMs are networked, appropriate software may have to be loaded before access can be achieved. So, even though many new services are being provided, support is still required from library staff. The need for some technical knowledge of the new systems and a preparedness to provide assistance in introducing them to their wider clientele have meant that the role of libraries and of librarians is changing.

7.3 Network = Library?

What a library provides and where and how it provides it are issues much considered by professional librarians in the 1990s. Some are even testing the use of cellular links to information resources. They see wireless data communication as "the next logical step in the evolution of library systems." The Virtual Library, the Digital Library, the Electronic Library, the Library without Walls, the Library without a Roof, are among the expressions used to describe the way many in the profession are thinking about the future. Online vendors, too, are entering into joint projects with libraries, ensuring a place in the information market of the future. The Institute for Scientific Information (ISI), for example, has undertaken an Electronic Library Project to deliver not only databases like its popular Current Contents, but also electronic versions of journals and delivery of journal articles at economically competitive subscription rates. Will traditional libraries be bypassed by such services? Will the needs of ordinary users be ignored? Concerns about such systems focus less on the user and more on proprietary rights: ensuring that only authorised (or paying) users have access. Hence, issues of security focus on copyright and maintaining a balance

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39 Digital Library Projects are appearing throughout both the US and Europe and have considerable government funding to support them.
between useability and security against copyright infringement. These are, of course, important concerns, especially, as has been pointed out in one article,\textsuperscript{42} when the infringement may not be merely in taking a print copy, but in capturing the data to a file. However, similar arguments could be made against having photocopiers in libraries, although some may suggest this is qualitatively different.

As is clear from the above discussion, knowing one's way around a computer is insufficient. A knowledge of the protocols involved in interrogating the networks, and in moving from one network environment to another, poses a challenge, and is time consuming. Once one has mastered the systems the amount of information with which one is confronted can be overwhelming. Knowing what a database contains and how it is structured and indexed, and which fields in records are searchable add to the difficulties encountered in many existing systems. Networks expand these problems. Getting information is often a matter of trial and error. Some gateways between services have been developed. For users of the Westlaw service, for example, only knowledge of that system is required to search on Dialog using the Westlaw gateway. Some libraries provide access to databases loaded on their local computer network and searchable via their online catalogue. Liblink allows searching on a number of library catalogues at once. OTC's Intelnet provided access to a wide range of database services without knowing any of the search protocols, and even provided real online help, i.e.: responses to unique questions, not standardised help screens. Networks have expanded access, to an extent that many prefer the electronic service to the paper based. However responses to a survey of students who were either in the workforce or about to join it, indicates a need for libraries and librarians to rethink their roles.


\textsuperscript{42}Ibid.: 20.
7.4 Survey of final year Information Technology students

Access to electronic information resources is extending the reach and expectations of tertiary students. Indeed, many students prefer such resources to the paper-based. If they are able to search an electronic file and retrieve sufficient references to fulfil their needs for the current assignment, they will choose this means over the hardcopy indexing and abstracting services. When full text is provided whether on CD-ROM image databases like BPO (Business Periodicals on Disc) or text files like Computer Select or even from remote ftp sites, or via the World Wide Web, they see no reason to go further. Their expectations of what computerised resources can provide has increased and some, at least, prefer them. The following section examines the responses of students to the fourteen week, Online Information Services course presented as part of the Bachelor (fourth year) and the Master of Information and Communication Technology degrees at the University of Wollongong. A brief outline of the course content is provided and the results of a short questionnaire gauging student reactions to the course is presented. Many students expressed surprise that they were not made aware early in their degrees of the wealth of resources available. Others had reservations because of the costs involved. The majority anticipated that the course would significantly change their future information seeking practices. Where the fourth year undergraduate students are concerned this was apparent in subsequent discussions regarding research sources. If a legitimate source was available electronically and cheaply, several students stated that they preferred this medium to paper as it saved them time.

7.4.1 Online Information Services training: an example

The Online Information Services course was first offered in the Spring Session of 1992 to fourth year students in the Bachelor of Information Technology and Communication Degree. It has since been offered in the Autumn Session of each subsequent year to
both Bachelor and Master of Information Technology and Communication degree students. As well as covering some of the issues relating to the development of online information services, this subject introduces students to the range of electronic resources available either through online database hosts such as DIALOG or AUSINET or via networks like AARNet or the Internet. CD-ROMs are also considered and comparisons made with online services. The use of the Web as an information retrieval tool and the development of home pages (using HTML) providing links to information resources are the most recent extensions to this subject.

The course has a significant practical component and while students are obviously not expected to become expert searchers, they are required to prepare and complete a search on at least two online systems: DIALOG and AUSTRALIS were chosen in the Spring 1993 session. Dialog has continued to be used and other services available through the network added. The Department has joined DIALOG'S Classroom Instruction Program and the Library had, until the recent changes, a subscription to AUSTRALIS, so the costs for both were predictable and containable. Telecommunications charges for DIALOG were largely avoided since, apart from the initial demonstration, the students' searches were conducted via the network. This was much more successful than reports had indicated, with few time delays or problems with connections. Alias DIALOG passwords were set up for use during the tutorial and these were cancelled immediately on conclusion of the class. This ensured against unauthorised access. A demonstration of AUSINET was also arranged with students actively participating in the formulation of searches and choice of subjects. Apart from these demonstration and practice sessions, students are made aware of the range of services provided through a variety of Australian and overseas online hosts including
some not available through the Library. Those covered (in some cases only briefly) have included:

<table>
<thead>
<tr>
<th>AUSINET</th>
<th>DIALOG</th>
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<tbody>
<tr>
<td>ABN</td>
<td>LEXIS/NEXIS</td>
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<tr>
<td>OZLINE/SOFI</td>
<td>STN</td>
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<tr>
<td>InfoOne</td>
<td>DATASTAR</td>
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<tr>
<td>KIWINET</td>
<td>BRS &amp; ORBIT</td>
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</tbody>
</table>

The tutorial sessions were conducted either in the Library or using one of the campus computer laboratories (students have a choice of IBM compatible or Macintosh computers). All students were provided with appropriate passwords to allow them access to the campus network as well as telnet and ftp access to the wider international networks. As well as the online searching already mentioned, practical sessions covered many of the important facilities available on the network including the use of:

- Email
- Bulletin Board Services
- USENET newsgroups
- ftp archives to retrieve full-text documents
- Subscriptions to Discussion Groups and Electronic Journals
- CARL Uncover
- liblink (New South Wales library catalogues)
- Remote Library Catalogues (national and international)
- archie, gopher and veronica

In the last two years, other services have been added including:

- OCLC FirstSearch
- World Wide Web locations (Mosaic, then Netscape)

and instruction has been provided in the use of HTML. Students were also asked to complete searches on databases from the library's CD-ROM products, including one of
the Image databases. Of the Library's twenty-five CD-ROMs in 1993, the most commonly chosen were:

- ABI (UMI)
- ERIC (SilverPlatter)
- Compendex (DIALOG)
- Austrom (RMIT and NLA) and
- Computer Select

These continue to be popular. The library now has forty one CD-ROM titles, among them two Image database collections: IPO and GPO which are both heavily used. Statistics for CD-ROM usage are provided in the Appendix.

Prior to this course, and up until 1995, most students' knowledge was limited to the use of the library catalogues and some had used CD-ROMs. One undergraduate student was also familiar with bulletin board services on the network but had not investigated the other resources. None of the postgraduate students had used the network resources before and neither group had used online database services.

As well as completing the practical work during tutorial sessions, students were asked to work in groups to prepare a seminar on an area covered in these sessions. Group topics included Australian and New Zealand online databases, International online databases, CD-ROMs and Network Resources. These were conducted by students with varying levels of success, the CD-ROM and Network sessions being the most successful, perhaps because of the superior facilities available for their demonstration, and that no inhibitions relating to costs attached to their use. Some of the demonstrations which accompanied these seminars were extremely sophisticated with students using a combination of media and attractive presentation software.

Students were not required to purchase any textbooks for these practical sessions but were referred to the Library which made available its online database manuals and

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43This changed in 1996 with many undergraduate students now having a knowledge of some aspects of the network, particularly the Web.
resources for student reference. Where the network was concerned, some handouts were provided by the University's Information Technology Services Network Support Officer, who also demonstrated the e-mail and bulletin board services available on campus. Other instruction sheets were prepared as necessary. Network references recommended for further information were Krol, LaQuey, and Tennant. As well, some resources were retrieved from the network itself and other useful archive sites indicated. While specific tasks were assigned, students were encouraged to investigate resources with their own research interests in mind. By the end of this course students demonstrated a good general knowledge of the electronic resources available to them and most seemed comfortable with using networked resources.

7.4.2 Meeting students' needs

Of the twenty-two students undertaking the course in the Autumn session of 1993, sixteen responded to the questionnaire (eight of the nine Masters students and eight of the thirteen Bachelor of Information Technology students). A second survey was conducted in Autumn Session of 1995 with eighteen students surveyed. The majority of the students questioned in both 1993 and 1995, said that they found the subject matter interesting and that the tasks undertaken in the tutorial sessions and particularly in the computer laboratories had been a worthwhile learning experience. Fourteen of the sixteen 1993 respondents, and seventeen of the eighteen in 1995, indicated that they believed that the subject material would be relevant or most relevant to their future employment. All but one of the respondents in each year agreed that the course had considerably changed their information seeking methods and all agreed that it had

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extended their knowledge of computerised information resources. While most thought that the sessions in the computer laboratories had been sufficient for the purposes of the course and most believed they had learned sufficient to give them the basis for extending their skills, there was a strong response (twelve of the sixteen 1993, and all eighteen in 1995) from those definitely interested in learning more about the network. In spite of the difficulties encountered whether it be in coping with varying search software or in negotiating often complicated network protocols, it is clear from these responses that students are adapting to the electronic resources available to them. As well, they want to access the information themselves and are perfectly capable of doing so.

A group of about thirty fourth year and Masters students, approximately two-thirds of whom had completed the online course, were asked (in a class in 1993) to list the resources they used when researching their assignments. Not one student mentioned hardcopy indexing and abstracting services until pressed and one student agreed that she did find that the hardcopy version of APAIS was often more up-to-date than the CD-ROM. All students included CD-ROM and many also listed network resources as important. The speed with which the information could be accessed and the ease with which it could be gathered appeared to predominate as important considerations, especially for undergraduate students. The Masters students, many of whom were already in the workforce, were less sure about the value of the electronic full-text resources and were more reticent about parting with journals and books as their main source of high quality information. Nevertheless, some of them did make use of full-text CD-ROM sources like Business Periodicals OnDisc where these were available. (Some students are Sydney based and make use of Sydney libraries.)

As indicated above, tertiary students want, and in many cases prefer, access to resources via electronic means. They are reluctant to use online databases like DIALOG and AUSINET because of the charges involved, but the equivalent databases
on CD-ROM are heavily used as can be supported by library booking sheets during session. Where networked resources are concerned, more assistance with subject access is essential to help students, once initiated into the use of the 'net', find their way through its seemingly endless maze to the resources they require. This will be an important role for the librarian in the future as more databases and full-text publications are provided in an ever increasing number of archive sites. Software developments like WAIS, so convincingly demonstrated by Brewster Kahle at the Electronic Library conference in Canberra early this year, may help to some extent, but more guidance is needed if valuable resources are not to be overlooked.

While full-text resources are popular among students seeking quick results in extending their research, more traditional online sources are also being made available on the network. In the UK, ISI has leased all the ISI databases to the Information Systems Committee of the Universities Funding Council to provide access via the network to students and staff involved in higher education. There are now 3,000 users accessing these databases through the network each day. Derek Law spoke of these developments when discussing SuperJANET (an expansion of the JANET network in the UK and the proposed equivalent of NREN in the US) at the Information Online & On Disc Conference in Sydney early this year. On a smaller scale, ISI Current Contents databases are being made available in a similar way to participating university libraries from the National Library through AARNet. Trials were conducted in August 1993 and the service was officially launched on the 27th September of that year. If the same success as that experienced in the UK is to be anticipated, student demands for training in the use of network services will grow. It is essential that more training programmes be established to guide them through the maze and that some subject orientation be embedded in these programmes.

46Papers from this conference: Changes in scholarly communication patterns: Australia and the Electronic Library (14-16 April, 1993, Canberra) have now been published by the Australian Academy of Humanities, and include Brewster Kahle's Wide Area Information Servers: access to semi-structured and unstructured documents.

7.5 Conclusion

"What many envision, ultimately, is a situation in which the individual reader at a particular institution is led easily through a series of options culminating in direct access to the aggregate content of the nation's principal research collections in which local and remote library catalog entries and bibliographic records merge with readily retrievable electronic versions of full texts that can be downloaded and printed locally at one's own work station." 48

The above quotation from the Mellon Report on University Libraries and scholarly communication, expresses fairly precisely the expectations of many undergraduate students. Their experience and imagination tell them it can be done although they seem unaware of the complexity and nature of the task. Seduced by the system, many students believe that if only they know how to track information on the network all their needs can indeed be met! In reality, there are two major problems when searching for information in this way: 1) being sure that all the most relevant and high quality information is in fact located and 2) sieving through the vast amount of "noise" inevitably retrieved when no standards or common subject classifications exist. While researchers are addressing the problem of access and making tentative recommendations based on existing library practices (such as those made in the 1993 OCLC Research Report), 49 it will be some time before any measure of success is achieved. In the mean time, demand to use the resources on the network is bound to

1) Implement the creation of machine-readable cataloging records (MARC) for remotely accessible electronic information objects.
2) Monitor the use effectiveness of records created for providing description and access information.
3) Extend cataloguing rules and formats to include interactive network systems and services.
increase and, along with it, demand for training in using networked resources. Responses from students in both undergraduate and post-graduate course at the University of Wollongong indicate that they want more training and more access to these resources. Clearly, this has significance for reader education programmes whether in courses for credit within a degree or as part of the traditional service supplied by libraries. Not only are basic introductory courses essential, there is also a need for subject oriented courses in much the same way as subject oriented literature searching instruction has been provided in the past for print resources. If these needs are not met, librarians may well lose their client base. Students want the instruction, and the profile of the Library is raised as its position as central information conduit and research facilitator is confirmed.

As was clear from the survey of students mentioned above, the course they undertook had considerably changed their information seeking methods, while expanding their knowledge of computerised information resources. Their desire to know more about the network and to search for information themselves is likely to be reflected in the wider community as libraries everywhere change to incorporate these new media. However, it is possible that the "value-added" label applied to online services will be extended to training end users, since courses may be tailored to individual or group needs. Using the same argument as has been put forward by those advocating fees for online resources, will fees be charged for these services too? At least one library now offers its clients a course of the type outlined above, and for a fee. As with charges for the services themselves, the aim is to cover costs, not to make a profit. However, with library resources focused heavily on those with access to the technology, the needs of other clients may be overlooked. The combined attractions of the market place and the new technology are hard to resist, but it is essential that the needs of ordinary clients continue to be met both by providing the access to the technology and resources in a central, public location, and the necessary instruction to use this media available, just as reader assistance has been provided for traditional, print based media in the past. With
library services geared only to those able to afford access to the technology and resources, the division between the information rich and poor will increase.

Chapter Eight brings together the main themes of the thesis summarising the arguments presented in each chapter and focusing on the essential role that libraries have within the developing information society.
Chapter Eight

Libraries in an Information Society: the Political Economy of Information

8.0 Introduction

This thesis commenced with the assertion that, because of the emphasis on a "user pays" philosophy and the application of this philosophy to "value added" services such as those provided through electronic systems, access to information once available free of charge, might, in future, be available only to those able to pay for the service. Many changes have occurred since this issue arose as concern among library professionals. This concern has been expressed quite strongly by librarians in the United States. In Australia, the issue has been largely discounted as of little relevance to the business of offering the best in library technology to a demanding clientele. Libraries operate within a highly technical environment, requiring skilled staff who are able to respond effectively to the information needs of their clients. In an information society, libraries are an essential part of the information infrastructure. The purpose of a library is the same as it always has been: a central resource which is available to a community to fulfil its information needs, independent of ability to pay. This chapter reviews the issues raised in this thesis bringing together the main themes. It concludes that if libraries are to have a role in an increasingly competitive information age, budget funds must be provided to support electronic information delivery to all their clientele.
8.1 Libraries in an Information Society

"It is the burgeoning buying and selling of information, according to the customers ability to pay, that is forcing librarians to yield their historic role as guardians of the public's right to free and unrestricted information. Assuredly, commercial information activities have an important function to fulfill. Yet to imagine that these services are the sum total of a librarian's contribution - as information broker - is to acquiesce in the emergence of a society in which social aims have been discarded." Herbert Schiller, 1996.\(^1\)

Herbert Schiller, one of the Information Society theorists mentioned earlier in this thesis, has long been an advocate of free library information access. He warns that it is not only the role of libraries that are changing, but the "self-image of librarians as well"\(^2\). Information brokers are not just a phenomena of the private sector. As was seen in the survey in Chapter Four, many libraries are experimenting with information brokerages within their walls. Charging for information services in libraries is likely to continue in the foreseeable, at least for some services.

The Literature Review set out the arguments for and against the charging for information in libraries debate. Many of these arguments have been widely discussed over the last fifteen years. Much of the discussion has focussed on mediated searching: that is, searching done by a library intermediary. The debate is changing somewhat, with the focus now on end-user searching which raises other issues, not the least being access to the technology. However, to some degree, the arguments are the same when considering end-user searching within the library, especially if electronic services are serving the purpose once fulfilled by print based media.

\(^2\)Ibid.
In Chapter Three, an overview of the technology used in libraries was presented. During the past five years, the introduction of network technology has meant that libraries and their clientele have access to a different range of resources. The older online information services are still available, but networks now provide new services. These services offer varying levels of sophistication in terms of both what they provide and how effectively they provide it. Database resources like those from the National Library are valued, but the retrieval software is discouraging. The World Wide Web browsers like Netscape are more attractive than older mechanisms but are they effective in delivering the information required? However, changes occur almost daily where online information delivery is concerned. Assertions made one week may be out of date the next. This can be at once discouraging and exciting when attempting to establish the existing state of affairs. With this in mind, it was nevertheless thought essential to this thesis that a survey be done to ascertain the state and direction of libraries in Australia in the 1990s.

This survey was conducted, in part, because the information it obtained was unavailable from other sources at that time. The CAUL statistics on academic libraries, for example, had not been provided since the changes to University Libraries in the late 1980s, although they have since been produced. The libraries chosen were the major public (State, National and central city) libraries and the academic libraries. The focus was not only on the technology and resources, but also on the attitudes of librarians dealing with the current changes and the direction in which they saw libraries heading. Among the relevant conclusions from that research were that while most libraries charged something for traditional online services, profits were rarely sought. Most significantly, these services appeared to be underutilised. Little money was budgeted for them or spent on them, when compared to other library expenditure. Almost no change had occurred in their use during the preceding three years. The cost of maintaining trained staff and technology for systems so little used seems wasteful. With such a small commitment to traditional online services, these libraries were clearly not a significant part of the market for online vendors.
Within the broader online information industry dramatic changes are occurring to such a degree that there is a blurring of roles of the various players. The converging of technologies has led to a convergence of industries. This is of concern to libraries as it may influence what is available through online vendors, and the quality and reliability of their services. As has been emphasised elsewhere in this thesis, a balance will need to be retained in terms of safeguarding public interests while satisfying those of commercial information providers. Publishers, research and educational establishments, libraries, media groups, hardware and software companies, all are establishing links with the online information industry, attempting to secure their position in a networked future. While libraries have a place within these alignments, those with a mass clientele are unlikely to be significant revenue producers for the more aggressive players. Indeed, the survey findings mentioned above, had indicated this. Discussions with online vendors confirmed that their major source of revenue was not these libraries but, more probably, the special libraries located in businesses and government departments. It was concluded therefore, that if online services were to be funded and provided like any other service in the library, this could only benefit online vendor companies in terms of both increased revenue and promotion of their services. The significant capital investment in trained staff and equipment would then be better utilised and service improved.

In any discussion of the development and delivery of online information services, it is impossible to ignore the role of government. Not only do they fund the libraries to which the public has access (in particular, those covered in the survey above), but they have also played a role in the development of the online information services themselves. The role of government was covered in some detail in Chapter Six. Arguments favouring free access to online services revolve around this role of government. "Why should the tax payer pay twice?" it is asked. In some instances these arguments are valid, especially where funding has gone to the private sector for specific developments. In others, where a private company has "added-value" to a product at their own expense, even though the
original information resource was produced through government funding, the argument is less clear-cut. This situation is being repeated in the developments affecting the National Information Infrastructure and has been raised again in the privatising of Internet access.

Few would dispute the importance of the Internet in either the private or public sectors. Where libraries are concerned, it has had an influence on both the kinds of resources they provide and on the way librarians view their role. This was demonstrated first in Chapter Four in the survey on libraries across Australia, and later taken up in Chapter Seven where the views and training needs of current (and future) researchers were investigated. An enthusiasm for the new resources, a desire for extended information provision in this form, and a need for further instruction in the use of the new technology were established. This will place continuing demands on library budgets. These factors, along with the attractiveness and easy marketability of the new media, may tempt libraries to charge not only for the online services but also for training in their use.

Library budgets for information provision have, to date, been geared to the provision of physical resources, mainly print based media such as books and serial publications. If other forms of delivery are to be employed, some method of funding these is needed. Either traditional media must be displaced or extra funds must be found from other sources. This could be achieved through increased allocation to the library or through charging for some services, as has been done in the past, to cover the cost of delivery. However, as was seen in Chapter Four, traditionally charged for services are underutilised. The rational for charging was that they provided a value-added service to the client. The new services require the user to search for them selves. In this sense, they are little different from books and journals with indexes or tables of contents provided. Some form of charging for electronic delivery of networked databases is an issue which will undoubtedly receive close attention as more resources are provided in this way.
The direction of the New Library is decidedly electronic. Digital library projects are appearing in Europe and the US with the blessing and financial support of governments. While these are exciting developments, it is important that the role of libraries as a source of information for the whole community is not forgotten. Libraries have been valued as places for the curious and inquisitive wishing to extend their knowledge, sometimes in a haphazard manner, but nevertheless with the desire for some measure of self improvement. Their benefit to a society is difficult to measure. It has been argued that an informed society is an essential element in any successful democracy. Libraries which are open to all independent of ability to pay provide a resource which is essential to achieving this. As more services are provided electronically, some of the hardcopy resources may disappear. Some will want access to be provided to their homes and offices rather than through a central location. For them, the library will be truly digital. Others will be able to afford neither the equipment nor the access to and knowledge of information resources. For them, it is essential that a central location, well equipped and staffed, should be maintained to ensure opportunities for all within society, independent of means.

8.2 Australian libraries: a digital future?

Among the priorities relating to information access listed in a recent (1996) draft report from a joint committee of CAUL and the National Library of Australia were the following:\(^3\):

- Mirroring significant international databases in Australia to lessen dependence on international communication links
- Developing software to facilitate network access to information

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- Promoting information literacy as a necessary skill of all members of the academic community
- Developing, implementing and promulgating metadata standards for the storage and transmission of information
- Developing standards-based (eg Z39.50) access to all Australian university library catalogues and related databases
- Developing a reliable and pervasive higher education communication network which meets the needs of Australian scholars

Clearly, librarians within the research establishments are committed to improved access to electronic information resources. Indeed, librarians from all sectors are adopting the new technologies with enthusiasm. As the survey in Chapter Four showed, while there was an increasing adoption of electronic information delivery systems, librarians still considered the role of the library an important one. Their role might change, and this is again reflected in the priorities listed above, but the need for a central resource, whether digital, or print, or multi-media, would continue. Certainly their view is a positive one with a strong commitment to their clientele. Nevertheless, the future of Australian libraries is at least partly digital, with all the problems and promises that this medium entails.

8.3 Conclusion

"The government will now provide $11.4 m, in 1996-1997 as grants to Local Government authorities of State Governments (as appropriate) to ensure that every public library is linked to on-line services for public use. The Government will also assist libraries with training in using the technology and in managing the access points."

Former Prime Minister, Paul Keating, 1995\(^4\).

What are the implications of such a change and how will this affect access to resources for those lacking either the physical or the financial capacity to take advantage of this

technology? For almost certainly, individual charging and the consequent inequity of access, will be a feature of these changes. It is essential that the services provided be examined closely and that policy decisions be taken that ensure appropriate dissemination of information resources, independent of ability to pay. This is particularly important in areas such as education and research upon which a country's economic well-being rests. However, it does require a budgetary commitment which some libraries will find difficult to accommodate, given continuing funding constraints. Many government reports during the past five years have indicated that governments are aware of the difficulties but committed to improving broadly based access to information resources. The establishment of a National Information Infrastructure is of high priority in Australia as elsewhere, and will doubtless continue to be so, independent of changes in governing parties. The promise is one of universal access to electronic information services, and public libraries in particular are viewed as important elements in programmes focussed on community access.

The prospect of an ever expanding information resource available via the telecommunications network and independent of place, is exciting. As elsewhere in the world, there is an explosion in the development of world wide web sites in libraries, each providing some new link in the information chain. The constant stream of articles appearing in the news media reflects the general level of enthusiasm for what is commonly referred to as the "information superhighway", as does the emphasis on the importance of putting in place a national, information infrastructure. Whether the technology continues to reside in a specific location such as a library is irrelevant. Facilitating access is the issue of greatest importance.
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**GLOSSARY**

AAP: Australian Associated Press

AARNet: Australian Academic and Research Libraries Network (now Telstra Internet)

ABN: Australian Bibliographic Network

ABS: Australian Bureau of Statistics

ADDA: Australian Database Development Association

AGPS: Australian Government Printing Service

ALIA: Australian Library and Information Association

ASCOT: Australian Securities Commission information service

Australis: CSIRO databases (now merged with Ozline)

Ausinet: Australian database vendor providing a variety of databases, some full-text.

CARL: Colorado Alliance of Research Libraries: Uncover database provider

CAUL: Council of Australian University Librarians

CELLO: a world wide web browser

Dialog/ Knight-Ridder Information: One of the largest and oldest online database vendors

gopher: network access tool

GPO: Government Printing Office (US)

Image Databases: CD-ROM databases which provide images of journal pages

Internet: the now international network of networks which originated in the US

IIA: Information Industry Association (US)

Info-One: Australian database service including legal materials (formerly CLIRS)

JANET/ SuperJANET: UK network linked to the Internet
KiwiNet: New Zealand database service
LEXIS/NEXIS: Major, US based, full-text online service: legal, news information
Lynx: text only world wide web browser
Mosaic: a world wide web browser, providing text and pictures
NCLIS: National Council of Library and Information Services (US)
NDIS: National Document and Information Service
NLA: National Library of Australia
Netscape: a world wide web browser, providing text and pictures
NREN: National Research Education Network (US)
NZBN: New Zealand Bibliographic Network
OCLC: Online Computer Library Center
OPAC: Online Public Access Catalogue
Ozline/SOFI: a database service operating through the Australian National Library
PressCom: an Australian, full-text, newspaper database service
QNIS: Queensland Newspapers Information Service
Reuters: international newswire service
RMIT: Royal Melbourne Institute of Technology
STN: a science and technology database vendor
Telstra: Australian Telecom
UMI: University Microforms International: Microform and CD-ROM vendor
Uncover: Database service providing contents information on current journals
WAIS: Wide Area Information Service
www: World Wide Web
APPENDIX 1

QUESTIONNAIRE

Australian Library Survey
1. Type of Library and environment

Academic ☐ State ☐ Public ☐

Other (state which):______________________________

PCs ☐ Macs ☐ Mixed ☐

Other (state which):______________________________

Number of patrons:______________________________

2. Which online database services are available?

(a) International

Dialog ☐ BRS ☐ Orbit ☐ Lexis/Nexis ☐

Other (please list):______________________________

(b) Australian and New Zealand

Ausinet ☐ Australis ☐ Ozline ☐

Other (please list):______________________________

3. Is there a budget allocation for online searching?

Yes ☐ No ☐

How much is allocated?___________________________

4. Do you charge patrons for online searches?

Yes ☐ No ☐ Sometimes ☐

If yes, which costs are recouped and is there a profit margin

If no, who has access and is there a limit on cost?

If sometimes, when is a charge levied, who has discretion, and what costs are recovered?
5. Has the Library set up a formal information brokerage?
   Yes ☐  No ☐
   If yes, how long has it been operating? ____________
   Do you have brochures available outlining your service?
   Yes ☐  No ☐
   If yes, would you please supply a copy of this please?

6. If an information brokerage has been set up, is any online searching done through this operation?
   All ☐  None ☐  Some ☐
   If none or some, is such searching contracted out to (i) another section of the Library or (ii) outside the library?
   __________________________________________________________________________
   If some, which is contracted out? Eg.: Business, non-traditional Library clients, ...??
   __________________________________________________________________________

7. If all online searching is charged to the client, is any provision made for access to online searches for those who cannot afford to pay?
   Yes ☐  No ☐
   If yes, to what extent? (Eg. per cent of the cost or nominal charge)
   __________________________________________________________________________

8. Are records kept of the number of online searches completed annually?
   Yes ☐  No ☐
   If Yes, how many?
   1990 __________________
   1991 __________________
   1992 __________________
   1993 __________________
   Are expenditure/ costs available over the same period?
   Yes ☐  No ☐
|-----------------|-----| |----------| |----------| |----------| |----------| |

9. Which CDROMs does your Library provide? (if insufficient space, please attach list to completed survey)

   


Which CDROMs has your Library subscribed to in the past? Please list the years held eg, 1991-1992 etc (If insufficient space please attach list to completed survey)

   


10. What network service does your Library have access to?

     AARNet/Internet  

     Other:  

11. Does your Library provide network access to its patrons?

     All  | None  | Some  

     (Please specify which and to what extent)

   

12. Do you maintain an electronic archive site of network resources?

     Yes  | No  

     If yes, what does this contain? Eg.: reports, software, electronic journals, electronic newsletters, other electronic publications...?
13. Does your Library provide access software to some network information resources?
   Yes ☐ No ☐
   If yes, what do you use? Eg.: gopher, WAIS, Mosaic, WWW?

14. What database access is available in you Library via the Network?
   ISI Current Contents ☐ Uncover ☐ Ozline ☐
   Remote library catalogues ☐ OCLC First Search ☐
   Other (state which): __________________________

15. Do you charge for network use?
   Yes ☐ No ☐
   If so, who do you charge, for which services and how much?
   ____________________________________________
   ____________________________________________
   ________________________
   If not, do you intend charging in the future?
   Yes ☐ No ☐

16. What degree of change do you anticipate for your library during the next five/ten years?
   (a) Paper based Books and journals still the main source of information
   Within 5 Years
   Most Likely
   | 1 | 2 | 3 | 4 | 5 |
   Unlikely
   Within 10 Years
   Most Likely
   | 1 | 2 | 3 | 4 | 5 |
   Unlikely
(b) All Journals available electronically

Within 5 Years
Most Likely

Within 10 Years
Most Likely

(c) Newspapers published electronically

Within 5 Years
Most Likely

Within 10 Years
Most Likely

(d) All newspapers archived on CDROM

Within 5 Years
Most Likely

Within 10 Years
Most Likely

(e) Technical literature available electronically (reports, journals, books, articles, conference papers)

Within 5 Years
Most Likely

Within 10 Years
Most Likely

(f) Ready reference largely electronic

Within 5 Years
Most Likely

Within 10 Years
Most Likely
(g) All Document delivery services available at clients desktop/workstation

Within 5 Years

Most Likely

Within 10 Years

Most Likely

(h) Multi-media generally available at workstations in the Library (pictures, video, audio)

Within 5 Years

Most Likely

Within 10 Years

Most Likely

(i) Coin or card operated machines providing network access for all resources (including Bulletin Board Services, email, databases, gopher, ftp and telnet.. etc.)

Within 5 Years

Most Likely

Within 10 Years

Most Likely

(j) All researchers conducting their own online searches via the network

Within 5 Years

Most Likely

Within 10 Years

Most Likely

(k) The library as a physical entity no longer needed

Within 5 Years

Most Likely

Within 10 Years

Most Likely

(l) Librarian's role becomes that of information consultant advising end users

Within 5 Years

Most Likely

Within 10 Years

Most Likely
5th July 1994

Librarian
Online Information Services

Dear Sir or Madam,

I am forwarding to you a copy of a questionnaire relating to electronic information delivery in libraries. I would be grateful if you would respond to the questions it contains as it will provide much valuable information to assist me in completing my PhD thesis research. Any additional comments you may have would be welcomed.

I will contact you by phone in the next few days to clarify any difficulties which you may encounter in completing the questionnaire.

If you would prefer an e-mail copy, please let me know and I will provide this. My e-mail and fax numbers are included below.

If your Library has an Annual Report I would be grateful if you would send me a copy as this may be one way of providing some of the information I require. Any other brochures giving information about your services would also be appreciated.

Thank you for your time.

Yours sincerely.

Carole Alcock
Lecturer
IACT Department
Phone: (042)213884
Fax: (042)214170
Email: c.alcock@uow.edu.au
APPENDIX 2

List of Australian Libraries Surveyed
APPENDIX 2
Libraries Responding to the Questionnaire
July/August 1994

1. University Libraries

[R] Australian Catholic University (Sydney)
[R] Australian Defence Force Academy
[R] Australian National University
[R] Bond University
[R] Charles Sturt University (Riverina)
[N] Curtin University
[R] Deakin University
[R] Edith Cowan University
[R] Flinders University
[R] Griffith University
[R] James Cook University
[R] Latrobe University
[R] Macquarie University
[R] Monash University
[R] Murdoch University
[L] Queensland University of Technology (City)
[R] RMIT Melbourne
[R] Swinburne University
[R] University of Adelaide
[R] University of Canberra
[R] University of Central Queensland
[N] University of Melbourne
[R] University of New England
[R] University of New South Wales
[R] University of Newcastle
[R] University of the Northern Territory
[R] University of Queensland
[R] University of South Australia (City)
[R] University of South Australia (Other Campus)
[R] University of Southern Queensland
[R] University of Sydney
[R] University of Tasmania
[R] University of Technology Sydney
[R] University of Western Australia
[R] University of Western Sydney (Macarthur)
[R] University of Wollongong
[N] Victoria University

(R=33 out of 37; N=3; L=1)
2. **National, State and Major Public Libraries:**

[R] Australia: National Library of Australia

[R] New South Wales: State Library of New South Wales
[R] Northern Territory: State Library of the Northern Territory
[R] Queensland: State Library of Queensland
[R] South Australia: State Library of South Australia
[R] Tasmania: State Library of Tasmania
[R] Victoria: State Library of Victoria
[R] Western Australia: Library and Information Services of Western Australia

[N] ACT Library Service
[R] Brisbane City Council Libraries
[R] Darwin City Council Libraries
[R] Gold Coast City Council Library
[R] Melbourne City Libraries
[R] Newcastle Public Library
[N] Sydney Public Library
[R] Perth: City of Perth Library and Information Service
[R] Wollongong City Council Library

[Hobart and Adelaide: through State Library Service]

(R=15 out of 17;  N=2)

### All Libraries

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Requests Sent:</td>
<td>54</td>
</tr>
<tr>
<td>Total Received:</td>
<td>48</td>
</tr>
<tr>
<td>Not Returned:</td>
<td>5</td>
</tr>
<tr>
<td>Lost in transit:</td>
<td>1</td>
</tr>
</tbody>
</table>

R = Received;  N = Not Returned;  L = Lost in transit.
APPENDIX 3

Tabulated Results of
Australian Library Survey
APPENDIX 4

Student Questionnaire
APPENDIX 4
Questions *

1. The subject material has usually been ...
   VERY INTERESTING  VERY UNINTERESTING

2. Tasks in the Tutorials / Seminars have been worthwhile learning experiences ...
   ALWAYS  NEVER

3. Tasks undertaken in the labs were worthwhile learning experiences ...
   ALWAYS  NEVER

4. For me, the subject matter has been ...
   VERY FAMILIAR  VERY UNFAMILIAR

5. In relation to my future employment, the subject matter has been ...
   MOST RELEVANT  MOST IRRELEVANT

6. This course has changed my information seeking methods ...
   GREATLY  NOT AT ALL

7. This course has extended my knowledge of computerised information and research resources ...
   GREATLY  NOT AT ALL

8. The practical sessions in the MacLab have been ...
   SUFFICIENT  INSUFFICIENT

9. I would like to know more about the Network ...
   DEFINITELY  NOT AT ALL

10. I have learned sufficient about the network to give me a basis for extending my skills ...
    AMPLE  INSUFFICIENT

* [Extracted from a larger questionnaire which covered aspects of the course other than the strictly practical..]