DIGITAL LIBRARIES ON INTERNET AS A KEY FOR THE UPGRADING OF INFORMATION AND LIBRARY SERVICES

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1. SUMMARY

The qualitative upgrading of the services offered by libraries and information services are connected with the existence and operation of digital libraries in the Internet. Definitions are presented, while distinction between terms like *electronic, digital* and *virtual library* as well as *Libraries Networks* and *libraries consortia* are provided. A brief reference to a number of the most important publishers, involved in the area of digital information provision, follows. The various components of a digital library from the content, procedures and technical characteristics points of view are described. Commends are also provided concerning technological, and institutional issues as well as problems faced by librarians, arisen during the current transitional phase of establishment of digital libraries. Finally a checklist of actions to do is presented including the procedures needed for the development and the operation of a digital library system.

KEYWORDS: *Digital library, virtual library, libraries consortia, electronic journals*

1. INTRODUCTION

The terms ***ηλεκτρονικής ψηφιακή, νοητή (*** *εικονική, ιδεατή* and even *νοερή)* ***βιβλιοθήκη*** are appearing more often during the everyday activities of the Greek academic, research and business community. These terms are mostly used inconsiderately, in order to express relatively new forms and operations of the traditional libraries, as well as other information services, offered by organisations such as museums, scientific, educational and research institutes. These terms stand for the English terms ***electronic, digital ^ virtual library*** τ addition to the terms the components, the operations and the facilities of the digital-virtual libraries are appearing not only in the rooms of the traditional libraries but also in the offices and houses of the users of the libraries and information services.

The reason that permitted or invoked this capability is generally the rapid evolution of the computer technologies and telecommunications; specifically in Greece the main reason is the financing through the 2nd Community Support Framework in the Higher Education Institutes (EPEAEK) and the research Institutes (EPET II). In the next paragraphs a distinction between

the aforementioned terms is attempted followed by a presentation of the most important providers of electronic services in digital forms.

3. DEFINITIONS

Electronic Library

Electronic library (Ηλεκτρονική βιβλιοθήκης j, a library where all or a big part of its everyday operations is carried out with the use of computer(s). Such operations are usually the cataloguing, the search and identification of relative documents, the circulation (lending) of library material, the registration of users, the management of the document orders, the acquisition of new material, the serials and collection management, the usage statistics etc. The term ***electronic library*** r e f e r s to the *way of management* of the documents (=content) and operations. The content can of course be printed.

Digital library

The term

digital library (ψηφιακή βιβλιοθήκη) r e f e r s t o m e *natural mean (= bearer, form)* of the collection of a library material (= content). This material can include (always in digital form) periodicals, multimedia, educational packages, encyclopedias, maps, guides, music works, videotapes of conferences, films and movies, hyperlinks to web pages, even books (digital ones). It is difficult to imagine that the management of such a collection consisted by digital material can be faced by a traditional, chirographic manner or system. It is obvious that the *digital library* presupposes the existence of the *electronic library.*

Hybrid Library

The term ***hybrid library (υβριδική βιβλιοθήκη)*** r e f e r s t o m e coexistence of content in digital as well as in "traditional" - printed forms within the same library. As a matter of fact this consists the most often case, as the purely digital libraries are for the moment rare.

Virtual library

As a ***virtual library (νοητή βιβλιοθήκη)*** j, defined a complex of computer systems, software and networks containing and managing digitised information of different origin, content, format and capabilities of further processing. The virtual library offers the user an integrated way to access, search, display and exploit digitised pieces of information installed on different geographical areas.

Library Networks

The main attribute of the ***libraries networks (δίκτυα βιβλιοθηκών)*** i s m e existence of a *cooperation mechanism* between libraries. Libraries networks are not necessarily identified with the use of telecommunication networks. Libraries networks existed and operated many years before the invention of the first computer. However the appearance of the telecommunication networks reinforced and upgraded the existing cooperation between libraries. These types of cooperation that are carried out in the frame of libraries network concern a number of operations such as interlibrary loan, document exchange, document delivery to remote users of other libraries, and (later on) exchange of bibliographic records in machine readable catalogues (MARC). The National Documentation Centre developed such a mechanism in Greece in 1994. More than 110 Greek and Cypriot libraries are currently participating in the Hellenic Interlibrary Loan Network [1].

Libraries consortia

The appearance of the *electronic journals* in the INTERNET created a new kind of cooperation between libraries. It is the so-called ***libraries consortium (κοινοπραξία βιβλιοθηκών)***. Libraries consortium consists a special (official or unofficial) type of

collaboration between libraries. Libraries consortia directly involve not only libraries but also publishers. The cooperation concerns the common, coordinated purchase of (or more accurately, the *access license* to) digital material provided by publishers. Libraries consortia are already well spread and applied in the field of scientific periodicals in digital form (or *electronic journals).* License agreements are signed between libraries (or authorised representatives) and each one of the publishers. In this way **every library-member of** a **consortium, spending the same budget for subscriptions** to periodicals, offer to its users (= persons entitled) the capability to have access not only to the periodicals to which an individual library has subscriptions to, but also **to the whole number of electronic journals that each one of the other libraries-members has subscription to** [2J. What is new by this type of cooperation is the creation of a virtual collection, the consortium collection. Libraries consortia effectively expand the available resources of scientific information and upgrade the services offered by the library to the users.

4. PROVIDERS OF SCIENTIFIC INFORMATION IN DIGITAL FORM

The number of electronic journals is increasing with a current rate of 100% per year. It is estimated that there are more than 8.000 **electronic journals** [3] in the web pages of publishers and related organisations and societies, offered in parallel or independently with the corresponding titles of the printed versions. The most important of the publishers offer free of charge to all users different levels of services such as capabilities of browsing the table of contents (ToCs) and the display or downloading of the abstract. Furthermore, they offer to the subscribers of the printed version (with or with no additional charge on the price of the printed version) display and downloading of articles of serials they publish, hyperlinks to and from cited articles, alert services via e-mail, personal filing facilities etc. A11 these services are offered via the INTERNET and the web graphical interface.
The list of some of the most important digital information providers that follows (in alphabetic order) with links to their sites and web services is quite indicative of the trends.

4.1. ACADEMIC PRESS (http://www.apnet.com)

Creator of **IDEAL** (International Digital Electronic Access Library). The system is consisted of more than 180 electronic journals. Special license agreements have been signed with libraries consortia permitting to each one of the personnel of the participating libraries to access all the e-journals of the consortium, (e.g. OHIOLINK [4]). The number of the staff having access to the journals is higher than 6.000.000 worldwide [5].

4.2. ACM, Association for Computing Machinery (http://www.acm.org)

25 serial titles and more than 100.000+ pages are offered with the full texts (and images) of the publications since 1991. Access to ToCs and abstracts is free to all users. Since 1999 special prices are offered to consortia. Electronic versions are offered with the printed ones used as archive.

4.3. AMERICAN INSTITUTE OF PHYSICS (http://www.aip.org)

More than 45+ e-joumals via **OJPS (Online Journal Publishing Service)** concerning publications of the Institute and other related associations (e.g. **APS: American Physical Society,** etc.). Abstracts and ToCs are freely available to all users. Full text is available to subscribers only. Subscribers to Physical Reviews A-E have free access to **PROLA** (Physical Review Online Archives 1985-1996).

4.4. BLACKWELL (http://navigator.blackwell.co.uk)

360 e-joumals are offered via **Electronic Journal Navigator.**

4.5. CATCHWORD fhttp://www.catchword.com/)

Catch Word was created in 1994. It is financed by publishing firms and hosts their electronic journals. Services offered freely to subscribers of the corresponding printed versions of journals. Articles are displayed in **PDF, RealPage** or **XML** formats. Registration of an organisation to Catchword is free and permits access a number of free e-journals.

4.6. EBSCO (http://www.epnet.com)

EBSCO Information Services offers three basic services: EBSCO subscription services offering gateway access to publisher sites. EBSCO publishing consisted of full text databases. EBSCOdoc ensures the full text of articles not included in the two previous services.

4.7. ELSEVIER (http://scienceserver.orionsci.com http://mcdouKal.elsevier.com http://sciencedirect.com)

Elsevier is with no doubt the biggest electronic publisher. Access to **1.200** e-joumals is permitted via ScienceServe. Hyperlinks to citations is offered. Alert services via e-mail are also provided. Alternatively ScienceDirect permits access to individual e-journals from a total of 1.700 with 5 years back issues in HTML and PDF formats. Elsevier is also the leader in agreements with libraries consortia.

4.8. HIGHWIRE PRESS (http://highwire.stanford.edu)

Unit of STANFORD University Library. Offers more than 80+ e-journals. Acting as a non-profit organisation. There are permanently about 20+ e-journals freely available or available for free trial (1 year etc).

4.9. IEEE (http://www.ieee.org/)

The IEEE (Institute of Electrical and Electronics Engineers) publishes 30% of the international production of knowledge in the field of electronic technology. Programs have been developed such as:

- **OPeRA (Online Periodicals and Research Area)** http://opera.ieee.org/opera/browse.html. Browsing to 55 e-journals of IEEE and related societies is offered. 40% of IEEE Transactions and Journal is available on the Internet.
- **Bibliographic on-line:** http://www.biblio.ieee.org.

4.10. INFORMATION QUEST (http://www.eiq.com/)

Related company of the subscription brokers DOWSON and FAXON. Operates as an intermediate for identifying digital articles with a specially developed search engine and subsequently access to a great number of publishers site. An expert system based on fuzzy searching techniques is used permitting the users to enter queries in **natural language.**

4.11.INGENTA (http://www.ingenta.com/)

Starting in 1998 as a provider of online services for publishers and users offers:

Databases: Such as **BIDS Academic Services** covering fields like engineering, medicine, economics, politics, education and arts, and **Inside Information** with information for **20.000** journal articles

Journals: 800 journal titles and **120.000** full text articles.

4.12. INSTITUTE OF PHYSICS **(http://www.iop.org/)**

IOP offers to institutional subscribers access to full text of its **33** e-joumals. Hypecite permits links to and from the full text of cited articles published in IOP's journals and the abstracts of articles indexed by INSPEC since 1969. It is one of the first attempts to break the monopoly

of ISI (Institute of Scientific Information, Citation Index) in this scientific field. All users are permitted to browse and search the ToCs ad abstracts free of charge.

4.13. JOHN HOPKINS UNIVERSITY PRESS (http://muse.jhu.edu)

Started in 1996 by HOPKINS PRESS, the library and the computer centre of Eisenhower University and financed by Mellon Foundation and the National Endowment for the Humanities they created the MUSE system. MUSE offers access to 40+ journals of social sciences and humanities permitting free access to the table of content and full text of selected sample issues.

4.14. JSTOR (http://www.istor.org)

JSTOR started by Mellon Foundation as a project aiming to the saving of space occupied by older issues of scientific periodicals. Recognising the incapability of individual libraries to create and maintain **digital archives of serials** they scanned **750.000** pages of **10** journals from the issues published before 1990. In 1995 the non-profit organisation JSTOR was established on a cooperative base. JSTOR currently includes **117** journals of **67 different publishers.** The full text of **92** of these journals is already available. The images of the scanned journals are OCRed (optical character recognition) for searching reasons while articles are displayed in image form. 15 scientific fields are covered such as Anthropology, Ecology, Economics, Mathematics, Political Sciences, etc. JSTOR acts as a *"trusted archive" addressed to libraries against a subscription.* **439** *libraries* within USA (http://www.jstor.org/about/participants_na.html) and **57** libraries from **13** different countries (http://www.jstor.org/about/participants_intl.html) such as Australia, Germany, Canada, UK, Netherlands, Turkey, etc *are participating.*

4.15. MCB (http://www.mcb.co.uk/)

MCB with related organisations Anbar Electronic Intelligence (http://www.anbar.co.uk/) and EMERALD (http://www.emerald-library.com/), concentrate three full text (and image) databases with **55.000** articles in computer sciences, **65.000** articles in civil engineering and **85.000** articles in management. Document delivery services are offered against payment per order while alerting via e-mail is offered freely.

4.16. OCLC (http://www.oclc.or.g/oclc/menu/eco.htm)

OCLC acting as an organisation of participating libraries tries to solve the problem of digital archiving of scientific electronic periodicals. Agreements with publishers ensure the installation of data on Electronic Collections Online (ECO) the system of OCLC. ECO started with **100** electronic titles and currently covers more than **500.** Libraries pay an annual subscription for the access to the e-joumals and the subscription to the publishers of the subscription brokers. Subscription to OCLC ensures future access of libraries covering cost of future upgrading of central equipment, software and technical support.

4.17. OVID (http://www.ovid.com/)

Provide access to **320+** full text e-journals in the STM fields (Science, Technology, Medicine). **86** of them are offered in 6 subject packages: Core Biomedical I, II, III, IV, Nursing, Mental Health. Hyperlinks to full text articles are designed from 80 databases provided by OVID. Conversion of the most important journals in SGML format is designed in collaboration with 6 Publishers (Blackwell Science, Lipponcott-Raven, Munksgaard, Plenum, Williams & Wilkins). Alerting and document delivery for articles not yet digitised is offered in collaboration with ISI.

4.18. SPRINGER (http://link.springer.de)

Provides more than **180** electronic journals out of **400,** which publishes in printed format. LINK system developed by SPRINGER covers 10 online "libraries", in chemistry, economics, environment, medicine, biology, computer science, engineering, geo-sciences, mathematics, physics. All "libraries" consist the Forum for Science as users can browse ToCs of journals and books, attend programs demo, calendar of scientific events, and participate in moderated discussions at no charge. Two levels of searching are available for expert and novice users. Electronic publications of SPRINGER are offered with complementary material such as colored images, sound, video, datasets and software applications. Hyperlinks to databases (Medline and Chemical Abstracts) are planned.

4.19. SWETS (http://www.swetnet.com)

SwetsNet service includes more than **4.000** electronic journals in full text and image formats. Articles are installed either on SwetsNet system or on the sites of corresponding publishers where access is provided via gateway. There is an annual fee of about 2 NLG/title for the access to the system. Subscription to the printed-electronic version of the journal is of course prerequisite. Subscribers to SwetsNet can browse the table of contents of all **14.000** journals included in the system. For the journals that a library is subscriber to printed-electronic versions searching is also available to the titles and abstracts of the articles. Users can create subject profile based on keywords, author names or journal titles and establish alerting services for current awareness. Connection with local (or remote) holdings of libraries is planned while application is developed following **Z39.50** protocol for compatibility with library automation software used locally. As the comparative advantage of SwetsNet is considered the relatively big number of journals included by the system and the single interface used for the access to all the e-joumals included in the system.

Some more organisations to be mentioned are: **American Chemical Society, Royal Chemical Society, Wiley, Karger, Oxford University Press, Cambridge University Press,** etc.

4.20. National Documentation Centre /National Hellenic Research Foundation (http://www.ekt.gr, http://www.eie.gr)

For the moment the **digital Library of NDC** is considered the bigger one in Greece, as it includes:

- **631 current electronic scientific journals, 411** of which with **full text and image.** All e-journals are accessible through Internet (http://www.ekt.gr/inform/biblio/ekt_digital_library.htm), only by authorised users of NDC (i.e. staff of NHRF and library visitors). However there are permanently more than **100+ free e-journals** (=e-journals offered free **of charge** by their publishers) to all users of Internet.
- **800+ e-journals with full text and image** of system **ABI/Inform-BPO** (Business Periodicals Ondisk), (http://www.ekt.gr/infomi/biblio/abi/info.htm). Journals cover issues on economics, marketing, operational research, management, etc. They are installed locally and accessible from Intranet-Internet and a CD-ROM mirroring system.
- **9.000** Dissertation Theses (about **1.500.000** pages) the full text of which is available in image format via the web (http://docuweb.ekt.gr).
- **39** of most important (commercial) **databases** covering a wide range of scientific fields installed locally on a CD-ROM mirroring system accessible via internet-intranet by authorised users.

- The components of the **digital library of NDC** are completed with: the collaboration with **110** Hellenic scientific libraries in the frame of the **Hellenic Interlibrary** Loan **Network** (http://www.ekt.gr/inform/biblio/full.htm), the collaboration with **210** Hellenic libraries in the frame of the development of the **Union Catalogue of Periodicals (http://iris.ekt.gr:1234/web_pages/welcome**.html) and finally the **Document delivery service** for articles not found in Greece or Cyprus which are ordered abroad.

5. TYPOLOGY **OF THE** COMPONENT **PARTS OF A** DIGITAL LIBRARY.

A typology is attempted concerning the components of digital - virtual library. Special emphasis is given to libraries consisted of electronic journals. Three basic parameters were selected: **content, access techniques and access-usage rights.** Categories and subcategories are mentioned for each one of the parameters.

5.1. Content

Type

From the type of content point of view, a digital / virtual library can include quite a number of different kinds of content and combinations of them. An indicative list could includes: bibliographic databases, journal articles, dissertation theses, studies, reports, conference papers and proceedings, events calendars, videotaped events (e.g. conferences, tours in museums or galleries), movies, music works, maps, encyclopedias, tourist guides, news, statistics, multimedia applications, educational courses or packages, software applications, curriculum vitae (http://www.eie.gr/staff/Tsimpoglou_F/), etc.

Form

As far as it concerns electronic journals they appear in the following forms: indexes of subjects, author names, volumes, issues, ToC = Table of Content per issue, abstracts, full text in ASCII form, full text in image form, hyperlinks from and /or to citations.

Storage and/or display formats

In general, the dominating format of displaying and storing the content of digital libraries is HTML (HyperText Markup Language). As far as it concerns electronic journals however, the first place belongs to PDF (Portable Document Format) and far away follow other formats such as RealPage, Postscript, TIFF, RTO, etc.

5.2. Access techniques

Concerning the **distance** between the user place and the geographic area where the content is installed, access is distinguished in **local** and **remote** one. It is quite usual, of course, part of the content to be installed in a local environment (e.g. indexes, databases on CD-ROM, lists with hyperlinks to WebPages) and the rest of it, installed remotely (e.g. full text, videotaped material).

Searching and displaying software

For the user side known browsers (Netscape Navigator, Internet explorer) are necessary for searching and displaying e-joumals. In addition it is needed the installation of readers or add-ins like: Acrobat Reader or Acrobat exchange, Ghost view, Winzip, Realpage. Especially for Realpage previous registration to the provider Catchword is needed for obtaining institutional customer ID (see **3.5).** All above software are freely available through INTERNET.

5.3. Access rights

In addition to the subscription to the printed and/or electronic version of a journal for obtaining access rights the signature of a special license agreement is needed for each one of

the publishers and in several cases for each one of the journal titles of each publisher (!). License agreements refer to the terms (rights - restrictions) as well as to the offered services.

Authorised users (end users) are generally the member (=staff) of an organisation, which signs the agreement and pay the subscription. Access is legally permitted to the visitors-readers of the library from the premises (actually the IP addresses) of the organisation. In the case of libraries consortium authorised users are all the members of the consortium (e.g. all researchers of the Research Centres or all faculty and students of Universities or Technological Institutes).

The recognition and validation of an authorised user can be realised in three ways a) IP (Internet Protocol) address, b) user name or login and password, γ) combination of a and b.
In most of the cases the downloading of articles to the PC of the authorised user is permitted but as a rule the creation of a digital archive of articles of electronic journals in the local environment of the library is prohibited. For the moment most of the publishers do not permit the systematic delivery of digital articles via I L L (interlibrary loan) systems.

5.4. Subscription cost of electronic journals

The pricing policy for the electronic journals is different from publisher to publisher and several times within the same publisher it differs from journal to journal. For the majority of the electronic journals the access to the electronic version is not charged with any additional cost (in other words the price for the electronic version is already included in the price of the printed version). In some journals publishers charge an additional subscription to the price of the printed edition. This surcharge rises generally from **5% to 25%** of the price of the printed edition. There are of course a small number of journals of which the electronic subscription is double or even triple of the price of the printed one. However in the final budget of a library collection the annual surcharge for access to the electronic editions is less **than 10%** of the budget for the printed collection. This means 100 cost units for the printed edition +10 cost units for the electronic one =110 cost units as the final price. For the moment, it is not permitted the subscription to the electronic **only** edition. The only publisher permitting such an arrangements (Academic Press) charges its electronic only editions the same as the printed only editions, granting a discount (sic) of 75% of the price of the printed edition to the subscriber of the electronic edition that purchases also the printed one. This means 100 cost units for one of the two editions or 125 cost units for both of them. Generally the final 10% of the surcharge for the cost of access to electronic journals can be more reduced as a result f a reasonable exploitation of special prices and offers of journal packages (ACS, Physical Reviews, Tetrahedron etc.).

5.5. Procedures for ensuring the access to electronic journals

A checklist with "actions to do" is following with the basic steps for the creation of one of the component parts of a digital/virtual library the one concerning electronic journals.

1. Examine if the actual or potential users of the library are provided with the infrastructure needed in terms of equipment and networks to exploit the digital library. Ensure the infrastructure needed.
2. Formulate the rules for the features of the collection to be created. Phrase the criteria to be fulfilled for a journal to be included in the collection.
3. Identify the e-joumals available in the Internet and the form they are available. In case there are more providers compare the services offered and the corresponding cost (if applicable). Select the optimum solution. Keep "alive" the alternative providers.
4. Definite decision for the access to the journal.

5. Identify the site of the publisher, find the license agreement forms, find out the customer number for the journal in question, fill in, sign and send the agreement to the publisher and/or the provider.
6. Select or ask for ΓΡ only validation procedure by the publisher for your authorised users. Avoid mess of user names and passwords for each publisher-journal-user.
7. Activate the access right (follow advises from publisher for online registration and/or activation).
8. Check the real access procedure from different workstations (IP, subnets, buildings, servers, etc.).
9. Check for compatibility of display format offered by the provider and display software installed on the users work places (versions, platforms, fonts, etc.)
10. Create a help file with guidelines to the users. Include some Frequently asked replied questions (FARQs). Inform the users for the existence of the digital collection with e-mail. Create a web archive of the mails sent to the users available to all users. Remind the URL of the archive in all related consequent e-mail.
11. Create WebPages and regularly update alphabetic and thematic catalogues with hyperlinks to the definitely accessible e-joumals. Use unchanged the addresses of the WebPages used for these catalogues in the library or the organisation site.
12. Check and update periodically the pages with the catalogues. Check the validation of the hyperlinks to the e-joumals.
13. Training of Personnel on the use of electronic journals, training of the personnel on user support.
14. Training of the users in full exploitation of the offered services (searching, creation "personal pages", filing, alerting, hot journals, queries, articles)
15. Collect and keep statistics for possible rephrasing of the rules and reorganization of the collection.

6. PROBLEMS

Main problems met in the present phase are distinguished in four categories:

6.1. Technical - procedural

1. The procedures for the signature of the license agreements are time consuming, different from publisher to publisher. Basic knowledge on copyright issues is needed.
2. Where ΓΡ address validation is not applicable, the management of quite a number of different user names, logins and passwords for all e-joumals proves to be an obstacle for an easy and user-friendly access. It is of great importance publishers to be asked for simple ΓΡ address validation for authorised users (e.g. Class C range).
3. The existing polymorphy of the various user interfaces of each publisher confuses the novice users. Despite systems are similar (but not identical) no standards are followed concerning the searching. Attempts for unified interfaces are still very early. Nevertheless Z 3950 protocol is a standard solution for a category of library users.
4. Regular checking the validation of hyperlinks (point 12. of the checklist is time consuming for relatively big collections (e.g. >300 journal titles).
5. Speed rates of INTERNET are absolutely decisive for the acceptance of the digital library by the users. The user always compares the time needed to display or print an article with the time needed to identify and photocopy a printed journal from the selves of the library.

6. The compatibility between future versions of software, storage and display formats and the equipment available from the library or the user is not guaranteed. The cost of possible future infrastructure upgrade is not estimated

6.2. Institutional

1. Law 2121/93 governs the status of intellectual property rights in Greece. Unlike to all European (and not only) countries the copyright law is prohibitively strict for the operation of the libraries and information services. There is no any reference related to paragraph b, article 9 of the Bern "mother" convention on copyright, concerning exceptions to be institutionalised by countries-members in order to facilitate the operations carried out by libraries. Restricting reproduction of printed works (e.g. scientific journal articles) exclusively for conservation reasons (!) and only if there is no copy available in the market (!) the law substantially prohibit the basic function of the information services and libraries to operate their basic mission, that is this of disseminating the registered knowledge in the society. What is impressive here is that the directly «offended» side, that is publishers of scientific periodical publications from all over the planet, permits libraries to reproduce scientific articles in the frame of so-called "fair use". It is absolutely incumbent the law to be adapted to the real life of the libraries and not to the virtual reality of the legislator. Till then, it is foreseen that libraries and information services will continue to operate under a status of illegality.
2. According to the legal nature of the license agreements that publishers propose for signature, the terms included in these documents are subjected to negotiation (e.g. prohibition of use of library material for ILL). It is impossible for an individual library, which tries to create a digital collection, to confront the procedures of term negotiations with each one of the publishers it signs an agreement. It incomparable easier and more effective these negotiations to be undertaken by a person or team entitled on behalf of all the members of a libraries **consortium.**

6.3. Library keeping problems

Among the problems that librarians meet in the creation and operation of digital libraries it is worth mentioning the following:

1. Selection of Library material.

- Up to date the fact that a journal was also available in electronic form was not one of the selection criteria to be included in the collection. It is sure that will not continue for long time. The user needs will turn this feature to one of the prerequisites for the inclusion of a title in the composition of a collection.
- The selection of individual journals against journal "packages" requires evaluation in detail with high accuracy of various parameters such as obligations-capabilities and exploitation rights-cost, etc.

2. Cataloguing problems

- During this early phase of development of the digital collections double efforts are needed a). Update of electronic cardex and/or INTERNET - OPAC, β) update of autotelic WebPages with the alphabetic and /or subject catalogues of journal and links to the appropriate sites.
- In terms of library software and library practice, the digital form of a printed journal is considered as a different record, perhaps corresponding to the printed one. The main reason is that there is different (even not always) ISSN that is assigned to the each one of the two forms. Furthermore these two forms of publications are not always identical the

same but simply corresponding. Apart these problems the starting date of the holdings of the digital form is not at all unchanged, as it usually happens with the printed editions. Retrospective digitization is an everyday phenomenon between hundreds of publishers. Finally the starting date of the holdings of the electronic version is not the same with the starting date corresponding printed version.

3. **Quality control**

- The quality control, which corresponds to the check for misprinted copies in the printed version, is actually impractical for "received" digital material, either concerning CD-ROMs or access to INTERNET (i.e. check between thousands of articles for corrupted files on a CD-ROM or invalid hyperlinks on INTERNET).
- The user support and the maintenance and often update of the installed infrastructure is crucial for the proper operation of the library. New skills are requested by the existing personnel and/or new personnel for the covering the new needs.

4. **Human factor**

- Scientists directly and actively involved with the setup of digital libraries, recognize the need for cooperation in the frame of **Libraries Consortia,** as self-evident. In almost all the workplaces, where action is taking place, the concept that the "individual libraries benefit" is harmonized and achieved through the "total benefit" is considered a "general truth". However, for the successful upgrading of information services and libraries, voluntary self-commitment of the consortium members and a different perception is needed, mainly by those entitled with a directorial role. The economic and technological conjuncture leaves no margins to libraries for uncoordinated and isolated actions, either in the name of a miserable "particularity" or in the name of a doubtful "avant-garde" and an illusive self-centeredness. Such concepts deprive the scientific community from the capability to exploit on time the technological evolutions.

7. CONCLUSIONS

During the present transitional phase, the qualitative upgrading of the information services and libraries passes through the creation, the operation and the exploitation of the digital/virtual libraries. A gradual change is noticed concerning the form of the library (more terminals and work stations, networks and printers instead of selves, photocopy machines). The library paradigm is changing *(hybrid library)*. Access rights are more and more important than acquisition. Library staff acquires new skills and adapt themselves in the new conditions. Needs and roles are appearing for evaluators and negotiators of contracts and license agreements with publishers and providers of digital information.

Ensuring the **national digital archive** is a problem to be confronted within the few next years. Till now, ceasing the subscription of printed journal, the users continued to find the back issues on the selves of a library. The same right is not at all guaranteed for the electronic journals. According to the contracts proposed by the publishers, after the cease of a subscription to an electronic journal, many publishers are not bound (or much worst explicitly deny) the access to those digital issues, for which subscription had been paid in the past years. But even if archiving is permitted (legal facet) via downloading the digital material on the library infrastructure, it is quite sure that individual libraries are not in such a position to afford and maintain local archives (technological and economic approach).

It is quite obvious even from the definition given before (see 2.6), that the establishment of Libraries Consortium is a key for the upgrading of the offered services by information and libraries services. A very positive beginning has already been made in Greece by the creation

of **HEALink (Hellenic Academic Libraries Link, http://leykada.physics.auth.gr/)** as a result of cooperation between 32 Academic Institutes and their Libraries in the frame of EPEAEK program **[6].** Efforts have also been made by other groups of libraries (e.g. Research Centres financed by the General Secretariat for Research and Technology in the frame of EPETII program). Cooperation between the consortia under creation will ensure the maximum of capabilities offer by Hellenic Information libraries, keeping, in national level, relatively stable the levels of expenses for journal subscriptions. A common effort of the involved organizations and people can bend any «reservations» from the publishers' side for the "general benefit".

8. BIBLIOGRAPHY - REFERENCES

[1] Filippos Tsimpoglou. **"The operation of the National Network of Scientific and Technological Libraries and the expected influence on the reformation of the National Collection of Journals"** original title: **"Η λειτουργία του Εθνικού Δικτύου Επιστημονικών & Τεχνολογικών Βιβλιοθηκών και οι αναμενόμενες επιδράσεις του στην αναδιαμόρφωση της Εθνικής Συλλογής Περιοδικών",** in 6th Panhellenic Conference of Academic Libraries. "Academic libraries and the chalenges of modernisation" Athens, 5-7 November 1997, National and Capodistrian University of Athens, 1998, pp. 207-237.
See also http://www.eie.sr/Staff/Tsimpoglou_F/tsimpoglou_6_psab.pdf/.

[2] Filippos Tsimpoglou **«Consortia of Hellenic Libraries. The necessary good of the digital libraries"** original title: **"Κοινοπραξίες Ελληνικών Βιβλιοθηκών. Το "αναγκαίο καλό" των ψηφιακών βιβλιοθηκών".** In 7th Panhellenic Conference of Academic Libraries, Volos 4-6, November 1998, University of Thessaly. (To be published).
See also: http://www.eie.gr/Staff/Tsimpoglou_F/tsimpoglou_7_PSAB.pdf
And videotaped announcement http://www.lib.uth.gr/english/video2s.htm (0:53' - 1:23')

[3] http://gort.ucsd.edu/newjour/ (last update: 26/06/1999)

[4] Don L. Tolliver **"Policy and Cost Implication for Libraries in Statewide Consortia: The OhioLINK Experience"** in 6th Panhellenic Conference of Academic Libraries. "Academic libraries and the chalenges of modernisation" Athens, 5-7 November 1997, National and Capodistrian University of Athens, 1998, pp. 33-40.

[5] http ://www. academicpress. com/www/ap/consli st. htm

[6] Filippos Tsimpoglou, Anna Fraggou, Klontine Dervou-Xenidou, Marina Korfiates, Maria Lekidou. **"Rational reformation of journal collections in Hellenic Akademic Libraries"** original title: **"Ορθολογική αναδιάρθρωση των συλλογών των περιοδικών στις ελληνικές Ακαδημαϊκές βιβλιοθήκες".** Study of working group, Horizontal Action EPEAEK, (Ministry of Education), Thessaloniki **(1998).** http://www.ntua.gr/library/deliv04.htm