

A STRATEGIC INFRASTRUCTURE FOR ITALIAN DIGITAL LIBRARIES: THE DAFNE PROJECT

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1. Introduction

The technological revolution, which is in progress in the sector of informatics and telecommunications, has created the conditions for a new environment for the realisation of the digital library, as a collection of digital resources organised for a service focused on users. Italian actors on information management (librarians, teachers, publishers, suppliers, information providers) – urged by the increasingly market demand – are seeking a resolution to the problems which have caused a delay in the development of a strategy for digital library in Italy.

1.1 Weakness

There is some weakness in the Italian situation, of which the administrative obstacles are the most important. Bureaucracy means that the decision-making process is very slow and also that the interinstitutional Cupertino is very difficult. The fragmentation of responsibilities in a very rigid hierarchical organisation is a barrier to innovation and change. The organisation culture is that of isolation and not of convergence. The fragmentation in many little size libraries in Italian universities could give an example of the difficulty to co-operate; the presence of many small publishers' enterprises is another example of the prevalence of a culture of individualism.

In particular, libraries' lack in Italy of qualified librarians, with the right skills for becoming digital librarians; the reason is that Italian library schools are few and very conservative.

1.2 Threats

New technology is a good stimulus to change, together with the new competition arena built by Internet. Different actors are changing the traditional role: libraries are not the only one point of access to information and sometimes libraries are in competition with the calculation centres. Now a user can choose the information service more adapted to his needs. The European Union regulations, in particular, are stimulating to changing the legislative rules for the financing of public institutions, the organisation of education, the information value (and the Intellectual property rights management).

1.3 Strengths

In the last few years, many organisations have begun to explore in Italy the concept of a digital library. These include the National Library of Florence, the Ministry of Cultural Heritage, the Ministry of University, some local organisations, the Discoteca di Stato, the Italian Libraries Association (AIB). The first efforts have been devoted to build a digital collection of rare books, electronic journals, images, and sounds. The digitising activities are not co-ordinated at national level as yet, but many hope to plan a systematic process of conversion of the many old collections of our libraries.

The National Library of Florence has digitised all works and manuscripts of Galileo Galilei and is now adding to the National Bibliography the tables of contents (TOC) of current books.

CIBIT, Biblioteca Italiana Telematica, is the biggest project, co-ordinated by a group of Italian literature teachers and financed from the Ministry of Research. Its aim is to collect the most important Italian texts, of every subject, of every type, of every time. In some cases, the digital edition is the only available version of texts.

The Discoteca di Stato is participating to the European project Bibliotheca Universalis and is responsible for digitising Italian music.

Italian partners are also involved in European Union financed projects and others international projects. For example, two digital collections have been realised for the mathematics community (EULER) and for subject computing (ECDL).

Publishers are also investigating the digital library concepts. In particular the most advanced experiences of electronic publishing are those of Casalini, Giunti, Il Mulino, Laterza.

1.4 Opportunities

This new commitment is effectively projected in the potential digital exploitation (organisation and management of delivery) of the accessible information using interactive models – as far as possible not pre-structured – guaranteeing where possible the diffusion/distribution of the information itself in real time in respect of the request.

This naturally implicates a reconsideration of the telecommunications web, so that this can be seen on the one hand as an essential infrastructure which makes the diffusion of on-line services requesting the ‘goods-information’ effectively possible, and on the other as a medium in the true sense of the word, that is a means which enables acceleration of information distribution, promoting new forms of communication/commerce and conditioning the processes which generate them. This becomes more significant in proportion to the extent to which the information sources of a system, organisation or organism, however this may be structured, are distributed

in a capillary manner over an extended and heterogeneous territory.

In this phase, Italian libraries are starting to organise a digital collection, acquiring digital resources from vendors. Subscriptions are decreasing, especially subscriptions to scientific journals; the new electronic journals posed new problems for the libraries budget. Consortia are developing an acquisition plan in co-operation: CILEA is the most influential consortium, in the north of Italy, CASPUR is the second in importance, in the south. Both CILEA and CASPUR are consortia of universities, adding new information services to the others offered to academic partners. INFER is an Italian alliance of librarians for information and support in negotiation with publishers.

New alliances were done with suppliers, as intermediate for negotiation or as gateways to different publishers' digital collections. The library services of the Universities of Bologna, Firenze, Genova, Padova, Venezia and European University Institute in Florence have been committed over a long time in independent projects, with similar background and goals, to develop and integrate their library services, and have a strong interest in technological developments that could enable integration of database networking systems with direct access to periodical literature available in electronic format. Within this framework, the above-mentioned library services have discussed the possibilities of further co-operation and have reached a formal agreement to a set up a pilot project, named CIPE – Cooperazione Interuniversitaria sui Periodici Elettronici (Inter-university Co-operation for Electronic Journals) – with the purpose of gaining access to scientific information in electronic format, ensuring a high level of consistency with the more advanced international standards and the best possible results in terms of economic costs and usage rights and provisions.

All digital resources acquired or created by digitising are accessed through the web.

This reconsideration of the concept of the web poses a problem, which is complex to resolve. It involves administrative, cultural, political, economic and social aspects, and demands considerable efforts on the part of public bodies and institutions as well as by private and social operators so that the emerging need can be satisfied. It is in fact very clear that only a strong and conscious affirmation of the web, both as an infrastructure and as a medium, will guarantee the capacity of our national system to respond to the challenges of the new global market. Electronic documents constitute a growing part of the cultural heritage, and offer users notable benefits. The growth of digital information is changing the way in which information is created, managed, transmitted and exploited.

More specifically, the vision of the world of digital information is centred on the user. The removal of intermediaries will considerably reduce the costs of the information distribution chain, with significant consequences in terms of an awareness

of users' needs, the identification and localisation of information, and the economic and juridical aspects of book commerce. For this purpose we have to accelerate the completion of the infrastructure, stimulating the production of electronic documents and the realisation of research systems which can identify, make accessible and distribute the electronic resources. This infrastructure is the aim of the DAFNE project.

2. The DAFNE Project (District Architecture for Networked Editions)

The importance of the DAFNE project lies in the realisation and fine-tuning of a complete structure which enables the user to have access to information and document retrieval, prefiguring the National Digital Library, and enables the producers of goods and services – even if these are frequently entities of limited size – to take advantage of the 'Italian district of electronic publishing'.

The objectives of the DAFNE project are:

- to realise an Agent for licensing
- to plan the digitalisation of collections at national level
- to build an index to Italian scientific periodicals
- to co-ordinate the development of the University presses and the collaboration with publishers.

The DAFNE project has 5 academic proponents: University of Padova, University of Bologna, University of Firenze, Istituto di Documentazione Giuridica/CNR – Firenze, Biblioteca Nazionale Centrale Firenze. It has also 5 private firms as partners: Parco Scientifico Tecnologico Galileo Padova, Ariadne s.r.l. Pavia, Fratelli Bassilichi SpA Firenze, Casalini Libri SpA Firenze, Editrice Bibliografica SpA Milano. Others partners are: Silver Platter Italia SpA, Consorzio Interuniversitario di Calcolo: Cineca, Bologna, La Biblioteca del Mulino SpA, Bologna. The DAFNE project will finish in 2003.

The centrality of the user who has access to universal electronic resources is nevertheless in contrast with the physical, administrative and political development of the isolated local structures. It is therefore necessary to establish an equilibrium between the local priorities, the interests of publishers and the common objectives of national interest.

A complete integrated circuit, as well as constituting a model of administrative infrastructure which includes all the interested parties (from the author to the user) also promotes the production of electronic documents through small and medium sized Italian scientific publishers, who on their own would not be able to face the competitive demands emerging from a market in continual evolution. In fact, the specificity of electronic publishing on the web in respect of that in other mediums (including CD-ROMS) as well as the priority distribution channel for electronic publishing created by electronic commerce, necessarily implies a continual updating of the instruments and

standards adopted and investments which the circuit redistributes and shares among all the users at a pre-established price. We have only to consider the difficulties of integration and insertion in other integrated circuits of proprietary products and services.

2.1 Structure of the Product/Process

The DAFNE project aims to provide the technical-administrative infrastructure and the instruments necessary to allow the individuals and entities involved to carry out, in an efficient and effective manner, all the operations envisaged by the demand-supply circuit for electronic documents in Italy, within the context of a global market. It also promotes the integration of the two Italian districts of the Italian publishing accessible on the web and that of the digital library. For this reason, as well as integrating existent instruments and services, it is also aimed at developing those not yet available.

The graphic below represents the overall structure of the district, the blocks, which go to make it up, and the principal flows between the entities involved in the whole circuit of the production and circulation of electronic documents.

Demand-Supply Circuit of On-line Publications

We can observe a horizontal axis, which, from west to east, displays the flow of publications and electronic documents from the producer towards the distributors (commercial and/or library) and from these to the user. DAFNE will concern itself with organising this flow, which will take place via web, and will arrange all the technical, economic and administrative solutions necessary in order that the user may have easy access to the publications, or to a single part of them (for example a single article from a journal).

The second axis is that of the services; this goes from north to south and is centred on the distribution system. The intangibility of the support and the transmission medium makes it indispensable to augment the role of the information systems (inclusive of libraries) and at the same time increases the importance of electronic commerce in line with the trend to access immediately only the texts which have effectively been requested at the moment of the demand.

This group of three blocks has to inter-collaborate through the exchange of a series of messages between open systems. This requires an in-depth analysis of the functions, the operators who perform them and the real (even if intangible) and monetary flows between them.

The upper arc between producers, information services/systems and users shows the flow of information necessary for a correct knowledge of the offer on the part of the user, a market transparency and a coherent and pertinent choice. In the world of intangible

goods, such as electronic documents, a correct, complete and easily accessible information assumes an essential role in valorising and guaranteeing competition for editorial products, and in providing a satisfactory response to the information request of the user.

2.2 DAFNE Interoperability

The DAFNE project defines interoperability as the ability of digital library components or services to be functionally and logically interchangeable by virtue of their having been implemented in accordance with a set of well-defined, publicly known interfaces. In this model, different services and components can communicate with each other through open interfaces, and clients can interact with them in an equivalent manner. When repositories and digital objects are created in this manner, the overall effect can be a federation of repositories that aggregate content with very different attributes, but that can be treated in the same manner due to their shared interface definitions.

Our approach to interoperability is backed up by three fundamental principles: (1) agreement on common abstractions, (2) definition of open interfaces to services and components that implement the common abstractions, and (3) creation of an upgrade mechanism for introducing new functionality into the architecture without interfering with core interoperability. The basic services will be:

Search services: Searching across domains presents particular challenges given their different underlying content models and descriptive standards. Different search services may be provided: for textual material, for image content, and so on.

Request/order services. These manage the request transaction from placing a request to its successful completion. They need to interwork at technical and business levels, and communicates with accounting, billing, authentication and other services. There is some standardisation in university area, with the CINECA electronic portfolio.

User interface services. Services may be presented in different environments: web-based, immersive, or through some form of visualisation. Services may share some basic services and infrastructure within agreed frameworks for communication.

For example, resource discovery services may report on the availability of services, may use location services to identify instances of resources (mirror sites for example), may be combined with user profile or ratings services to refine selections, and so on. A service which mediates access to the holdings of several memory organisations might provide support for discovery and selection of services, manage service requests, translate formats, aggregate services, consolidate results, manage authentication and financial transactions, and so on.

Some Development Areas Will Be:

Resource discovery services. These will support the discovery and selection of services and resources. An example of a resource discovery service will be a 'subject gateway' for social sciences.

Terminology and knowledge representation services. These may provide vocabulary support for query expansion or indexing. Participating institutions have invested significantly in knowledge representation activities to support discovery or metadata creation.

Authentication services. In the new-shared space of the Internet, users and services may have no prior knowledge of each other. Users, services and resources may need to be authenticated to provide assurance that they are what they purport to be.

E-commerce services. Partners of the DAFNE project will increasingly provide charged for services, and common approaches will be needed.

Caching and mirroring services. These services will become more common later in the Project, assisting the economic use of network resources.

Some services of the DAFNE project will begin to be shared in the social sciences area, using some existing finding aids. For example:

Legal and economic databases. These are existing citation descriptions, and will provide infrastructure for support of distributed access, use and preservation of resources.

Location services. We use this phrase for the resolution of identifiers into locations. Persistent identifiers will be valuable in a range of application contexts. The scenario of the DAFNE project is one which is being explored in a library context and in a market context, where multiple copies of items may exist. The development and deployment of identifiers, and their interworking, present significant R&D challenges.

User profile services. These may be necessary for personalisation services, and store data about user permissions, profiles, and behaviour. Third party services may emerge, and there are clear links to authentication and other services. How to characterise user preferences, behaviour and privileges in acceptable and useful ways is an open question.

3. Conclusion

The emergence of so many interested groups in digital library exploitation suggests that enough of the enabling technologies are now available in Italy to try new forms of information creation, management and distribution. By keeping abreast of new developments in the digital library, different actors are trying a new strategic alliance. The author hopes that, at a future reading of this article, the predictions of the realisation of the infrastructure will be matched.

Notes

The digital collection of the National Library is available at:

<http://galileo.imss.firenze.it/multi/luoghi/firenze/bibliote/inazion.htm>

CIBIT is available at:

<http://cibit.humnet.unipi.it/>

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Information on Discoteca di Stato available at:

www.librari.beniculturali.it/struttura/discoteca.htm

Information on EULER available at:

www.unifi.it/Biblioteche

Information on publishers' full text projects available at:

www.casalini.it

www.giuntimultimedia.com

www.mulino.it

www.laterza.it/internet/

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