Web-based Document Delivery System for Scientific Information Management in Italian Research Libraries

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Keywords

Document supply, Internet, Management, Research Libraries.

Abstract

Providing users with a rapid online searching and requesting of Journal articles, with desktop delivery options to view full-text versions on-screen, or to download and print “Just-when-you-like”, is a high priority in many libraries.

The topic of web-based document delivery service is presently being investigated across disciplines, often with a strong technological emphasis. The present article takes a managerial and organizational approach by placing the document delivery service in the context of the Italian Research Libraries, (IRL) and focusing on opinions of the librarians concerning the document delivery developments with web-based technology.

The focus of this paper is also a description and maintenance of the Internet Delivery System (IDS) project and it examines organizational and individual approaches to librarian assignment.

Changes in Research Libraries

To create an efficient library service, the library must be able to look beyond the functional organization of services to a more collegial model that is not bureaucratic or task orientated (De Robbio 1999).

IRL today use multiple model to manage document delivery service. Some librarians of Italian National Research Council (INRC) need to make informed decisions about the use of document delivery systems based on many competing factors which includes: meeting user requirements and priorities; cost effectiveness; appropriate use of different INRC institutes of resources; technological feasibility. This study is directly concerned whit advances in web applications, that contain elements for user satisfaction and it looks at organizational and individual solutions to the assignment of responsabilities and

presents a collegial model that benefits both the library and the users. (Arte 2001)

The very interesting perspective and expertise that a team of librarians brings to an electronic document delivery system and to the other parts of technical services, includes the ability to prioritize user satisfaction and a historical knowledge of changes in technologies to provide web-based document delivery service.

The aim of the IDS project

The aim of the project showed in this article is to analyse different factors of a web-based document delivery system:

- Requesting and delivery times;
- Costs;
- Document quality;
- Cooperation between libraries.

The purpose of this is to evaluate the success of the IDS project according to this criteria.

The assessments of the problems associated with the developmend of IDS and their relative value for library and users, include:

- Costs of computer hardware and software;
- Training of librarians in new technologies and digitization of paper materials;
- Elimination of the physical space for study and socialization.

The web-based document delivery offers the opportunity of accessing information residing at remote sites. For this reason, it offers benefits, as much to libraries on small budgets as to those where this is pre-eminent.

The most remarkable change offered by IDS project is probably tied to the reorganization of a library. Reorganization in this case imply many things, from dividing or consolidating functions to implementing an entirely new model (e.g. from a single-individual library model to a cooperation library model whit self-managing teams).

Whether a reorganization is done for budgetary or philosophical reasons, or both, its purpose is to delivery service by dividing the librarian's activities among librarians of different sites. The creation of new technological services into the traditional library means the assignment of responsibility to librarians that follows the new organizational pattern (Rusbridge 1998). In IDS project librarians have to improve the knowledge of web environment to provide web-based versions of their services which allow rapid online searching and requesting of journal articles.

Computer-based technologies for requesting, storage, retrieval, and transmission does not mean that the system model builds exclusively on computer technologies.

The web-based document delivery system coexists in the same physical structure as the traditional library.

The library administrator will be challenged to maintain the print-media library while obtaining resources, and funding for acquisition of e-journal in the Consortia. Librarians will serve as coordinators and educators of a "hybrid"

environment in which coexist print journal and e-journal. Users can bypass the librarian using modern technologies that can automatically deliver articles to the consumer's computer via web mail (Badoer and De Robbio 1999). The new relationships between researchers and librarians in a scientific environment is nonetheless interesting and derail the library from its institutionalised roles.

Methodology

The whole structure of the system is based on the serviceability of FileMaker Pro® (Maggi and Di Cintio 2002). According to this, two different interfaces were set out, implying that the system is structured to operate in different conditions and can use different platforms: an interface for realities that need such software and an other one for realities that do not use FileMaker Pro®.

The project provides the existence of three different operators, a system server (IDS Server), different operative realities (at present three IDS Clients) and the users (more than 100 scientific realities, IDS User).

As stated in the introduction, the IDS is finalised to create an electronic document net which allows communication among scientific and non-scientific national realities and consequently an implementation of a Source and Reference Database.

The System is divided into three areas with different tasks and selective access and the IDS Server is in charge of the entire system. In the first area is localised the Source and Reference Database, to which all scientific and non-scientific national realities have access. The second area is reserved to web-interfaces

needed to run (or manage) the database. Only the IDS Client has access to this area. In the third area are localised all the electronic documents and, similarly to the database area, all the operators involved in the project have access to this area. The typology of the IP address electronic configuration of the operators (IDS Client and IDS User) determine the access to one or more areas.

On this basis, to use the IDS service, the IDS User has necessarily to set up its electronic configuration on the IDS Server. For this reason a model has been implemented in web. As the setting procedure is completed, the IDS Server provides the IDS User an Access Personal Code (APC) which will enable submission of enquires to the IDS Client.

In the following figure a scheme of the IDS project is provided.

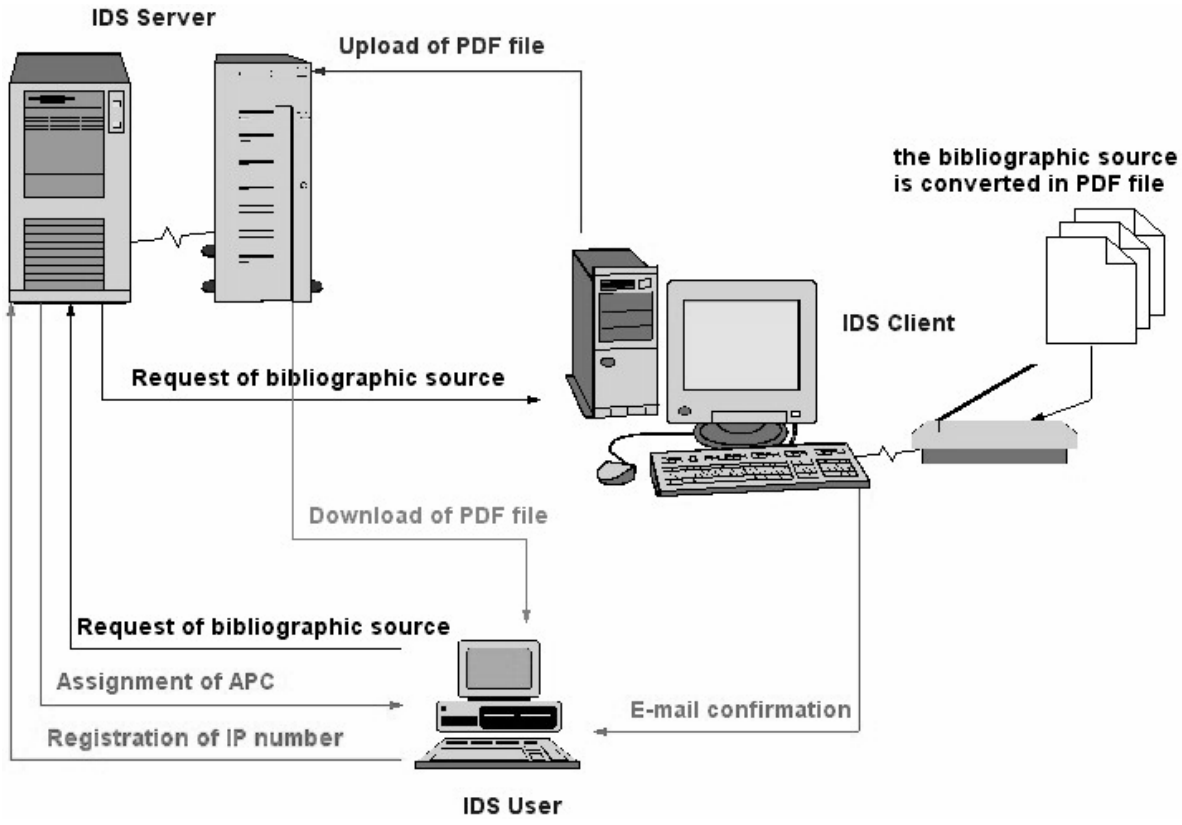

Fig.1 Scheme of the IDS project steps.

Architectural System

The IDS project, started at beginning of last year, involves three scientific partners, strategically distributed on the national territory: the Research Area of Genoa (in the north), the Research Area of Roma 1 – Montelibretti (in the centre), and the Research Area of Potenza (in the south). At present, the Library and the Document delivery services are, in these Research Areas, already able to offer the scientific community more than 8,000 journals in fields such as agronomy and agricultural sciences, archaeology, biology, chemistry, physics, mathematics, computer sciences, and engineering. Such journals are also searchable using a gateway (at the address http://www.ge.cnr.it/SDS/Aree), through enquires from local OPAC, which is able to connect the user directly to the local OPAC satisfying enquires.

The above mentioned search engine, which can be considered a Gateway, is made of a series of web interfaces, structured using Claris Home Page and aimed to search a database implemented with FileMaker Pro®.

The wideness of such database (more than 8,000 scientific journals) and its frequency of enquiring (an average of 180 –200 daily accesses) are by themselves enough to justify the existence of the IDS project and its aims, i.e. structuring of an electronic service to automate the different stages related to the production, registration and filing of a digital document.

The compulsory conditions that the project has to satisfy are the following:

- Cheapness;
- Quality;

- Rapidity;
- Simplicity.

A feasibility and experimentation study (Maggi and Di Cintio 2001), lasted for more than a year before the IDS project started, identified the PDF format as the standard to adopt in order to realise digital copies. The extremely versatility of the PDF format is due to many reasons, i.e. simplicity of visualisation (the system has a multi-platform structure and its viewer is freely distributed by Internet), a good zipping ratio (a 10 pages article scanned at 300 dpi is stored in a multi-page file of about 1 Mbyte whereas the equivalent TIFF file is 5 times larger), rapidity (a simple desktop scanner is able to make a digital copy of a 10 pages article in five minutes), cheapness of the software needed to produce PDF files.

Another crucial aspect of the IDS project was the choice of the digital document transmission: “Via e-mail” was one of the possibilities of transmission of PDF files. Unfortunately this procedure would have caused a collapse of the system protocol. Another possibility was the transmission through an FTP site, although such a way would imply some experience of the user. Therefore, it was decided to adopt for the digital document transmission the “download from a web-site” procedure, surely efficient and very simple even for a non-expert user. On this basis, an IDS project based on two databases was initialised: a first database is relative to the user himself and a second relative to the searching of journals, as described in Source and Reference Database paragraph. The two databases by being searched by the users themselves are clearly implemented.

The database, as specified before, are localised on the IDS Server: a PC IBM compatible equipped with a Intel Pentium IV 1700 MHz processor, 512 Mb

SDRAM PC133, 5 Hard disk SCSI with more than 100 Gb (1 inside with 18 Gb and 4 in an external rack with 8 slots, of which 2 with 32 Gb and 2 with 10 Gb), Microsoft Windows NT Server 4.0 operating system, Internet Information Service 4.0 and FileMaker Pro 5, Unlimited version. The IDS Server is then interconnected with the three IDS Clients. All of them are PC IBM compatible with Intel Pentium II 333 MHz or III 800 MHz, RAM varying from a minimum of 128 and a maximum of 384 Mb, Microsoft Windows NT Server 4.0 operating system and FileMaker Pro 5 Unlimited version. Such electronic configurations house local OPAC, implemented with FileMaker Pro and web interfaces relative to the IDS project. The IDS Server hard disk is partitioned as follows: 2 Gb for the operating system, Internet Information Service and FileMaker Pro; 16 Gb to house the databases necessary for the project and the web interfaces, and 32 Gb for filing digitalized documents. For the latter, 84 Gb are at present available although it is believed that such memory is enough to store not more than 30.000 documents and therefore to last for about 5 years, at the present operative conditions. The architectural system is represented in the following figure 2.

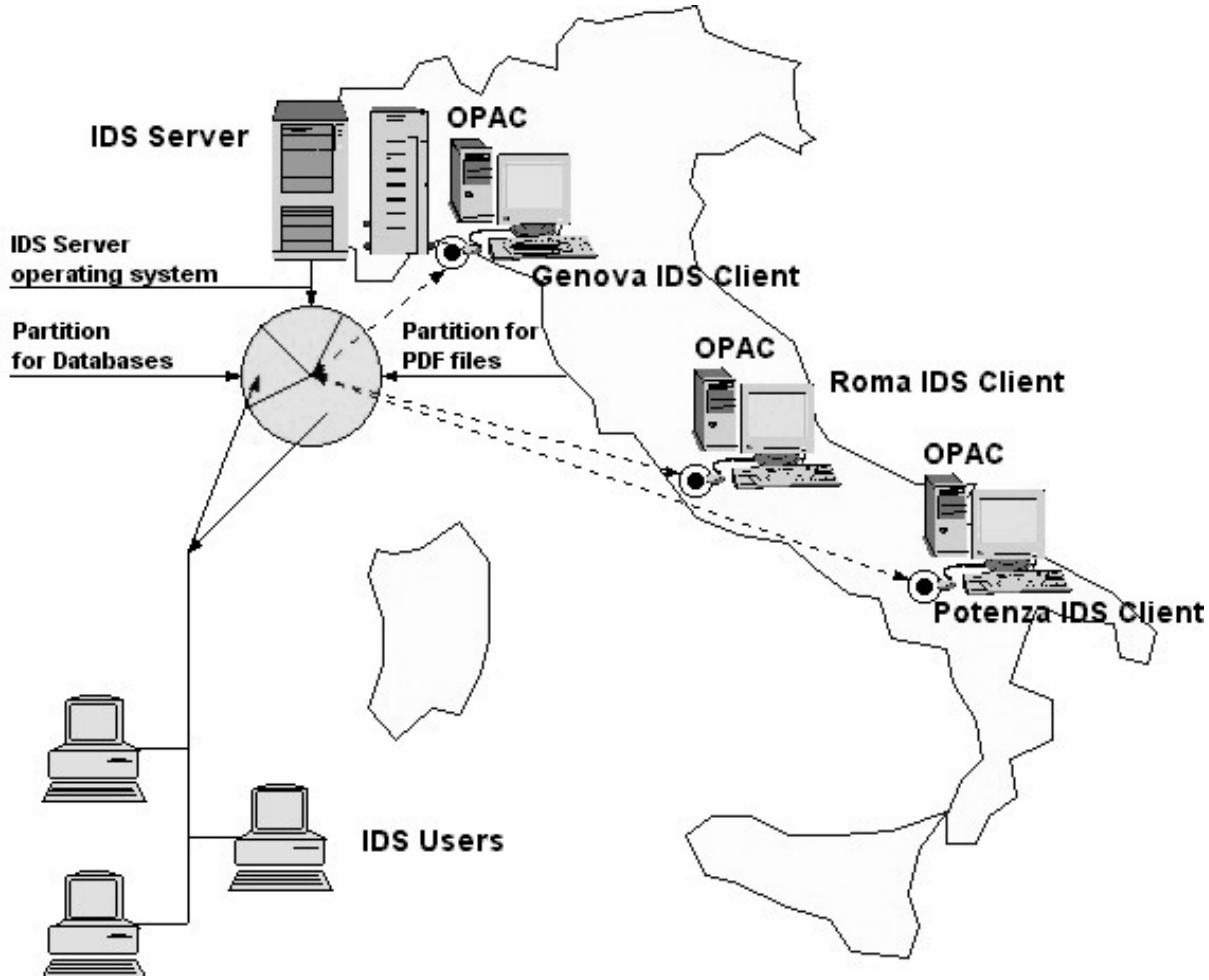

Fig.2 Representation of the clusters in the IDS project.

Conclusion

Despite the limits that the Italian copyright regulation imposes, the document delivery service is commonly and successfully used in all the public Libraries, especially in those dedicated to science. However, the number of those Libraries that do not use the document delivery and do not offer to the scientific community a rapid and high-quality service is still large. Very often such Libraries send documents via mail to be able to preserve the quality of the original

document or even via fax to accelerate the service, not taking into account the loss of quality occurring using fax transmission.

The IDS project has therefore the aim to conjugate document quality and rapidity of transmission and shows that the document downloading from Internet preserves the document quality (300 dpi scansion). In figure 3 a page of scientific journal acquired at 300 dpi saved as a PDF file and sent via fax is compared with the same page downloaded from Internet, clearly with a strong loss of quality.

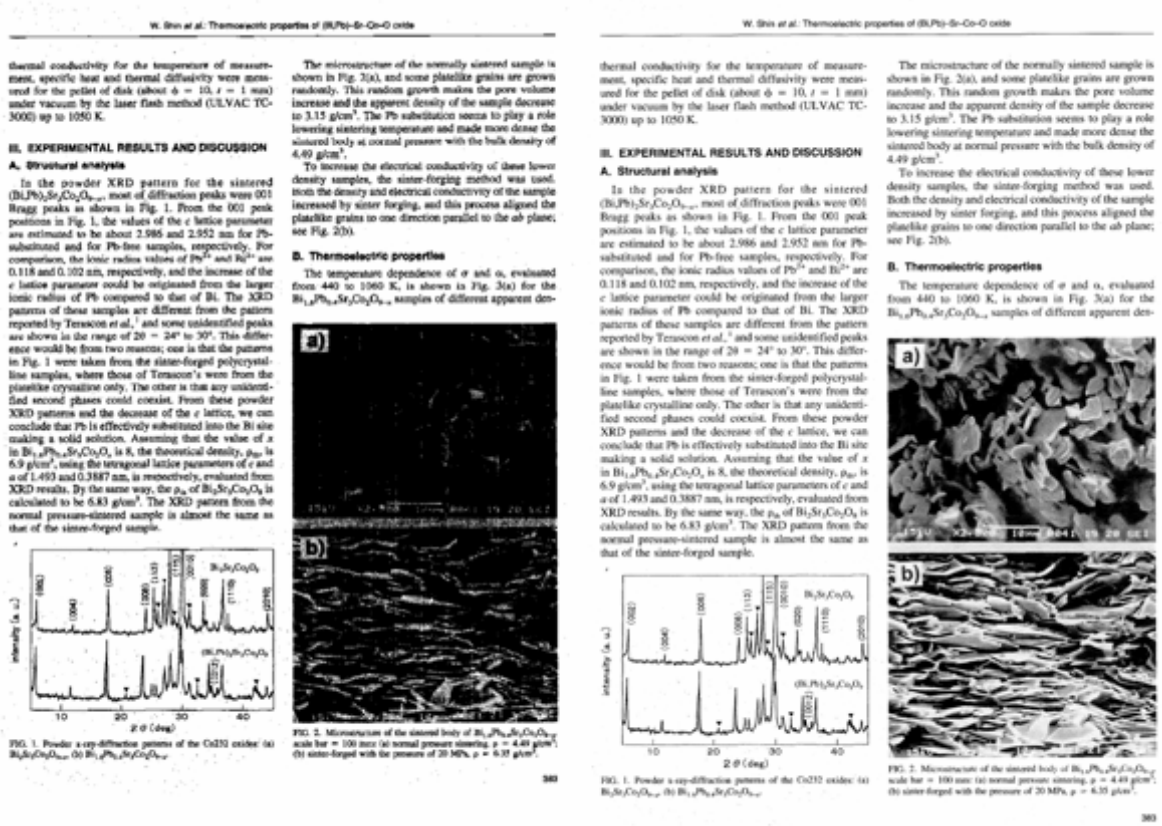

Fig. 3 Comparison from a document sent via fax (on the left) and a document downloaded via Internet (on the right).

Further, the IDS project takes into account the possibility to offer a cheap service. By avoiding sending document via mail or fax the service allows saving money of about 20-25 %. Another not secondary aspect the project offers is its “ecological” nature. Using the document downloading the system does not use a large

amount of paper. In figure 4 are sketched all the aspects, i.e. cheapness, quality, rapidity and attention to environment the ISD project offers and a comparison between the traditional system and the IDS project is also shown.

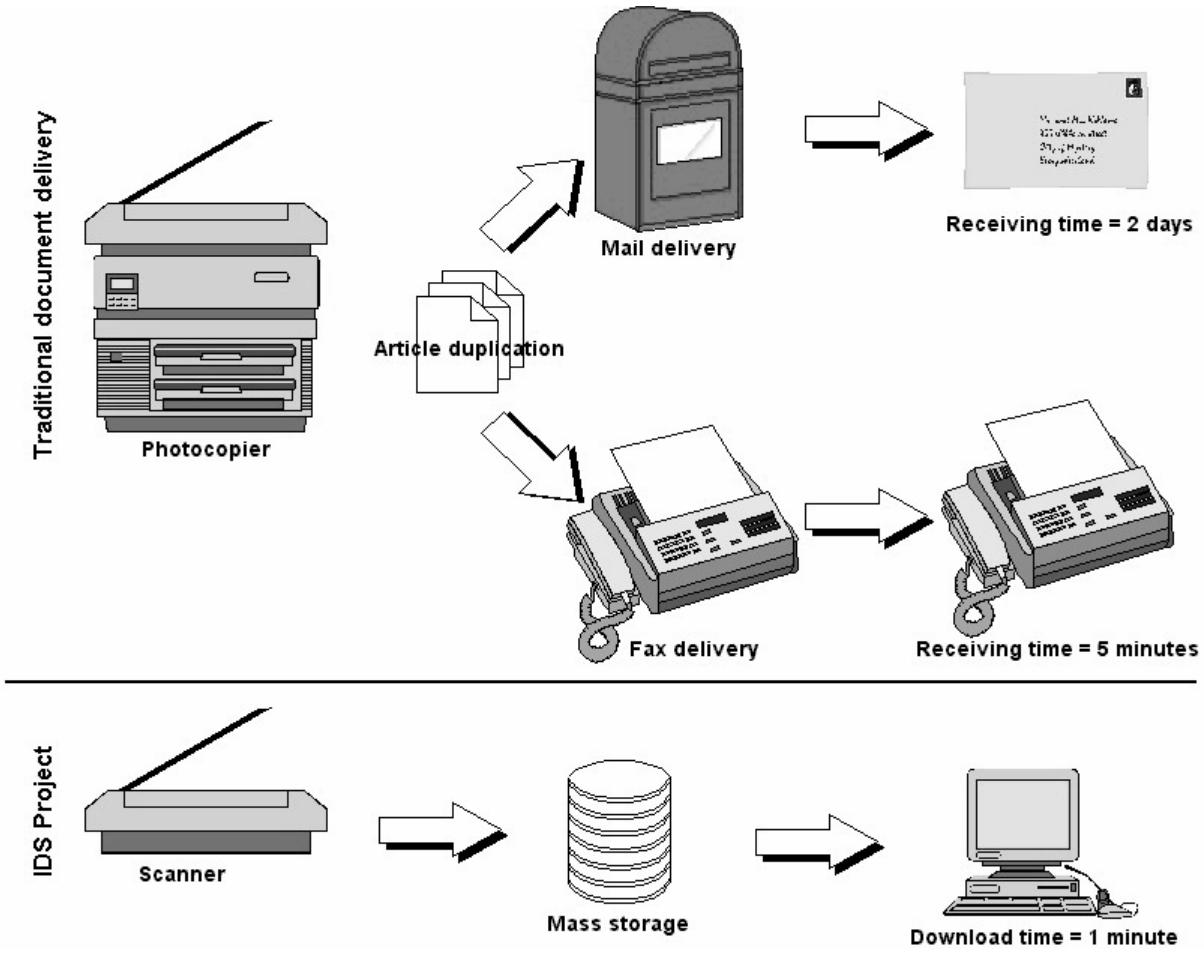

Fig. 4 Comparison from the steps of a traditional document delivery system and the IDS project.

In conclusion, the methodology here described succeeds to conjugate the document quality and delivery rapidity. Both elements in fact allow pursuing the idea of an Hybrid Library as a model for the future, as suggested by Chris Rusbridge (1998).

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