

Document Delivery in a Medium-sized Scientific Library: the Impact of Increased Access to the Global Library

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Abstract

In numerous fields of science and technology, and in particular in those areas which have opened up in the last thirty years, life sciences and engineering, the Consiglio Nazionale delle Ricerche (CNR) Institutes represent an advanced point in Italian research. Many of the CNR Institutes established the Units of Research and developed into CNR's own scientific network.

CNR's headquarters is organised by departments (general affairs, assets, accounting, personnel and scientific affairs) and services (library, data processing, international relations, workplace safety, networks).

Research parks are field infrastructures for the Institutes located in Italy. This paper describes the library services located in the southern Italian Region called Basilicata and discusses the document supply service. The extraordinary developments in information technology profoundly concern libraries, which are today experiencing a phase of substantial change. The most significant transformations have been the automation of procedures and the development of online catalogues. Subsequently, the arrival of the Internet has led to the final change in the library paradigm, which is no longer based on the total acquisition of documents, but oriented towards access and use of remote resources.

This paper presents two research studies that aimed to find out how researchers use the EDD services to help them do their work. The studies cover a range of methods and approaches and include a case study that focused on bibliographic information and online search assistance services. The management of these services has recently been considerably influenced by the use of Internet. Moreover the paper answers some questions -- Have libraries adapted new technologies to ensure a broader access to information? --Has acquisition management changed, becoming increasingly oriented towards access to documents available on the network or through document delivery systems?

These questions will help us to better understand the current state of EDD in the era of globalisation of information and give some indications of potential future applications and use of networked resources.

Historical Context

First among the new Area of southern Italy, Potenza combines scientific and cultural heritage researchers in a single centre. The Area comprises the following Institutes:

1. Istituto Internazionale di Studi Federiciani - IISF (International Institute for the Study of the age of the Fredericks)
2. Istituto di Ricerca sulle Argille - IRA (Institute for Clay Research)
3. Istituto di Metodologie Avanzate di Analisi Ambientale - IMAAA (Institute of Advanced Environmental Analysis)
4. Istituto per i Materiali Speciali - IMS (Institute of Special Materials)
5. Istituto di Orticoltura e Colture Industriali - IOCI (Institute of Horticulture and Industrial Crops)
6. Istituto di Tecnologie Informatiche Spaziali - ITIS (Institute of Space Information Technology).

The creation of the Institutes has contributed to the development and spread of cultural activity in both the sciences and the humanities. This varied cultural background has been recognised by the Research Area in its development of the Library, whose collections cover the study of the medieval age of Frederick II within the framework of the history of Southern Italy; geological, mineralogical and

geochemical research on clay deposits; the study of the atmospheric phenomena in the dynamics of environmental processes; the use of laser technologies in the reduction and characterisation of advanced materials; the study and application of information technologies in space-related activities and research on improving food quality and safety through the use of innovative production technologies.

Exactly five years ago this library opened its collections to the scientific community in Basilicata. Work has also begun on an on-line system of catalogues, databases and archives, creating an efficient and extensive system of bibliographical information for local researchers. It offers about 300 scientific periodicals, more than 5.000 monographs, and a growing number of data banks on CD-ROM. Economic considerations and the evolution of modern technologies have led the librarian to understand that developing collections is only a little part of managing a scientific library. Thus, because Research Area collections are not comprehensive enough for researchers, the document delivery service permits very rapid response to requests for documents. Moreover Potenza Research Area is located only a few minutes from the heart of the city, the Basilicata University and other public libraries, but is not within easy reach of special library and information services located on Italian territory. For all these reasons EDD was thought the best way to test the efficiency of a library service located in a little Italian region.

Aim

In order to deal with economic considerations and increasing demands, in 1996 the CNR Research Area of Potenza, began to rely on providing copies of journal articles on demand. The objective was to provide users of the Basilicata Region with all bibliographic information they require and support them with a document delivery network. The library supplies on demand several articles each week and a table of contents service to keep users informed of what is being published. This service allows the library to provide access to information sources without having to own or maintain them. By January 1998 Research Area of Potenza cancelled some of its printed journal subscriptions and used the money for electronic journals to support the document delivery service. The library staff plan practical technical developments that would enable the library to redesign its document delivery service for a networked environment and set up an experiment in EDD.

The main aim of the experiment was to see if EDD could save money on expensive journal subscriptions and to increase the cost effectiveness of obtaining journal articles, thus ensuring value for money, and to test the acceptability of a service delivering full text articles to users. At no point did we consider replacing existing journal collections with electronic document delivery. The two would be run as complementary services. In observance of copyright law, the library offers to the scientist journals, proceedings, grey literature and newspaper articles in the relevant subject field.

In any case, document delivery systems, whether or not electronic, have been developed to allow researchers quick access to primary information available both at their own CNR libraries and at the other libraries.

The paper was approached in the following ways and these are described below:

1. Approach to document delivery;
2. Library system architecture;
3. System environment for electronic document delivery;
4. Some statistical data of user requests.

Approach to Document Delivery

Since 1996 the Library has adhered to a common work plan of the CNR library "G. Marconi" in Rome and other CNR libraries. The work plan for these libraries identified three areas in which technical developments were needed to develop a document delivery service: 1) the creation of the *On line public catalogue* (OPAC); 2) widespread use of *national standards* at the CNR Area for system interoperability; 3) the supply of articles in 24 hours by file transfer or fax free of charge for internal users only.

With the help of all these services, information, documents and especially articles, could be found very quickly. So "to identify references" and "to get documents" were considered a phase of primary importance that gave as results: "efficiency to library" and "satisfaction to users".

In a more pragmatic sense, the first move towards document delivery began with the CNR libraries' co-operation. The national network consists of co-operating Research Libraries from CNR who have built a database of local library holdings. There is a Union Catalogue at <http://www.ge.cnr.it/SDS/Aree/> which helps library staff to identify where the serials are in CNR.

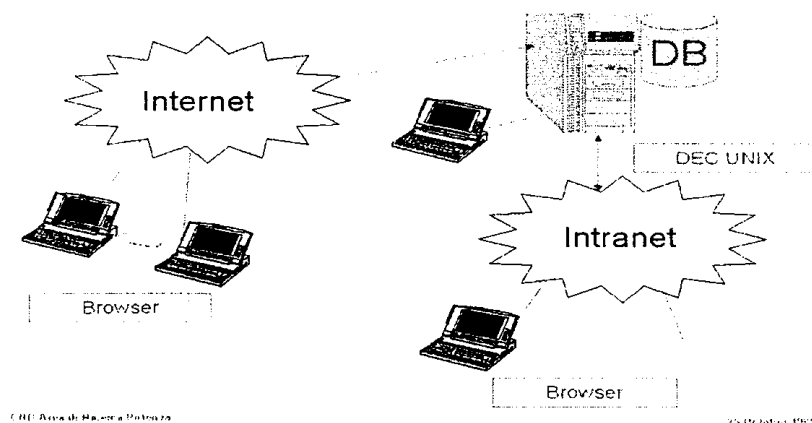
In order to encourage co-operation and to obtain a good quality of document delivery service, the CNR Libraries decided to establish Internet connections to improve availability of information, and they agreed to deliver articles for internal users free of charge.

Every effort has been made by all the CNR Area, located in the Italian territory, to improve the service even when faced with an increase in requests, and with staff levels remaining constant. The Library of Potenza now co-operates with 14 Research Areas. The Union Catalog of Scientific Serials, edited by the Research Area of Genova, provides information on the availability and access to documents, and allows libraries to optimise the size of journal collections which are subject to budget restrictions. During the last three years document delivery services at Research Area have become increasingly important in comparison with the number of journals held, over 5,270 titles held by the following CNR Libraries: Milano, Genova, Bologna, Firenze, Pisa, Tor Vergata, Roma, Napoli, Bari, Potenza, Lecce, Catania, Cosenza and Palermo. It was essential to make drastic changes to the journal collections in those Areas in which there were duplicate titles, finding benefits in moving to document delivery, especially for those expensive duplicate journals and low-use ones.

Library System Architecture

The changing and diverse needs of today's special library requires a flexible and robust system architecture that supports broad access to a variety of information. The World Wide Web has changed the face of information access and as a result, is changing library management. So the library staff believed that the most effective way to position a modern library was through a Web interface. Internet connection between our Library and the national network is through a C-Lan Frame Relay which allows users access to electronic mail and to www. The workstation DEC Unix allows access to the OPAC of the library and the use of remote resources. The architecture represented in this paper shows the structure of the library.

Architecture

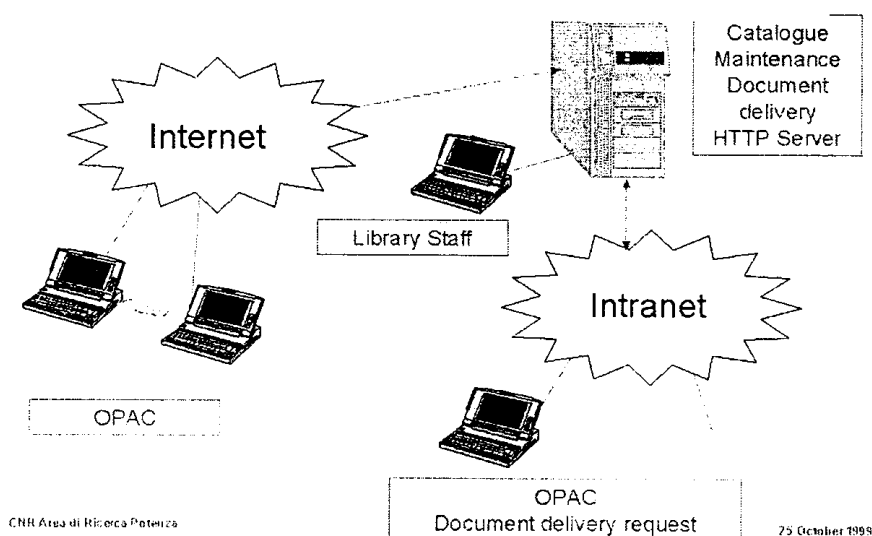


The software we have chosen is a suite of integrated components designed to manage library cataloguing, circulation, serials control and acquisitions. The integrated Web environment provides convenient and efficient patron access to library collections and digital documents. The software manages collections of intellectual assets and facilitates integration of enterprise-wide document management.

The present Architecture includes the following modules:

1. OPAC for Intranets provides access to the library catalogue via the open infrastructure of the World Wide Web. Using any popular Web browser, OPAC for Intranets provides direct access to the library catalogue with complete item status details, hyperlinks to internal and external information resources, and user request features.
2. The Cataloguing module provides a complete facility for managing the library catalogue, including retrieval, data entry, and reporting.
3. The http server provides a central system to the library staff forwarding external requests to appropriate libraries and manages all services on www such as electronic journals.

Library Services



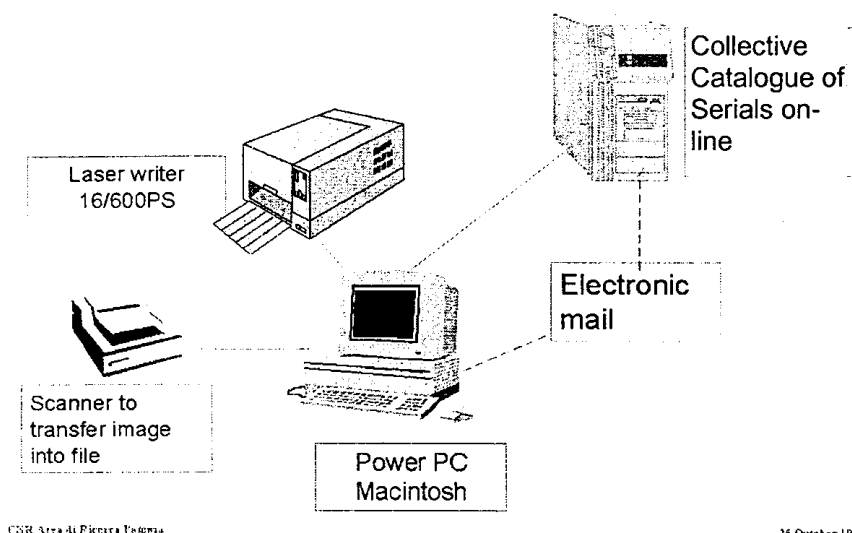
System Environment of Electronic Document Delivery

An organised document delivery system for scientists did not exist in Research Area of Potenza until March 1998. The system was originally intended to be fax based, but for customer satisfaction it was changed to imaging and transmission by file transfer. The first objective of the EDD system had been to meet internal demand in a local area network (LAN) environment. The library staff developed in house a local low-cost EDD system as a way to look into the future and to share the journal resources of CNR libraries through appropriate technology. Journal articles are scanned and transmitted by electronic mail. Technical standards for storage and retrieval of image and text files became of great importance and are connected with customers' demand. As in any area of information technology the system has been developed with the most important technical aspects in mind: 1) request management; 2) document production; 3) document transmission.

The EDD system consists of some applications and a server which contains the OPAC. In a LAN environment, the server interacts with local devices and uses the LAN for electronic document transmission and user notifications by means of electronic mail.

The EDD system includes in its design the support for user facilities: the Collective Catalogue of Serials availability on-line, an Alphastation running the unix operating system for file transmission, electronic mail to communicate requests, a scanner to transfer images into file, a Power PC Macintosh 7600, and a Laser writer 16/600 PS.

Document delivery system architecture



The phases developed are:

Request Management

The Server receives requests from local and remote users by electronic mail in conformity with IFLA recommendations, at the address biblio@area.pz.cnr.it. Requests are stored in a database on Power PC Macintosh. Applications were accepted originally only manually. After that from our experience in the technical library supporting a mid-size organisation with one specific focus (a service rather than a product), we advocate a combination of intranet Web pages and e-mails. The Web is useful for information of a general nature, with a relatively long life. E-mail is the method of choice for bringing to people's attention information that is immediate or "one-time-use" in nature. For example, we used it to advertise certain new acquisitions or selected information picked up from our own Web surfing. It was particularly successful because requests could be made electronically without users having to come in to the Library and fill in a form. Users increasingly wanted to order material via their PC and have it delivered to their desk. Applications could be easily written and sent to the library staff, so that requests can be received, processed and satisfied without human intervention.

Document Production

The preparation of documents consists of scanning journal articles with Adobe acrobat capture and saving files in PDF format. Storage of documents scanned is made on the Alphastation server waiting to be distributed to its destination. In this way response time is reduced and text quality is improved. The resolution is usually set at 300 dpi, and the quality is acceptable for text and graphics.

Document Transmission

The documents generated by scanner within 24-48 hours are sent by e-mail to their destination. The introduction of an EDD system for forwarding requests by e-mail has reduced their waiting times.

Library staff decided to shift from manual to electronic service having considered all user needs and all Library needs. This is particularly valuable when a user requires articles within 24 hours as direct personal delivery, ie via e-mail, fax, without a visit to the Library. Another question which most interests the user is the copy quality of article requested which is largely satisfied by electronic format.

Some Statistical Data of User Requests

For this model system the Library conducted an analysis of the type of documents requested and kind of subjects involved in the requests. The figures below show the type of document requests in 1997 and in 1998.

Figure 1: Type of documents requested in 1997

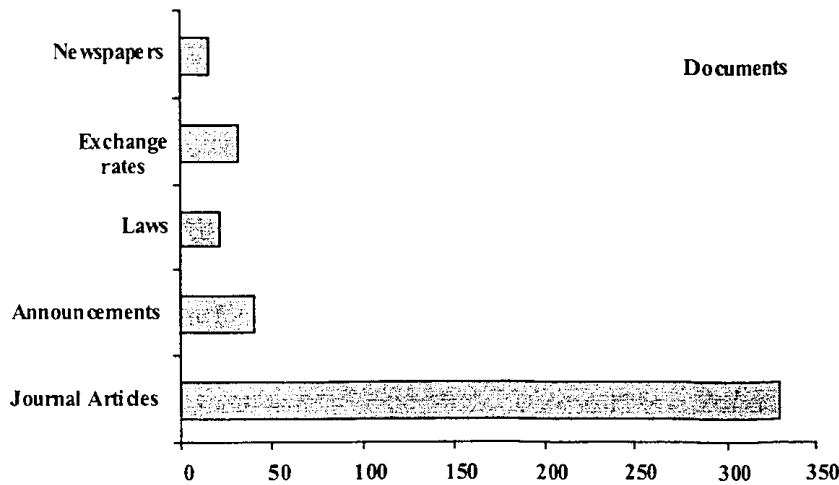
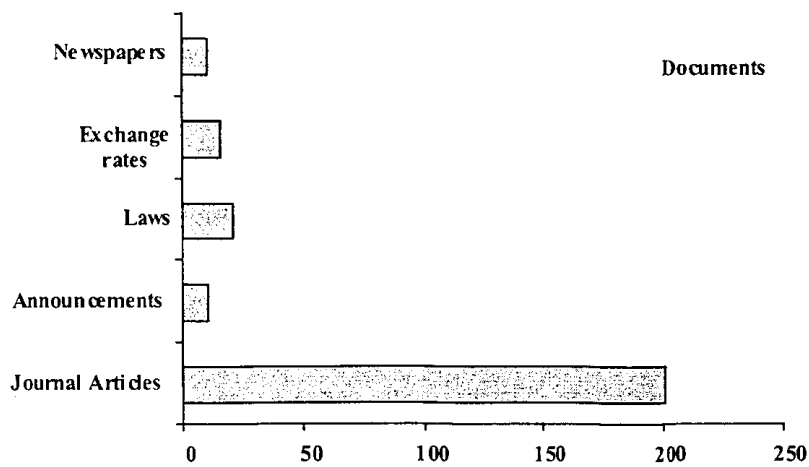


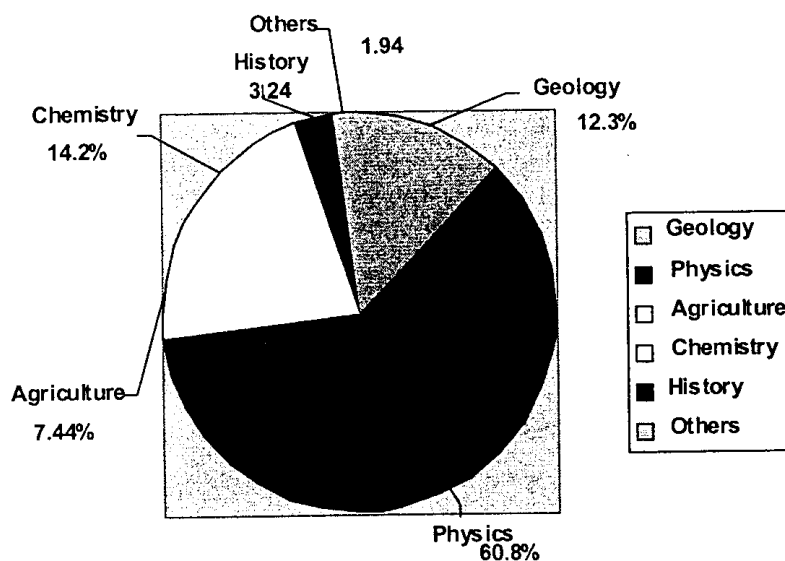
Figure 2: Type of documents requested in 1998



The data presented in this article relate to the document delivery service between June 1997 and December 1998. The requests processed concern documents which the Library supplied to scientists working in Research Area of Potenza. In 1997 customers' requests have been analysed in terms of subject and type of Institute because these criteria prove that the trend of requests by subject are related to the price of journals. Moreover, the data analysed by subject allows us to identify the scientific publishers who have higher costs and to exclude them from the annual subscription. This was a result of the continued increase in periodical prices above the rate of inflation, the increasing difficulty in subscribing to core journals caused by price increases. At the same time that increasing costs have reduced the amount of materials the library can supply from its own collections, the availability of computer searchable indexes has expanded the number of sources that library users are able to identify. The Institutes involved in those subjects had a lower number of journals to which the Library subscribed, but the Library supports their work by supplying users through the document delivery service.

The following graphic shows satisfied requests for different subjects of Institutes located in the Research Area of Potenza:

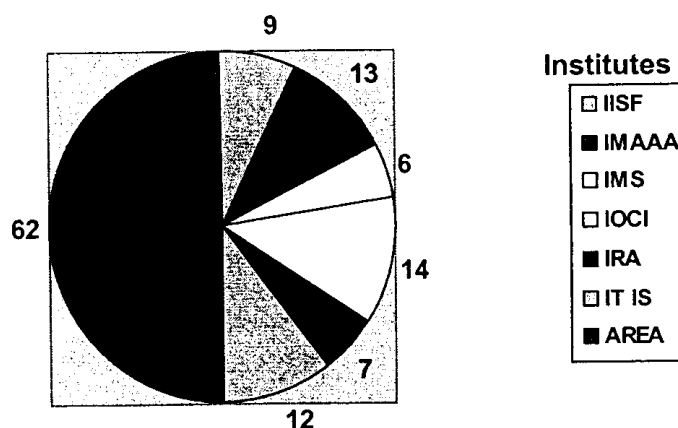
Figure 3: Subject Analysis Year 1997



It is clear that during the year 1997 physics, geology and chemistry were the largest subject of the document delivery service. In these areas most researchers have not been satisfied by the local availability of collections. The reason for this may be that in 1997 the budget for those journals was reduced and the prices of those journals, at the same time, increased. The lowest level of requests, from agriculture and history, is explained by the availability of a higher number of journals for those subjects.

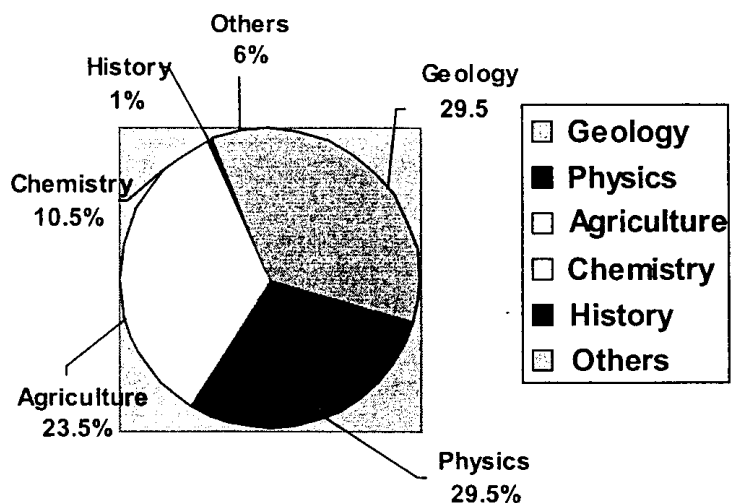
Figure 4 shows the number of journals bought in 1997 by the same amount for different institutes:

Figure 4: Number of current journals for Institutes, Year 1997



Here lower journal costs are the most important factor because this influences the number of journals received which is more consistent than the others. This reduced access is not due to a minor scientific activity in the field of agriculture and historical sciences, but particularly to economic reasons.

Figure 5: Subject analysis, Year 1998



The above graphic is representative of this library system, where demand is concentrated on a few titles held by the biggest CNR Areas. It is important to note that in the libraries in which the budget is higher, the more expensive journals are bought also for the libraries in which the budget is lower. This means that libraries with a lower budget can be satisfied by those libraries with a higher budget through EDD. This is the greatest example of co-operation and collaboration among libraries of the CNR that makes every effort to eliminate gaps in the acquisition of serials in different subject areas. In this way document delivery becomes for the librarian the best tool for customer satisfaction in a place in which the Lucanian librarianship system is very poor. At the present moment the scientific community of the Basilicata region needs to obtain documents and information that are not located in the area, because there is no other scientific library in which there is a document delivery service. So the Library of Research Area of Potenza facilitates the needs of researchers who live and study there, and exists to meet only the needs of those researchers. This is because the library staff is too small to offer the service for external requests. An analysis of methods used for satisfied requests give us the following results: a great number of documents in different fields have been obtained by an electronic system (PDF format) that has allowed us to supply articles in good time. In this way the aim of the document delivery service is achieved because 95 per cent of demand is satisfied in about 24 - 48 hours, where the material is in its own collection. About 60 per cent of document orders are sent electronically.

Conclusion

To a large extent the experiment had demonstrated that EDD could be a viable alternative to expensive periodical subscriptions but further research was necessary before Library Administration would be willing to risk cancelling journals and relying solely on EDD.

Thus, the major objective of this project, providing bibliographic information and delivering documents to scientists working in this Research Area, has been achieved. It is also true that the experiment proved there is not enough national co-operation, but there is useful co-operation on new technology developments across international institutions.

An EDD service should be provided in the future as a complementary service to holdings and not a substitute for them. Although immediate delivery was not always necessary there was a demand for it, and users would be unhappy for the service to be discontinued.

Regarding the future, developments in technology are advancing so fast, that with the increasing number of full-text journals becoming available online, would this type of service be needed in the future?

I would like to thank Doctor Carla Pietrapertosa and Donato Conte who gave their contribution in technical support and a useful discussion on library system architecture.

References

- Barden, P. (1990), "ADONIS The British Library experience", *Interlending & Document Supply*, Vol. 18 No. 3, pp. 88-91.
- Braid, A. (1998), "Standardisation in electronic document delivery", *IATUL Proceedings*, Vol. new ser 6, pp. 8-20.
- Cornish, G. P. (1998), "Copyright and document delivery in the electronic environment", *Interlending & Document Supply*, Vol. 26 No. 3, pp. 123-129.
- Costers, L. and Koopman, S. M. J. (1993), "The Dutch RAPDOC Project: from interlibrary loan to electronic document delivery", *Interlending & Document Supply*, Vol. 21 No. 1, pp. 4-6.
- Dade, P. (1997), "Electronic information and document delivery: final report on the pilot trial of the Uncover database", *Vine*, Vol. 103, pp. 43-45.
- Gould, S. (1998), "Interlending and document supply: a review of recent literature", *Interlending & Document Supply*, Vol. 26 No. 1, pp. 36-43.
- Gould, S. and Watkins, J. (1998), "International co-operation: the role of the IFLA Offices for UAP and International Lending", *Journal of Librarianship & Information Science*, Vol. 30 No. 3, pp. 195-199.
- Hong, Y. and Wang, H. (1997), "Confronting the challenge of electronic document delivery: a literature review", *Journal of Interlibrary Loan, Document Delivery & Information Supply*, Vol. 7 No. 3, pp. 3-12.
- Malinconico, M. (1996), "Electronic documents and research libraries", *IFLA Journal*, Vol. 22 No. 3, pp. 211-225.
- Mounir, A. K. (1996), "Using the Internet for document delivery", *Internet References Service Quarterly*, No. 2, pp. 38-39.