The DAFNE Project is the synthesis of three complex projects developed respectively by the University of Padova, the University of Firenze, the University of Bologna and the Firenze Central Library that originate from similar but distinct points of view origin to take certain significant steps in the product/process informally known in the trade as the National Digital Library.

In its expression of the spirit of the Bando Parnaso, the Dafne Project is the fruit of a co-ordination and integration effort conducted for the purpose of identifying and developing selected innovative and strategic aspects for the competitive growth of small- and medium-sized Italian publishing and user services.

The Dafne Project proposes the creation of a national prototype of the technological and organisational infrastructure required for original and derived document electronic publishing products: a "virtual industrial park" that integrates cultural document supply and demand in a complete circuit with the greatest transparency for the user and provides the instruments necessary to permit the parties involved to efficiently perform all the operations envisioned in the Italian electronic document supply and demand circuit in the context of the global market. The Dafne Project also promotes the integration of Italian electronic publishing with the creation of the digital library.

Project cultural objectives:

In the context of today's new technological scenario, the Dafne Project intends to enhance the value and visibility of national scientific-academic publishing by:

- promoting transformation into electronic publishing through the creation of an Italian electronic publishing system/service for original and derived documents and the registration and management of intellectual and cultural property rights;
- supporting the transformation of periodicals - a key sector in scientific/academic production - into the respective electronic versions at the national level;
- enabling the functional integration of bibliographic databases, on-line library catalogues, and the complete texts of the articles conserved in publisher's or related service servers;
- improving the visibility of the national scientific community through the creation of a bibliographic database for Italian academic production in the economic, social, judicial and humanities fields, complete with abstracts in Italian and English together with links to the original texts of the articles reviewed installed in publisher's or related service servers;
- offering a series of "Agency" services that includes: library deposit of electronic documents, official registration of locators (URL), on-line resource directory, telematic copyright registry, and electronic transaction and payment procedures

Project technological profile:

The Dafne Project intends to develop a s/w architecture based on a system of inter-operability utilising international market standards approved by the AIPA for public administration. In particular, in addition to a user-oriented web interface, the architecture modules will also implement open application interfaces.

Implementation plan:

This project will be developed in 7 Work-Packages with strong interaction between all proponents and envisions the prototype creation of: 5 electronic document sales counters, 1 service center for the management of economic transactions, relations with banks and inter-banking services, 1 information center that can consulted and accessed through national reference standards, 1 prototype of the data base installed and that can be consulted through 2 ERL Servers (OVID/SilverPlatter), 1 software application for the creation and management of the Copyright, and 1 software program for electronic commerce management.

The evident added-value provided by linking the various parties in a joint project and the scientific/industrial weight of the public and private structures involved in its creation are sufficient to both illustrate the innovative value of the DAFNE Project and ensure the achievement of the objectives established.

The international scenario

Today's international electronic publication market is characterised by no little instability created by the emphatic entry in the market of important traditional publishers such as Elsevier, Blackwell Springer and others who are now proposing significant offers of a part of their production in electronic format.

Although the appearance of these new figures in the digital publishing market is redefining the context and opening interesting new horizons, it also tends to place previously consolidated elements and configurations in question, and foreshadows the need to redefine the roles played by libraries, publishers, professional distributors, and bibliographic database producers, among others.

At the same time, this entry of the leading international scientific publishers in the electronic market has led to a wide range of alliances and/or acquisitions for the purpose of forming groups with increasingly wider ranges of capability in order to occupy more strategic positions in this new segment of the market

The national scene

The Italian publishing panorama characterised by the significant activity of small- and medium-sized publishers does not appear capable of accruing the critical mass necessary to compete with the publishing groupings currently being formed at European level.

Although the technological innovation process currently underway has established the technical foundation required for the sector's evolution, the

characteristic fragmentation of the current national publishing apparatus, uncertainty regarding the extent of the investments to be made and the timelines and size of the corresponding economic return seem to be negatively affecting both the re-conversion process and aperture in the direction of new market segments.

DAFNE believes periodicals and their electronic versions to represent the key sector in scientific-academic production. Although electronic support guarantees greater activity in the publishing market, certain conditions regarding format, feasibility and connectivity to other cultural objects in a hypertext structure that can be easily used and shared by final users must be respected immediately from the outset.

Scientific/academic publishing in Italy

The current state of difficulty in national academic publishing is indicated by its purely marginal presence in the leading international scientific compilations (Bibliographic databases) of citations regarding Italian production in economic, social, judicial and humanities fields.

This gap is destined to increase to the degree that current technological development tends to grant final users passage from bibliographic research in scientific databases (secondary information) to the texts of articles (primary information) contained in the sites of the publishers through the payment of copyright.

The limited presence of Italian intellectual publishing in this market segment leads to a lack of overall visibility for contributions from schools of thought expressed primarily in the Italian language, thereby destining this work to a progressively more and more localised context.

Ensuring the presence in the international secondary information circuit (databases with Article Title, Magazine, Key Words and Abstract in both Italian and English, Authors, etc.) of Italian publishing production in scientific repertory developed according to the most commonly-used standards with links to the URL of the articles provided on publisher servers therefore assumes fundamental strategic important .

A database with these characteristics would offer the information contained much greater visibility to international audiences interested in reading the article selected and permit consultation/printing following the respective economic transaction.

The Dafne Project believes the most promising sector to be the electronic journals produced by the scientific-academic community due to this market's propensity for greater activity using telematic support. The model can also be extended to other cultural objects with equal informative value and dynamically inter-connected in a hypertext structure that can be easily used and shared by final users

Through decisive innovative activity and a considerable organisational effort, the Dafne Project intends to provide an adequate response to the groups of problems identified by defining, among others:

- the levels of investment necessary for the re-conversion of the productive/organisational chain
- the different ways texts can be used by final users
- the legal framework for copyright protection
- transaction payment method
- Technological model (standard)

General Project goals

The project aspires to the creation of a national prototype of the technological and organisational infrastructure required for both original and derived electronic publishing products: a "virtual industrial park" that unites cultural product production and cultural product demand in a complete and comprehensive circuit.

The project aims to enhance the value of national scientific/academic publishing and provide it with greater visibility on the international circuit by:

- promoting transformation into electronic publishing;
- creating an Italian electronic publishing system/service for original and derived documents, and the registration and control of intellectual and cultural property rights;
- managing administrative transactions regarding electronic payment for services while protecting author and publisher copyrights;
- integrating bibliographic databases, on-line library catalogues, and the complete texts of the articles conserved in publisher or related service servers through methods that ensure the greatest transparency for the final user;
- creating a bibliographic database for works in the Italian language in the economic, social, judicial and humanities fields complete with abstracts in Italian and English and link procedures to the original texts of the articles reviewed in publisher servers;
- distributing this bibliographic database prototype over 2 servers used by leading international research and training institutes.

This system must prove capable of:

- offering a national and international cultural, organisational, bibliographic, technological, normative and economic reference model;
- interacting with technological access solutions, fee payment methods, and the pricing policies adopted by publishers.

DAFNE partners

DAFNE is the synthesis of three complex projects developed respectively by the Universities Bologna, Firenze, and Padova as certain significant steps in the product/process chain leading to the creation of the so-called "digital library".

L'attivazione da parte del MURST of the Bando Parnaso for the funding of technological innovation projects has encouraged the pooling and integration of three initially separate projects.

The evident added value provided by linking the various parties in a joint integrated project and their scientific/industrial validity have aroused the interest of the CNR's Judicial Documentation Institute, the Central National Library of Firenze, and a number of industrial partners in the successful achievement of its objectives.

Participation and contributions by these institutions have further demonstrated the project's strategic and innovative potential for the competitive growth of small- and medium-sized Italian publishers and user services.

The Project's 5 initial proponents

The Universities of Bologna, Firenze, and Padova are among the oldest and most revered in Italy with wide ranges of offer in education and research activity and longstanding traditions of interrelation and international visibility, and the Central National Library of Firenze, and the Judicial Documentation Institute (IDG) (CNR-Firenze) that houses the national production of judicial literature are all renowned and esteemed.

Partners

- The Galileo Science and Technology Park is a joint stock consortium of public agencies and private companies based in Padova founded for technological innovation and the application and transfer of the fruits of scientific research with technological and market value to businesses.
- The Fratelli Bassilichi SpA Company of Firenze applies information technology in the field of cultural assets and our heritage of books;
- The Ariadne S.p.A. Company develops Internet systems for e-commerce, with particular experience in the publishing field;
- Casalini Libri and Editrice Bibliografica are both internationally active in the brokerage of Italian scientific/academic information;
- OVID/Silver Platter SpA is the Italian branch of OVID/Silver Platter, a company that has developed index systems equipped with standard search engines and inter-operability present around the world.

The DAFNE Project is figuratively based on a diamond that represents the essential data flows and the teams of operators in the global village served by Internet that requires the traditional circuit of goods and services and its matching economic circuit for the attribution of resources to grafted to the third new branch of on-line information. Traditional, spontaneous and heterogeneous channels of promotion and documentation are declining in importance. Without a meta-data scheme of the objects in question, the web does not enable easy recovery of the information desired without prior agreement between supplier and user, and therefore places the latter in a position of dependence. The experience of the web has demonstrated the potential offered by the adoption of uniform information standards, but today

the limits of past conventions are amply evident, hence the need to enrich the network with a new standard and models that permit data to be shared by the various and independent programs of the suppliers and users.

The horizontal axis therefore represents the flow of real resources that go to satisfy user needs. The users risk failing to take advantage of what has been placed at their disposal because they cannot easily access or much less select or appropriately integrate the most relevant (and abundant) information because it is filed in different ways and on sources distributed in a global network. In a network populated solely by representation, it is indispensable that the sources of information available for a given datum or service be easily correlated even if they come from different origins equipped with their own software and archives. The primary sources of information are the producers who can showcase their goods on the web only through description (by cataloguing, reviewing, and copying); such producers must also define the terms of sale or use (copyright, prices, limits on access, etc.). The distributors and the deposits are required to document product availability through their catalogues (while also bearing in mind the state of conservation and perishability of the goods in question) and the services that they are ready to offer requesting users. The distributors and the archives can decide how to enrich their catalogue by accessing the information on one hand, and contribute to the information available in the network through their description of the goods in their possession and their offers for the same on the other. Producers of repertories and bibliographies, informative and quality classification (ranking) agencies are suppliers who are specialised in the information not provided by the producers, distributors and public archives themselves. The final users make their requests for goods and services thanks to a system which after establishing their rights and the existence of the resources necessary transmits the order, the sum due, or the credit granted to the deliverer.

Block E hosts the systems for the certification of the users, the collection of their orders and the checking of economic viability (loan service, e-commerce, e-money, treasury services, etc.). The latter activities are now the center of attention for new European Union projects.

Implementation plan:

This project will be developed in 7 Work-Packages with strong interaction between all proponents and envisions the prototype development of: 5 electronic document sales counters, 1 service center for the management of economic transactions, relations with banks and inter-banking services, 1 information center that can be consulted and accessed through national reference standards, 1 prototype of the data base installed that can consulted using an ERL server (OVID/SilverPlatter), 1 software application for the creation and management of the Copyright, and 1 software program for electronic commerce management.

The evident added value provided by linking the various parties in a joint project and the scientific/industrial weight of the public and private structures involved in its creation are sufficient to both illustrate the innovative value of the DAFNE Project and ensure the achievement of its objectives.

WP1: Ideate and design models for a cultural, judicial and economic administration system for the identification of Italian electronic publishing resources.

WP1a1 : Analyse the current technological coherence of Italian electronic publishing, the level of know-how vaunted by companies in the sectors of production, delivery, and use of Italian electronic publishing products, and Italian librarianship and communication standards.
Innovation. Identification and measurement of the "objective causes" (cultural - financial – technological), the inadequacy of the national publishing industry in the development of advanced services aligned with international librarianship standards; comparative assessment of key factors for development.

WP1a2 : Design the organisational model
Design of the production-delivery system organisation, architecture alternatives, government structure. Identification of the organisational relationship model most suited for the control of the value chain and the establishment of a collaborative-competitive system. Preparation of an operative model for the calculation of the costs required for the optimisation of the productive cycle with regard to both individual members and the entire productive system.
Innovation. Design an organisational model for a Small-Medium Industries network (managed either directly or through outsourcing) that enhances one function (commercialisation) of the entire system through the achievement of the "critical mass" necessary (Note that this objective can be achieved only if the respective advantages/disadvantages are clearly demonstrated to private company management, such as the advantage of a foreseeable commercial return or the disadvantage of decreased competitiveness)

WP1a3 : Design the technological model
Identification of the current limits on the technology, user interface and functionality with existing systems. Identification of compatibility with global network co-operative architecture standards. Identification of open and innovative technologies (also with regard to cultural goods) and their integration with existing technologies for the creation of the entire system. Definition of the logic architecture for the entire system.
Innovation. Analysis and design of the operating specifications of a "middleware" system which is visible world-wide for access to the various

Italian publisher servers and which enables the various classes of international users to exploit the system through specific modes.

WP1a4 : Design of the legal framework
Definition of the legal framework for the division of rights among the various parties authorised for electronic distribution. Design of an Italian agency for the management of intellectual and cultural property rights in the digital publishing sector.
Innovation. Identification of a "reference legal framework" capable of:
- integrating national legislation governing contracts for e-commerce and copyright management with EU and international laws;
- ensuring the protection of copyright and rendering the terms, rights, clauses and constraints regarding electronic commercial transactions transparent to the user;

Note: the design of a legal framework reference model is one of the conditions required to both develop the national digital market and guarantee investments in the sector.

WP1a5 : Design the economic model
Definition of the Italian Registration Agency's on-line services and management of intellectual property rights. Definition of the services required for the registration of terms and rights to the use, negotiation, and
certification of authorisation and use.
Innovation. Design and specification of the characteristics of a payment system that provides for the payment of abstracts and excerpts and not only the full text.

WP2: Ideate, design and test an integrated system for accessing and using the meta-catalogued resources

WP2a1 : Access Legacy systems
Access legacy systems. Formalisation of the requisites and constraints for the integration of the national user access interface/systems with the information resources. Development of the functional specifications, design and development of the public service counters envisioned by the project.
Innovation. The establishment of national service counters will enable the immediate use of the system by final users and constitute a bridge to the resources contained in the National Library System.

WP2a2 : Identification systems
Design of the instruments and adoption of the unequivocal identification standards. Definition of document hypertext references via URN. Definition and development of a global Information Networking system for the creation

of the dynamic hypertext connection for all the cultural objects distributed in the network with transparency for the user.

Design of the directory, definition of the respective information flows and the automatic supply system.

Innovation. In its initial application, the Project is oriented to national scientific publishing. Its completion will provide the basis for the possibility to extend identification to all the cultural objects distributed in the network (photographic archives, museum archaeological goods, etc.)

WP2a3 : locating systems

Research, design and testing of the locating systems technologies for the creation of the dynamic integration of the forms of representation to be used for cultural goods in the web. Integration of the DOI Project identification and locating systems at the national level. Innovation. Although in its initial application the Project is oriented to national scientific publishing, its completion will provide the basis for the possibility to extend identification to all the cultural objects distributed in the network (photographic archives, museum archaeological goods, etc.)

WP2a4 : workflow system for meta-data maintenance

Analysis and identification of a meta-data standard. Design of the organisational and management procedures required and the issue of the operating specifications for meta-data creation and updating. Design and development of software procedures that work with the organisational model designed.

Definition of the project and development of the software procedures for the automatic assignment of the identifier adopted for the electronic object starting from the identifiers already being used in the library system.

Innovation: experimental creation of the first Italian repertory/archive of both original and derived scientific-academic electronic publications.

WP2a5 : The Italian scientific-academic production data base prototype

Identification of the international standards to be implemented in the prototype and for conversion into formats adequate for publisher full texts.

Analysis, design and development of a Italian scientific-academic publishing data base complete with abstracts of the articles in Italian and English.

Activities for conversion and alignment in the prototype database format and publishing of the abstracts in English.

Implementation in the data base prototype of the locating systems functions towards the full-text articles allocated in publisher and/or related service servers.

Innovation: The implementation of the abstracts in English language in the data base through the use of expert systems capable of economically translating both the specialised terminology used in the scientific jargon of the

various disciplines and the metaphors employed in literary language is already in itself an innovative factor at the national level. This factor, integrated with the development of the parallel data base/full text supply chain, will help make the material published more visible at the international level.

WP2a6 : Design and testing of supply chain management
Design and testing of supply chain management parallel to the bibliographic record of the database and the respective articles in full text on publisher and/or related service servers (supply chain design and management)
Innovation: Design and development of the parallel database/full text supply chain in a fragmented and technologically uneven productive context. This will permit in-field experimentation of the model's organisational efficacy and contribute to the evolution of the productive system in the direction of a web-oriented organisation model with homogenous production in alignment with librarianship standards and advanced technologies.

WP2a7 : Implementation of the full texts in service servers
Conversion into standard format of the full text of the articles. Implementation of the articles in full text on publisher and/or related service servers
Check on the technical, management and connective requisites in order to ensure the efficiency and continuity (full tolerant) of the publisher and/or related service servers
Implementation of the experimental management of the service server (similar to the server used by the publishers).
Innovation. The development of the service structure for:
- server management
- the conversion of publisher full texts into standard format
is a necessary requisite to standardise current production that is dis-homogenous and in large part technologically antiquated. This service structure will permit the triggering of a process that will transcend the current state of fragmentation of the national cultural object productive system and enable the achievement of the critical mass necessary to compete with the leading international publishing groups.

WP3 : Ideate, design and create a system for the management of publication rights in the web

WP3a1 : System for the registration and certification of classes of users
Standards, instruments and services for the identification and classification of final user categories. Standards, instruments and services for the registration and certification of authorised operators.
Definition of the organisational procedures and s/w procedures for management (creation, modification, cancellation, etc.)

Innovation: WP3a1 provides an original approach coherent with the needs involved in creating a "virtual industrial park" orientated to a plurality of systems in competition by defining and testing a management model for the various classes and types of user (e.g. aggregate agencies, users linked to aggregate agencies, users not linked to aggregate agencies, subscriber users, users on demand, etc.)

WP3a2 : copyright administration system
Design and implementation of the model for the administration, organisation, management and technology to be used for copyright protection. Definition, classification and protection of copyright system rights. Integration with international agencies specialised in the management of such rights.
Innovation: transformation from traditional to electronic publishing cannot be made today without guaranteed computerised protection and management of copyright rights because the investments would not be guaranteed. .

WP4: Ideate, design and create an e-commerce system for the resources accessible.

WP4a1 : Purchase management system (shopping basket)
Design and implementation of a prototype for the forwarding of requests, the editing of shopping basket, and order confirmation with protocols that use encrypting algorithms to ensure secure data flows.
Innovation: the inter-connection between electronically published cultural resources in general and e-commerce as yet undeveloped in the context due to the lack of a sufficiently ramified and comprehensive project calibrated to local needs capable of reaching the critical mass required.

WP4a2 : payment authorisation system
Feasibility study and analysis of electronic card payment possibilities.
Innovation: exploitation of advanced electronic payment technologies.

WP4a3 : Delivery management system
Implementation of physical delivery services using telematic or traditional means at the distribution points (service centers and/or offices c/o library sites).
Innovation: the inter-connection of cultural goods digital publishing and e-commerce resources so far undeveloped in this context due to the lack of a sufficiently ramified and comprehensive project calibrated to local needs capable of reaching the critical mass required.

WP4a4 : Administrative control system
Administrative control and accounting and billing service system.

Innovation: analysis and prototype implementation that also avails of the possibility for direct payments at the site.

WP4a5 : Claims management system
The implementation of an integrated order management module that lets the user signal any malfunctions that occur in the delivery of products and services for the purpose of ensuring a response to any claims advanced with the chance to provide an economic correction or a new delivery
Innovation: the inter-connection of digital publishing and e-commerce resources so far undeveloped in this context due to the lack of a sufficiently ramified and comprehensive project calibrated to local needs capable of reaching the critical mass required.

WP5 : System integration, variant management, validation

WP5a1 : Installation, system and test integration
This phase envisions the implementation of various industrial research products in a definitive prototype/system that do not raise particular problems in research and innovation.

WP5a2 : Design and construction of the testing and validation model
The construction of a testing and validation model for the products/services envisioned by the Dafne Project requires a considerable effort due to its complexity and must be developed ad hoc for all its ramifications with an integrated vision of the whole.
Innovation: even the selection of a reliable sample of international users to be sent a simple assessment form requires careful study on the potential market monitoring methods to be employed.

WP5A3 : Establish a benchmarking mechanism
An integral part of the Dafne system validation process is the establishment of a product and process benchmarking system developed with regard for similar systems already existing in other nations (international seminars)

WP5A4 : Define variant and validation operations

WP6 : Final reports and exploitation
Occasions for the presentation of Project results will consist in the organisation of a seminar and a number of web pages which will present the development of the studies conducted as time goes on. An official final report will be delivered to the Ministry Commission and a summary report will be distributed on the web pages above.

WP7 : Project management and monitoring

The scope of WP7 is to manage and monitor all the activities that determine the respective WP through the use of management and control instruments capable of ensuring the maximum integration between the persons in charge of the various activities. These instruments (for the management of the requisites, the definition of the project schemes and the management of variants, etc.) will also represent the key elements for the generation of the Project reports that will document positive monitoring results and the consequent access to the various phases of development method adopted.