Constantin I. Karadja in the Collections of the Romanian Academy Library

1. Introduction

The title of this talk contains the names of three distinctive entities, namely : a) *Constantin I. Karadja,* b) *the Romanian Academy Library*, and c) *the collections*.

The main emphasis of the talk will be laid upon the documents associated with the name of Constantin I. Karadja in the Library's collections. To set the stage for describing this collection, a few data about his personality and the Library will be given first. Then a sample of several items out of Kardaja funds shall follow. More copies of documents shall be displayed in the exhibition and an almost permanent trace of the material is to be found on the website of the Library (http://www.biblacad.ro/).

2. C. I. Karadja

Today we pay homage to an outstanding European inter-war diplomat, a great historian and a passionate bibliophile, an exquisite collector and a generous donor, Prince Constantin Jean Lars Anthony Démétrius Karadja (1889-1950). Honorific Member of the Romanian Academy (AR) since 1946, he embodies the figure of an erudite called to raise the spirit of his time and the standards of diplomacy. Of a Phanariote-Romanian and Swedish origin, after graduating the Law Faculty Inner Temple in London to become a barrister specialized in economics, conversant in 12 languages, he entered diplomacy, but kept alive his enthusiasm for culture all his life.

The impressive fact is that, although hardly naturalized Romanian in 1920, after his marriage to Marcella Karadja, Constantin Karadja felt at home only in Romania. Thus he wrote to Bianu: "life is completely different and although I feel at home in Stockholm, I have to admit that, at the same time, I feel very far from home and from my family!" (Stefanescu Mitu, 1985).

On June 3rd, 1946, at the 80th general session of the Romanian Academy presided by Andrei Rădulescu, Vice-president of the Academy, the well-known Romanian historian of military art, General Radu Rosetti, proposed Constantin I. Karadja for election as Honorary Member of the Academy, characterizing him as follows: "Mr. C. Karadja, Consul General, is not only an emeritus bibliophile, a renowned bibliographer, but also a diligent researcher of facts from our past. As a bibliophile, he has gathered a rich library of incunabula, of rare editions and of studies of the greatest utility for the historical researches. As a bibliographer, we mention that he has published numerous texts regarding our past, as those on the participation of the

Moldavian church to the Council of Constance, the study on Behaim's chronicle in verses and many others. At the same time, we should say that editors of the international catalogue of incunabula have entrusted him the elaboration and publication of the part referring to the incunabula existent in public and private libraries of Romania, an already finished opus. As a researcher, we should mention his studies on matters of details, of the highest interest for our historians. (…), eventually, Mr. C. Karadja has generously endowed our library with innumerable books of the greatest historical and bibliographic value. For these reasons, the undersigned propose the recognition of his merits by calling him in the Academy, as an honorary member". The proposal is signed by academicians R. Rosetti, Ion I. Nistor, G. Spacu, D. Pompeiu, C. I. Parhon, N. Bănescu, D. Voinov, C. Rădulescu-Motru, Em. Racoviță, G. Macovei, Iorgu Iordan, C. Ionescu-Mihăeşti, Em. C. Teodorescu, Şt. Ciobanu, N. Vasilescu-Carpen, S. Dragomir, Alex. Lapedatu. (AAR,1946, p. 331 apud Stefanescu Mitu, 1985)

Three days later, at the meeting of June 6th, 1946, Andrei Rădulescu, Vice-president of the Academy, salutes the presence of Constantin Karadja at the meeting, as a newly elected honorary member, addressing him the traditional wish "Welcome among us!". His answer to these words of appreciation was "I thank you deeply touched by your considerate words about my modest works of history (…). I receive your call with humility, as I envisage it the dearest to receive in my life, of being an honorary member of this first institution of culture of the country. This feeling of humility is accompanied by one of joy. I will no longer say like Ovid "Nitimur in vetitur semper, cupimusque negata", as You, dear colleagues, have offered me more than I could have the right to crave as a result of my modest works. (AAR, 1946 p. 61 apud Stefanescu Mitu, 1985). As a great book collector, C. I. Karadja gathered more than 100 incunables and his library of Grumăzeşti,Northern Romania, contained more than 6000 rare volumes (Schatz,2002), some of them being now part of the Romanian Academy Library's patrimony.

Fig. 1 Constantin I. Karadja

Fig. 2 The new building of the Library

3. The Romanian Academy Library

Founded on August the 6th, 1867, one year after the foundation of the Romanian Academic Society, The *Romanian Academy Library* (BAR) was assigned the mission of gathering and preserving the national fund of manuscripts and printed documents illustrating the Romanian and universal history, culture and civilization. It is still considered, after more than a century of existence, the richest national Romanian library, holding the most comprizing funds of Romanian documents, old and recent, acting as a scientific and encyclopaedic library. Its collections are organized, so that they may offer the documentary material necessary to the fundamental scientific research in general and specifically to the research unfolded in the institutes of the Romanian Academy. It shelters over 11 million library units, out of which 10,000 volumes of manuscripts, over 500,000 correspondence and archive records, 138,000 engravings and drawings, about 3000,000 photographs, 53,112 cartographic documents, 190,000 coins, medals, plates, and seals, more than 600 engraved stones and 40,000 stamps, 55, 000 musical scores, 20,775 audio-video items, 5,3 million monographs and almost 7 million serials. At present the collections are sheltered in a new and modern building (Fig. 2).

Beneficiary of the Legal Deposit since 1885, it includes among its attributions the publication of the retrospective bibliography of the Romanian books and serials and of special bibliographies, such as Mihai Eminescu Bibliography or The Independence War Bibliography, providing assistance for documentation and research on the Romanian science and culture. The special collections of its patrimony confer it one of the highest ranks among the institutions of the kind in Romania. Its fund of manuscripts is the most extensive and most valuable in the country and its collections of prints, scores, maps and its numismatic treasures are regarded as real reference points in the field.

The Romanian Academy Library cultivates an ample exchange with other academies, scientific institutions of higher education or prominent libraries abroad and coordinates the activity of exchanging publications of its subsidiaries, being the nucleus of a vast network of branches and pending research institutes. Thus, in order to keep the pace with modernization both in collections and in organization, this institution has centered its acquisition policy of foreign publications first and foremost on international exchange, but also on purchase as well. At the same time, the legacies and donations of illustrious personalities have always been an important source of enriching the library heritage.

We are now in the „Information Society and Internet Era". Efforts have been made over the last two dacades to modernize the library, so that access would be facilitated for everybody, from any place of the world, at any time. Since 1992 the

website of the Library (www.biblacad.ro) has accomodated and encouraged the virtual access to its rich collections. The following images represent a sample of rare books, letters and drawings respectively, to be found in the collections of the Library. The image of Fig. 4 is taken from the Greek manuscript 1294, a Canon of Penitence from the 12th century, on parchment. It has been identified as the oldest text of a canon known, older than that in the Library of Vatican. The 20 miniatures are of great artistic value representing monks praying to attain perfection on the Ladder of Divine Ascent of Saint John the Sinaite (Strempel, 1971).

Fig. 3 *Canon of Penitence* (12th Century)

Fig. 4 Ortelius Atlas, *Theatrum Orbis. Map of Dacia* (16th century)

Fig. 5. Picasso - *Lola*

Fig. 6 Letter of Napoleon to Maria Walewska

At present, the Library is involved in several national and international works meant to create digital collections. The most recent project is „Europeana Library" (PIC:984300226), which is funded by the European Commission and started in January this year. The consortium of the project includes also the Library of the Uppsala University.

4. Karadja Collections

The Library is the beneficiary of Constantin Karadja's steady donations throughout his lifetime due to his relationship with many academicians and scholars in this prominent cultural forum of the country and the Department of Manuscripts and Rare Books is in possession of numerous and diverse documents donated by C. I. Karadja himself or purchased from his family after his death. There are registered more than 400 historical documents from the 15th century onwards, mainly Moldavian, both in the original and in photocopy, documents in the course of returning from the State Archives. Besides, several Romanian, Latin, Italian, French, German manuscripts from the 15th to the 18th century, more than 15 rare books, out of which three incunables in the original, eight incunables in photocopy or in facsimile and some post-incunables complete the inventory. An attractive collection of letters signed Constantin Karadja is part of the archive Nicolae Iorga, the great historian with whom he had a prolific scientific collaboration.

We have selected out of this vast collection a few titles from all these categories of documents: rare books, manuscripts, archive and correspondence.

The following series of images is meant to give the reader an idea of the donations made by the brilliant bibliographer and bibliophile, in themselves a treasure for any important library in the world in rarity, oldness and aging, artistry in miniatures, the typographer's and bookbinder's craftsmanship.

They are printed in various fonts, with historiated initials, decorated with lavish miniatures in colour and gold, with text in full page or in columns, with engravings describing scenes or delineating portraits of high beauty and refinement, elegant frontispieces, most of them presenting themselves in exquisite original leather gilt-impressed bindings or in parchment or velvet, with golden schnitt, some of them with Baroque silver locks. Inked inscriptions and marginalia, ex-libris and supralibros enhance their value by adding information about their temporary ownership or readers.

4. 1. Rare Books

Fig. 7 is an image of a gilt-stamped supralibros belonging to C. I. Karadja on a rare book, **Chalcondile Athenien's** *Histoire des turcs, L'histoire de la décadence de l'empire grec et eétablissement de Celvy des Turcs*, translation by Blaise De Vigenere Bourbonois, bearing a series of engravings with portraits of the emperors of Turkey, 907 f., printed in Paris in1650 (Brunet, 1860). The second image (Fig. 8) is from **Aeneas Silvius Piccolomini's** *In Europam*, printed at Memmingen, published by Albrecht Kunne de Duderstat, a photocopy. Actually, it is Pope Pius II's work In Europam, first edition. This pope encouraged Vlad III Dracula, whom he held in high

regard, to start a war against the sultan Mehmet II, even to assassinate him ("The Night Attack").

Fig. 7

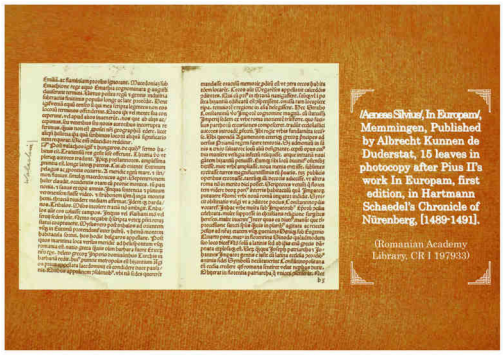

Fig. 8

A third item (Fig. 9) is **Johann Saubert's** *Historia Bibliothecae Reip. Noribergensis*…, published in Nüremberg by Woflgang Endter, 1643, 214 p. with stylish engraved frontispieces, First edition of a history of the city library of Nüremberg, containing an inventory of over 900 fifteenth-century editions. The author was Nüremberg's city librarian from 1637 until his death. His useful and only somewhat arbitrary decision to study and catalogue 15th-century printed books separately, as a specific field of interest, was soon followed by other bibliographers and will never be abandoned. A fourth rare book (Fig. 10) is **Jeremia II,** Patriarch of Constantinople's *Censur oder Urtheil der Orientalischen Kirchen*…, published at Ingolstadt by David Sartorio, 1583, 268 f.. It has parchment covers with stamped medallion and frame, an inked inscription on the back of the front cover.

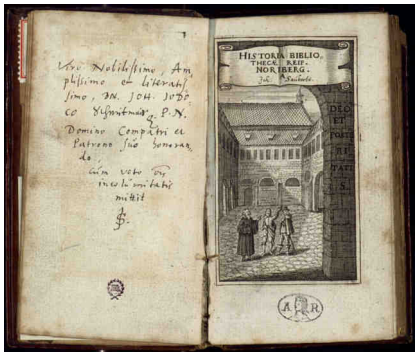

Fig. 9

Fig. 10

Fig. 11 contains an image of a rare book by **C. Sallustius Crispus**, *Cum veterum Historicorum fragmentis*, printed in Lugduni Batavorum (Leyden), Ex officina Elzeviriana, 1634, /8/ f. + 310/-344/ p., original leather binding and golden schnitt. It bears an engraved title by Cor. Cl. Duysent and a medallion portrait of Sallust facing p.1 and an ornament of the Medusa on p. 216. The French bibliography considers that

only the first genuine edition which has the Medusa's head. And now a very rare book in Latin, donated by C. Karadja in 1946, having as author **Johann Hartung,** *Bibliotheca sive antiquitates urbis Constantinopolitanae*, printed in Argentorati (Strasbourg), 1578, /48/ p (Fig. 12). He mentions its rarity in his article in Revue Historique du Sud-Est Europe, 1935, nr 10-12. It is a well-known fact that he was an adept at identifying old printed books, having permanent and reliable suppliers of catalogues from Germany, France and other countries. Only 2 editions are published in Latin and held by 9 libraries worldwide.

Fig. 11

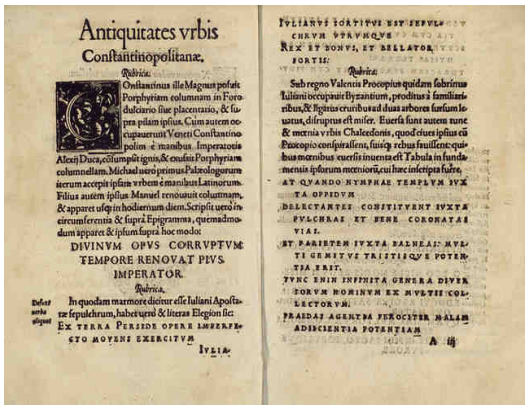

Fig. 12

A spectacular *Livre d'heures* (Fig. 13), a Book of Hours, on parchment, richly adorned with 15 miniatures on engravings of saints and scenes of the Apocalypse, the Annunciation, the Crucifixion, the Nativity, the Flight to Egypt, the Adoration of the Magi etc., issued in Paris in 1520, bound in garnet velvet with magnificent silver locks by Hering, a piece of great beauty. Other 4 marginal miniatures and 10 minute figures of saints complete it. It also displays gilt-stamped leather inside binding with coat of arms in medallion, 77 f., purchased from Marcella Caradja in 1952. In Fig. 14 there is a post-incunable by **Justinus**, entitled *In Trogi Pompei historias exordium* - **Florus Lucius***, gestorum Romanorum epithoma,* Venetiis, 1503, 54 leaves, black letters, modern binding.


Fig. 13

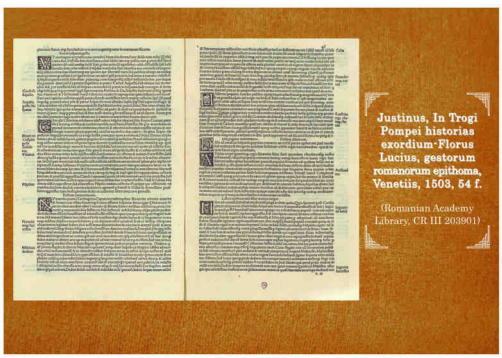

Fig. 14

Padre **Giacomo Fiorelli's** *La monarchia d'Oriente, Comincia da Constantino'L grande. Nell'Anno CCCXXX (330). E termina in Constantino Paleologo. Nell'Anno MCCCCLIII (*1453) in Venice by Domenico Milocco, an in-folio issued in 1679, /3/f. + 448 p. + 1 f. with an engraved portrait of the author on the back of the front leaf (Bacaru,1970) is shown in Fig. 15. The image in Fig. 16 is taken from an incunable. The author is **Franciscus Philelphus,** his work is *Epistolae familiares*, printed in Venice by Ioannem de Cereto alias Tacuinum de Tridino in 1498, on paper. It contains black historiated initials and a typographer's mark in the end.

Fig. 15

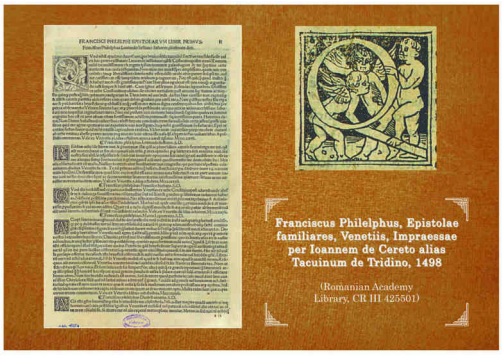

Fig. 16

Fig. 17 shows an image from *Biblia latina* printed by **Johannes Petri** and **Johannes Froben**, an incunable of 1498, an in-folio with coloured and gold lettrines, text on two columns, with explanatory windows. The binding is on wood covers with beautifully embossed leather.

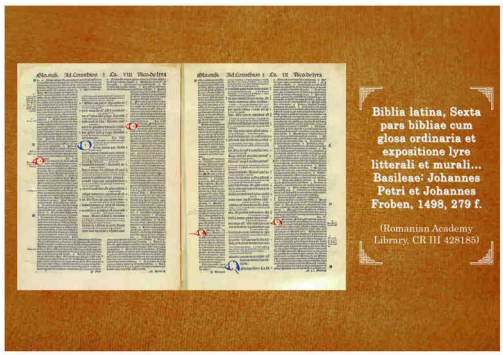

Fig. 17

4. 2. Manuscripts

But Constantin I. Karadja donated also several manuscripts. For example, Fig. 18 shows the Latin manuscript 130, **Letter of the Bishop Leonardus Chiensis of Mitilène** (Lesbos), the topic being the siege and fall of Constantinople, circa 1500, actually a manuscript of French origin. It gives the complete letter, in 16 leaves, written by the Bishop of Mitilene (Lesbos), Leonardus Chiensis, dated August 16th, 1453, containing an account of the siege of Constantinople. Its author was killed by

the Turks in 1462. The golden unvan of an Oriental manuscript, nr. 23 of Fig. 19 is a Turkish **Chronicle of Ahmed Asam**, from the 18th century, bought by Karadja from Franz Babinger in Berlin in 1936, the only manuscript known by this author at the State Library in Vienna, an unpublished version, the beautiful Oriental binding was torn and stolen when the manor of Grumăzeşti was spoliated in the fall 1945, he explains in a note on the guard leaf. It was donated in 1946 to the Romanian Academy Library.

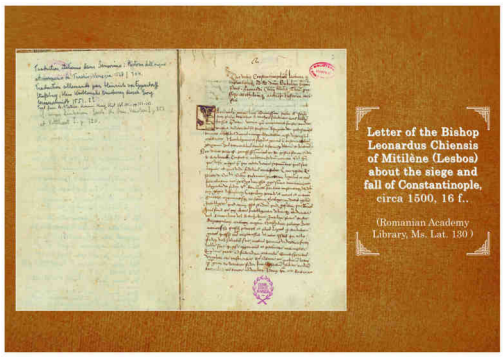

Fig. 18

Fig. 19

The image in Fig. 20 displays the image of a Romanian manuscript, nr. 5545, a translation of a French manuscript from his own library, entitled *History of Alţidalis and Zelida* by **Vincent Voiture** dating back the 18th century, 94 leaves, which he bought from Father Filaret Buliga from the Neamt Monastery in 1926 and donated it in 1946. Vincent Voiture was a man of letters and a poet, a founder member of the Academie Francaise, a leading figure of the circles of the Hotel de Rambouillet. Around 1630, he wrote a *nouvelle mauresque*, the *Histoire d'Alcidalis et Zélide*, very popular in *gallant* circles, never published in his life-time; its imaginative force reveals another side of a writer with diverse skills.

Most of the pieces of information we detain are taken from the marginal notes and the inner covers. It had been translated from French, in Iasi in 1783, during Voivode Alexandru Constantin Mavrocordat's time, by **Vasile Deacon**, at the order of biv vel ban Gheorghie Beldiman. More information about various events of the time arouses interest by some details about the Turks' invasion in Moldavia, in 1821; the locusts' swarming in 1823; the burning of the Moldavian forests and of the Neamt Monastery in 1826; the earthquake in 1828, the lapidation of the boyar Calimach by the people. Another image (Fig. 21), this time of a Romanian manuscript, nr. 5887, **Costache Conachi's** *Political View of the Whole Europe*, dated 1825, an ograph text of 39 leaves in black ink, in Romanian language with Cyrillic alphabet, containing rich footnotes, donated by C. I. Karadja in 1947. It had been received as a gift from professor A. B. Brandea in 1919, who stated its origin in logothete Vasile Malinescu's

private archive until 1866. It relates Conachi's personal point of view about the continent and its political actors.

Fig. 20

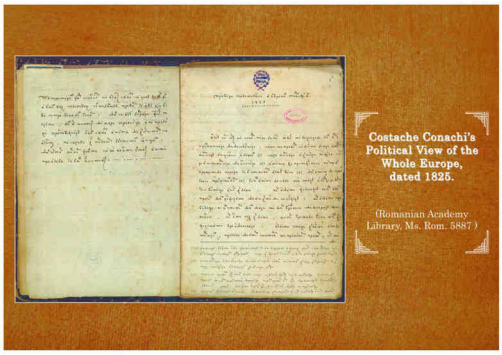

Fig. 21

The image of Fig. 22 is taken from a French manuscript, nr. 212, **Canow's** *Memoirs and Negotiations from My Campaigns in Hungary* in 1692, with original leather binding, text in black ink, in 78 leaves. It contains numerous important pieces of information on the unfolding actions and refers to many historic names of the time in charge with taking decisions on top among whom King Leopold I, marshal of Stahremberg, the great defender of Vienna, Count Luigi Ferdinando Marsigli, who gathered, on this occasion, documentation for his large and consistent geographical works in 150 volumes, now in manuscript at the Academy of Sciences and in the library of the palace Marsili in Bologna.

Fig. 23 contains a 17th century German manuscript, nr. 114, *Eineß traŭrig Anfangs...,* of provenance from the Monastery of Minorites in Kaltern, Upper Tirol, 86 f., with parchment binding, a caligraphed text in black ink, page with impressed frame. It is another account about the siege of Vienna by the Turks in 1683, in 16 chapters.

In spite of the fact that the ruler of the Romanian Country, Prince Serban Cantacuzino, had to act as an ally of the Turks in the battle, being a vassal, he secretively supported the actions of the defenders, developped an ingenious system of communications with them, that is why he eventually was awarded the title of Count of the Holy Roman Empire from Leopold I. The manuscript evokes the fact that he erected a cross of 5 meters tall in front of his tent as a token of his actions as a Christian.

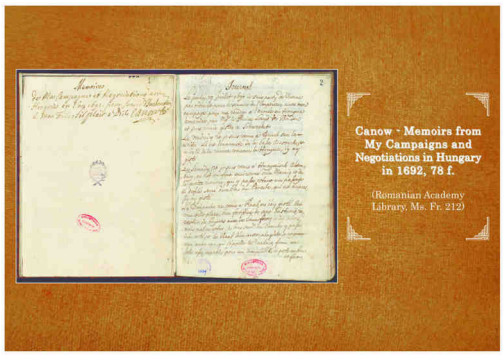

Fig. 22

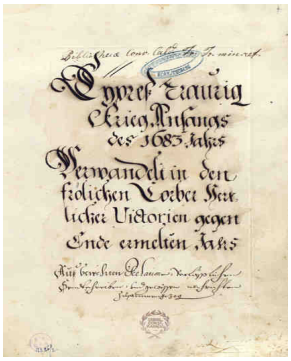

Fig. 23

4.3. Correspondence

The Romanian Academy Library preserves also Karadja's correspondence with Nicolae Iorga, in the latter's fund. Some of them have been scanned and can be seen in the exhibition. In his letters, more than 20, addressed to the well known Romanian historian he usually informed him of his studies and articles published at various publishing houses, or about foreign visitors to his estate of Grumazesti (like the German humanist pastor Mihael Neander), as well as his search for documents and bibliography about the Romanian countries, containing bibliographies issued before 1850, ready to be sent to the historian. He also signalled events which threw a light on the Romanian culture, I refer to the the exhibition of Romanian folk textile artifacts opened on the 21st of May 1929, at the Celleri Modern, Sturegatan 26, which was unanimously praised, fact confirmed by R. Uhrynowski's report and in Svenska Dagbladet and in articles from other Swedish papers.

The personal archive C. I. Karadja contains acts like birth and death certificates of the members of his family or of his ancestors, diplomas of graduation and membership on parchment, manuscripts, maps of estates, varia and printed documents. Figures 24 and 25 contain Karadja's father's, Jean Karadja Pacha's *birth certificate* and *will* with the sealed envelope, respectively.

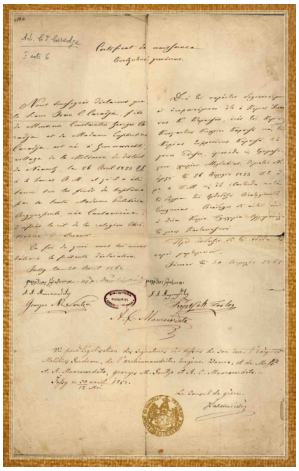

Fig. 24. Birth Certificate of Jean Karadja Pacha

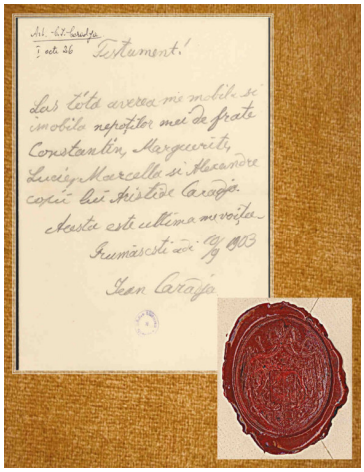

Fig. 25. Jean Karadja Pacha's Will, ollograph ms

Undoubtedly, Karadja's name could be repeatedly heard, if we continued our list of documents held by the Library, but we can eventually express our deepest admiration and gratitude to such a personality and patriot as Constantin I. Karadja, so dedicated to collecting and preserving the highest values of mankind, such as thinking and knowledge transferred to the next generations in documents, sometimes in the form of masterly works of art represented by illuminated old manuscripts and rare books, a noble and gradiose undertaking usually designated to national institutions of culture.

As Dan Simonescu (1971) remarked „Constantin I. Karadja was an example of uninterrupted meritous work, as a diplomat and a man of science, as a historian and a bibliologist" .

Acknowledgements. *The author acknowledges the contributions of his colleagues of the „ Manuscripts and Rare Books" department, Mrs. Gabriela Dumitrescu and Mrs. Lorenta Popescu, to preparing this document.*

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Florin Gheorghe Filip
(http://www.biblacad.ro/FlorinFilip.html)

Preserving, conserving and archiving digital patrimony

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Abstract: Mass digitization and the large quantity of already digitized material were the main factors that made digital preservation and conservation to be a real problem for the holders of electronic resources and digital documents. Libraries too face these challenges. Long-term preservation and conservation implies national rules and regulations in accordance with the local realities and with the international developments; the development of local standards, building a strong infrastructure, sharing the resources and using adequate software are ways of creating access to the digital resources.
Solutions and policies for preserving and conserving the digital heritage can be found at institutional level, national level, European level, international level.
Keywords: Digital preservation; Digital heritage; Digital library; Standards; Procedures; Legislation.

The digital environment becomes more and more complex and more difficult to manage. Massive digitisation; creation of documents in digital format without traditional equivalent; the extraordinary dynamics of technology and of information applications, with their ensuing obsolescence; the large amount of standards and formats for electronic documents; lack of unitary working norms along the life cycle of an electronic document; all the above create a problem of paramount importance for the structures possessing such documents and in charge with the management of institutional heritage as part of the national cultural and scientific heritage. Libraries are included among such institutions, responsible for the development, valorisation and preservation of the managed patrimony.

Unesco adopted the *Charte sur la conservation du patrimoine numérique* recognising digital patrimony as being part of the common patrimony and pointing to the risk of loosing a large part of humanity's cultural heritage in lack of adopting specific legislative, technological, financial, professional measures. In accordance with the *Charte*, the digital patrimony includes unique documents related to human knowledge and expression, be they of cultural, scientific, educational, administrative, artistic type, created in digital format or converted in digital format from existing traditional resources. In dealing with documents of digital origin, it is sometimes difficult to identify the original digital form or the respective form may not be the most adequate to convey the information message. Digital documents come in many formats, such as text documents, data bases, fixed or animated images, audio and graphic documents, informatics applications, web pages, sites, portals etc. In many cases such documents are ephemeral or have high dynamics content, numerous variants. Therefore, the issue of preservation, conservation, archiving the digital patrimony is much more complex than in the case of traditional patrimony, requiring a specific approach. The characteristics of digital documents and collections should be taken into consideration, as well as strategies and solutions of preservation, conservation and archiving.

Characteristics of digital documents and collections:

- *Density of information on the storage support*. The main function of the support is the mass dissemination of the content, not one of conservation. We can notice the obsolescence of storage supports and the fact that their longevity has not yet been tested.

- *Complexity of use*. Between the digital document and the user we find operating systems, application programmes, all of which should be compatible both with the document and its format and with the computer in use. Conservation and archiving should take into account the document's dependence on the techniques it is associated with.
- *The multitude of formats.* We witness a multitude of formats, both as concerns typology and the versions within the typologies. "Freezing" the digital content in a format incompatible with hard and soft technologies would result in its lost.
- *Instability of technologies.* The life-cycle of technologies is shorter than the life-cycle of information and documentation resources. Technological progress entails the rapid obsolescence of hard and soft technologies and, therefore, the need to replace them permanently ensuring technological compatibility.
- *Dynamics of the production of digital content.* Electronic publications, multimedia productions, cultural and scientific data bases, internet sites etc. are in a continuous dynamics. We witness the quantitative increase of information resources, changes of content, co-existence of multiple variants of the same content, ephemeral contents. It is a quantitative increase, not necessarily qualitative. Assessment of the quality of digital production can be carried out concentrating on certain aspects of interest for certain research topics. Therefore, it is difficult to ascertain at global level what should be archived in perennial archiving conditions as part of the digital patrimony.
- *Instability of the web.* The Library of Congress, as quoted by Unesco in the study mentioned, considered in 2003 that the average life of an Internet page is of two and a half months and almost half of the content posted on the Internet disappears after a half year. Nowadays, the instability of the web is much more evident; we mainly have in view the dynamics of resources on the sites, not necessarily the disappearance of the web addresses. Through Web 2.0, which offers users the possibility to become creators of digital content, the instability of web becomes a basic characteristic of a certain type of presentation of digital content, meanwhile making almost impossible to decide on a perennial conservation and archiving.

The digital document having diverse typology and a complex structure requires particularised decisions and solutions for preservation, conservation and archiving. It is necessary to specify what should be preserved: the whole document (information content + informatics application) or only the information content.

The following characteristics are supposed to ensure the integrity of a digital document:

- the information it contains;
- the stability of the document;
- reference of the document;
- its provenance;
- the context of the document.

The integrity of the document is subject to all the above information; it should be created and preserved together with the document for its entire life.

The information contained. Long-term archiving of digital documents mainly takes into account the preservation of the information, the intellectual content of such a document. Theoretical studies have not succeeded in defining "the intellectual content of an object with electronic information". There are several levels of abstracting to be taken into consideration when defining a content that needs preserving. At basic level, all the electronic information is made up of a succession of bits with values from 0 and 1 and each object differs from another by the exact ensemble of succession of the contained bits. Conserving information at this level consists in the exact conservation of that succession of bits. Standards and norms for electronic documents stipulate the rules for the structuring of the information - ASCII, UNICOD, SGML, XML, HTML – are means to encapsulate it in a logical structure.

Stability. Preservation of a digital document (of an object with electronic information) should not take into consideration only the content but rather a stabile and fixed version of the whole document, one that could not be modified without a precise and unambiguous identification of the versions in their succession in time. Meanwhile, the version considered as being basic or referential, main, may be marked in an electronic format (a kind of electronic footprint or filigree). There is also a way to signal the successive alternatives of a document by creating individual notes for each change linked to the basic document (see special data bases, legislative data bases).

Reference. It is not enough to preserve, conserve and archive a digital document. It should be easily retrievable, so as to comply with its role of information source. For traditional documents, references are made in bibliographies, dictionaries, catalogues, indexes, search tools. In the electronic space, reference should be an active link that would allow direct access to the resource or a minimum of explanations concerning the conditions of access.

There are several methods that facilitate access to objects of electronic information:

- traditional systems of description but created in information context (such as electronic bibliographies and catalogues) include a link and a possible description of the electronic document (field 856 in MARC format);
- obtaining concrete references on an electronic document by including elements with references to the source in a distinctive part of the said document. The TEI format (Text Encoding Initiative) – a format in which description and identification information are included in the heading of the document. This principle is also present in the metadata of the HTML format.
- URL (Uniform Resource Locator) included in HTML on the Web pages are codes of localisation of electronic objects on a computer in the Internet network. Uniform Resource Locator is a link that physically localises the object and which is changed at the moment of relocation.
- URI – Uniform Resource Identification – defines the general framework for the identification, numbering and locating electronic objects on the Web. This generic framework includes:
- URN – Uniform Resource Name, which is a unique and permanent identifier of the resource that is registered in a repertory (allowing to solve the situations in which there are several locations for the same name).
- URC – Uniform Resource Characteristic, that allows the association of information with an identity and certain access conditions to the electronic object.

Provenance – a basic concept of the modern archiving related to the history of a document. In electronic context, provenance is closely linked to the stability of a document, being important when establishing multiple versions and editions of a document, tracking the migration of such a document; the history of the conservation chain of a resource from its creation to its preservation, conservation, archiving, in order to ensure the authenticity of the object and as a guarantee of its integrity.

The context. The digital document is dependent on the technical context that defines its use; it is related to other documents through links according to its own content; it is linked through its communication vector. All these constraints of utilisation represent problems in long-term conservation. An electronic object written in HTML allows through its links the opening of another object situated on another site. To present such a document means preserving it with all the links it contains and with all the objects that can be open with those links. Therefore, the Web ensemble should be periodically preserved, in order to implicitly ensure the preservation of all the electronic objects and of the links they are bind by.

The communication characteristics of electronic objects depend on the way they are communicated – off-line or on-line.

Strategies and solutions for the preservation, conservation, archiving of the digital patrimony.

Research in Information Technology and Information and Communication Sciences aims to developing models for long-term archiving of digital resources, taking into account two trends: ensuring a life as long as possible for the physical support, and continuous renewal of the support

(by transfer to another support). Obsolescence of the support – see the evolution of the support from the magnetic tape (in the 1980s) to the CD-ROM, DVD (Digital Versatile Disk) raises the issue of compatibility of the information programmes.

Concern for the conservation of electronic information dates back to the eighth decade and is due to the entities responsible for the preservation of the information by text processing, and the archives. The first issue (and the most important) was the fragility of the support (magnetic). In the early 1990s the archives adopted the method of periodically copying data from one support to another. This method is efficient when the information is coded in a format independent from the hard and soft platform used for its production and use or when a superior version of an information programme is compatible with the previous versions.

At the beginning the supports for publication and archiving of electronic documents were magnetic ones, followed by CD and DVD (Digital Versatile Disk). They are used for registering audio, video information or multimedia applications, and also extensively used as support for archiving electronic documents of patrimony from archives, libraries, museums or electronic documents produced by various institutions. The producers claim a life span of 75-200 years for CD, DVD, depending on the material components in the disk structure. There are no established norms to measure the life span of a CD or DVD.

Tests carried out by the Library of Congress and the National Library of France made possible to draw certain conclusions as to the life span of each specific type of CD, this way ensuring the renewal of the information content before the disk becomes unusable. Another conclusion: the micro-climate conditions exert a radical influence on the life span of the support.

In connection with the obsolescence of the support, the obsolescence of information technologies associated to each electronic resource should also be assessed. Hardware components, informatics programmes are subject to rapid moral wear and tear (life-cycles of 2-5 years). The technological evolution of the last decade bears witness that digital information and documentation resources are produced in extremely different ways, depending on the information content and the programmes in use (without ensuring compatibility in all instances).

There are two solutions to be proposed in response to technology obsolescence:

- migration of data (including or not the migration of formats)
- emulation of information environments.

Migration of data means periodical transfer of an electronic resource from one support to another, from one information context (content + information programme). The migration should preserve the integrity of a digital object, so as it might be usable (information search, posting and use should be identical with those at the time when the information resource was produced). Migration of data involves the renewal of the support and not necessarily an identical copy but an identical information content in a new technical context. This is carried out at each change of the information context.

Migration of formats means transferring an information content from one format to another implicitly changing the structure of the document, of the folder that contains it, so as it might be readable by another programme in another information application.

Migration of data has legal implications on the right to modify digital objects that become more and more complex objects made up of elements pertaining to different legal provisions (the need to organise the operations of data migration at national and international levels in a cooperative infrastructure).

Emulation consists in corroborating an information context, ensuring compatibilities in an information context. Emulation techniques applied to the long-term preservation of electronic resources is related to the endeavours of defining a method that would allow obsolete information systems to become compatible with the yet not fully known systems of the future. Such an approach is still in research phase.

Consequence: cost efficiency and ensured circulation of information;

- cost efficiency: emulation, corroboration of information systems, are likely to eliminate permanent migration of data (in an ever increasing quantity) at each change of formats, of information programmes, of used materials.

Emulation of information contexts means:

- development of techniques that might be generalised (including the specifications of the computers of the future) that allow registration of characteristics necessary for the re-creation of the behaviour of current and future documents;
- development of techniques for metadata registering necessary for the retrieval, access to electronic documents and their re-creation;
- development of techniques the encapsulation of documents, of their metadata, of information programmes and of the emulation specifications, of compatibilisation, in order to prevent their alteration (OAIS method – Open Archival Information System).

Alternatives: conserving data and information on paper support (support already tested in time); conserving on micro-formats; creating spare electronic alternatives not intended to be communicated (a kind of legal deposit copies); ensuring redundancy of the digital patrimony subject to conservation and archiving (solutions back-up).

Libraries obliged to comply with the challenges of digital environment are extending their functions and activities towards this new medium of information and communication. Libraries acquire DVDs, video games; digitise their own collections; archive web information and documentation resources directly in digital format. The management and valorisation of such information and documentation, and their preservation, conservation and archiving involve a number of specific activities. Analysis of best practices in the domain is conducing to the identification of the following activities:

- creation of reliable archives, digital deposits;
- shared infrastructure, back-up storage solutions;
- utilisation of open source programmes that comply with the unitary norms of work and inter-operability;
- identification of specific components and specialisation of human resources;
- establishment of specific processes, procedures and definition of responsibilities;
- development and implementation of international standards.

At institutional level the libraries are concerned with the preservation, conservation and archiving of the digital patrimony. Unfortunately, with the exception of large libraries, these are sporadic activities, without the necessary financial and technological support. At the level of large libraries, the activities as identified above are present in a higher or lower proportion. Large libraries, in particular national libraries, take upon themselves their patrimonial function and are concerned in developing a specific infrastructure; creating reliable referential archives and digital deposits; establishing clear responsibilities, procedures, specific competences, and specialising human resources.

At national level the situation varies from one country to another, as far as professional initiatives are, backed by an adequate legislative frame work, validated scientific and professional norms, unitary practices of the professional community. E.g. in France the group of experts „Conseil national du livre et le livre numérique » and „Perennisation de l'Information numérique" prepared norms, recommendations for the digitisation and preservation of digital patrimony. In Great Britain there is a consortium and the group of experts Digital Curation Centre, and in Germany the Network Expertise in long-term STORage - NESTOR.

At European level the European Commission issued two recommendations *Commission recommendation on the digitisation and online accessibility of cultural material and digital preservation (2006/585/EC); Council Conclusions on Digitisation and Online Accessibility of Cultural Material, and Digital Preservation (2006/C 297/01)* encouraging Member States to

develop national strategies of digitisation for the preservation, conservation of digital patrimony. Among the related European projects we mention PLANETS, Digital Preservation Europe.

At international level concerns relate to the development of standards, unitary norms of work; finding concrete solutions for the preservation of digital content. In 2003 UNESCO issued the *Charter for long term preservation of digital heritage*. It was followed by the *International Internet Preservation Consortium* aiming at the development of technologies, information programmes, standards that would preserve and allow access to Internet information for future generations. *Unified Digital Format Registry* created in 2009 is a referential register of utilised digital formats.

Conclusions

The issue of preservation, conservation and archiving of the digital patrimony is extremely complex due to the specific characteristics of digital documents; to the extraordinary dynamics of hard and soft technologies involved; the impossibility to generalise unitary norms and standards of work; an incomplete and imprecise legal framework; an insufficient level of related scientific and professional research. However, there are some trends at international level, namely:

- Producers, providers, legal owners have the initial responsibility of archiving electronic documents and ensure their preservation. They might transfer this responsibility (by clearly drawn agreements) to archiving systems that take over – in full or in part – the responsibility of archiving. Libraries, archives may take over responsibilities. Economic advantages for both parties and additional structures of the type of archives, libraries, museums may also ensure access and utilisation of the information.

- National libraries assess technical and juridical issues related to the collection and conservation in network of the publications. They are obliged to fulfil their mission of ensuring the country's cultural and historical heritage (by collecting, preserving and conserving the entire cultural and scientific production).

- Communities of intellectual content producers (such as researchers) and various institutions (producing technical, economical etc. archives) wish to organise their archives (on long-term) through their own means or through independent cooperative organisations (access to archives).

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SIPTEH project: integrated system of technical digital content

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Abstract

Abstract: The paper provides a summary of the experiences concerning the SIPTEH project, launched in the summer of 2008 and having as major interests creation of an institutional repository at „Dunarea de Jos" University of Galati (local level) and of an integrated system of technical digital content at partnership level.
The key issues reported by users were considered as it follows: generating and gathering of relevant information, optimum pre-indexing and indexing, construction of a multilingual thesaurus, the achievement of self-guided information storing systems, fast processing – following the principle of parallel processing of the information gathered from these self-guided systems and especially the centralized storing of information in order to be retrieved rapidly by the users, using friendly user interfaces during the whole processing.
The paper sets out the stage of the project till present outlining the activities that have been developed to contribute to digital content creation: intellectual property issues; materials selecting and digitizing; open access and open source; digital libraries and institutional repositories; digital libraries integrated systems; mathematical models, etc.
As the first initiative of an integrated information processing system at national level, this project is intended to demonstrate that information can be processed not only by the consortium members involved, but also by an enlarged community.

Keywords: national digitization project; institutional repository; integrated digital content system.

1. Introduction

The rapid changes in information environment involve dedicated efforts to optimize processing, storage, and easy retrieval solutions in order to deal with the huge amount of information long term accessible „reliably and consistently" [8].

In February 2008, the team of Dunarea de Jos University of Galati suggested a solution for extrapolating the globalization trend of free access to information to the fundamental level of processing and storing information by setting up an integrated system for pre-indexing, indexing, storage and retrieving of information in a central deposit [9].

The project SIPTEH (Shared Integrated System for Processing of Technical Content) was approved and funded by the National Centre of Project Management (CNMP - Centrul Național de Management al Proiectelor) in the summer of 2008, integrated in the National Plan for Research-Development and Innovation II (PNCDI2 – Planul Național de Cercetare-Dezvoltare şi Inovare) 2007-2013, 4th Programme – Partnerships in major fields, 1st Research Direction – Information technology and communications. The project is to be carried out in the next three years, with July 2011 as deadline, and comprises a partnership between Dunarea de Jos

University of Galati (coordinator), Transilvania University of Brasov, Politehnica University of Bucharest and Lucian Blaga University of Sibiu (partners).

2. The model suggested

The users reported some requirements for the project of Dunarea de Jos University of Galati, as follows:

- to generate and gather relevant information;
- to optimize pre-indexing and indexing;
- to construct a multilingual thesaurus;
- to achieve self-guided information storage systems;
- fast processing, based on the principle of parallel processing of information gathered by the self-guided systems and especially for the centralized deposit of information, in order to be retrieved rapidly;
- friendly user interface.

Thus, the team recommended the use of a pre-indexing, indexing, storage and digital information retrieving system as in the figure below:

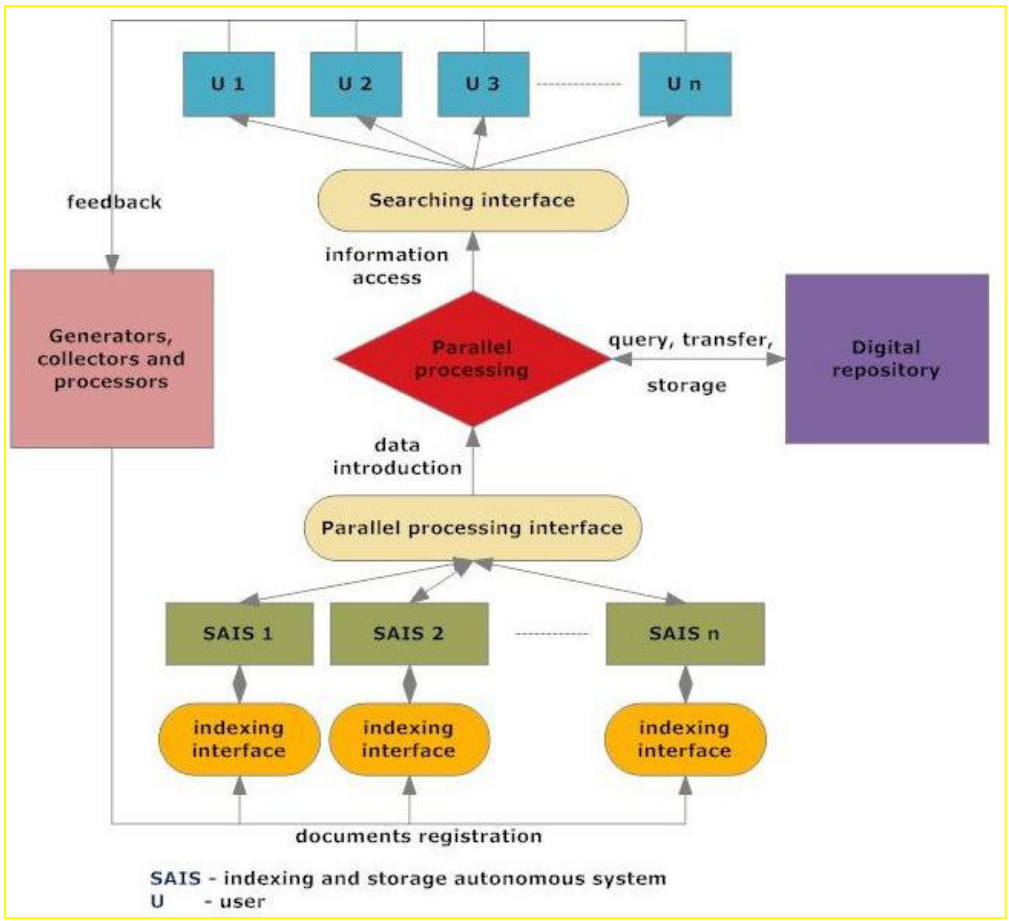

Fig.1. On-line indexing and sharing integrated system of digital documents [9]

3. The project team

The project consortium involves experienced academics in:

- project management;
- research – development – design and consultancy;

- automation equipments and information technology (IT).

The team has successfully developed many projects and research grants in IT (both theoretically and applicatively); European projects carried out through the 5th and 6th Framework Programmes (8 projects) in the field of IT and other fields (chemistry, metallurgy, biochemistry, energetics, machine building, shipbuilding, food industry, environment, economics and human sciences etc.). The results of these projects can be found in published books, articles, or patents.

The management of the project is to be made according to the model illustrated in figure 2.

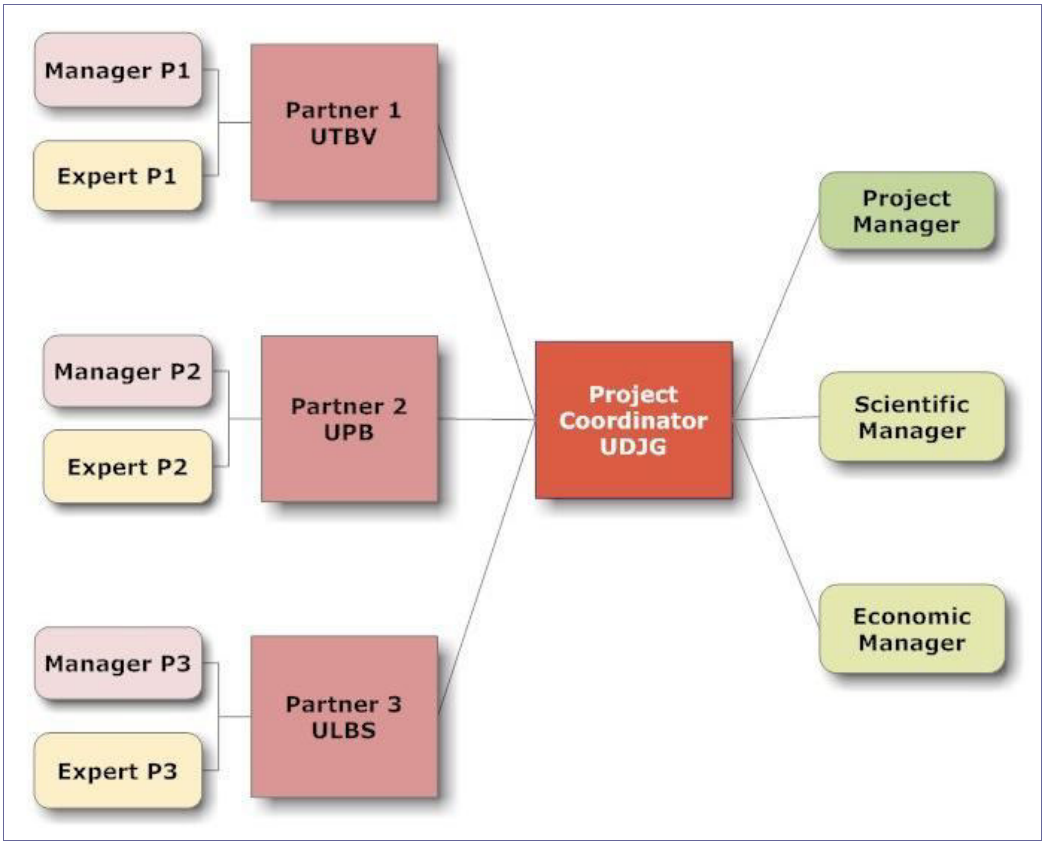

Fig.2. SIPTEH Project Management [9]

4. The stages developed

Till now, the team of Dunarea de Jos University of Galati has completed the following stages of the project:

1. Critical and comparative study about pre-indexing, indexing, storage and searching of digitezed documents systems - First stage, first part of 2009;
2. Technical solution for the integrated system - Second stage, second part of 2009;
3. Modelling and simulation of the information processing structures - Third stage, 2010.

4.1. The first stage of the SIPTEH Project

The team of Galati has performed a depth analysis at national and international level considering:

- defining open access and open sources;
- the legal framework for implementing digital repositories;
- policies and strategies on acquiring digital content;
- indexing information and software methodologies involved for doing it;
- information storing and software methodologies involved for doing it;

- ❖ comparative analysis of the solutions identified;
- ❖ defining appropriate paths for implementing the solution suggested in the project.

Legal aspects on intellectual property in the EU, USA, Netherlands, United Kingdom and IFLA position „on copyright in the electronic environment" [9] were analysed.

The Romanian National Library issued guidelines on digitization process. The document states the legal framework of digitization in Romania, listing all the laws reffering to it [2]:

- Law no. 8/1996 on Copyright and related rights;
- Law no. 135/2007 on Archiving of electronic documents;
- Law no. 182/2000 on Protection of the national cultural heritage;
- Law no 186/2003 on Sustainability and promotion of written works;
- Library Law no 334/2002, republished.

Another important issue analyzed at this stage was the digitization policy, in other words which are the criteria for documents digitization. Digital libraries in the world experienced in the field (Glasgow, California, Cornell University) were studied. A digitization approach on The National Digital Forum from New Zealand provides hints to the priorities and selection criteria in digitization process. The criteria that should be taken into account before starting digitization process are [5]:

- ✓ copyright policy;
- ✓ supply and demand of relevant information and the quality of digitizing process;
- ✓ resources (human, technical and financial);
- ✓ partnerships;
- ✓ new technologies, tools and services in retrieving information;
- ✓ preservation policy.

Before digitization process starts three plans need to be developed [3]:

1. the digitization plan (why, what, how to digitize);
2. the implementation plan (how and where to: make, store, retrieve and use data);
3. the preservation plan (hardware generations, software obsolescence and human abilities).

Next subject studied was indexing information and software methodologies involved to do it. The attention was focused on some particular integrated library systems such as: Evergreen, Koha or PMB as open sources and Aleph, Vubis Smart as non-open sources. A comparison study between them was made. As a conclusion, the recommended solution for project implementation to choose an existing open source integrated library system and to customize it according to project needs.

Another important issue studied at this stage of the project was the information storage and retrieving and the software involved to do it. The institutional repository was the key for this activity. It was important to define concepts such as: digital library, institutional repository, open access, open archive initiatives or metadata harvesting. For a rigurous comparison connected to storage and retrieving information software, the features and functionalities of the most known open source software were studied: Fedora, Eprints and DSpace.

Certain conclusions arise at this stage:

- a unique vision for obtaining an integrated digital system and a powerful cohesion in achieving the system is necessary;

- the criteria for implementing the software solution must be based on clarity, efficiency, interoperability and flexibility;
- the software solution has to be a knowledge organization system with a coherent structure and large addressability.

4.2. The second stage of the SIPTEH Project

At this stage the issues analysed were:

- ❖ the requirements for an institutional repository as a library service;
- ❖ institutional repositories and open source software - a comparative analysis focused on: architectures, metadata and functions; choosing the optimum solutions;
- ❖ integrated systems for digital information processing (integrated digital libraries systems) – a comparative analysis focused on: data organization, users, system functionality, architecture and services provided.

The team of Dunarea de Jos University of Galati sets up two questionnaires on the institutional repository service and on users requirements [1].

Certain institutional repositories and open source softwares were analysed, taking into account: the item, collections, metadata, storage of digital content, searching and browsing, objects management, user interfaces, access control, interoperability, etc. The open source softwares analysed were: DSpace, EPrints, Fedora and Greenstone. The conclusion is that the requirements were different from an organisation to another, depending on: the number of collections, the type of objects, the document type, frequency updating, type of access to content.

Four integrated digital library systems, developed by DELOS partner institutions, were also examined: OpenDLib, OSIRIS/ISIS, NSDL and Daffodil. The analysis of these integrated digital library systems has focused on data organization, users, functionality and services architecture. As conclusions, the indexing algorithm for the integrated system to be implemented within the consortium has to:

- ✓ have a minimum of subroutines to provide a rapid response to searching;
- ✓ be flexible in order to satisfy a number users;
- ✓ provide a multipartition functionality to the repository;
- ✓ be easy implementable into the systems of the consortium partners;
- ✓ be continously developed and adapted when new partners are added.

As a general conclusion for this stage, a biomimetic architectural solution for the integrated system is suggested.

The architecture of the integrated system based on the constructal principle is shown in figure 3. The consortium partners need to be highly committed to the development of the proposed SIPTEH integrated system. Thus, they will participate with their own equipment (workstations, access servers) and repository spaces to allow a good interconnection within the consortium. The coordinator server will enable access to the shared data provided by the consortium partners. The routes indicates the interaction between the partners and the coordinator, and between the consortium members and the central repository, implemented at the coordinator [4].

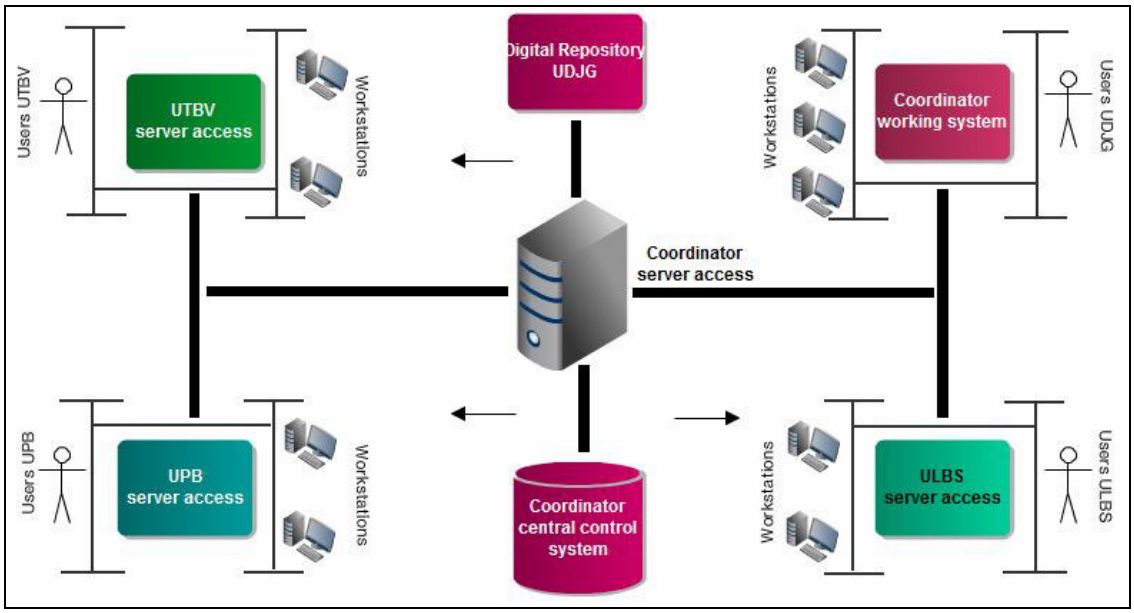

Fig.3. Architecture of the integrated system proposed [4]

4.3. The third stage of the SIPTEH Project

At this stage, the activities were:

- the workflows corresponding to harvesting, digitizing, indexing, storing and retrieving information in the institutional repository;
- modelling and simulation of the autonomous partners systems of digital information processing;
- modelling and simulation of the integrated system of digital information processing;
- specific software design of information processing in the integrated system.

The key of this stage of the project is the software designed to manage the integrated system of information processing as an open system. Thus, SIPTEH is to become a networked system, with open architecture and services that „can act both as an information provider and as an information consumer" [7].

The software designed to manage the integrated system created in ECLIPSE framework allows:

- storage and dissemination of digital content;
- harvesting content published by OAI-PMH compliant archives;
- indexing and browsing content, according to the metadata formats;
- distributed hierarchical administration of the system.

Transilvania University of Brasov has already implemented DSpace as an open source repository software. Since DSpace proved to be an adequate solution for Dunarea de Jos University of Galati too, it was agreed upon downloading DSpace for the institutional repository to be created. The institutional repository created, ARTHRA is intended to provide better access to academic information and to facilitate scholarly communication [8]. The main activities (authentication, submission, communication, data processing), the key actors (e-persons, repository administrator, librarians and users) and their responsabilities in the framework of a sustainable development of the institutional repository are shown in figure 4.

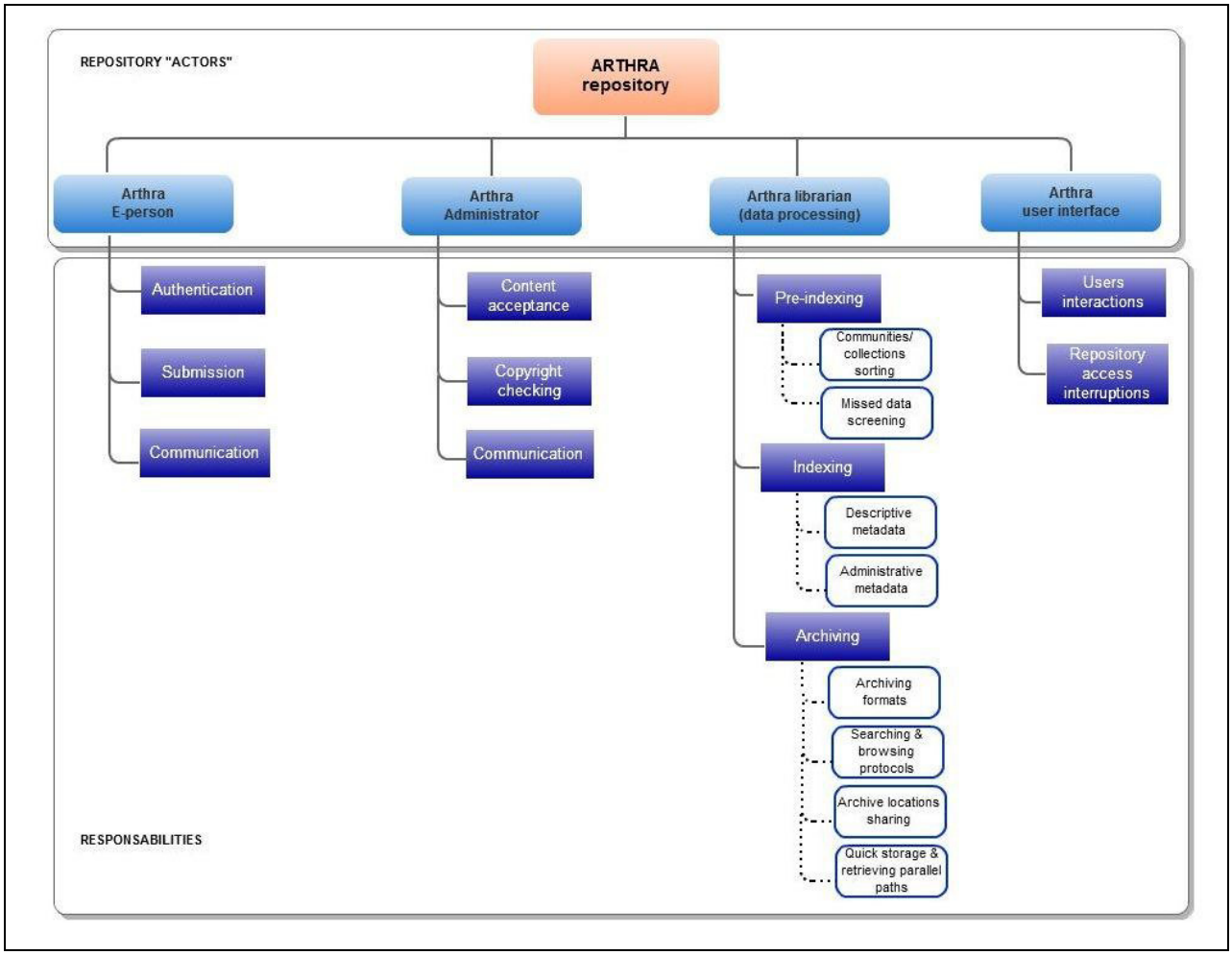

Fig.4. The workflow in the ARTHRA repository

The services provided to the community in order to disseminate digital materials stored in an institutional repository are shown in figure 5. The depositing of the material for inclusion in the repository can be mediated between author and librarian, the content access can be restricted for a period of time and the usage of items can be measured. The services illustrated were designed considering the idea "the easier it is for academics or departments to add content, the more likely they are to do so"(Barton, 2004) [6].

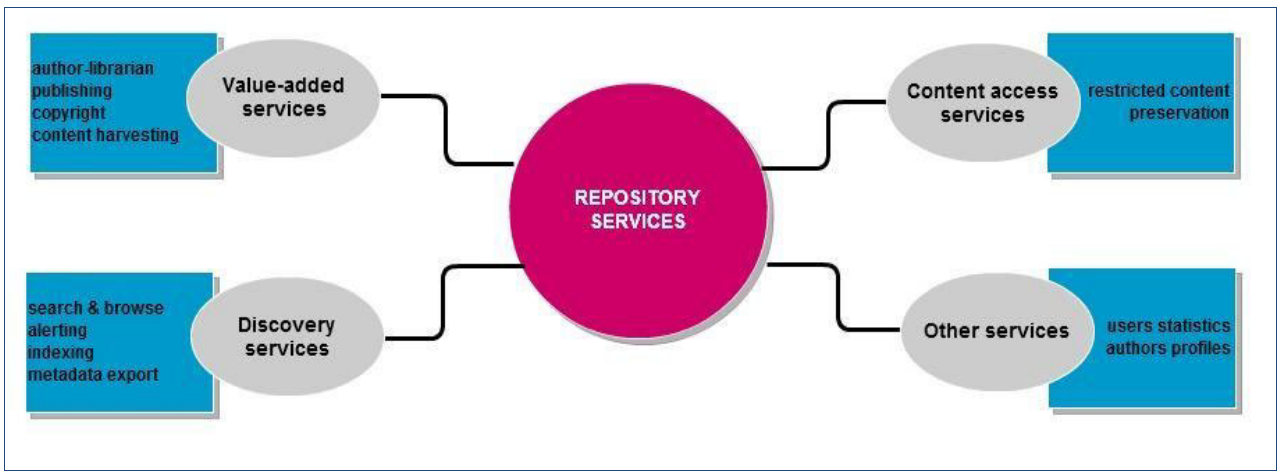

Fig.5. Services of an institutional repository

5. Conclusions

The conclusions are:

- ✓ the project is a step in library digitization in Romania;
- ✓ the project makes possible participation to European conferences and workshops on digitization, as part of Romania's integration in the European Union;
- ✓ the project is to take advantage of the scientific and managerial ability of the team;
- ✓ the solutions agreed upon of this project will be found in published books, conference papers and workshop presentations, good opportunities for the team [9];
- ✓ open access is a brand new concept in Romania and the potential users are eager to access the most recent scientific and research information.

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NEW VALUES OF UNIVERSITY LIBRARY IN THE DIGITAL AGE

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Librarian Gabriela VASILE

ABSTRACT: Today we assist at a transition from the traditional library to a digital library. There have been numerous changes in the way that libraries organize information and how users seek, gain access to, and obtain library materials. These changes have modified many traditional library services, introduced new terms, and created new library uses. In the Information Age, is needed a digital library because the emergence of digital technology and computer networks has provided a means whereby information can be stored, retrieved, disseminated and duplicated in a fast and efficient manner.
Starting from these aspects the paper focuses on evolving of digital library and development of information technology, on the purpose, challenge and new redesigning of library and librarian in the digital library environment.

KEYWORDS: digital library, information age, information resources, access, storage, digitisation

1. INTRODUCTION

In the digital world, libraries are becoming more involved in the creation and dissemination of knowledge. The shift from traditional libraries to the digital library is not merely a technological evolution, but requires a change in the paradigm by which people access and interact with information. While traditional libraries measure their size by number of books, periodicals and other items held, the relevant statistic for a digital library is the size of the corpus its users may access. No longer a space for storage, and loaning books, periodicals and other issues, the modern libraries are organizations that provide the resources, including the specialized staff, to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of, and ensure the persistence over time of collections of digital works so that they are readily and economically available for use by a defined community .Now the library is a information and learning centre, provid open and free access to information and are involved at all stages, and in all contexts,of knowledge creation, dissemination. The library's primary task is to select, maintain, and provide access to relevant and representative information resources. Due to technological developments, libraries are, in the main, moving from holdings ('just in case') to access ('just in time') strategies (1)

2. UNIVERSITY LIBRARY IN TRANSITION

Libraries are central organs in a university and play significant roles in achieving the due objectives of higher education (Haider, 2004).
The evolving of information and knowledge, the advances in technology and in electronic information environment led to a climate of transition and change in university libraries . The vision

and mission of academic libraries are changing. The Library's mission is to provide comprehensive resources and services in support of the research, teaching, and learning needs of the university. From the “book warehouses” the library become now innovative, user-centered library using technological advances to accomplish its goals.(2). Libraries are progressing well in automating housekeeping operations, refining old services and starting fresh ones. There is also an increasing presence of electronic information sources, external and internal, and services based upon them. Libraries have progressively adopted library automation software, data bases, Web access to electronic journals and e-books, to digital library. Also, the libraries have adopted new forms of co-operation such as consortia (as an upper stage of co-operation opposite the ILL) for share the information, the access to new information resources.

An important component of transition process is represented by librarian..

The profession of librarianship is facing a future of change due to the explosion of information (Information Age) and to developments in information technology .

How to make information available? How to make information systems easy to use? These are challenges for information professionals. "Librarians play an important role in the education process by making people aware of a need and motivating the use of information, a new knowledge and a new ability. " [3]

The librarian must redefine the profession, must demonstrates the ability to embrace change; now is the time for librarian to acquires new knowledge, new abilities and skills and to become information manager, information adviser/instructor, system&networking. Competency in information literacy (IL) is an important aspect in information education.

Library professional staff have a greater role than they did in the past in university teaching, research, and information policy. Their collaboration with faculty helps to improve teaching and learning and adds value to the information search process for students.

2.1. LIBRARY STRATEGY

The world of information is changing rapidly. The library environment has changed in the past decades by the technological development. In light of the impact of technology, the library must develop a digital research information infrastructure. This infrastructure, including content, hardware and applications, is needed to support the research process within a digital environment. . The information resources became more accessible and more interesting to use in an online environment.

The main priority areas in which the potential of digital technologies is to be exploited to widen access to information are:

- online accessibility;
- the digitisation of collections;
- the preservation and storage of digital content.

In such context, the library is identified not only with the collections but also with the wide and free access they gave to users. So the library must continue to play a central role in providing open and free access to information and ideas.

As a natural evolution the libraries adopt distributed models for information access and management, and more often use open and collaborative models for developing library content and services. With the incorporation of distributed technologies and more open models, the library has the potential to become more involved at all stages, and in all contexts, of knowledge creation,

dissemination, and use. Rather than being defined by its collections or the services that support them, the library can become a diffuse agent within the university community. [4]
In other words the library becomes more deeply engaged in the fundamental mission of the academic institution - the creation and dissemination of knowledge .
This implies:

- to provide essential support to academic activities with efficiency and effectiveness
- to manage and develope the resources and to make them available to users within the university

The library's role in digital age is to to manage acces to information as well as managing the information itself, rather than collecting; also, the library must.actively promote their services and resources to their community thus demonstrating how their activities add values to the mission of the institution.[5]

2.2 FUNDAMENTALS CHANGES IN UNIVERSITY LIBRARY

Libraries in the digital age expanded beyond the walls to become an growing part of the virtual world. The changes affected all areas: space, staffing, services, collections, budgets, and work environment. With all the changes libraries have remained true to their misson to collect, organize, preserve, and distribute information, and to advise users on how best to make use of it.
Since several decades ago, the libraries started to build and develop online catalog, web site, to provide access to Internet, to electronic journals and data bases, to digitized their collection, to created repositories. All this in order to provide access to information resources in all their forms, creating more digital assets, and ensuring their preservation.
From this point of view we can say the traditional and digital academic libraries will coexist, and both will continue to grow rapidly. In fact, when using the tools found in the digital library, it will be difficult to ignore the traditional library, because so many of the records found in the digital library refer to traditional paper sources. [6]
The traditional role of library has always been as an intermediary between the information producer and the user. The digital age has changed the focus of library collection: now, the access, not holdings, is the key for libraries. The digital age provides us with information, which has three facets:

- the abundance of information (www, internal and external databases, digital images, audio files, a.o.)
- the currency of information (the period of time when an information is available)
- and the accessibility of information

Digital age is par excellence about online acces, storage and transmission of information.
One main challenge facing university libraries in the online environment is to
exploit all forms of digital and telecommunication technology and find new ways and
means to provide feasible forms of collections, services and access to library materials.
This challenges made the library services to reengineering. We talk now about :

- digital reference services
- online document delivery
- digital records management
- digital rights management
- digital preservation and open access archives (digital repository)

3. FUNCTIONS OF UNIVERSITY LIBRARY IN THE DIGITAL AGE

Libraries have always served as access points for information.The university library makes efforts to keep his place as major sources of informations and support of learning in the face of development of digital technology. Digital technology has revolutionized not only the way information is packaged, processed, stored, and disseminated, but also how users seek and access information

Universities libraries no longer restrict to print services such as collection development, cataloguing and classification, circulation and reference services, current awareness, selective dissemination, and other bibliographic services, but have extended their efforts to interdisciplinary concepts, and computer software and hardware and telecommunication engineering and technology. [7]

They developed new capabilities, such as:

- capture or creation of content
- indexing and cataloging (metadata)
- storage
- search and query
- asset and property rights protection
- retrieval and distribution

Considering these issues we can certainly conclude "numerous creative and useful services have evolved within academic libraries in the digital age: providing quality learning spaces, creating metadata, offering virtual reference services, teaching information literacy, choosing resources and managing resource licenses, collecting and digitizing archival materials, and maintaining digital repositories"[8].

3.1. THE ATTRIBUTES OF DIGITAL LIBRARY

A digital library is an organized collection of digitized material or it's holding in the digital form, which can be accessible by a computer on the network by using TCP/IP or other protocol. The computer technology has become part and parcel in every operation of library. The Internet and World Wide Web provide the impetus and technological environment for the development and operation of a digital library.

The Digital Library manages a collection of information with associated services where the information is stored in digital format and accessible over a network.

This suppose [9]:

- Organized collection of multimedia and other types of resources.
- Resources are available in computer processable form.
- The function of acquisition, storage, preservation, retrieval is carried out through the use of digital technology.
- Access to the entire collection is globally available directly or indirectly across a network.
- Support users in dealing with information objects

The resources of a digital library include both print and electronic or digital material. The online resources could be local databases, e-books, v-books, e-journals, audio, video, multimedia; the off line resources could be cd-rom, jukebox.

While the traditional libraries are limited by storage space; digital libraries have the potential to store much more information, simply because digital information requires very little physical space to contain it. As such, the cost of maintaining a digital library is much lower than that of a traditional library.

The main advantages of digital library relates to:

- No physical boundary
- Round the clock availability
- Multiple accesses:
- Structured approach:
- Information retrieval:.
- Preservation and conservation:
- Space:

According with definition of Donald Waters (1998), "digital libraries are organizations that provide the resources, including the specialized staff, to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of, and ensure the persistence over time of collections of digital works so that they are readily and economically available for use by a defined community or set of communities"[10] we can enounce the main caracterstiques of a digital library:

- digital libraries are the digital face of traditional libraries that include both digital collections and traditional, fixed media collections. So they encompass both electronic and paper materials.
- digital libraries will also include digital materials that exist outside the physical and administrative bounds of any one digital library
- digital libraries will include all the processes and services that are the backbone and nervous system of libraries. However, such traditional processes, though forming the basis digital library work, will have to be revised and enhanced to accommodate the differences between new digital media and traditional fixed media.
- digital libraries ideally provide a coherent view of all of the information contained within a library, no matter its form or format
- digital libraries will serve particular communities or constituencies, as traditional libraries do now, though those communities may be widely dispersed throughout the network.
- digital libraries will require both the skills of librarians and well as those of computer scientists to be viable.

4. CONCLUSIONS

The explosive growth in networked connectivity and rapid advances in computing power are replacing the older notion of information with newer notions of interconnected digital libraries.

Digital libraries have evolved, and developments in information technology have changed the concept of the library from one of print and paper media. The success of a digital library depends upon the computers, communication skills, and knowledge of library professionals in connection with modern technology.

Today we stand at a transition from the traditional library to a global digital library. The idea is to provide universal access to digital content available only in a digital library environment. In the

Information Age, we require a digital library because the emergence of digital technology and computer networks has provided a means whereby information can be stored, retrieved, disseminated and duplicated in a fast and efficient manner. On a global level, digital libraries (DLs) have made considerable advances both in technology and its application..

Digital libraries are managed collections of digital objects, created or acquired according to the principles of collection development, in which information is stored and distributed in digital form with the associated value-added services necessary to allow users to retrieve and exploit the resources just as in a traditional library. The e-documents in a digital library are accessible readily with a multitude of user-friendly attributes, and proper methodology ensures the persistence of such documents over time.[11]

In the digital age academic libraries are considered the centres of academic institutions which support teaching, research, and other academic programmes in various ways.

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Tools for the digital library

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Abstract: It is beyond my capacity to give a genuine definition for a digital library solution, and therefore, I shall restrict myself to identifying some of its major characteristics. Although this might be easier a task than defining a digital library itself, it remains a difficult and subjective task. Without the intention of being complete and concentrating on those topics that are relevant within the context of the "Tools for the digital library" discussion, the following elements can be indicators: access to different data types, access to local and remote information, access from local and remote sites, access from different platforms, access from different user-interfaces, access to all the information through a same interface, access-control and accounting and interconnecting formal library information.

Keywords: digital library, traditional library, information, internet, user

The first and second reorientation in library automation

The title of this Conference, "Information science and information literacy" brings to my mind a library Seminar that was held in Belgium. An English translation of the topic of that meeting might be "From automated housekeeping of archives and libraries to automated information". [1]

That Seminar addressed a remarkable first reorientation in library automation, where concentration shifted from automating in-house library procedures (cataloguing, loan, acquisitions, serial control) that support the delivery of traditional print-based information to end-users, to automating the information and information delivery procedures. It is a shift from empowering the library towards empowering the end-user. This shift originated from a technology-based impulse, in which the sudden availability of secondary information on CD-ROM and the increasing use of Local Area Networks were the main catalysts. Suddenly, technology enabled libraries to offer more than catalogue information to their end-user community and as such, an ever increasing amount of libraries have chosen for that new path. However, I feel there has only been a slow shift, given the observation that the basic technologies have been made available between the late nineties, and that numerous libraries are still waiting to undertake concrete actions. An important cause for this is probably the underestimation of the immense importance of secondary sources in an academic environment.

This seminar deals with a second reorientation in library automation, and the topic of the meeting perfectly summarises what it is about, for those who understand. In the light of the above, it

suggests that the digital library is more than the sum of electronic networked databases. In order to explain the exact difference, it is inspiring to us a metaphor taken from the work of Marvin Minsky [2]. In "The society of mind", Minsky reveals his ideas on the functioning of the human brain. He explains the notion of an agent, the smallest operational entity in the human brain, only capable of a very simple, specific task. The interaction between some agents that form a group can result in handling a more complex task, and the cooperation between groups of agents, in yet more complex tasks. Finally, using the right interactions between agents and groups of agents, intelligence emerges.

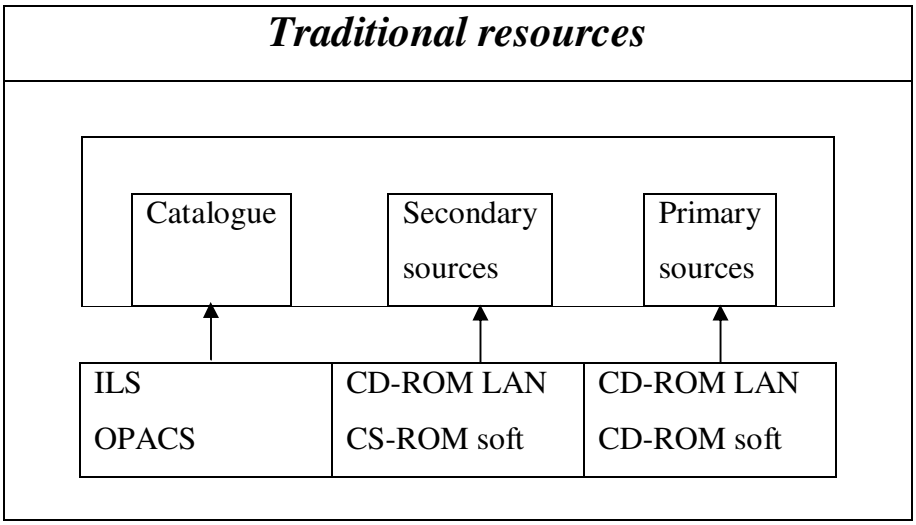

Fig. 1: first shift solutions

The information environment that resulted from the first reorientation is characterised by information made accessible on a network, searchable via different kinds of monolithic software. The fact that there is no interaction between the software results - for the end-user - in the lack of integration between information, that is or can be related. The second reorientation, towards a digital library solution, is - amongst others - about creating an easy-to-use entry point to the information environment. Referring to Minksy, it means building intelligent solutions, by creating interactions between information entities, and by doing so, making the sum of the pieces much more than the individual parts used. A digital library is more than a browsable list of searchable items, it is an intelligent interlinked information solution. Again, this second shift is technology driven, with open client-server technologies, inter-application tools, the www and the increasing availability of primary electronic information as the most important catalysts.

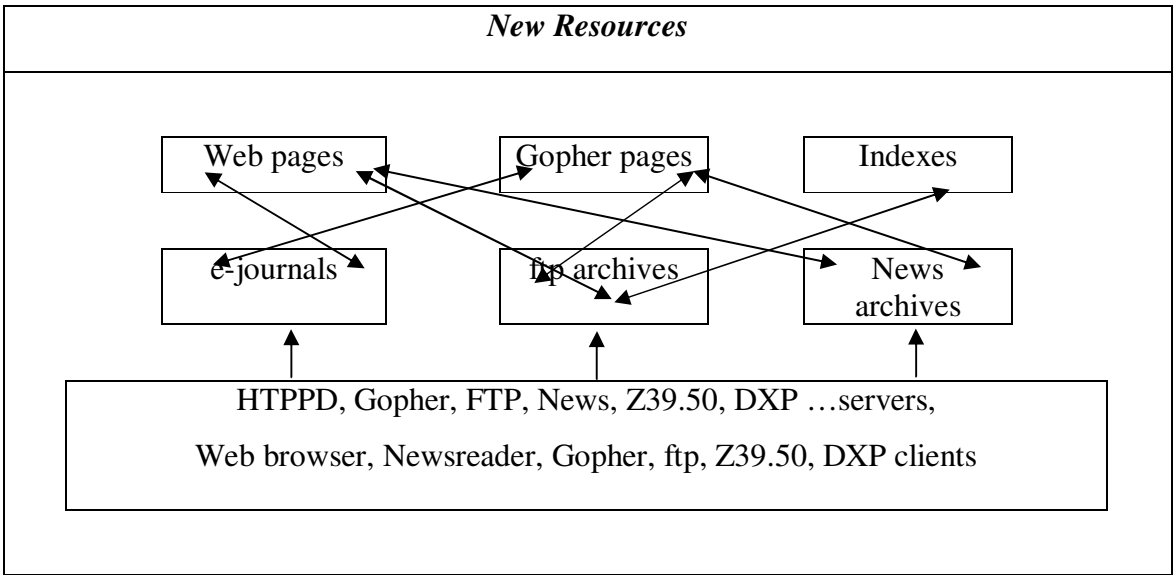

Fig. 2: the interlinked informal information environment

It might very well be that this shift is going to be much faster, and probably some libraries that have been slow in reacting to the first shift, will move immediately into the second one. There are very good reasons for doing so. According to various sources [3], the future of libraries depends on the success new digital library services will be realised with. This means that - in order to survive - the implementation of certain electronic services is no longer optional, no more to be discussed. If these will not be delivered by their "own" library, researchers - no longer limited by geographical boundaries - will address themselves to other libraries, making the *raison-d'etre* of the "own" library less and less relevant. Libraries, in this context, must also be interpreted as new solutions originating from innovative companies, competing with services developed by traditional libraries. Traditional libraries must be pro-active in this domain, because they represent some important values that might be endangered in a mere commercial environment: the democratic provision of information, the archiving of information, the integrity of information.

The digital library

It is beyond my capacity to give a genuine definition of a digital library solution, and therefore, I shall restrict myself to identifying some of its major characteristics. Although this might be easier a task than defining a digital library itself, it remains a difficult and subjective task. Without the intention of being complete and concentrating on those topics that are relevant within the context of the "Tools for the digital library" discussion, the following elements can be indicators [4]:

a. access to different data types:

Digital libraries should provide access to formal secondary, catalogue and primary sources.

The implementation of secondary sources is no longer optional, since they become mission-critical tools to point to primary information. Digital libraries should very much take into account the fact that non-formal (Internet-based) sources have become an essential part of the information environment over the years.

b. access to local and remote information:

Digital libraries should provide networked services, and the sources accessible through these services will be both intranet - and Internet - based. The digital library has no geographical boundaries as to the scope of the information it makes accessible, as long as the information is available on the same global network.

c. access from local and remote sites:

In a traditional model the user goes to the library. The digital library reaches out to the user. The user accesses the library through the network, wherever he is: at the research desk, at home, at a conference... The user of a digital library is no longer restricted by geographical boundaries, since he is wired to the global network.

d. access from different platforms:

Since the digital library delivers services to a dispersed user community, it can no longer dictate the end-user hardware as it did in a traditional environment, by installing the libraries' brand of public access workstations. The digital library user chooses a computer platform that fits his overall needs, not only his library-related needs. Therefore access to a digital library should be possible through the most common computer platforms, and access-software is needed for all these platforms.

e. access from different user-interfaces:

The user of a digital library uses his own choice of software to wander on the information highway. Therefore, the digital library should be able to deliver its services through a variety of *de-facto* standard net-communication software. Only by doing this, formal and non-formal information become operationally integrated.

f. access to all the information through a same interface:

All information should be accessible through the same interface, or through a seamless (automatic) switching from one application to another.

g. access-control and accounting:

Actually, "access-control and accounting" is one of the major issues in a digital library environment. Since:

- users will be accessing intranet and Internet information within the same search-activity,
- the business models of different information providers that will be "visited" during searching will be different,

- one of the major *raisons-d'etre* of libraries is to deliver democratic information services,

it will be necessary to develop complex access-control and accounting mechanisms between end-users and libraries and between libraries and information services.

h. interconnecting formal library information;

The expectations of a net-traveller when using a digital library are inspired by his hyperlinked experiences in the non-formal information environment. To this user, it is not comprehensible that formal secondary sources, catalogues and primary sources, that are logically related, are not functionally hyperlinked.

The above list tries to raise some "universal" issues in a nearly abstract manner. It should be clear however that all of the above are extrapolations of elements of a subjective view, inspired by the current technical and information environment. In that view, the digital library is the combination of a collection of information (in-house and remote) and mechanisms to access that information. These mechanisms are thought of as being open-systems and TCP/IP-based. Peers visit their digital library via www-browsers (HTTP) and need not to be aware of complex behind-the-scene gateway functions between the'local technical solutions and the remote technical solutions (HTTP, Z39.50, DXP, accounting procedures...), taken care of by their library.

Horizontal and vertical solutions

The combination of (a) and (h) deserves some more of our attention. Our information environment is still far from being completely digital and therefore, solutions that only take into account the digital - vertical - solutions are not yet acceptable when seen from the traditional libraries' perspective. An acceptable digital library solution takes into account the traditional library, storing information worth a fortune. As opposed to the digital-only approach, we could refer to this concept as being horizontal. This makes the task at hand even more complex, because a lot of integrating work needs to be done.

The figure analyses the consultation chain [5] in different environments; from left to right: "the traditional library", "the digital library", "the Internet". The direction left to right indicates a shift from formal to non-formal information, as well as from atoms to bits [6]. It is obvious that the digital-only solutions will be inspired by the Internet-mechanisms, linking directly from secondary tools to primary electronic information. This is the domain of an increasing number of vapor-, paper- or operational solutions such as Blackwell Navigator, SwetNet, Elsevier Science Direct, UMI Proquest Direct, SilverPlatter's Silver Linker, ISI's Electronic Library, Ovid's Biomedical Collection. Libraries will judge these tools using a wide variety of criteria, and I tend to believe that "horizontality" will be one of these. The library-holding link is an obvious, and meanwhile popular, example [5,7,8]. A gateway to an interlibrary loan service - being a special case of document

delivery - is another example, as is the link between a catalogue system and primary document servers. Companies open to collaboration in this domain might very well prove to become more successful.

Conclusion

Given the task at hand, it is very worthwhile to contemplate on the tools for a digital library. Identifying and selecting tools, appropriate for the implementation of locally conceived library solutions, deserve our very special attention, because it will prove to be a crucial element in the survival of our libraries. Our good intentions will be obscured, at the amazing pace of technical innovation, by commercial hyping of tools making straight forward evaluation impossible.

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Digital Libraries in the Social Networks Era

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Abstract

The impact of the social networks nowadays is impossible to ignore. Sales companies turn towards them as they acknowledge the opportunities provided by the virulence with which information spreads within the communities of these networks. Facebook, at more than 600 million users is the largest one of these, to date. The use of its framework for the promotion of digital libraries constitutes an opportunity and a challenge at the same time. In this paper we propose an architecture to enable the promotion of digital libraries within the social network environment.

Keywords: Digital libraries, Social network, Facebook, Social learning, Consumer, Software Architecture

1. What is a Social network?

In [3] we have the following definition: a social network is a social structure made up of individuals (or organizations) called "nodes", which are tied (connected) by one or more specific types of interdependency, such as friendship, kinship, common interest, financial exchange, dislike, sexual relationships, or relationships of beliefs, knowledge or prestige.

Social network analysis views social relationships in terms of network theory consisting of nodes and ties (also called edges, links, or connections). Nodes are the individual actors within the networks, and ties are the relationships between the actors. The resulting graph-based structures are often very complex. There can be many kinds of ties between the nodes. Research in a number of academic fields has shown that social networks operate on many levels, from families up to the level of nations, and play a critical role in determining the way problems are solved, organizations are run, and the degree to which individuals succeed in achieving their goals [3].

In its simplest form, a social network is a map of specified ties, such as friendship, between the nodes being studied. The nodes to which an individual is thus connected are the social contacts of that individual. The network can also be used to measure social capital – the value that an individual gets from the social network. These concepts are often displayed in a social network diagram, where nodes are the points and ties are the lines.

Another definition of Social Network can be found in [2]. Social networking is the grouping of individuals into specific groups, like small rural communities or a neighborhood subdivision, if you will. Although social networking is possible in person, especially in the workplace, universities, and high schools, it is most popular online. This is because unlike most high schools, colleges, or workplaces, the internet is filled with millions of individuals who are looking to meet other people,

to gather and share first-hand information and experiences about cooking, golfing, gardening, developing friendships or professional alliances, finding employment, business-to-business marketing and even groups sharing information about the end of the Mayan calendar and the Great Shift to arrive December 21-2012. The topics and interests are as varied and rich as the story of our world.

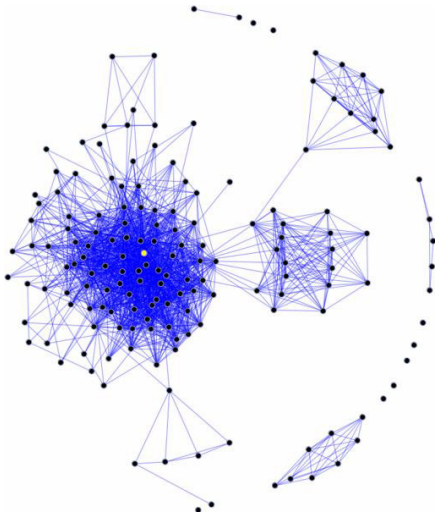

Figure 1. An example of a social network diagram

In [4] there is an interesting study on social networks in US. Social networking is one of the fastest growing subject matter areas in the US patent office. The graph below shows the rate at which these applications have been filed and rate at which patents have issued from these applications over the past few years.

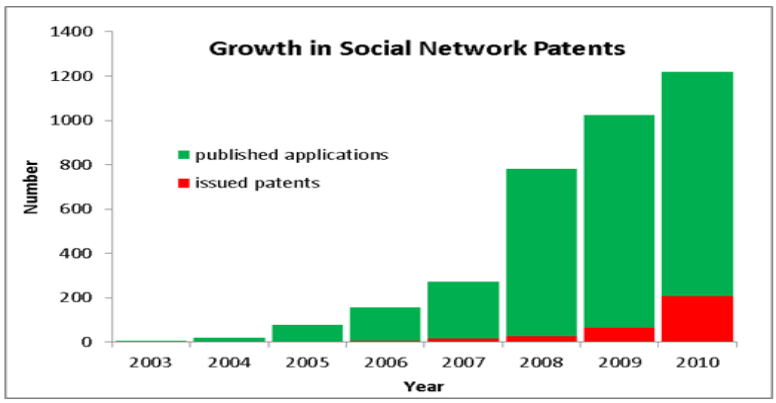

Figure 2. Growt in Social Network Patents([4])

The total number of patent applications published in a given year is shown in green. The total number of issued patents is shown in red. Social networking patents include any application or issued patent that has the phrase “social network” in it.

Facebook is a social networking service and website launched in February 2004. As of January 2011, Facebook has more than 600 million active users[12]. Users may create a personal profile, add other users as friends, and exchange messages, including automatic notifications when they update their profile. Additionally, users may join common interest user groups, organized by workplace, school or college, or other characteristics. The name of the service stems from the colloquial name for the book given to students at the start of the academic year by university administrations in the United States to help students get to know each other better. Facebook allows

anyone who declares themselves to be at least 13 years old to become a registered user of the website.

Facebook was founded by Mark Zuckerberg with his college roommates and fellow computer science students Eduardo Saverin, Dustin Moskovitz and Chris Hughes. A January 2009 Compete.com study ranked Facebook as the most used social networking service by worldwide monthly active users, followed by MySpace. Quantcast estimates Facebook has 135.1 million monthly unique U.S. visitors in October 2010.[14] According to Social Media Today, in April 2010 an estimated 41.6% of the U.S. population had a Facebook account.

2. The impact of the social networks over the customers

Some have said that “reviews are the new advertising”. Others that, “retention is the new acquisition”. Great big thoughts but sometimes you need something a little more tangible to convince Finance because, like many marketing revolutions, it's difficult at first for some to grasp the profound impact the growth in rating & reviewing is having on business. Here are 12 stats on the word-of-mouth revolution ([1], [15], [16], [17], [18], [19]).

- Traffic to the top 10 review sites grew on average 158% last year
- 97% who made a purchase based on an online review found the review to be accurate
- 92% have more confidence in info found online than they do in anything from a salesclerk or other source
- 90% of online consumers trust recommendations from people they know; 70% trust unknown users, 27% trust experts, 14% trust advertising, 8% trust celebrities
- 75% of people don't believe that companies tell the truth in advertisements
- 70% consult reviews or ratings before purchasing
- 7 in 10 who read reviews share them with friends, family & colleagues thus amplifying their impact
- 51% of consumers use the Internet even before making a purchase in shops
- 45% say they are influenced a fair amount or a great deal by reviews on social sites from people they follow (46% say reviews in newspaper or magazine influence them.)
- 34% have turned to social media to air their feelings about a company. 26% to express dissatisfaction, 23% to share companies or products they like.
- Why do they share? 46% feel they can be brutally honest on the Internet. 38% aim to influence others when they express their preferences online
- Reviews on a site can boost conversion +20% (Bazaarvoice.com/resources/stats 'Conversion Results')

3. Digital libraries

The DELOS Digital Library Reference Model [5] defines a digital library as “an organization, which might be virtual, that comprehensively collects, manages and preserves for the long term rich digital content, and offers to its user communities specialized functionality on that content, of measurable quality and according to codified policies”.

The advantages of digital libraries as a means of easily and rapidly accessing books, archives and images of various types are now widely recognized by commercial interests and public bodies alike.[11] Traditional libraries are limited by storage space; digital libraries have the potential to store much more information, simply because digital information requires very little physical space

to contain it. As such, the cost of maintaining a digital library is much lower than that of a traditional library.

A traditional library must spend large sums of money paying for staff, book maintenance, rent, and additional books. Digital libraries may reduce or, in some instances, do away with these fees. Both types of library require cataloguing input to allow users to locate and retrieve material. Digital libraries may be more willing to adopt innovations in technology providing users with improvements in electronic and audio book technology as well as presenting new forms of communication such as wikis and blogs; conventional libraries may consider that providing online access to their OPAC catalogue is sufficient. An important advantage to digital conversion is increased accessibility to users. They also increase availability to individuals who may not be traditional patrons of a library, due to geographic location or organizational affiliation.[6]

- No physical boundary. The user of a digital library need not to go to the library physically; people from all over the world can gain access to the same information, as long as an Internet connection is available.
- Round the clock availability A major advantage of digital libraries is that people can gain access 24/7 to the information.
- Multiple access. The same resources can be used simultaneously by a number of institutions and patrons. This may not be the case for copyrighted material: a library may have a license for "lending out" only one copy at a time; this is achieved with a system of digital rights management where a resource can become inaccessible after expiration of the lending period or after the lender chooses to make it inaccessible (equivalent to returning the resource).
- Information retrieval. The user is able to use any search term (word, phrase, title, name, subject) to search the entire collection. Digital libraries can provide very user-friendly interfaces, giving clickable access to its resources.
- Preservation and conservation. Digitization is not a long-term preservation solution for physical collections, but does succeed in providing access copies for materials that would otherwise fall to degradation from repeated use. Digitized collections and born-digital objects pose many preservation and conservation concerns that analog materials do not. Please see the following "Problems" section of this page for examples.
- Space. Whereas traditional libraries are limited by storage space, digital libraries have the potential to store much more information, simply because digital information requires very little physical space to contain them and media storage technologies are more affordable than ever before.
- Added value. Certain characteristics of objects, primarily the quality of images, may be improved. Digitization can enhance legibility and remove visible flaws such as stains and discoloration.
- Easily accessible.

4. Using social networks to promote digital content or eLearning tools

There are several companies building software for social eLearning. These suppliers provide software to enable collaborative learning and knowledge sharing. The focus is as much about user generated content as it is about courses. Much of the functionality is similar to that found on social networking websites. A list of some of these companies and their products can be found in [7].

Digital libraries should improve their support of social interactions, especially the building of communities around and within themselves, to integrate better with social groups and communities across boundaries. [8]

Usually, digital libraries were and are not designed or developed with social contexts in mind, and often do not support these well ([9], [10]). They should improve this support of social interactions to integrate better with, cross the boundaries of, and build the communities that use them ([11]).

Building a Facebook application to promote a digital library content or services will provide a much larger visibility and promotion.

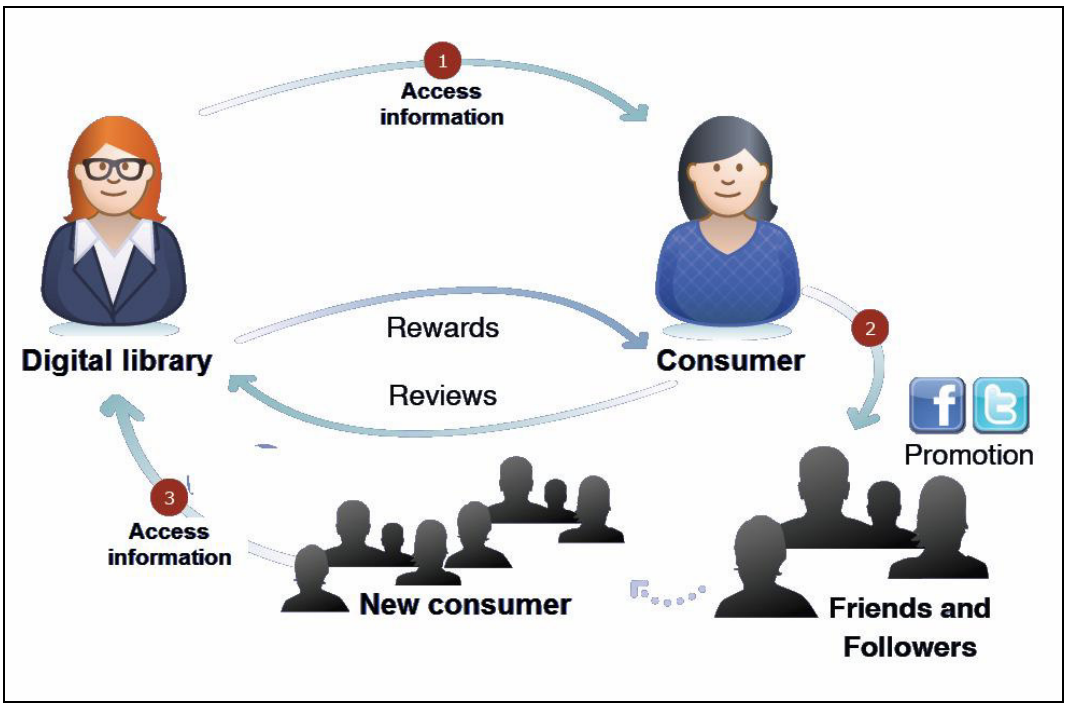

Figure 3 – The architecture of the proposed solution

There are three major steps:

1. The user of the digital library (denoted as consumer in the figure 3) access the needed information. These can be, for instance, a book, an article or some multimedia content
2. The user share with his social network friends *what* information and *where* the information can be accessed
3. Some of the friends, the one with similar interests, have now the opportunity to access the same information as the original user.

This is a win-win situation. The library will be more and more visible to the potential users. On the other side, the users will have the chance to find out about the digital conent accesed by their friends.

5. Conclusions

Commercial companies use social network for advertising and for gaining new customers. Using social networks like Facebook for promoting digital libraries represent a logical step to make. One architecture for achieving these was proposed.

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Digital Preservation –
A New Challenge for Digital Libraries and Institutional Repositories

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Abstract

The paper intends to analyze the new concept of digital preservation. After defining the term and presenting a brief history of it, the paper exposes challenges and requirements of the preservation of the digital heritage. It also debates strategies and experiences, and it draws attention on its vulnerabilities.

Keywords: digital objects, digital preservation, digital repositories

1. Introduction

Today everyone produces digital information. By information one could understand from personal photos and records to huge digital repositories. Digital preservation is fundamentally important, although preservation could be neglected in the rush to get materials digitized. Selecting what to be digitized seems to be an important contemporary issue. The challenge today is the growing digital records and it is our obligation to future generations to preserve today's digital information.
Digital documents are fragile and therefore they require careful preservation to ensure they remain accessible and can be interpretable far into the future. It must be determined the best preservation strategy for various types of digital objects. Recent developments in information technology are remarkable. Though, this represents a major impact on the longevity of digital objects. Digital objects from the past decades are already difficult to access and use, because the software they need for reading them became obsolete, and so the hardware needed to run the software. Therefore, it is imperative to develop appropriate preservation techniques, which must maintain digital objects through time, ensuring they will remain accessible for future generations of users.[1]
In order to preserve a digital object, the preservation strategy to be implemented is determined by various factors. These include the type of digital object to be preserved and if it is also needed to preserve its behavioral aspects. The main goal is that the digital object keeps its authenticity and usability through time.

2. Defining Digital Preservation

In the literature there are plenty of definitions, although the most used is that of "a set of activities aimed towards ensuring access do digital materials over time".[2] Digital preservation "combines policies, strategies and actions to ensure access in digital formats over time" [3], it "refers to the series of managed activities necessary to ensure continues access to digital materials for as long as necessary" [4], and it "is the series of actions and interventions required to ensure continued and reliable access to authentic digital objects for as long as they are deemed to be of value" [5]. Also, "digital preservation is a set of activities aimed at ensuring access to digital materials over

time" [6], it is "the mitigation of the deleterious effects of technology obsolescence, media degradation, and fading human memory" [7], and it "combines policies, strategies and actions to ensure the most accurate rendering possible of authenticated content over time, regardless of the challenges of file corruption, media failure and technological change" [8]. Digital preservation applies to content that is born digital or converted to digital form.

3. A Short History of Digital Preservation

The preservation profession developed in response the 1966 disaster, when River Arno from Florence flood a store of priceless cultural heritage objects. Practitioners and thinkers in the conservation field rallied in the salvation effort, and participated in a long reevaluation of traditional practices.

In the early 1980s they noticed hydrolysis, a chemical process that impaired the magnetic media and tape. Solutions and treatments for the magnetic media didn't totally succeed, so the data had to be copied to a new long-term carrier, and so emerge the optical storage, with a life expectancy of decades.[9]

A temporary solution was data cartridges tapes (pure iron particulate on polyester tape in cartridges). Their life was limited not in decades, but in number of passes, that is number of times the data could be accessed. Permanence was no longer in the carrier, but in the ability to migrate the data from these cartridges to the next generation of storage systems.

This became the main goal of the preservation activity. The concern was not in finding a permanent carrier, but in copying the data with maximum accuracy. Migration of the data from carrier to carrier is the solution to the problem of carrier failure. New versions of type of objects will replace the old ones, to prevent file format obsolescence, as equipment will become obsolete and, even if it will still be functional, it will certainly be slow and technically non-performing.

With the advent of computer files, a new concept came, the Universal Virtual Computer (UVC), with the advantage of extracting data so that they could be modeled on technologies that are in use at the time of access. Planned in 2002, the UVC was not embraced by the digital archiving community.

Not much later the idea of digital repositories emerged. In the repositories and digital archives, the emphasis is set on access as a measure of preservation. This led to an alliance with those concerned with content delivery, and the need to expose the data to more and more users, having the ability to feedback to the host archive. The digital repository is the center of today's digital preservation debate. It ideally holds the materials, provides access, tracks the changes, and maintains the authenticity of the object.

3. Goals of Preservation Activity

Most of the definitions define digital preservation as a set of activities. Most of the literature agrees that these activities must ensure the availability, identity, understandability, fixity, authenticity, viability, and renderability of information.[10]

3.1. Availability

Getting a digitized copy of a material can be easy or difficult, depending on the material and on the circumstances. Libraries may want to preserve digital images resulted from a scanning project, another library may want to digitize tapes, one can want to preserve the entire knowledge of a university in a digital repository. There is always something different to think about, like deposit agreements, licenses negotiated, contracts with publishers and so on.

3.2. Identity

The creation of metadata is an important preservation activity. The digital objects needs to be carefully described in order to have enough details for future access and use.

3.3. Understandability

A digital repository must ensure that the digitized data is completely and independently understandable to users. The repository must provide and preserve enough information, as metadata, documentation, related objects, to enable future users to understand that objects.

3.4. Fixity

The preserved digital objects must be protected from unauthorized changes. Computer security regimes include virus protection, firewalls, authentication, intrusion detection, security alerts. Fixity errors are commonly detected by calculating the size of the objects at different times (process called "checksums"). If the checksums are identical, the object has not been changed.

3.5. Authenticity

Authenticity means that the integrity of both the source and the content of a document can be verified. A preservation program must not compromise the authenticity of a digital object in any way. The object must not be altered in any unauthorized manner and there must be policies and procedures that ensure data integrity. All changes should be documented.

3.6. Viability

Viability means that the data could be read from the media. The common threats to viability are media deterioration and media obsolescence. Viability of digital objects can be ensured by actively managing them. Digital data can be copied without loss of quality, like analog data. So information can be copied periodically onto new media.

3.7. Renderability

Renderability means that a digital object can be displayed, played, and used as appropriate. An object can be authentic, viable and uncorrupted, but unrenderable because of the hardware or the software used to render it that is no longer available.

3. International Projects

The major source of funding digital preservation projects was the National Digital Information Infrastructure and Preservation Program (NDIIPP). In 2000, Library of Congress received 100 million USD to develop and start this program. A quarter of them were available at once, and the rest of three quarters will be available as funds for nonfederal donations.[11]

The Joint Information Steering Committee (JISC) is the primary source in funding for information technology in United Kingdom higher education. One of its objectives is to provide the long-term availability of scholarly and educational resources. Consequently, JISC supports the Digital Curation Centre (DCC), the Digital Preservation Coalition (DPC), and other UK initiatives. The DPC is an organization that ensures the digital preservation in UK. It runs the Digital Preservation Training Programme, a set of instructional modules aimed at managers and operational staff.[12] DCC supports institutions of higher education from UK in curating and preserving digital resources for scholarship and research. It works with librarians, archivists, information scientists, but also with the research community.[13]

NESTOR (Network of Expertise in Long-Term Storage of Digital Resources) is an alliance of cultural heritage institutions committed to share information about digital preservation and coordinating preservation activities in Germany. Funded by the Federal Ministry of Research and Education, it is conducted by the national library of Germany, Die Deutsche Bibliothek. NESTOR publishes studies, coordinates training, and sponsors several working groups, including one on the certification of trusted digital repositories.[14] KOPAL (Co-operative Development of a Long-Term Digital Information Archive) is a partnership between Göttingen State and University Library and IBM in order to develop an operational preservation repository. The use of the system is restricted to the two partners.[15]

The National Library of the Netherlands, the Koninklijke Bibliotheek has always a real preoccupation in digital preservation. In 1990s it conducted NEDLIB, a collaborative project of European national libraries to develop an infrastructure for a networked European deposit library. It led to e-Depot, the first digital archiving system for academic e-journals (2003). E-Depot now archives publications of Kluwer, Elsevier, Springer and many other major publishers. E-Depot uses the Digital Information and Archiving System (DAIS), a system developed by IBM for the Koninklijke Bibliotheek.[16]

DigitalPreservationEurope (DPE) is one of the three preservation programs funded by the European Commission under its Sixth Framework, along with PLANETS and CASPAR. DPE is a confederation of projects partners in eight European countries which attempts to improve coordination and collaboration across the various national preservation initiatives in Europe. Like DPC, it holds workshops and trainings and publishes articles about various aspects of digital preservation. Recently, DPE launched a program, the Research and Industrial Exchange Programme (DPEX), to improve communication between academic researchers and practitioners in industry.[17] PLANETS (Preservation and Long-Term Access through Networked Services) is a program of research and development that involves sixteen partner institutions (national libraries, national archives, research universities, technology companies) coordinated by British Library. Its goal is to build an integrated framework of services and tools for preservation planning, format characterization, and preservation actions.[18] CASPAR (Cultural, Artistic and Scientific Knowledge for Preservation, Access and Retrieval) is a project with the goal of building a preservation environment based on OAIS (Open Archive Information System) information model.[19]

At the Fifth International Conference on Preservation of Digital Objects (iPRES 2008), 29-30 September, in London, The British Library chief executive Lynne Brindley reviewed four pioneering projects for The British Library: 1) Digital Lives, a research project that focuses on personal digital collections; 2) Email Britain, a one-month snapshot from British life created from an email archive of contributors from the general public; 3) a complete web archive of the entire U.K. domain; and 4) working with an EU-funded program – Planets, Preservation and Long-term Access through Networked Services – to create digital preservation tools and services.[20]

The National Library of Australia is one of the first institutions that established a Web archive. It launched the PANDORA archive of online Australian publications in 1996. Nowadays, PANDORA contains more than 16,000 titles selected by the National Library of Australia and nine partner institutions.[21]

The Department of Education Science and Training from the Australian federal government funded the Australian Partnership for Sustainable Repositories (APSR), which provides a center of expertise to help research universities to implement institutional repositories using DSpace or Fedora. APSR sponsors a series of special projects designed to support repository management, sustainability, and interoperation. It holds trainings, informational events, and publishes papers, reports, and a regular newsletter.[22]

Australasian Digital Recordkeeping Initiative (ADRI) is a collaboration between the National Archives of Australia, Archives of New Zealand and Australia state and territory archives to ensure a common approach of digital recordkeeping and archiving. The preservation strategy of ADRI is based on converting record formats from those created by commercial software programs to more stable, open ones. The National Archives of Australia developed Xena, an open-source software application that identities the original format of a file and converts it to a preferred format. The Public Records Office Victoria, another ADRI member, developed extensive specifications using VERS electronic records strategy.[23]

The SHERPA Digital Preservation project (2005-2007) investigated the preservation of digital resources stored by institutional repositories participating in the SHERPA project. An emphasis was placed on the preservation of e-prints. The methodology used by the SHERPA DP project has similarity with other projects that were funded by JISC. The PRESERV project, managed at the University of Southampton, also investigated the development of preservation services in the institutional repository sphere. The project takes a different, but complimentary approach, considering the type of information that may be stored by an institutional repository itself that may prove useful. The Repository Bridge project also has some similarities through an investigation of the interaction between DSpace / EPrints and Fedora as a method of preserving electronic theses.[24]

Lots of Copies Keep Stuff Safe (LOCKSS) has more than forty libraries as partners, and it also has the support of more than thirty publishers. Its goal is to provide a low-cost, low-tech system of ensuring continue access to journal literature. It collects new published content using a Web crawler, it compares the content it collected with the same content on other distributed computers and repairs or reconciles any differences. Later, another project called Controlled LOCKSS (CLOCKSS), which uses the LOCKSS methodology, was developed as a backup archive intended to serve as a fail-safe repository.

Portico is another important preservation initiative which provides limited access for audit purposes and institutional access. Sponsored by The Andrew W. Mellon Foundation, Ithaka, the Library of Congress, and JSTOR, Portico intends to provide a reliable methodology for ongoing access to an institution's scholarly collection. As partners, Portico has a number of important publishers, like Elsevier, Oxford University Press, the University of Chicago Press, John Wiley and Sons, the UK Serials Group, the American Anthropological Association, the Berkeley Electronic Press and others. More than 5,000 journals are available in its collections, and nearly 200 libraries are partners, or are considering becoming ones.[25]

Brewster Kahle's Internet archive, Wayback Machine, is another effort to archive digital information, specifically Web pages. It provides the ability to browse more than 55 billion pages. The Internet Archive collaborated with the Smithsonian and Library of Congress for developing a number of important collections, including the United Kingdom Central Government Web Archive, a collection sites instrumental in the early development of the Internet, and a number of election sites. It now offers a Web Archive on Demand Service, which is a subscription-based service targeted to a range of institutions at lower costs than other archiving platforms. Called Archive It, it allows subscribers to capture, organize, and theoretically preserve digital material from the Internet as well as their own institutions and collections.[26]

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Europeana Libraries - the Aggregation of European Cultural Heritage through Data Standardisation

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Motto:
There is probably no greater ambition than to perpetuate our rich cultural heritage. It is therefore in full consciousness of our responsibility towards past and future generations and in deep humility that we have approached our mission. (Comité des Sages)

Abstract: This paper wants to launch in the professional environment of the Romanian libraries, the European scale project - the digital library, ***Europeana***.
Being the result of collaboration of professional organizations, universities and research libraries from several countries, Europeana aims at making the cultural heritage available, anywhere, anytime, online - in the virtual environment of the Internet.
Although we are only two participants from Romania: The LBUS Library together with the Romanian Academy Library, we consider it is our mission and honour, to promote and disseminate this project launched two years and a half ago. It involved enormous work, had gathered valuable experience and established processes for developing digital content aggregation ranged from multiple sources of different data standards.

Keywords: europeana libraries, digital library, metadata standards, cultural heritage.

New Renaissance Vision:

Designed as an Europe's digital library, museum and archive, the goal of Europeana is to make Europe's cultural and scientific heritage accessible to the public online.

In their report for a "*New Renaissance*", the *"Comité des Sages*"[1] claims-- to have Europe's cultural heritage online. The key conclusions and recommendations are:

"*The **Europeana** portal should become the central reference point for Europe's online cultural heritage. Member States must ensure that all material digitised with public funding is available on the site, and bring all their public domain masterpieces into Europeana by 2016. Cultural institutions, the European Commission and Member States should actively and widely promote Europeana*."

Europeana: think culture [2]

The objective is to give free access to the digital resources of Europe's museums, libraries, archives and audio-visual collections, enriching the end-user knowledge, towards the shaping of cultural thinking. Europe is 'par excellence' a rich diversity of languages, traditions and cultures. Europeana is also a multilingual space of a variety of cultural and scientific heritage, where ideas and inspirations can be found within more than 15 million items. These objects include:

- Images - paintings, drawings, maps, photos and pictures of museum objects
- Texts - books, newspapers, letters, diaries and archival papers
- Sounds - music and spoken word from cylinders, tapes, discs and radio broadcasts
- Videos - films, newsreels and TV broadcasts.

About 1500 institutions have contributed to Europeana, among the best known being the **British Library** in London, the **Rijksmuseum** in Amsterdam and the **Louvre** in Paris. Together with smaller organizations across Europe, their assembled collections allow anyone to explore Europe's history

from ancient times to the modern days. More than that, Europeana always connects you to the original source of the material, so that you can be sure of its authenticity.

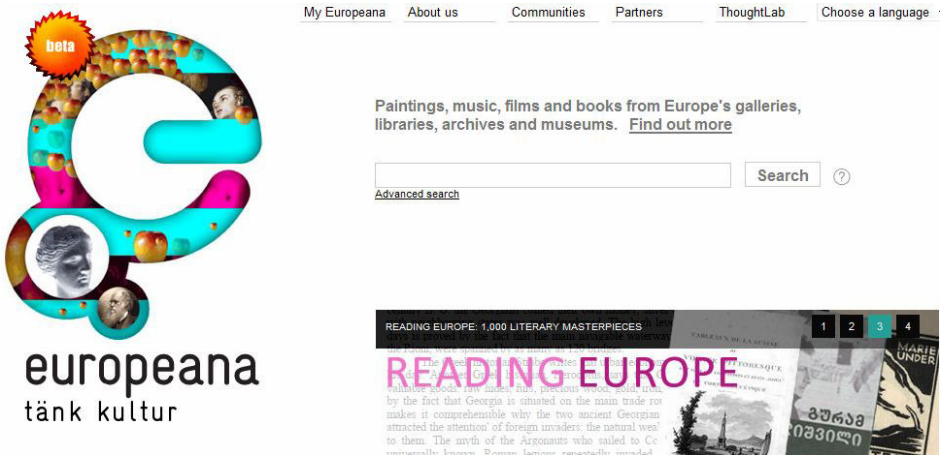


Fig.1 The first search page : www.europeana.eu

The Roots

The ***Conference of European National Librarians*** *(CENL)* is the foundation on which it was build in 2005 the ***European Library*** project (http://www.theeuropeanlibrary.org). Based on the experience of the European Library, **Europeana** (http://www.europeana.eu) had been launched in 2008 with two million objects.
The project is funded by the **European Commission** and it is hosted by the **National Library of the Netherlands**, the Koninklijke Bibliotheek.

Overseeing the project is the ***Europeana Foundation***, which proposes the following objectives:

- *to provide access to Europe's cultural and scientific heritage through the cross-domain portal*
- *to facilitate formal agreement across museums, archives, audiovisual archives and libraries on the cooperation in the delivery and sustainability of a joint portal*
- *to stimulate and facilitate initiatives that bring together existing digital content*
- *to support and facilitate digitization of Europe's cultural and scientific heritage.*

Europeana Milestones

2005 A letter to the European Commission from 6 Heads of State suggesting the creation of a European digital library.

2007 Work begins in order to create a prototype of the project.

2008 The Europeana's prototype is launched in November, 20th by Viviane Reding, the European Commissioner for Information Society and Media, and the President of the Commission, José Manuel Barroso.

2009 The Europeana's collection reaches 5 million items.

2010 A European Parliament report in February asks for more content and funding for Europeana. It is unanimously approved. In July, Europeana's collection reaches 10 million items.

2011 The "Comité des Sages" report (PDF) makes recommendations about Europeana. Here begins the new project of the Europeana Libraries.

A decentralized library managed by experts

Launched as a prototype in November 2008, Europeana has already passed the initial target for 2010 of 10 million objects and is giving now access to over 15 million digitized items from Europe's cultural and scientific heritage organizations, including resources from 48 national libraries of Europe.

"*The European digital library does not bring together content into a single database but Europeana is a single access point, linking up databases all over Europe. Users no longer need to search digital*

libraries individually to find what they are looking for. A single access point ("portal") is run by ***Europeana Foundation***." [2]

Being a complex project, its first stage (2008-2010) was dedicated to solve many problems:

- to enhance Europeana with more functions and features for users
- to include virtual exhibitions and better search capabilities.

Further support came from over 180 heritage and knowledge organizations and IT experts from all over Europe. They are still involved in solviing technical and usability issues.

The Europeana Libraries – the Current Project from 2011 to 2012

This 2-year project will bring the digital collections of some of the Europe's leading research libraries to Europeana. Funded by the European Commission's IST-PSP programme, Europeana Libraries will be ***the first cultural digitization project to investigate full-text searching of the 5 million objects*** that will be added here. The leading organizations of the project are:
- *Conference of European National Librarians (CENL),*
- *Association of European Research Libraries (LIBER)*
- *Consortium of European Research Libraries (CERL) and*
- *Europeana Foundation.*

„Together, they will establish ***the European Library*** as an effective and efficient **domain-level aggregator** of content into Europeana. The project will achieve this by building a platform capable of large-scale aggregation of national and research libraries collections extendible to other libraries in the future. By achieving interoperability between content, the project will create a successful single gateway to Europe's library resources, able to deliver these resources to Europeana." (quoted from the project) [4]

As main objectives, the Europeana Libraries project will:

1. bring togheter the digital collections of 11 countries. ***The content is of the highest quality and is also significant in terms of scale, as compared to some of the largest digital collections in Europe***, including the extensive collections from Google Books, theses and dissertations from DART-Europe and open-access journal articles via the Directory of Open Access Journals.
   An amount of over 5,160,000 pages/images/books and theses/AV clips/articles will be loaded into Europeana as an outcome of Europeana Libraries; [3]
2. ***be the first project to offer digital collections where the text will be fully searchable in Europeana***, making possible the search inside books and other materials. It's also intended to enhance full-text searching capabilities and features;
3. ***establish systems and processes capable of ingesting and indexing significant quantities of digitzed material, including text, images, moving images and sound clips***. „The outcome will be an efficient and effective library-domain aggregator service for Europeana. Once the library aggregation model has been established over the two-year life of Europeana Libraries, the service will be fully capable of extension to other libraries across Europe, including the rest of LIBER and CERL membership - over 400 libraries in over 40 countries across Europe." (quoted from the project)[3].
4. build strong and sustainable relationships and collaboration between the national and the research library communities; it will also save effort for Europeana in areas such as ***standardization and normalization of library metadata content*** and in the management of relationships with over 400 LIBER and CERL libraries across Europe, by including the work already done in the research libraries community; [6]
5. scale up the existing infrastructure **to manage the large-scale aggregation and ingestion of content into the libraries domain aggregator.** The underlying harvesting infrastructure also needs to be enhanced, both the OAI harvesting infrastructures and the alternative (non-OAI based) transfer mechanisms will be addressed;
6. **improve interoperability** by creating a single workflow for the ingestion of libraries content into the **European Library** and **Europeana**. Interoperability, between national and research libraries

data and between library and other cultural heritage data, will be improved and made more sustainable. The **European Library** will take on board ***emerging standards*** for usability and re-usability required by Europeana through its aggregators;

7. **improve the quality of metadata** taking into account the need for better search results in both the European Library portal and the Europeana service. A programme of metadata improvement and mapping will reffer to the aggregation of the existing digital cultural content to make it searchable and accessible through Europeana. This work is vitally important for the future search and the retrieving capabilities of Europeana.[7]
   Europeana Libraries proposes a programme of structural improvement to add, improve and enrich metadata to accomplish these needs.

The Europeana Libraries partners will bring content in the following thematic areas:

- National History, Culture and Area Studies
- Travel and Exploration
- European Treasures
- European History, Culture and Area Studies
- History of Science and Medicine
- Creating a Modern Digital Europe
- History of Art , History of Science and Medicine
- Literature and Letters
- European Cultural Capitals. [3]

The Aggregators' Role

Europeana works mainly with aggregators, rather than with individual institutions. Aggregators gather material from many separate organizations, standardize the file formats and metadata, and channel it into Europeana. Types of aggregators:

- National - e.g. culture.fr, which brings together materials from libraries and museums across France
- Regional - e.g. Europeana Local
- Thematic - e.g. Judaica Europeana, Musical Instrument Museum Online
- Domain - e.g.
  - Sound archives: Europeana Connect
  - Films: European Film Gateway
  - Libraries: The European Library
  - Museums: Athens
  - Television: EU Screen
  - Archives: APEnet - Archives Portal Europe
  - Archaelogy and Architecture: CARARE.

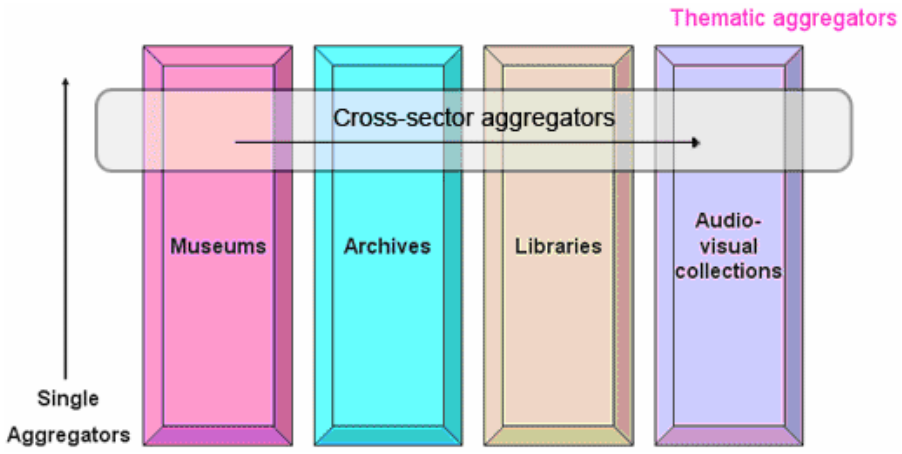


Fig.2 The Aggegator types

Europeana is at the centre of a network of projects known as the Europeana group. Many of these projects are funded by the EU to aggregate the digital content. Together, they are bringing a critical mass of content into Europeana from various providers.

Ways to deliver content to Europeana

Europeana works in partnership with organizations, projects or portals. Many of these partners gather content or 'aggregate' content from many individual institutions representing different areas, such as museums, libraries and archives. These aggregators standardise the data, to make possible the ingestion of the material into the Europeana portal. Europeana can also work directly with individual institutions, in case there is no appropriate aggregator.
Europeana Libraries has been funded as ***a Best Practice Network*** (BPN). The objective of a BPN is "to promote the adoption of standards and specifications to make European digital libraries more accessible and usable." A BPN should do this by "consensus building and awareness raising", alongside the practical work of the project.

Technical Requirements

Whether the data comes to Europeana directly or via an aggregator, it must fulfill certain basic requirements:

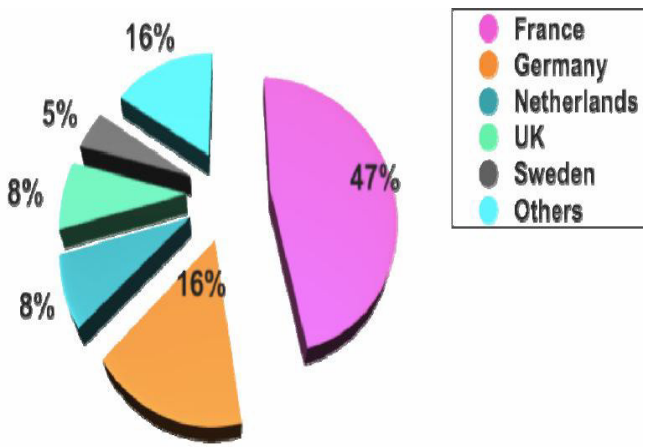
- the metadata must be in accordance with the Europeana Semantic Elements (ESE), a Dublin Core-based set of fields with 12 additional elements necessary for records to display correctly in Europeana. Aggregators are developing tools to help their providers structure their data to the Europeana Semantic Elements.[5]

- **persistent identifier**: because Europeana links from the metadata in its index to the digital object in the partner's site, this one must provide a persistent URL: a web location that never changes, so that the users of Europeana can always link to the object in its own website.

- **OAI-PMH: the Protocol for Metadata Harvesting** is the preferred method of capturing the partner's metadata, so it will be needed an implementation of OAI-PMH in the system. The alternative is to put the data on an FTP server from which it can be picked up.[6]

- the current project will enrich the ESE metadata to the **Europeana Data Model** (EDM for short), with the aim of being an integration medium for collecting, connecting and enriching the descriptions provided by the Europeana content providers.[3]

Europeana Content Analysis



- 70% of the content currently comes from 4 aggregators/providers
- 82% of the content currently comes from 4 countries
- 77% of the content is currently classified as an image

Fig. 3 Data provided by country, september 2009

"However, I find it alarming that only 5% of all digitized books in the EU are available on Europeana. I also note that almost half of Europeana's digitized works have come from one country alone, while all other Member States continue to under-perform dramatically."
Viviane Reding, EU Commissioner [9]

2011 - Case study: the Romanian Cultural Profile in Europeana

Romania is represented in Europeana by two providers:

- cIMeC (Institute for Cultural Memory) – with 11.453 images
- Athena (eContent Plus, 2008 – 2011) – 11.371 images.

Togheter they had contributed with 22.824 images from representative Romanian museums: the National Art Museum, the Brukenthal Museum, the Romanian Peasant Museum and others.

It is very interesting shaping the Romanian cultural profile in Europeana by searching for the main cities, historic or cultural personalities. By searching with the following keywords, the results are:

Table 1. Searching by keywords: romanian cities, historic or cultural personalities

Keywords	Total	texts	images	videos	sounds
Romania	**12.287**	500	11.704	57	26
Bucharest	**11.532**	25	11.483	1	23
Cluj	**1.493**	10	1.475	2	6
Sibiu	**1.319**	3	1.313	2	1
Hermannstadt	**183**	132	51	0	0
Brukenthal	**757**	2	755	0	0
Transilvania	**620**	26	594	0	0
Transylvania	**145**	109	36	8	2
Dacia	**511**	35	474	2	0
Pop Traian, redacția "Gazeta Transilvaniei"	**276**	4	244	6	22
Blaga	**151**	43	108	0	0
Brancusi	**148**	2	140	2	4
Ceausescu	**99**	3	83	12	1
Eminescu	**75**	7	68	0	0
Valachia	**44**	21	13	0	0
Goga (Muzeu Memorial O.Goga)	**44**	4	39	0	1
Enescu	**41**	1	17	0	23
Eliade	**36**	5	7	1	23
Cantemir	**30**	1	21	0	8
Mihai I	**16**	1	15	0	0
Avram Iancu	**15**	1	13	0	1
Porumbescu	**13**	0	13	0	0
Cioran	**10**	3	6	1	0
Sadoveanu	**9**	0	8	1	0
Arghezi	**8**	4	4	0	0
Caragiale	**6**	2	4	0	0
Noica	**0**				

Searching by providers:

	Athena	cIMeC	European Library	Bayerische Staatsbibliothek	Deutsche Fotothek
Dacia	**297**	95			40
Transylvania			**60**	24	
Hermannstadt	28			**111**	
Brukenthal	**496**	255			

Searching by Country: Transylvania: = Hungary = 49; Germany = 37 ; Europe = 29

We can make some critical remarks:
- the images from museums do not reflect a real hierarchy of Romanian culture
- local metadata are not in a digital archive
- the images are of poor quality
- lack of books scanned as text.

In this project, Transylvania, Sibiu/Hermannstadt and Brukenthal Museum are well represented. There is also a very good acknowledgement of the event ***„Sibiu 2007 – European Capital of Culture”***[13] and the participation of the University of Sibiu to Europeana is underlined as well.

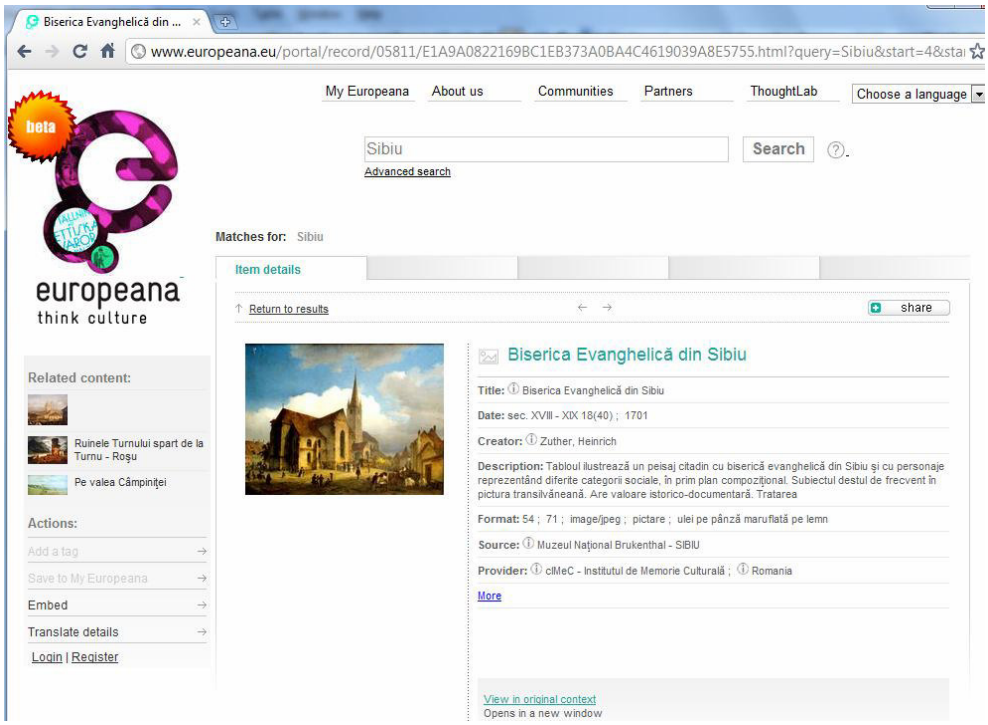


Fig. 4 Europeana screen capture with „image data”, the keyword: Sibiu

The LBUS Library participated to the event “*Sibiu 2007 - European Capital of Culture*” with the project “SCRIBe – information system for processing and viewing of rare books fund”. This was a good experience for the further development of the Europeana project.
The LBUS Library will contribute to Europeana programme with more than 3000 digital objects:
- 2000 pages scanned from old and rare books, most of them defining local historic or religious personalities like Andrei Saguna or Timotei Cipariu.
- 1000 images and video clips from the event “*Sibiu 2007 - European Capital of Culture*”, which include various themes and subjects from: theatres, museums, exhibitions, classical, rock or pop concerts.

As digital objects, the format of images will observe the requested European standards [7]:
- jpeg / pdf files of books scanned, some with text - OCR recognized (Latin characters)
- jpeg files from the event.

By adding our digital collections, we hope to enrich the Romanian cultural profile in Europeana and make a vivid illustration of our country.

Conclusions

a. Europeana is a major cultural project that gives people access to millions of digitized objects from Europe's museums, libraries, archives and audiovisual collections.

Bringing together the content of national and research libraries new research possibilities are opened, particularly for social science and anthropology researchers. Another particularity is that the work and content of research libraries become accessible to European citizens via Europeana, encouraging wider uptake and exploration of libraries digital content by governments and companies, also.

Europeana Libraries will stimulate research and encourage libraries to increase investment in their digitization programmes, knowing that their content will be fed into Europeana and thus will reach a wider audience. By combining the efforts of national and research libraries, the European Library will help preventing market fragmentation and duplication of effort in acquiring access to library content by Europeana.

b. Digitization project of a modern library requires tracking two distinct but related phases:
- setting the digital deposit with the main role of digital documentary heritage preservation
- digital library implementation in order to make the content available online.

Both processes of digitization and digital preservation involved copyright problem or the approval of the legal owner. Digitization is a relatively new system in Romania, and legislation in the digital copyright domain is absent. Therefore, it's necessary to analyze aspects of intellectual property protection both in national and international areas in order to establish an actual national copyright management for digital libraries.

c. In Romania, many institutions have developed or are currently underway in several digitization projects: DacoRomanica - the Romanian Digital Library – as a project[10]; cIMeC - Institute for Cultural Memory – the first provider to Europeana, has many other digitisation projects[11]; the Romanian Academy – with Eminescu Manuscriptums and Traian Vuia Archive[12]; Carol I - University Central Library of Bucharest; Lucian Blaga - University Central Library of Cluj-Napoca.
But it is no national connection – aggregation between all these projects!
The Europeana is the model and the solution for our national digital library!

„A final thought: our reflection focused on the conservation and valorisation of our heritage, but it is not looking solely at the past. By honouring our heritage, we prepare fertile ground for future growth."[1]

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Using Metaserch and Link Resolver in University Libraries

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Abstract: The paper presents the experience of Central University Library "*Eugen Todoran* in implementing and using MetaLib and SFX systems for manage the electronic resources library provides access to, and to offer to their customers metasearch opportunities and link to the full text resources as easy as possible.

Keywords: metasearch, link resolver, electronic resource, full text

Introduction

More and more electronic resources (ER) are available for information, study and research.

The libraries in general and university libraries in special cannot ignore the challenges and opportunities presented by these information resources. The libraries need to shift towards a new structure of information environment. The management of electronic resources put new problems for libraries and solutions have to be found.

Usually the libraries have a webpage with a list of electronic resources that described the use of these resources and provided links to databases and electronic journals; this is the simplest solution, for the situation when the resources are not too many.

The patrons have more resources to access and they have to learn how to use many different interfaces for searching and retrieving the information.

When the number of electronic resources is growing, new systems are necessary to organize and provide access to these resources. Also for the users the libraries should provide a single interface for searching in many resources simultaneous and linking to the full text when exist.

For solving this kind of problems there are systems that fulfill that requests by providing ***metasearch*** and ***link resolver*** solutions.

MetaLib and SFX

In Romania there are implemented such products developed by Ex Libris company. These products are ***MetaLib*** [1] and SFX®[2], implemented in a lot of important libraries all over the world, such as British Library, Harvard etc.

MetaLib provides tools for managing different information resources under one umbrella. The resources could be local or remote, and could be free or licensed. Such resources include, for example, libraries catalogs, online databases, e-Journals, eBooks, digital repositories, and subject-based Web gateways.

MetaLib provides federated search across heterogeneous resources. Users define the search once and the system optimizes the query so that the search engines of the resources interpret it correctly, performs the search, and returns the search results.

Administrators have a very important tool, MetaLib ***Knowledge Base***, that help them to find, configure and maintain the electronic resources library have and need to provide access to. The knowledge base allows to create dynamic resource lists, such as alphabetical or topic-based lists, that address the various needs of end users.

SFX® is the most widely used OpenURL link resolver, there are more than 2000 installation in 60 countries. SFX facilitates electronic access to full-text articles from journals or eBooks the library has subscribed.

SFX is incorporated in MetaLib, but can run with other system too. SFX, original OpenURL-compliant link server, provides context-sensitive links to services such as delivering the full text articles, details of print holdings. SFX services are available from MetaLib or through the interface of other OpenURL-enabled resources, like Aleph Web OPAC.

SFX functionalities are:

- Context sensitive linking to full text resources, the link could be directly or menu driven
- A-Z for databases or journals titles lists
- Using a Knowledge base with e resources
- Usage statistics of the electronic resources
- SFX also searches the library's online catalog (OPAC) to see if the library holds print journals, books, or eBooks being retrieved.

Central University Library ”Eugen Todoran” using MetaLib and SFX.

MetaLib and SFX were first time implemented in Romania in 2005 when the **ROLiNeST** [3], was built. ROLiNeST [4] is a portal and also a national virtual catalog in science and technology.

Central University Library ”*Eugen Todoran”*(B.C.U.T.) from Timişoara has the same problems facing the challenge of using electronic resources.

The library provides access, IP based, to electronic resources listed below.

AIP - American Institute of Physics	JSTOR
Cambridge	MathSciNet
CEEOL	Oxford Journals
CSA Research Pack	PROLA
Ebsco	ProQuest
Emerald	ScienceDirect
FRANTEXT	SciVal
IOP - Institute of Physics	SCOPUS
ISI Web of Knowledge	SpringerLink e-journals
ISI Web of Science	SpringerLink e-books
ISI Derwent Innovations Index	Taylor & Francis
ISSN	Ulrichs
	Wiley Online Library

The simplest solution having web pages with list and explanation about the electronic resources was implemented in this library too.

Starting 2005 B.C.U.T. is part of ROLiNeST, a portal build on MetaLib and SFX products. From the beginning of the project B.C.U.T. has the library’s WebOPAC integrated in ROLiNeST virtual catalog. For integrated library’s electronic resources in ROLiNeST portal, more SFX licenses have been bought for linking to the external resources.

The portal was parameterized for B.C.U.T. and a personalized interface was made. This interface integrates the electronic resources provides by the library. Generally for the subscribed electronic resources the access is IP based.

ROLiNeST user interface for the BCUT keep the MetaLib components:

- **QuickSearch**
- **Find Database**: finding databases of interest
- **Find e-Journal**: finding e-journals of interest
- **MetaSearch**: full metasearch process for more advanced users
- **My Space**: management of personal data

The library user interface of the portal was organized and parameterized both in MetaLib and SFX by system administrator. The electronic resources were organized in some sets for quick search as shown in Figure 2. The ***Multidisciplinary*** category was chosen also for quick search box (Figure 1) available from the library home page [5].

Figure 1. BCUT home page - Quick Metasearch

In ROLiNeST the B.C.U.T.'s portal interface is available only if a user login with user name and password, which is the same now, for all library's users. The login is the minimum condition but doesn't mean that automatically the access to the electronic resources it is allowed. The access to the electronic resources depends on licensing agreement library signed. If the user tries to access resources and is not in the IP range, the access will be not possible and the sign ***not authorized*** will appear (see also Figure 2).

If the user wants to access library electronic he must login, otherwise, the resources are locked as it could be seen in Figure 3.

Adding a New ER in MetaLib and SFX

If a library have subscribed to a new ER that is not in the library's resources list from MetaLib this resources should be added.

The workflow for adding a new resource is as follow:

The resource is search in MetaLib, usually if it is not a very special resources or less known, the resource is found in **MetaLib Knowledge Base** (KB). Also, KB should be updated periodically to have the information about resources up to date. The resources must be active in MetaLib. In SFX the administrator should checked if ER it is active and if is not, it should be activated. The services provide by ER and the portfolios also must be activated.

Figure 2. Quick Search

Figure 3. Login

For example, we have to parameterize ***AIP Journals*** for access via MetaLib.

We choose **Find Database** from ROLiNeST menu and search for AIP Journals. The code of resources is Scitation. If the resource is not active we could not see it in the portal database list.

The administrator of MetaLib has to find it in KB and activate it first (Figure 4).

Resource name	Resource ID	Status	Configuration code	Access Method
Scitation - RVL	XXX03545	A I T	SCITATION	WEBCONFIG_COMPLETE

Figure 4. MetaLib - Activating ER

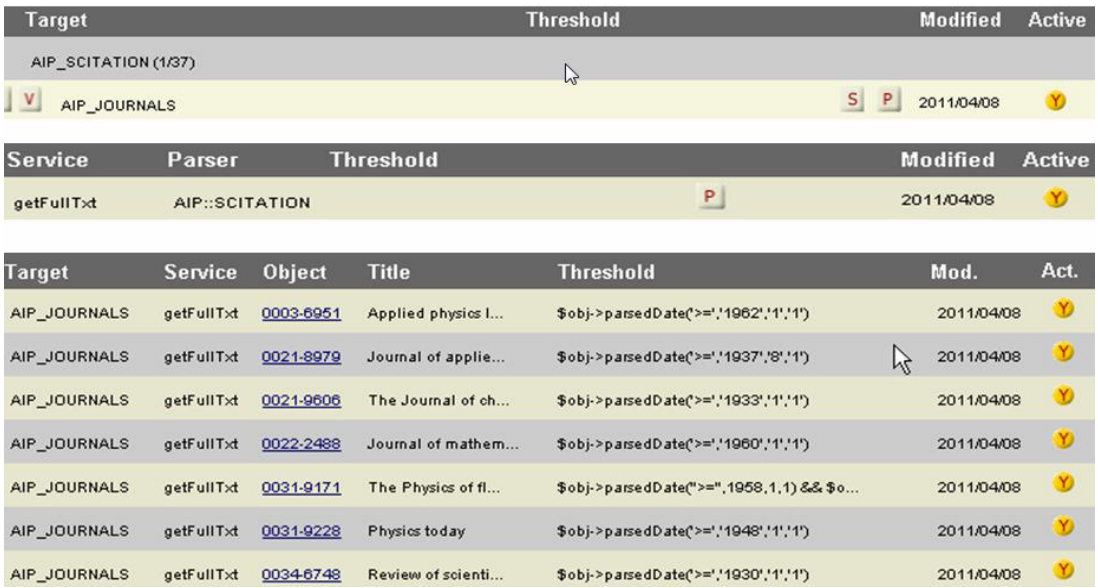
After the resource was activated in MetaLib should be add it to one or many categories, defined in the portal, for metasearching (for example to ALL category) (
Figure 5).

Figure 5. MetaLib - finding/adding ER

Now the resource Scitation (AIP) is active and could be found in the ROLiNeST database list (Figure 6):

Figure 6. MetaLib – Scitation (AIP)

The resource, that is the target for SFX, should be found and activate too. About target there is the following information: the name, threshold, services and portfolios and the active/inactive flag that could be Y or N. For the service the parser should be mention, for example ***AIP Scitation.*** For each journal of the target the portfolio must be define and activate. For known ER, like important databases or eJournals the parser, services and portfolios are defined in KB. Otherwise it should be defined together with the provider of the ER. For proper access, for the electronic resource, services and portfolios library needs, the active flag should be Y (Figure 7).



Target	Threshold	Modified	Active
AIP_SCITATION (1/37)			
AIP_JOURNALS		2011/04/08	

Service	Parser	Threshold	Modified	Active
getFullTxt	AIP::SCITATION		2011/04/08	

Target	Service	Object	Title	Threshold	Mod.	Act.
AIP_JOURNALS	getFullTxt	0003-6951	Applied physics l...	$obj->parsedDate('>=','1962','1','1')	2011/04/08	
AIP_JOURNALS	getFullTxt	0021-8979	Journal of applie...	$obj->parsedDate('>=','1937','8','1')	2011/04/08	
AIP_JOURNALS	getFullTxt	0021-9606	The Journal of ch...	$obj->parsedDate('>=','1933','1','1')	2011/04/08	
AIP_JOURNALS	getFullTxt	0022-2488	Journal of mathem...	$obj->parsedDate('>=','1960','1','1')	2011/04/08	
AIP_JOURNALS	getFullTxt	0031-9171	The Physics of fl...	$obj->parsedDate(">=",1958,1,1) && $o...	2011/04/08	
AIP_JOURNALS	getFullTxt	0031-9228	Physics today	$obj->parsedDate('>=','1948','1','1')	2011/04/08	
AIP_JOURNALS	getFullTxt	0034-6748	Review of scienti...	$obj->parsedDate('>=','1930','1','1')	2011/04/08	

Figure 7. SFX - Activating an ER

Because now the AIP Journals is active, if click on SFX button in the library Web OPAC, from a print titles journal, the SFX services are available and are displayed in the SFX screen (Figure 8).

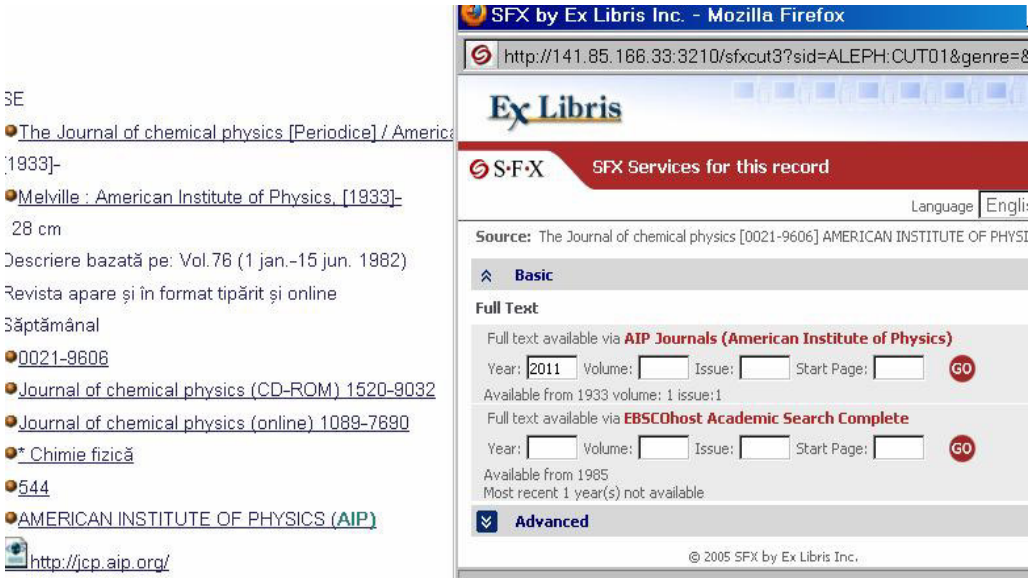


Figure 8. WebOPAC SFX link

The SFX services screen provide are AIP and EBSCO as resources where the full text of the journal articles are reachable. BCUT have access to both electronic resources that provide full text for the title we choose *Journal of chemical physics.* Comparing the two ER, AIP with Ebsco, we can see that AIP provide more information than EBSCO. AIP is the publisher of the journal so it provides access to the collection starting with volume 1 from 1933 while EBSCO provides access to the collection from 1985 and, in plus, has one year embargo.

For the same eJournals title there are available the same SFX services from RoLiNeST too (Figure 9). Also, the ***Locate*** service helps users to see what electronic resources provide full text for a journal articles.

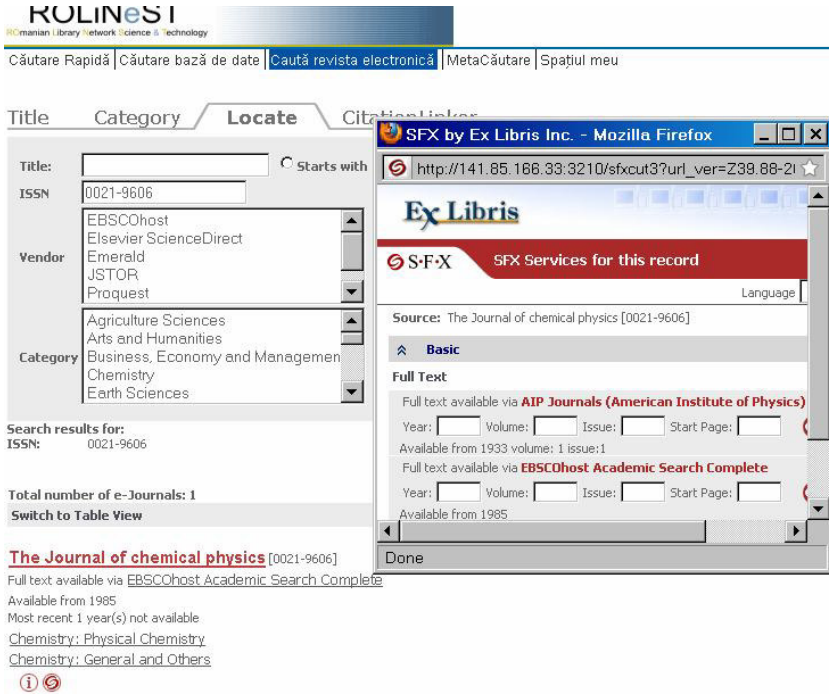


Figure 9. SFX - for eJournals form ROLiNeST

Ebook

In the same manner the eBook ER could be parameterized. If an eBook is available for the library and if the ER that could provide online full text of the book is not active or correct parameterized the SFX link will be not available and the SFX services windows could provide other link like GooleBook or Amzon, that have only with some information about the book.

From the same library web OPAC we found bibliographic record of an eBook from Springer publisher, with a click on the SFX button the SFX services screen will be open and the link to Springer full text eBook is made on ISBN base.

In the bibliographic records, in the field 856, it is also the URL address, imported form Springer. Click on that URL link let user accessing the eBook full text from Springer. (Figure 10).

The difference is that URL address should be check time to time and should be changes if it is necessary. In the imported bibliographic records, for the eBooks from Springer, we discover, after one year that the URL addresses are not available anymore. The company changed it.

Using SFX, the problem of updating or correcting the URL address from the 856 filed is no longer library's problem because the Knowledge Base update automatically all the information about the resources.

The SFX services, more than the link to the full text provider, give other opportunities for the patron like the cover image, link to Amazon or BookFinder for buying a book or to Google Book for more information.

The ebook can be found in ROLiNeST too and the SFX link to the same full text providers.

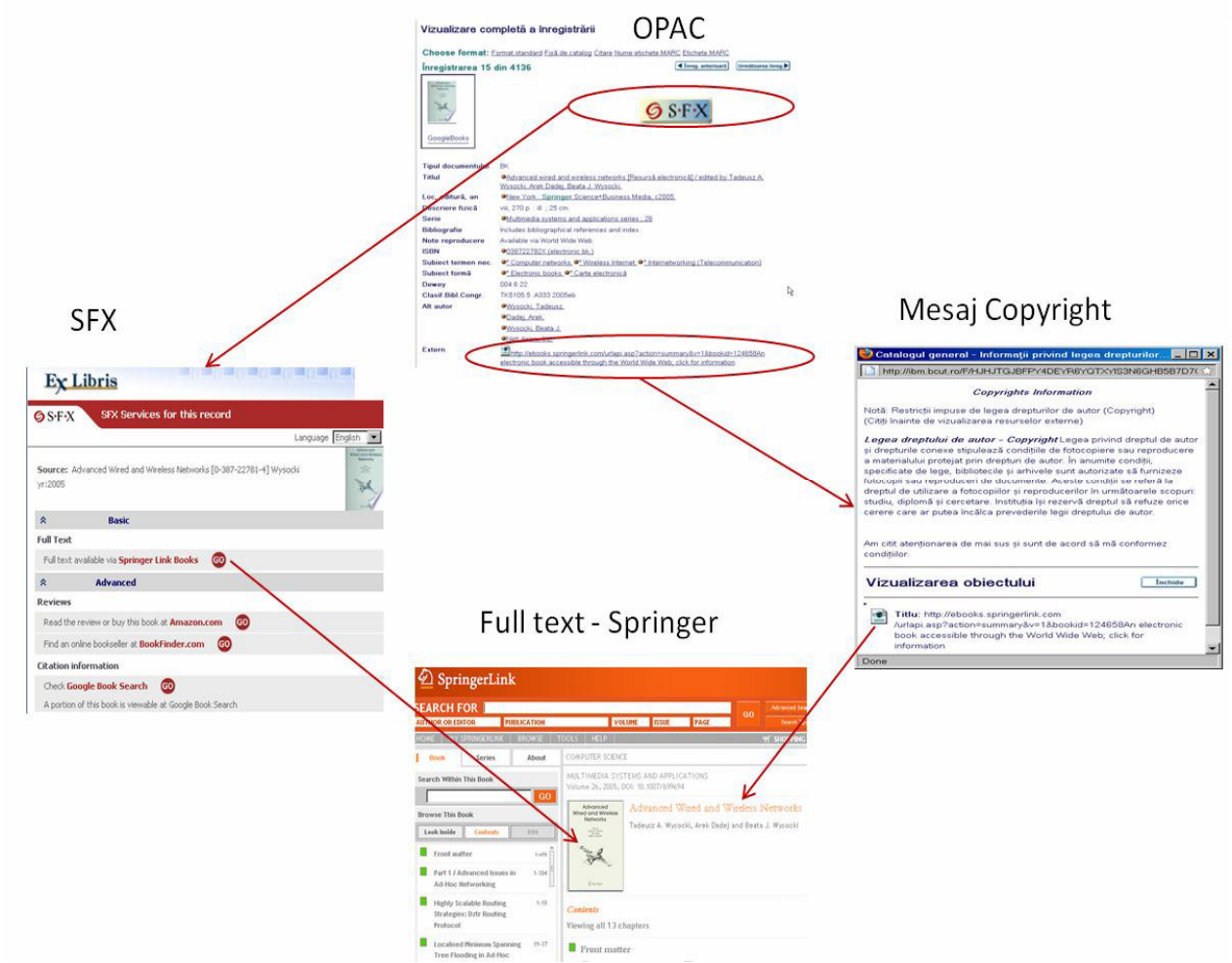


Figure 10 SFX link form WebOPAC eBook

Metasearch

Once the electronic resources, library offers access to, are activated and are available for the patrons in MetaLib, they can use the important feature of it - metasearch or federated search in more heterogeneous electronic resources.

For example we have chosen 5 databases and we search simultaneous for “sfx link“ (Figure 11).

MetaCăutare Rezultate

Caută pentru "sfx link" in "Baze de date" — Vizualizare rezultate — Anulare

Numele bazei de date	Statut	Rezultate	
Academic Research Library (PQ)	Căutare finalizată	0	
Academic Search Complete (EBSCO)	Z39.50 target error: [109] Database unavailable. AddInfo:Error Z3950_DATABASE_UNAVAILABLE		
Emerald Fulltext (Emerald)	Căutare finalizată	116	Vizualizare
Library, Information Science & Technology Abstracts (EBSCO)	Căutare finalizată	83	Vizualizare
ProQuest Central (PQ)	Căutare finalizată	0	
Rezultate combinate	**Primul 60 înregistrări**	**199**	**Vizualizare**

Figure 11. Metasearch

There are 199 results combined from different resources, for example Emerald or Library Information science and technology.

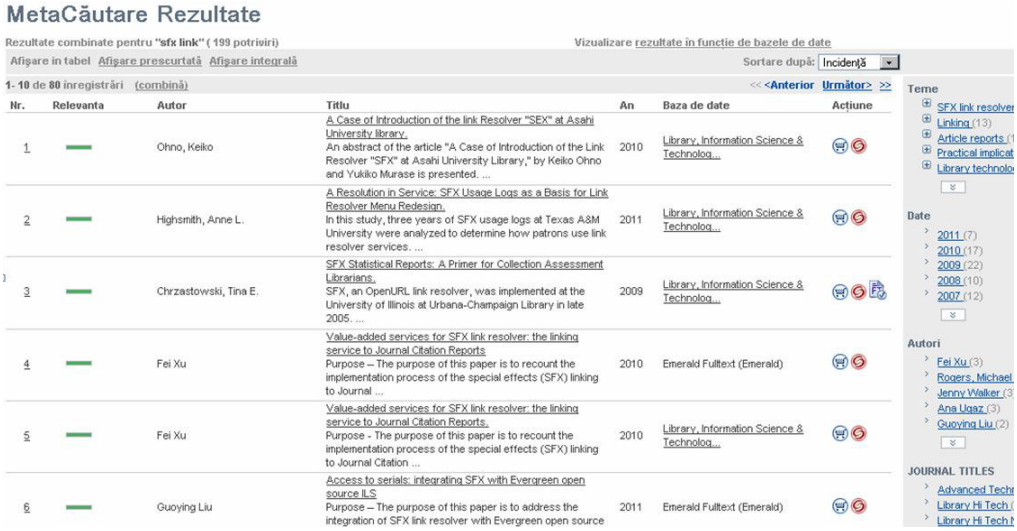


Figure 12. Combined results in MetaLib

The SFX button could be use to link to full text and other sources. Also Full Text button, appears only when available, and it is used to link directly to the full text without going through the SFX menu.

The ***Clusters and Facets*** panel appears on the right side of the Search Results page and it could be seen assigning documents to cluster topics an in addition, MetaLib also groups the selected documents by predetermined facets:

- Date: Documents are grouped according to their publication year.
- Author: Documents are grouped according to their authors.
- Journal Title: Documents are grouped according to their journal titles.

Generally the results that users select could be saved, emailed, printed or exported in reference systems.

After retrieving search results, if the user prefers the native interface of the electronic resource the link is available also.

Conclusions:

Metasearch and SFX products help a lot the university libraries that provide access to many electronic resources. The advantages for the librarians are that they can manage easier the electronic resources via Knowledge base.

For the patrons the portal is a tool easy to use for searching simultaneous in many resources trough a single interface, to find what they need, and to link to the full text if it is available.

The experience of BCUT in implementing these products could be shared with other interested libraries.

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[7] SFX user Guide

Web platform for the preservation and usage of information from BNR[1]

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Abstract: In this article we present the technological platform used for the development of the "Integrated On-line System for Management of the National Retrospective Bibliography (SIMBNR)". This platform covers: definition of the hardware and software architecture, database structure of the SIMBNR system; setting of the levels of access to information from the SIMBNR system database; presentation of the procedures for data visualization through a Web portal.
Keywords: technological platform, retrospective national bibliography, databases, Web portal.

1. Introduction

The bibliography is *"the thread intended to guide us along the maze of numerous writings",* is *"a universal language between librarians and scientists from all scientific and literary world"* [9].

From ancient times, the library has been the holder of documentary funds and has felt the need to organize and to build tools to classify these funds in order to keep records and retrieve them more efficiently.

The retrieval of primary documents on topics requested by specialists in all fields is based on their processing according to well-established rules. For special activities of collecting, processing, storage, retrieval and dissemination of documents – activities of biblioteconomy and bibliology - initially it was used the term "documentation" [1].

At the beginning, the catalogue was an inventory list to indicate the ownership, and the first arrangement of lists was the chronological one, then it was adopted the arrangement of lists by the user criterion and after that by the subject criterion; from the sixteenth century the catalogue gains value through the inclusion of retrieval function.

On-line catalogues locate the primary documents and show the stock (warehouse) of a particular library or library network. They are constituted as lists of documents but do not provide much information about the content of documents.

Library automation systems have as primarily scope the creation of their own on-line catalogue but also they allow new functions that should be provided by the users.

In contemporary society, where information is the relevant factor, it is essential to acquaint both librarians and recipients of documents with the stages of information, bibliography - with all its forms – having an undeniable role in the process of cognition. Thus, it is imposed the awareness of necessity of information and of the fact that accurate and complete bibliographic references represent the base for making informed decisions.

[1] **R**etrospective **N**ational **B**ibliography

For the usage and dissemination of great value information, contained in the bibliography of ancient and modern Romanian books, it was considered necessary the creation of an on-line alternative for consulting it by using multimedia technologies in order to obtain access as quickly as possible for the user.

New digital technologies make access to information, its storage and transmission much easier and more accessible. Having digital information, it can be transformed into new economic and social values, creating new opportunities for the development of new products and services. Information becomes the key resource for the digital economy.

Any information can be accessed by using the built-in search engines that allow its easy retrieval depending on a particular category, content or Web page.

Through a portal the information can be managed and accessed more easily, which leads us to affirm that it is the basic step for a better information management.

Portals have the functions of guiding the users to the areas that are interesting from each one's point of view and management of information as efficient as possible. They group several services that make research much easier and more enjoyable, hence their spread in all activity fields.

2. Description of technological platform of SIMBNR system

Consultation on Web of the content of the national retrospective bibliography involves the creation of a Web-oriented system whose core is a client-server application called bibliographical platform or on-line integrated system.

2.1. Basic principles

The Web platform is a comprehensive Web solution which integrates advanced technologies for information saving and updating in order to provide interactively data to visitors / users.

Platform means a software or hardware environment in which programs are running. Most platforms are a combination of the operating system and hardware.

An information platform [5] consists of:

- Computer network composed from a server and several workstations (depending on the platform type). There can be added printers, scanners, microphones and headphones, and equipment for connection to Internet and thereby to the Web communication portal;
- Software, consisting of basic software, necessary to run the network and to connect it to Internet;
- Modules that allow users to dispose of an effective and modern mean for professional information consultation.

The *technological platform* defines a standard around which a system can be developed. The platform consists of the technical resources and software products that allow interconnection of existing support entities which own information and provide access to it through Internet. Once the platform was defined, software developers can design and develop appropriate software, and users can purchase adequate hardware and appropriate applications.

The platform must provide the following functionalities: *application integration, management of roles and profiles, personalization, security, protection against Internet threats, data exchange formats*.

The main objective of the technological platform of SIMBNR system is to support university and academic research communities in their bibliographical documentation for coordinating and directing their researches based on modern biblioteconomy principles.

The SIMBNR technological platform is implemented as a Web portal [2], [3]. It offers to its users registration services, authentication and authorization, providing access to resources, information security and protection in accordance with user access rights.

2.2 Hardware and software architecture of SIMBNR technological platform

For the development of Internet applications, the *client-server architecture* is used because it allows an effective implementation of Internet services.

The *client / server* technology is a way to separate an application into two distinct parts and to ensure an effective communication between modules.

The proposed architecture is open, flexible, extensible, scalable, based on open standards.

2.2.1 Hardware architecture of technological platform

In terms of hardware, the SIMBNR system requires the existence of a platform consisting of a *server* (powerful and reliable computer that can work both as a database server and as an application and Web server) and a limited number of *local workstations* for off-line data management / processing.

The client / server architecture on three layers, used in the design of our system, has arisen due to the complexity of applications that could be deployed for more than three users. It has been determined by the emergence of Web software applications in order to impose their dynamic character. Schematically (Figure 2), this type of architecture (hardware) can be represented as:

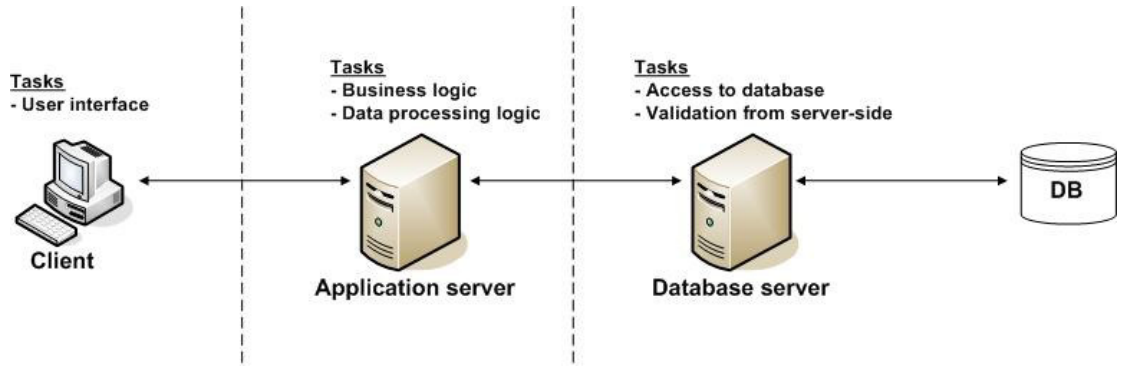

Figure 2. Hardware architecture

To implement the server-side, there are necessary at least two dedicated machines. Minimum indicative requirements are servers with processors at least Intel Dual Core at over 2 GHz, 2 GB RAM and HDD storage space available for at least 120 GB.

For the client-side, there are necessary hardware platforms capable to run Internet applications, in good conditions. The required architectures fit within a wide range, from P4, 1.5 GHz with 1 GB RAM (recommended). The interface must be designed for 1024x768. The optical drive is DVD-RW. It is required an Internet connection (TCP / IP communication support).

2.2.2 Software architecture of technological platform

In terms of software, the architecture of the SIMBNR technological platform is a multi-layer architecture, with three layers (three-tier), namely the data layer, the application layer and the data presentation layer to the user [5].

At layer 1, **the data layer**, for the data management we considered the usage of ***MySQL*** server, a reliable and fast server and additionally of Open Source type, which ensures portability of applications on different operating systems (Windows, Linux, UNIX and Mac OS X). Also, the MySQL server is equipped with mechanisms for data backup and restore and based on these the application developers are going to define a coherent strategy that covers the regular data backup.

At layer two, **the application layer**, it is used the ***PHP*** software development environment, due to its high degree of interoperability with other environments and the provided interfaces for all types of database servers. In addition, we consider for programming of certain functions also the using of ***JavaScript*** scripts.

The application layer makes the binding between the data and presentation layers, giving a dynamic character to RDBMS. It is the layer in which there are performed: data processing, data extraction and storage in the database, data formatting in order to present them, user management, data collection through on-line forms, file uploading etc., management of available application resources, start-up of other applications residing on the same server or on remote machines, local and remote database administration.

The layer 3, **the data presentation layer**, is providing the user interface. It is developed using the *HTML* language (directly, completed with scripts from JavaScript or called from *PHP* programs). Control of styles in the information displaying Web pages will be written in *CSS* (*C*ascading *S*tyle *S*heets) scripts.

The main considerations that led to the technological platform SIMBNR configuration were that the platform must:

- Be enclosed in the usual range, not requiring expensive maintenance, training etc.;
- Allow the installation and proper functioning of the basic software required for each layer;
- Permit expected application functionality, both in terms of speed and connectivity;
- Ensure reliability and operational availability.

The basic software platform needed for the **SIMBNR** system deployment is for:

- Database server: Windows 2003 Server / Linux operating system, TCP / IP protocol, MySQL;
- Application server: Windows (2000, 2003, XP) / Linux operating system, MySQL, ACCESS 2007, Microsoft Visual Studio 2005;
- Workstations, designed to use product components for database management: Windows 2000/2003/XP operating system, Internet Explorer, Mozilla, Firefox, Microsoft Office 2007.

3. Components of technological platform of SIMBNR system

The functional structure of SIMBNR system envisages a series of characteristics that define a modern and efficient system, such as: a modular, open, flexible and scalable structure, use of multimedia tools and Web technologies that allow users on-line access to bibliographic information [5].

The main functional components of the platform are:

- Component for management of user rights for access to the database content;
- System database;
- Component for visualization of information stored in the database.

3.1 Registration / authentication component

The system allows different levels of access (with selective access to information and functionality) depending on the on-line user type.

The **SIMBNR** system provides a security mechanism based on definition by the system administrator of the access rights to information for users according to the role they play in the system.

The main categories of SIMBNR system users are: technical manager, content manager, personnel with on-line data updating rights, regular user.

The access for the first three categories of users will be made based on the personal elements of identification / authentication (user name and password) in the system.

The access to information is differentiated in **full access** - granted by the administrator to the personnel working in the area - implying the possibility that all system modules and sub-modules to be updated in real time and **limited access** giving to the user only the right to consult the information from the system.

In terms of management and data management, the SIMBNR system users fall into three categories:

- *Content manager* - will be recorded in the system through an independent application by the system itself. He will have the following rights: free access to view the provided information, information structuring and completion, validation of users that require the right to complete information.
- *Authorized users* - have permission to access the database, to view and modify the data based on selective criteria.
- *Regular users* of information system - can only see the information contained in the database.

The right of access to information provided by the **SIMBNR** system is set by the system administrator. These rights are set at the moment when the user accesses the system Web portal.

The system administrator will have access to all system resources both through a special Web interface where identifies himself with *username* and *password* and directly into the system (back-end).

3.2 SIMBNR system database

For the development of the **SIMBNR** system database it was adopted a relational-hierarchical data management model that ensures:

- Flexibility: changes in definitions of entities and relationships between them will not require major changes in the structure of the database;
- Scalability: there will be no performance problems at increased processed data volume;
- Abstraction: the model must provide the data management for any Web application oriented to information publication.

Within the chosen model, the relationships of any degree are represented as a tree. All relationships are stored in a single database table and the relationship management interface is common to relationships of any degree.

The Integrated On-line System for Management of the National Retrospective Bibliography **SIMBNR** manages the ***"simbnr"*** metadatabase consisting of two components: "***brv***" database for the Old Retrospective Bibliography and ***"brm"*** database for the Modern Retrospective Bibliography.

The ***"brv"*** and ***"brm"*** components are relational databases, this organizational model allowing implementation of advanced management functions, information search and view.

The functional diagram of the **SIMBNR** system metadatabase is illustrated in Figure 3:

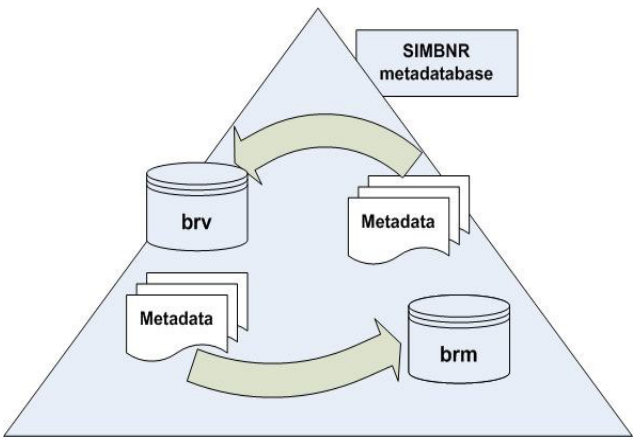

Figure 3. SIMBNR system metadatabase

The functional diagram of the **SIMBNR** system metadatabase is a reunion of schemes of the two components. This will allow the uniform management of the data contained in the two databases. Access to information will be fast and effective from any location that disposes of a computer connected to Internet.

3.2.1 Description of "brv" database

The Old Romanian Bibliography - BRV (1508-1830), elaborated by Ion Bianu and Nerva Hodoş, includes the books published inside or outside the Romanian borders, the only conditions for them being to be written in Romanian language or by Romanians in other languages [7].

The paper of major scientific relevance is complemented with numerous historical and literary notes, references, information and observations about the existence of specimens in the country, outstanding graphics reproductions of text fragments of the papers included in the bibliography, dedications, prefaces, epilogues, title pages and illustrations.

In order to reveal the content of this paper and make it accessible on-line, the "***brv***" database contains the *brv*, *brvcarti*, *brvpagini* tables.

They are in a 1→n relationship. The relationships between these tables are tree type (see Figure 4), set through the *IDvol* → *IDcarte* → *IDpagina* identifiers.

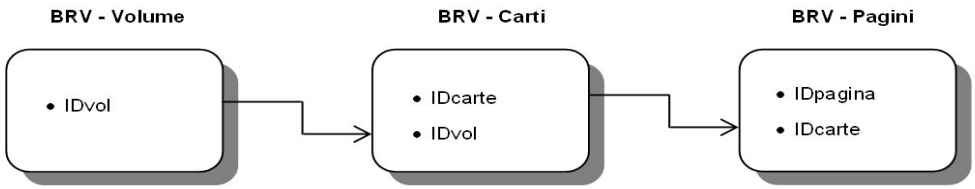

Figure 4. Relationships between tables - BRV

3.2.2 Description of "brm" database

The Modern Romanian Bibliography (**BRM**), representing the period 1830-1918, chronological continuation of the Old Romanian Bibliography, includes works of Romanian authors, regardless of which language they were written or where they appeared (including translations into other languages) and all books appeared - in full or in part - in Romanian language, irrespective of authorship or place of publication [8].

The four volumes of the paper include also works of the foreign authors temporarily or permanently established in our country who, through their work, have integrated themselves into the Romanian culture.

The paper is organized in a single alphabetical series, including both the works described according to the author as well as the anonymous ones.

BRM is made according to ISBD (M) norms, mainly based on the book funds of the Romanian Academy Library. The 73,473 positions that exist in the volumes that compose the Modern Romanian Bibliography are organized alphabetically (according to the Latin alphabet even in the case of titles in other languages and alphabets) including both the works described according to the author as well as the anonymous ones described in the title (first word from title).

Because it was possible to perform the scanning and the optical character recognition (OCR) of **BRM** pages, the database associated with this bibliography will contain primarily textual information grouped in the tables: *Volume*, *Autori* and *Descriere*.

The relationships between these tables are tree type (see Figure 5), set through the identifiers *IDvol* → *IDautor* → *IDdescriere*.

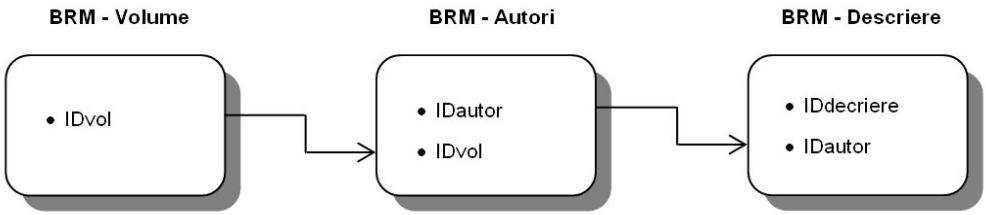

Figure 5. Relationships between tables - BRM

3.3 Component for visualisation of information stored in database

In any Web application, the user interface is the component that allows dialogue between user and application through a cvasi-natural language, by transmitting to the inference mechanism the user requests and to the user the processing results.

The main goal of the user interface is to provide a simple, logical, intuitive and much as possible user-centred interaction.

At the design and development of user interfaces we considered the following important requirements: usability, functionality, visual communication, aesthetic elements and accessibility.

To implement these requirements, Web application developers must use a series of standards while they develop applications. Web standards allow the grant of uniform access to information of all users and also ensure a rapid development of Web.

Using the standards at the design and development of Web applications ensures that they can be easily adapted to future changes of the Web. In addition, standards are important because they ensure a separation of content from the presentation way, with direct implications for accessibility.

At the design of the user interface for **SIMBNR** system we aimed it to be consistent and ergonomic, easily and intuitively to understand and use, allowing users to have easy access to databases, needing only minimal knowledge in working with computers.

The **SIMBNR** system Web interface [4] will allow to the user to communicate with the application, for this purpose using various graphical objects displayed on the screen - windows, buttons, check boxes, context menus etc. – that he / she will be able to operate by the keyboard or mouse.

The Web interface pages of **SIMBNR** system are structured into four distinct zones (see Figure 6):

- **Zone 1**: contains the header page;
- **Zone 2**: contains the main menu list and the search module;
- **Zone 3**: dynamic content zone, depending on the selected option;
- **Zone 4**: contains the page footer that shows information on terms and usage conditions, copyright or XHTML standards.

Figure 6. Main page structure of system interface

3.3.1 Web interface for BRV

In order to display the information contained in the ***"brv"*** database there were designed three types of Web pages.

The **BRV Home** page contains a concise description of its four component volumes. The format of this page is presented in Figure 7.

Figure 7. BRV Home page

By activating the **BRV - Vol. I** link, it is opened the **second type of page** in which there is displayed, in order of occurrence years, a range of information about the books printed during the period 1508-1717 presented in a tabular form which has the following structure:

Book No. (Nrc.)	**Year** (Anul)	**Book** (Cartea)	**Language** (Limba)	**Place** (Locul)

The information is displayed in subsequent pages, 10 records per page, with possibility of navigating "forward-backward" between pages.

The **third type of page** was designed to allow to users to view and navigate through the corresponding pages of a book, selected from the list above.

Thus, zone 3 of this type of page is divided into two columns: *first column* contains icons of corresponding pages of the selected book, and the *second column* shows the complete image of the contents of a selected icon.

3.3.2 Web interface for BRM

The structure of the Web interface for displaying the information contained in the Modern Romanian Bibliography (BRM) is similar to the structure of BRV Web interface. Thus, it includes three types of pages designed for:

- Summary description of the four component volumes;
- Displaying of alphabetical index of authors;
- Displaying of bibliographic description corresponding to a selected author.

The **BRM Home** page format (summary description of the four component volumes) is presented in Figure 8.

Figure 8. BRM Home page

By activating the link corresponding to a letter, for example **A**, it is opened the **second type of page** (displaying of alphabetical index of authors). In the **third type of page** it is displayed the bibliographic description corresponding to a selected author.

Conclusions

In conclusion, the main functions of the Web platform for preservation and usage of information from BNR, refer to:

- Information management (information collection, processing, storage and delivery in forms suggestive and useful to users);
- User management (registration, granting of access rights, information personalization, interactivity, private data protection);
- System management functions.

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Library Involvement in Knowledge Management

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ABSTRACT

At the beginning of the 21st century, due to the emerging development of information society governed in accordance with the initiative of the European Commission launched in 1999, called e-Europe and continued with the e-Europe+, the strategic directions and e-learning (integration of citizen in the digital age), e-working (activity in a knowledge-based environment), e-accesibility (universal participation in resources) and e-inclusion (in the digital inclusion of all regardless of social position, race, sex, age or financial possibilities), libraries face the challenge of adapting to new challenges and changes.

Modern library services must be part of the reality of our contemporary society, so that today's development path is directed towards knowledge-based organization, built on the idea of flexibility, innovation, creativity, value added, communications, community work, sustainable performance and competitiveness. This involves not only the implementation of information technology at the hardware and software level but also the importance of promoting a new thinking regarding the identity of the library. In this context, where, as early as 1992, Drucker said, "information society, in which mankind falls irreversibly, is defined as a knowledge society and at the same time, as a society of organizations" (Drucker, 1992), the management of structures within a complex infodocumentary system inevitably turn to knowledge management.

"Knowledge Management" – a definition

The concept "Knowledge Management" became well-known and popular in the 1990s. The associated definitions in the technical literature are extremely diverse and approaching different perspectives: managerial, informational, technological, philosophical or sociological perspective.

Starting from the five virtues of thought defined by Aristotle in his Nicomachean Ethics, Schwartz, David[1] maps them to levels of knowledge and knowledge management:

[1] Schwartz, D. Aristotelian View of Knowledge Management. In: Encyclopedia of Knowledge Management, 2006, p. 10

Epistémé: Factual or scientific knowledge

Téchné: Skills-based technical and action-oriented knowledge

Phrónésis: Experimental self-knowledge or practical wisdom based on experience

Nous: Intuition

Sophia: Theoretical knowledge of universal truths or first principles

Schwartz is going further and he is mapping the Aristotle's knowledge virtues to KM stages (Acquisition, Organization and Distribution) and to KM processes within the stages:

KM stages	**Acquisition**	**Organization**	**Distribution**
KM processes	creation	modeling	sharing
	discovery	classification	reuse
	gathering	calibration	maintenance
	validation	integration	dissemination

Later on, the definition embodied in the 2005 Australian knowledge management standard defined the concept in a holistic manner:

> "[…] a transdisciplinary approach to improving organizational outcomes and learning through maximizing the use of knowledge. It involves the design, implementation and review of social and technological activities and processes to improve the creating, sharing and applying or using of knowledge. Knowledge management is concerned with innovation and sharing behaviors, managing complexity and ambiguity through knowledge networks and connections, exploring smart processes, and deploying people-centric technologies."[2]

Some authors define the knowledge management concept as a list of processes[3]:

- Generating new knowledge.
- Accessing knowledge from external sources.
- Representing knowledge in documents, databases, software and so forth.
- Embedding knowledge in processes, products, or services.
- Transferring existing knowledge around an organization.
- Using accessible knowledge in decision making.
- Facilitating knowledge growth though culture and incentives.
- Measuring the value of knowledge assets and the impact of knowledge management

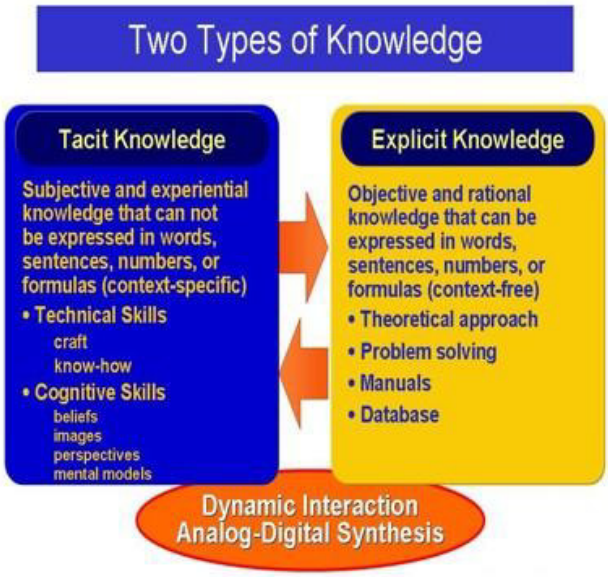
[2] Australian Standard. AS 5037-2005 : Knowledge management – a guide. http://goliath.ecnext.com/coms2/gi_0199-5932073/AS-5037-2005-knowledge-management.html (Retrieved 5.04.2011)

[3] Galagan, P. ``Smart companies (knowledge management)''. In: Training and Development, 1997, Vol. 51, No. 12, p. 20-25.

Jennifer Rowley writes about the Demerest's model which identifies four phases of knowledge management within an organization: knowledge construction, knowledge dissemination, and knowledge use and knowledge embodiment.[4]

Another definition highlights the two facets of knowledge, the tacit knowledge and the explicit knowledge:

> „Knowledge management is the act of making tacit knowledge explicit. Tacit knowledge is the knowledge we each carry in our heads about how to do things, who to call and the lessons learned through experience. Making it explicit is recording in some media that allows another person to use it. The media can be a complex computer database or a piece of paper tacked over the water cooler. There are as many definitions of knowledge management as there are ways to use it."[5]



Source: Knowledge Management Review, 2010, April 19
http://knowledgemanagement-review.blogspot.com/2010/04/tacit-knowledge-management.html (Retrieved 7.04.2011)

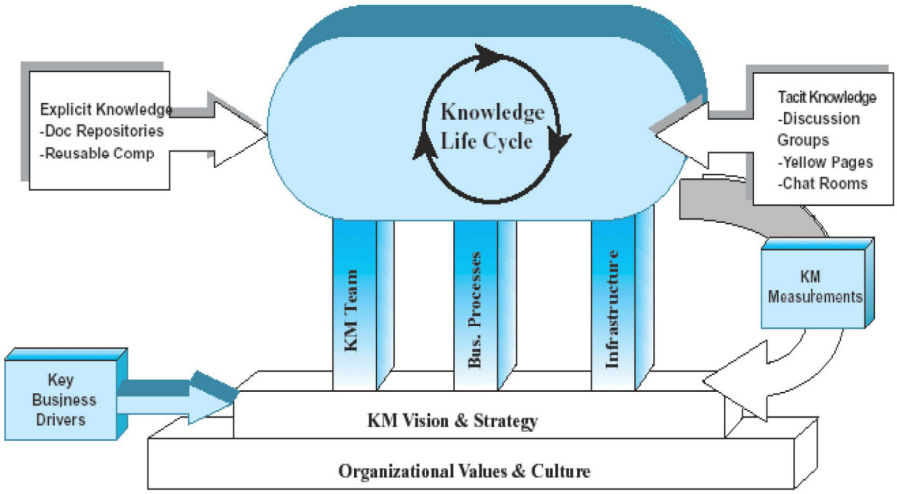
Knowledge Management and libraries

All the above definitions lead us to the library organizations which are not only knowledge repositories which improve knowledge access and transfer but also clusters of expertise and radiant sources of knowledge based on both, soft and hard sites. The hard site consists in technology (computer networks, library integrated systems, bibliographic and full-

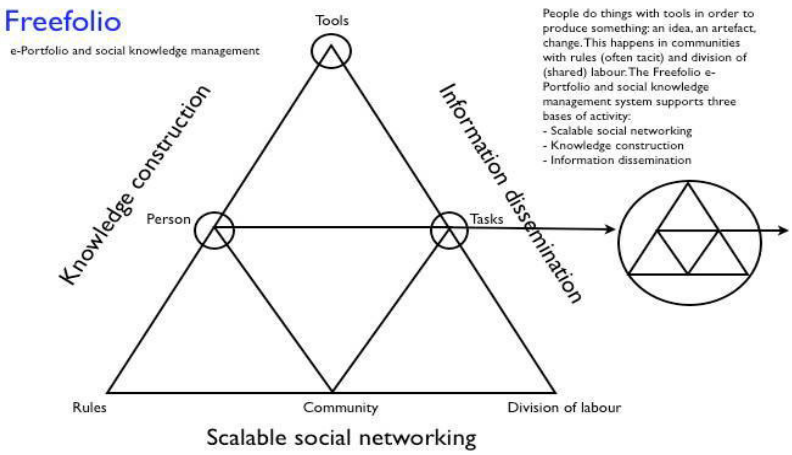
[4] Rowley, J. What is knowledge management?
In : Library Management Volume: 20 Issue: 8 1999 http://www.emeraldinsight.com/journals.htm?issn=0143-5124&volume=20&issue=8&articleid=858942&show=html (Retrieved 4.07.2011)

text databases, digitized collections, Internet connections and various collaborative tools) and the soft site consists in people – librarians and information specialists.

The library is hosting the whole chain of transforming the data into wisdom. The levels in between are information and knowledge. According to Hayes and Kent, data provides valuable evidence for increasing useful information, which, when combined with human interaction, forms knowledge that gives people the wisdom to make decisions.[6]



Source: http://knowledgemanagement-review.blogspot.com/2010/04/knowledge-management-best-practice.html
(Retrieved 7.04.2011)



Source: Knowledge Management Review, 2010, April 19
http://knowledgemanagement-review.blogspot.com/2010/04/what-is-knowledge-management-system.html
(Retrieved 7.04.2011)

[6] Hayes, Helen and Kent, Philip. *Knowledge management, universities and libraries. In: Envisioning future academic library services : initiatives, ideas and changes.* London : Facet Publishing, 2010, p. 121

Peter Brophy and Peter M. Wynne, define five basic functions of the electronic library in their report „**Management Information Systems and Performance Measurement for the Electronic Library: eLib Supporting Study (MIEL2)"[7]:**

- resource discovery (resource and location identification)
- resource delivery (request, acquire and deliver to user)
- resource utilization (exploitation tools - databases)
- infrastructure provision (space, equipment, networks, support services)
- resource management (prioritization, value for money)

None of the above functions assumes that the library acts as an intermediary. On the contrary, the library is an active contributor to the knowledge economy, a creator of knowledge and a dynamic channel between information and innovation and between innovation and application.

Within changing structures and collaborative approaches, libraries have many opportunities for innovation and to add greater value to their services. Besides their traditional functions of gathering, organizing, and disseminating information, libraries have a key role to play in creating, exchanging and accessing knowledge.

Librarianship versus Knowledge Management

Libraries are becoming more and more virtual research centers. The knowledge-based approach involves forms of effective collaboration to extract the best from the available information and knowledge and to reduce the failure risks. It also introduces new evaluation indicators of efficiency and of users' services which gives the measure of the use of knowledge rather than physical resources.

Jennifer Rowley observes that libraries have mostly been involved in KM through the implementation of their skills in acquiring, organizing, preserving and retrieving information.[8] In our days, due to the IT&C developments, libraries involvement has expanded to include the implementation of web pages and intranets, of institutional repositories, and the training of

[7]Brophy, P. and Wynne, P.M. *Management Information Systems and Performance Measurement for the Electronic Library: eLib Supporting Study (MIEL2): Final Report* http://www.ukoln.ac.uk/services/elib/papers/supporting/pdf/mis.pdf (Retrieved 7.04.2011)

[8] Rowley, Jennifer. *Knowledge management – the new librarianship? From custodians of history to gatekeepers to the future.* In: Library Management Volume: 24 Issue: 8/9 2003 http://www.emeraldinsight.com/journals.htm?issn=0143-5124&volume=24&issue=8/9&articleid=859111&show=html (Retrieved 8.04.2011)

users in the effective use of bibliographic and full-text databases and other electronic resources like e-journals and e-books scientific databases. In fact university libraries support their universities' goals of developing and maintaining successful research programs, being key members of the research enterprise. The librarians involved in such programs have the ability to conduct literature searches and to provide relevant articles as well as citations for additional information.

University libraries also organize different cultural and scientific events like conferences held by the professors of the host university or by well-known personalities, workshops and seminars for the large public or for targeted groups of users. Private-Public Partnerships have been initiated by the libraries in order to sustain the internal processes and the users' services.

Libraries' **visibility** has increased. In the KM environment the value of the university library has been reinforced among the research community.

Libraries have also adopted a more **commercial or business approach** in order to better market their resources and services. In this respect, Correia[9] gives some examples: developing best practices based on commercial standards, applying business marketing trends in library management, adopting corporate culture, treating library services as knowledge-based business, and investigating the relevance of competitive intelligence to the LIS profession.

Libraries are also **learning organizations** involved in knowledge generation and dissemination, operating competitively in order to satisfy users needs and be able to face the present challenges, threats and opportunities of the digital environment. Jain and Mutula have some suggestions:" libraries should create the climate for change and innovation. Libraries should create learning environments by working collaboratively with other disciplines, particularly educators and community developers and be better equipped to cope with independent learning. Libraries must also empower their employees to be flexible in order to take advantage of new and interchangeable roles as facilitators, mentors, coaches and stewards. Finally, libraries need to promote a culture of knowledge-sharing, collective learning and collaboration."[10]

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[9] Correia, C.C. *Libraries and competition: intelligence for management and strategy*. In: I*nformation Outlook*, Vol. 10 No.7, pp.23-6.

[10] Jain, P. and Mutula, S. *Libraries as learning organisations: implications for knowledge management*. In: : Library Hi Tech News Volume: 25 Issue: 8 2008

What are the differences between librarianship and KM? It is a matter of approach. KM is a people-centered concept which sees people as knowledge resources and knowledge generators. As Sarrafzadeh and Martin observe, the skills and the expertise of the people represent the most important asset of an organization[11]. Therefore, libraries have to capture the tacit expertise and know-how that librarians acquire through many years of practice and experience, so that their knowledge can be transformed in explicit knowledge at the organizational level.

Libraries have always involved people but mostly as knowledge users rather than knowledge resources. The focus of librarians has been on information objects, end-users and explicit knowledge which is more easily communicated and shared, mainly through IT&C systems. The knowledge-based approach shifts from information objects to knowledge resources.

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http://www.emeraldinsight.com/journals.htm?issn=0741-9058&volume=25&issue=8&articleid=1762131&show=html (Retrieved 8.04.2011)

[11] Sarrafzadeh, M. and Martin, B. Knowledge management and its potential applicability for libraries. In: Library Management Volume: 31 Issue: 3 2010 http://www.emeraldinsight.com/journals.htm?issn=0143-5124&volume=31&issue=3&articleid=1840207&show=html (Retrieved 8.04.2011)

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Webography

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3. Jain, P. and Mutula, S. *Libraries as learning organisations: implications for knowledge management*. In: : Library Hi Tech News Volume: 25 Issue: 8 2008 http://www.emeraldinsight.com/journals.htm?issn=0741-9058&volume=25&issue=8&articleid=1762131&show=html (Retrieved 8.04.2011);

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7. Sarrafzadeh, M. and Martin, B. *Knowledge management and its potential applicability for libraries*. In: Library Management Volume: 31 Issue: 3 2010 http://www.emeraldinsight.com/journals.htm?issn=0143-5124&volume=31&issue=3&articleid=1840207&show=html (Retrieved 8.04.2011);

Using Genetic Algorithms for Weights Space Exploration in an Eurovision-like weighted Meta-Classifier

Radu G. Creţulescu, Daniel I. Morariu, Macarie Breazu and Lucian N. Vinţan

Abstract — Automatic document classification has become an important task because of the continually increasing number of text documents with the users have to deal. The aim of this paper is to develop a non-adaptive meta-classifier for text documents in order to increase the classification accuracy. The developed meta-classifiers are based on combining some SVM classifiers and a Naïve Bayes classifier. We proposed a new meta-classification method which takes into consideration the corresponding positions and confidence degrees obtained for all the classes. In this work we have tried to find, using Genetic Algorithms, the optimal weighting factors for the values returned by each classifier separately. Consequently, there is a possibility for the meta-classifier to decide that the winner is a class that is not necessarily one of the winner classes returned by the individual classifiers. The experimental results have showed that the classification accuracy can be improved through the proposed method.

Keywords— Text Classification and Performance Evaluation, SVM, Meta-classification, Genetic Algorithms

1 INTRODUCTION

WHILE more and more textual information is available online, effective retrieval is difficult without good indexing and summarization of document content. Document categorization is one solution to this problem. The task of document categorization is to assign a user defined categorical label to a given document. In recent years a growing number of categorization methods and machine learning techniques have been developed and applied in different contexts.

Documents are typically represented as vectors in a features space. Each word in the vocabulary is represented as a separate dimension. The number of a certain word's occurrences in a document represents the value of the corresponding component in the document's vector.

In this paper we investigate a strategy for combining classifiers' results in order to improve the classification accuracy using genetic algorithms. We used classifiers based on Support Vector Machine (SVM) techniques and based on Naïve Bayes theory. They are less vulnerable to degrade with an increasing dimensionality of the feature space, and have been shown effective in many classification tasks. The SVM classifier is actually based on learning with kernels and support vectors.

We combine multiple classifiers hoping that the classification accuracy can be improved without a significant increase in response time. Instead of building just one highly accurate specialized classifier with much time and effort, we build and combine several simpler classifiers.

Several combination schemes have been described in the literature [4] and [7]. A usual approach is to build individual classifiers and later combine their judgments to make the final decision. Another approach, which is not so commonly used because it suffers from the "curse of dimensionality" [6], is to concatenate features from each classifier to make a longer feature vector and use it for the final decision. Anyway, meta-classification is effective only if its component classifiers synergies can be exploited.

In previous studies combination strategies were used ad hoc and are strategies like majority vote, linear combination, winner-take-all [4], or Bagging and Adaboost [15]. Also, some rather complex strategies have been suggested. For example in [6] and [9] meta-classification strategies using SVM [14] are presented and are compared with probability based strategies.

Section 2 and 3 contains prerequisites for the main work developed in this research. In sections 4 we present the methodology used for developing our experiments. Section 5 presents the experimental framework and section 6 presents the main results of our experiments. Finally the last section debates and concludes on the most important results obtained and proposes some further work.

2 CLASSIFIERS USED

2.1 Support Vector Machine

The Support Vector Machine (SVM) is a classification technique based on statistical learning theory that was applied with great success in many challenging non-linear classification problems and on large data sets ([12], [14]).

The SVM algorithm finds a hyperplane that optimally splits the training set. The optimal hyperplane can be distinguished by the maximum margin of separation between all training points and itself. Looking at a two-dimensional problem we actually want to find a line that "best" separates points in the positive class from points in the negative class. The hyperplane is characterized by a decision function like:

$$f(x) = \mathrm{sgn}\left(\langle \mathbf{w}, \mathbf{\Phi}(x) \rangle + b\right) \tag{1}$$

where **w** is the weight vector, orthogonal to the hyperplane, "*b*" is a scalar that represents the margin of the hyperplane, "*x*" is the current sample tested, "*Φ(x)*" is a function that transposes the input data into a higher dimensional feature space and $\langle \cdot, \cdot \rangle$ representing the dot product. *Sgn* is the sign function. If **w** has unit length, then <**w,** Φ*(x)*> is the length of Φ*(x)* along the direction of **w**. Generally **w** will be scaled by ||**w**||. In the training part the algorithm needs to find the normal vector "**w**" that leads to the largest "*b*" of the hyperplane.

2.2 Naïve Bayes

The Bayes classifier use the Bayes Theorem which basically computes prior probabilities for a given class based on the probability for a given term to belong to the specified class. Thus the classifier computes the probability for a document to be into a given class.

Bayesian theory works as a framework for making decision under uncertainty - a probabilistic approach to inference [5] - and it is particularly suited when the dimensionality of the inputs data is

high. Bayes theorized that the probability of future events could be calculated by determining their earlier frequency.

The Naive Bayes classifier is based on the simplified assumption that the attribute values are conditionally independent given target value. In other words the assumption is that, given the target value of the instance, the probability of observing the conjunction $y_1, y_2.....y_n$ is just the product of the probabilities for the individual attributes:

$$c_{map} = \arg\max_{1<i<m} \overline{P}(X_i|Y) = \arg\max_{1<i<m} \overline{P}(X_i)\prod_{j=1}^{n} \overline{P}(y_j|X_i)\,, \qquad (2)$$

For extending the SVM and the Naïve Bayes classifiers from two-class classification to multi-class classification typically one of two methods are used: "One versus the rest", where each topic is separated from the remaining topics, and "One versus the one", where a separate classifier is trained for each class pair [14]**.** We selected the first method for two reasons. First, preliminary experiments show that this method gives better performance, which might be explained by the fact that the Reuter's database contains strongly overlapped classes and assigns almost all samples in more than one class. Second, overall training time is much shorter for the first method.

3 GENETIC ALGORITHMS

Genetic algorithms encode a potential solution to a specific problem on a simple chromosome-like data structure and apply genetic operators to these structures in order to preserve critical information [16]. In our weights selection problem the chromosome is considered to be of the following form:

$$c = (w_1, w_2, ..., w_k) \qquad (3)$$

where w_i, $i = \overline{1,k}$ represent the weight for each class position returned by every classifier used into the meta-classifier. The training set has the form $\{\langle \vec{x}_{ij}, y\rangle, i = \overline{1,m}\ and\ j = \overline{1,n}\}$, where y represents the correct output for the input sample $\vec{x}_{ij}$, n represents the number of classes and m represents the number of classifiers used into the meta-classifier. For the genetic algorithm the training dataset consist of all outputs from all classifiers used into the meta-classifier. For simplifying the computing of the fitness function we choose a representation of the chromosome that uses the outputs of all classifiers from the meta-classifier. With this approach we take into consideration the position of each class in the classifier's output. The chromosome keeps only, for each class position, the weights that are used to compute the accuracy of meta-classifier. Thus, the potential solution of the problem encodes the weights that can be used to compute the final decision into meta-classifier [11].

For each chromosome we can compute the fitness function as the final classification accuracy of the meta-classifier using the testing file. The classification accuracy is computed as the number of final correct classified classes by the meta-classifier.

For each test we start with a generation of 100 chromosomes, each of them having values randomly generated between -1 and 1. In the next step we generate the next population using genetic operators as: selection, crossover or mutation [16]. The evolutionary process stops after a

predefined number of 1000 generations. The evolutionary process stops after a predefined number of generations are taken or when in the last 20 generations no changes occur.

At the end of the algorithm, we obtain for each class position the "best" weight that can be used for computing the winner class. The general scheme of the genetic algorithm is presented in pseudo code in the Algorithm 1:

```
Begin
 For each topic from a topics_set
  begin
   generate a population
   while not terminated condition
    For each chromosome from population
     compute the fitness functions
    make next population:
      select parents
      recombine pairs of parents
      apply mutation to offspring
   End while.
   Store the chromosome that obtain the best fitness
 End for.
   Take all stored chromosomes
End.
```

Algorithm 1: Pseudo code for GA algorithm

4 META-CLASSIFIER MODELS

In our previous work [2], [8] and [10] it is presented a meta-classifier, based on 8 SVM classifiers and one Bayes classifier, that were used to improve the classification accuracy for text documents. In those works 3 meta-classifier models are used: majority vote, selection based on the Euclidian distance and selection based on the cosine angle. The first model was a non-adaptive model that had the advantage of speed, but obtained not so good results. The last two were adaptive models that used a training part before they can be used in the classification. The training part is much time consuming and, unfortunately, this time increases when the meta-classifier learn more examples.

In this paper we propose a new non-adaptive meta-classifier model based on some pre-optimized weights that will increase the classification accuracy. In [11] we have presented a solution for this problem that uses static (pre-determined) values for the weights. Now we propose to use a genetic algorithm for pre-computing the optimal weights. Obviously, this adaptive optimization process will be done before the meta-classification process will start. The obtained weights' values will correspondingly weight all the results returned by every classifier for each document, as it is shown further.

All meta-classifiers presented in this article contain eight SVM type classifiers and one naïve Bayes classifier.

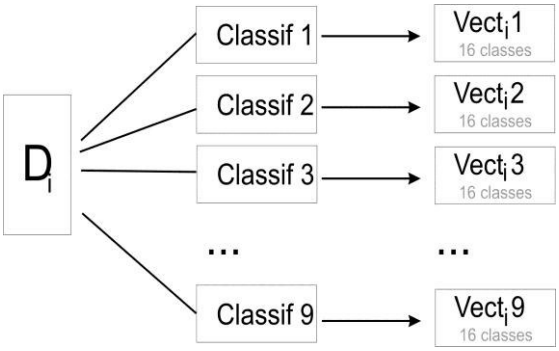

Fig. 4.1 Creating entry data for meta-classifiers

4.1 Non-adaptive Meta-classifier based on Majority Vote (M-MV)

This meta-classifier model, also presented in [8], is a non-adaptive model that obtains the same results for the same input every time. The idea is to use all selected classifiers to classify the current document. Each classifier will propose a class for the given document, and the meta-classifier will increment the corresponding class-counter. The winner class proposed by the meta-classifier is the class with the highest count. If we obtain two or more classes with identical maximal counts then we classify the current document in all the proposed classes. This method uses only the winner class from the classification returned by each classifier separately. The classes found on the subsequent positions are not taken into consideration.

4.2 Non-adaptive Meta-classifier based on sum (M-SUM)

Each classifier has as input a document that is represented as a vector having 1306 features and produces an output vector with 16 values. The output values represent the confidence degrees, given by the classifier. These values represent the "belonging degree" of the current document to each one of the 16 classes (see Fig. 4.1). More precisely, each element from the output vector represents the classifier's decision function value for each class separately. So far, in [8], as it was already described in paragraph 4.1, the highest value from the output vectors has been chosen and the class corresponding to that value was considered to be the winner class. The methods proposed in the following paragraph, take into account both the value obtained for each class separately and the corresponding rating position. Since there are 9 classifiers in the meta-classifier for each document there will be 9 corresponding vectors, each of them having 16 values (so-called confidence degrees).

The values of the decision functions for the SVM type classifiers are in the range (-∞,∞) but usually close to the value 0, and the values of the Naive Bayes classifier are in the range (-∞, 0). Considering these differences, and for making a correct sum of those values, we have transposed the values of all vectors into the interval [1, ∞). The formula used for transposing the values is:

$$V'_i = V_i + \left|\min(\vec{V})\right| + 1, \; for \; i = \overline{1,16} \qquad (4)$$

This transposing formula doesn't change the differences between the elements values from a vector even if it contains positive and negative values or only positive ones. Thus, for each vector the differences between its values remain unchanged. In order to calculate the sum of these vectors in the next step we have normalized the vectors bringing their values in the (0, 1] interval. This

normalization ensures that the value from the first position, of the descended arranged vector, is always 1. We avoid also that the value from the last position to be 0.

$$V'_i = \frac{V_i}{\max(\vec{V})} \tag{5}$$

In the current meta-classifier, that only makes the un-weighted sums, (called here M-SUM), we have calculated the sum of corresponding scalars from these 9 vectors. Thus we have obtained, for the current document, a single vector with 16 values. The meta-classifier will decide the winning class as the class with the highest obtained value. If there are two ore more classes with identical maximal values, the meta-classifier will propose all those classes.

$$Class = \max_{c_i, i=1,16} \sum_{k=1}^{9} V_i[k] \tag{6}$$

This approach gives the possibility that, even if a class that was never selected as a winner by the classifiers but always obtained a value very close to the winner class, such a class should have the chance that, after summing, to be selected by the meta-classifier as the winner class. The idea started from the fact that in many articles like [3], [2] and [10] we observed the tendency to use methods for choosing the second or the third class as the winner class mostly when it was obvious that the meta-classifier would not provide the correct winner class.

4.3 Non-adaptive Meta-classifier based on weighted sum (M-GSUM)

In this section we will introduce a new non-adaptive meta-classifier based on the weighted sum (we will call it as M-WSUM).

In this meta-classifier the values for the classes will be multiplied with a value, called weight. In [11] are presented some meta-classifiers using different weight values and their obtained results. Since choosing the optimum weight values for each class position is a difficult task, in this article we propose a method based on a genetic algorithm for computing the weights.

Starting from the test dataset [11] we have created a proper test file which is used for the genetic algorithm. In this new file, for each document entry we have saved all outputs from all classifiers separately. Thus for a document we obtained as output 9 vectors (because we have 9 classifiers), each vector having a number of 16 scalars (because we have 16 classes). In the genetic algorithm used one chromosome represents the weights value for each class separately, depending by the class position. The first value from the vector represents the weight of the first position class from the classifier; the second value from the vector represents the weight of the class from the next position, and so on.

$$c = (w_1, w_2, ..., w_j), \text{ with } j = \overline{1,16} \tag{7}$$

where w_j represents the value of weight for the j class position. We have fulfilled the following inequalities: $w_1 > w_2 > ... w_{16}$. For computing the fitness function the following steps are taken:

1. For each document from the testing set the algorithm obtains the output vector corresponding to each classifier;
2. Each output vector is weighted with the corresponding chromosome value;

3. The winner class is obtained by summing all results for each class and selecting the highest score (formula 8);

$$Class_j = \sum_{i=1}^{9} w_j c_{ij},\ for\ \ j = \overline{1,16} \quad and \quad WinClass = \arg\max_{j=\overline{1,16}}(Class_j) \tag{8}$$

where w_j represents the value of the chromosome for the j^{th} class position (called weight), c_{ij} represents the value computed by the i^{th} classifier for the j^{th} class position (called confidence degree) and $Class_j$ represents the value computed for the class from the j^{th} position.

4. The winner class (*WinClass*) will be compared with the real class proposed by Reuters and if the classes are identically we consider that the document was correctly classified;
5. After processing all documents the fitness value is the accuracy obtained on the whole testing set.

The best chromosome is that with the highest fitness. For building a population we have used 100 chromosomes and the algorithm was applied for 1000 generations.

As selection operator for choosing the chromosome from the current population to be used for the next population we have used two methods: Roulette method and Gaussian method. For the Gaussian method we have used the following formula:

$$Gauss(c) = e^{-\frac{1}{2}\frac{(fitness(c)-m)^2}{2\sigma^2}} \tag{9}$$

where c is the current chromosome, *fitness(c)* is the result obtained for the corresponding chromosome c, m represents the average and in our case is equal to 1 and σ is the standard deviation (here we have used a value equal with 0.5).

For creating the new population we have used all 3 genetic operators thus: 30% for new population is created using the selection operator (selecting the best chromosome - elitism), the rest o the population is created by using the mutation operator in 40% and crossover operator in 30%. After applying this operators the condition $w_1 > w_2 > ... w_{16}$ is respected. Thus, for crossover operator we search after a cut point (i) for which the condition $w_i^{first-parent} > w_{i+1}^{second\_parent}$ is valid. For mutation operator, after selecting randomly the mutation point (i) the new value is selected randomly in the interval $w_i \in (w_{i-1}, w_{i+1})$.

5 EXPERIMENTAL FRAMEWORKS

The Dataset

Our experiments were performed on the Reuters-2000 collection [13], which has 984 Mb of newspapers articles in a compressed format. The collection includes a total of 806,791 documents, with news stories published by Reuters Press covering the period from 20.07.1996 through 19.07.1997. The articles have 9822391 paragraphs and contain 11522874 sentences and 310033 distinct root words. Documents are pre-classified according to 3 categories: by the Region (366 regions) the article refers to, by Industry Codes (870 industry codes) and by Topics proposed by Reuters (126 topics, 23 of them contain no articles). Due to the huge dimensionality of the database we will present here results obtained using a subset of data. From all documents we selected the

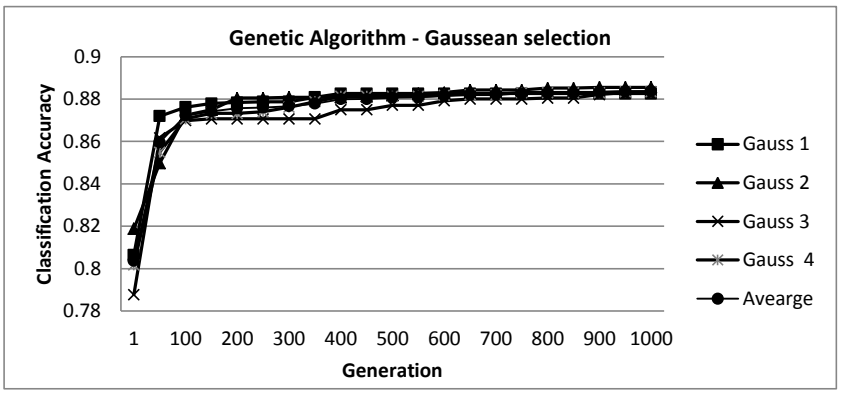

Fig.6.1 Classification accuracy - Gaussian method for selecting the best chromosomes for new generation

documents for which the industry code value is equal to "System software". We obtained 7083 files that are represented using 19038 features and 68 topics. We have represented a document as a vector of words, after applying a stop-word filter (from a standard set of 510 stop-words) and extracting the word stem [1]. From these 68 topics we have eliminated those topics that are poorly or excessively represented. Thus we eliminated those topics that contain less than 1% documents from all 7083 documents in the entire set. We have also eliminated topics that contain more than 99% samples from the entire set, as being excessively represented. After doing so we have obtained 24 different topics and 7053 documents, that were split randomly in a training set (4702 samples) and a testing set (2351 samples). In the feature extraction phase we take into consideration both the article and the title of the article. In the feature selection phase we have selected only 1306 features for each vector.

6 EXPERIMENTAL RESULTS

In [11] were presented first time the results obtained using static (pre-determined) weights values. The best classification accuracy obtained was 87.20% (i.e. 301 incorrectly classified documents

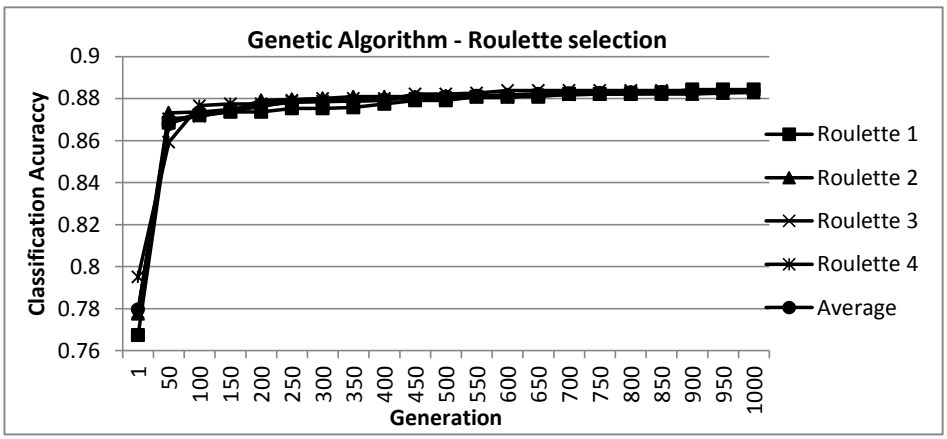

Fig. 6.2 Classification accuracy with Roulette method for selecting the best chromosome for new generation

from a number of 2351 documents). These results were obtained with a model of meta-classifier called "M-05W" that has weighting values that linearly decrease from 12 with a step of 0.5.

In the meta-classifier with genetic algorithm, for each chromosome we compute the fitness function using the training dataset. After selecting the best chromosome in this manner, we compute the fitness function obtained only by this chromosome using the testing dataset and in the figures only the values computed on the testing dataset are presented. Therefore, sometimes, the evolution of the best chromosome in the presented figures is not always ascending.

Because we start with a randomly generated population, and the obtained results depend of the starting points, we make four successively runs for the same method. Here we present the output for each method and also the average value.

In figure 6.1 we present the classification accuracy obtained on the testing dataset, when using the genetic algorithm with Gaussian method for selecting the chromosomes. The average accuracy obtained is 88.37%. Thus we obtained an average growth of 1.17% for the classification accuracy comparing with the case of the static values of weights presented in [11].

In case of using genetic algorithm with the Roulette method for selecting the chromosomes in the new population we have obtained an average classification accuracy of 88.36%, with only 1.16% greater the in M-SUM method. The results are presented in figure 6.2.

The best accuracy obtained by us in all four performed tests was obtained using Gaussian method for chromosome selection where the maximum accuracy value was 88.55%.

7 Conclusions and Further Work

In this article we presented a non-adaptive meta-classifier used for classifying text documents. This meta-classifier uses the outputs of eight independent SVM classifiers and a Naive Bayes classifier. The output of each classifier is a vector of values, where each position represents the confidence given by the classifier that the current document belongs to the corresponding class. The meta-classifier developed in this article uses a genetic algorithm for calculating the best values that could be used to weight the outputs of each classifier so that the final classification accuracy to be improved.

Since we started for the genetic algorithm with random initial weights we conducted four separate runs. As the average results compared with results obtained when classifiers outputs were weighted with pre-defined values [11] we have obtained an improvement of 1.17%. As classification accuracy, the best value obtained is 88.55% in case of using Gaussian method for selection of chromosomes for the new population.

In the further, an interesting natural extension of our work may be an adaptive and intelligent meta-classifier that uses a neural network for choosing the classifier that will be used in classifying the current document.

8 Acknowledgment

This work was partially supported by CNCSIS-UEFISCSU, project number PN II-RU code PD_670/2010.

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OpenAIRE, a model for access to scientific resources

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Abstract: Open Access Infrastructure for Research in Europe – OpenAIRE is a project that follows the European Open Access Policies, as set out by the **ERC Scientific Council Guidelines for Open Access** and the **Open Access pilot** launched by the European Commission. The project is building a Helpdesk system established at European level and also an electronic infrastructure for the researchers to use and contribute to. OpenAIRE is the project that makes Open Access paradigm a tangible European effort to open up the research output to anyone interested in getting up to date information in a particular field. For the two important components mentioned, OpenAIRE is to be considered a model for access to scientific resources.

Keywords: ERC, Open Access, OA, infrastructure, scientific resources, OpenAIRE

Open Access Infrastructure for Research in Europe

OpenAIRE (Open Access Infrastructure for Research in Europe) is a three-year project funded under the European Commission's 7th Framework project, started work on implementation of Open Access to pan-European scale. This ambitious effort unites 38 partners from 27 European countries.

OpenAIRE's main objective is to support Open Access Pilot[1] launched by the European Commission in August 2008. This open access pilot, aimed at a rate of 20% of FP7 budget, employs researchers in seven thematic areas (health, energy, environment, information and communications technology, research infrastructures, socio-economic sciences and humanities and science in society) in submitting their research publications in an institutional or disciplinary repository with open access to the whole world makes available the full text. OpenAIRE build basic structures for researchers to comply with the pilot through a system of European assistance to build infrastructure OpenAIRE electronic portal for electronic deposits and to explore scientific data management services, together with five disciplinary communities.

Consortium project incorporates the best existing expertise and access deposit infrastructures opened in Europe and establish a support structure based on a distributed network of offices covering all Member States support the European Union plus Norway. The consortium partners have been identified for each country, as in Luxembourg who provided support for developing and

[1] http://ec.europa.eu/research/science-society/document_library/pdf_06/open-access-pilot_en.pdf

implementing strategies and services for open access that have been accepted in the international community since 2003 with the launch of the Berlin Declaration[2].

A faceted evolution

There are many information channels to be exploited for a scholar to stay abreast with the latest discoveries in his field. Yet time and again there are moments when access barriers act as inhibitors for obtaining an enlarged view. One of these access barriers would be increasing difficulties for the libraries or any information-intensive organisations to cover all scientific production not to mention the costs involved in doing so.

Here the principle of Open Access proves to be effective in dissemination of scientific output as well as insuring an infrastructure able to preserve and further build upon.

European Union has started to take interest in how open dissemination channel develop when DG-Research commissioned the *Study on the economic and technical evolution of the scientific publication markets in Europe*[3] published in early January 2006 followed by a public consultation. In Recommendation A1. Guarantee public access to publicly-funded research results shortly after publication, the study pushed for two courses of actions: *(i) Establish a European policy mandating published articles arising from EC funded research to be available after a given time period in open access archives, and (ii) Explore with Member States and with European research and academic associations whether and how such policies and open repositories could be implemented.*

The same year but in December came the final report on *Scientific publication: policy on open access* of the European Research Advisory Board – EURAB. Here is an important recommendation for the European Commission as a funding body. *EURAB recommends that the Commission should consider mandating all researchers funded under FP7 to lodge their publications resulting from EC-funded research in an open access repository as soon as possible after publication, to be made openly accessible within 6 months at the latest.* This moment is important as the wording translated into the wording of the **Special Clause 39**[4]:

In addition to Article II.30.4, beneficiaries shall deposit an electronic copy of the published version or the final manuscript accepted for publication of a scientific publication relating to foreground published before or after the final report in an institutional or subject-based repository at the moment of publication.

Beneficiaries are required to make their best efforts to ensure that this electronic copy becomes freely and electronically available to anyone through this repository:

- immediately if the scientific publication is published "open access", i.e. if an electronic version is also available free of charge via the publisher, or

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[2] http://www.zim.mpg.de/openaccess-berlin/berlin_declaration.pdf

[3] http://ec.europa.eu/research/science-society/pdf/scientific-publication-study_en.pdf

[4] Commission Decision on the adoption and a modification of special clauses applicable to the model grant agreement adopted on 10 April 2007 in the context of the implementation of the Seventh Framework Programmes of the European Community (2007-2013) and the European Atomic Energy Community (2007-2011), and to the model grant agreement for 'frontier' research actions and to the Marie Curie model grant agreements adopted on 16 April 2007 in the context of the implementation of the Seventh Framework Programme of the European Community (2007-2013)

- within [X[5]] months of publication.

In 2007 European Commission made a Communication *on scientific information in the digital age: access, dissemination and preservation*[6] {SEC(2007)181} in which Open Access is recognised as an important trend and in the main arguments it is said that *can increase the impact of scientific research and innovation through improved access to and rapid dissemination of research results*.

Later on by the end on 2007 the European Council recognised *the strategic importance for Europe's scientific development of current initiatives to develop sustainable models for open access to scientific information* and underlines *the importance of scientific output resulting from publicly funded research being available on the Internet at no cost to the reader under economically viable circumstances, including delayed open access*. Also here is an important invitation to the European Commission to *experiment with open access to scientific data and publications resulting from projects funded by the EU Research Framework Programmes in order to assess the appropriateness of adopting specific contractual requirements*. In fact this step to which ERC Scientific Council Guidelines for Open Access conclusions were added started the process that led to the Special Clause 39.

Special Clause 39 adopted on 20th of August 2008 (Commission Decision – C (2008) 4408 final) applies to all new FP7 grant agreements signed after 20 August 2008 in the specific research areas being applicable during project and after project end. And so the European Commission launched the Open Access Pilot in FP7. The pilot covers approximately 20% of the Commission's FP7 research programme budget, and will run until the end of FP7. In the leafletproduced there is a very important question put: where to deposit?

The answer is that *researchers should deposit final articles or manuscripts into the institutional repository of the research institution with which they are affiliated. If this is not possible, they should identify an appropriate subject based/thematic repository. The Commission plans to provide a special repository for articles that can be stored neither in institutional nor in subject-based/thematic repositories.*

OpenAIRE will offer "a special repository for articles that can be stored neither in institutional nor in subject-based/thematic repositories"[7], while it will also prepare the way for similar functionality on primary and derived scientific data. This is a continuation of the DRIVER path of offering any form of scientific output and the original research data t*o establish the successful interoperation of both data network and knowledge repositories as integral parts of the E-infrastructure for research and education in Europe*[8].

OpenAIRE will focus on peer-reviewed publications in the seven disciplines highlighted in the Open Access pilot (energy, environment, health, cognitive systems / interaction / robotics, e-infrastructures, science in society, and socio-economic sciences / humanities) and on research datasets in a subset of them (environment, health, cognitive systems / interaction / robotics, and socio-economic sciences / humanities).

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[5]The number *x* will be 6 months in the thematic areas "Health", "Energy", "Environment (including Climate Change)", and "Information & communication technologies" (Challenge 2) and the activity "Research infrastructures" (e-infrastructures), and 12 months in the thematic area "Socio-economic Sciences and the Humanities" and the activity "Science in Society".

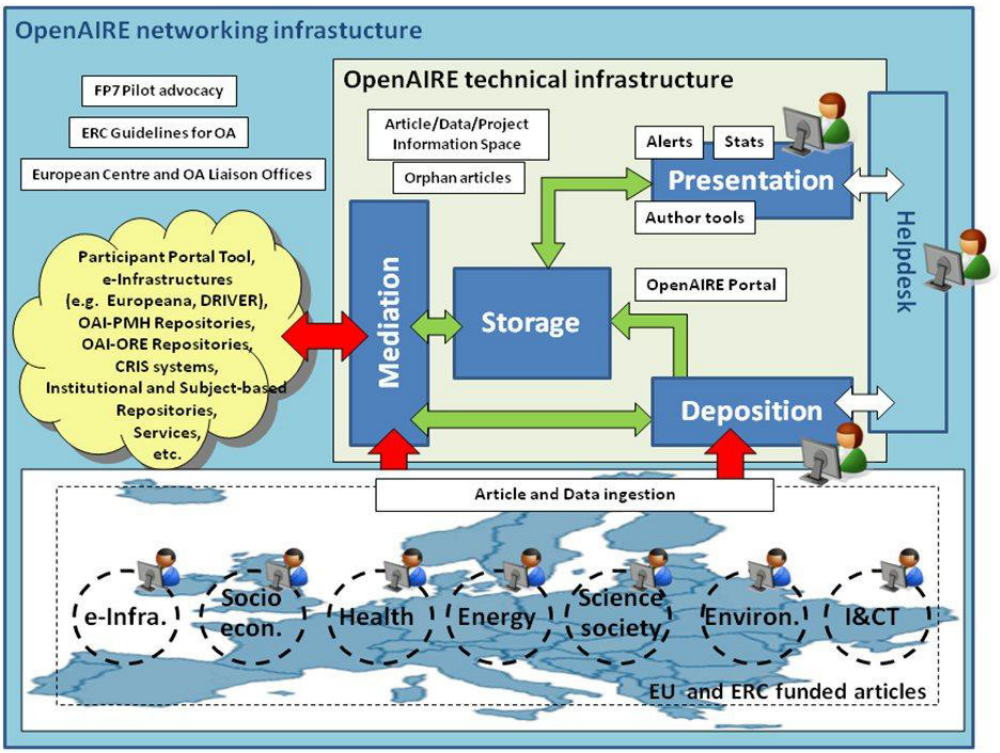
[6]http://ec.europa.eu/research/science-society/document_library/pdf_06/communication-022007_en.pdf

[7]ftp://ftp.cordis.europa.eu/pub/fp7/docs/open-access-pilot_en.pdf

[8]http://www.driver-repository.eu/Driver-About/About-DRIVER.html

The Infrastructure for knowledge sharing

OpenAIRE will offer "a special repository for articles that can be stored neither in institutional nor in subject-based/thematic repositories"[9], while it will also prepare the way for similar functionality on primary and derived scientific data. This is a continuation of the DRIVER path of offering any form of scientific output and the original research data to *establish the successful interoperation of both data network and knowledge repositories as integral parts of the E-infrastructure for research and education in Europe*[10].



1OpenAIRE system conceptual architecture

The infrastructure will host research output from FP7 Projects that include Open Access pilot support and the infrastructure needed for this will be built upon INVENIO solution from CERN. Also this repository will harvest also repositories from all over Europe. In order to "provide greater visibility to their work, potentially leading to more citations and greater research impact" there will be developed monitoring tools and statistic services.

Also the project develops a central portal www.openaire.eu acting as a gateway to all user-level services offered by the e-Infrastructure established. The services for the portal will accommodate several scenarios:

1. deposition of an article by the author;
2. signalling the main events of interest;
3. ensuring mechanisms for linking to other content sources and services;

[9] ftp://ftp.cordis.europa.eu/pub/fp7/docs/open-access-pilot_en.pdf

[10] http://www.driver-repository.eu/Driver-About/About-DRIVER.html

4. connect the research output with the project that originated it;
5. direct access to the European Helpdesk;
6. access to special services concerning visualisation and detailing of the scientific datasets associated to the research results;
7. offers statistical data to European Commission and also interested parties.

Conclusions

OpenAIRE through its dedicated portal and corresponding services provided and also through the European Helpdesk System is poised to offer dissemination, consultation, training for all the actors involved in scholarly communication arena.

Also another activity outreach is to balance the existing strategies for Open Access and doing so to highlight the advantages of the Open Access principles when it comes to dissemination and knowledge exchange far reaching implications.

In a nutshell OpenAIRE may be regarded as bringing together knowledge, experience and tools from local, national and European level to provide a portal and EU-wide support structure that combines the best available tools and practices to facilitate the depositing process, Open Access publishing and use.

What OpenAIRE promise is high visibility for the EC funded publications through the portal and associated services, an easy to deposit process and enhancing collaborative means with regards to establishing local and national OA policies and mandates. This perspective comes accompanied with a useful network of national offices needed to raise awareness and offer counseling to all interested parties.

Through OpenAIRE research activities new data models and functionalities will be experimented for the future extension of the technical infrastructure with applications for managing research data.

Besides the main objectives established by the project, the most valuable gain is that OpenAIRE will bridge as many as possible initiatives and liaise with the repository and Open Access activities in Europe. This also offers the opportunity to network in more comprehensive manner research efforts through efficient infrastructure mechanisms.

„HIGH PERFORMANCE" – CAREER MANAGEMENT

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A "good" start in any activity requires adequate persons. In order to start with their "right" foot these persons have to be motivated so they could become enthusiastic performers. It is very important, after employment and training to make these persons want to belong to the Group.
Training and re-training the staff members, selecting and using the mentors, setting a collaborative and cooperative working climate are necessary approaches in order to set up the foundation for the high performance.

Key words: Career, career planning, career management, career development, promotion system for managers, career evaluation, obstacles in managerial career.

Career management through the individual Management Committees:

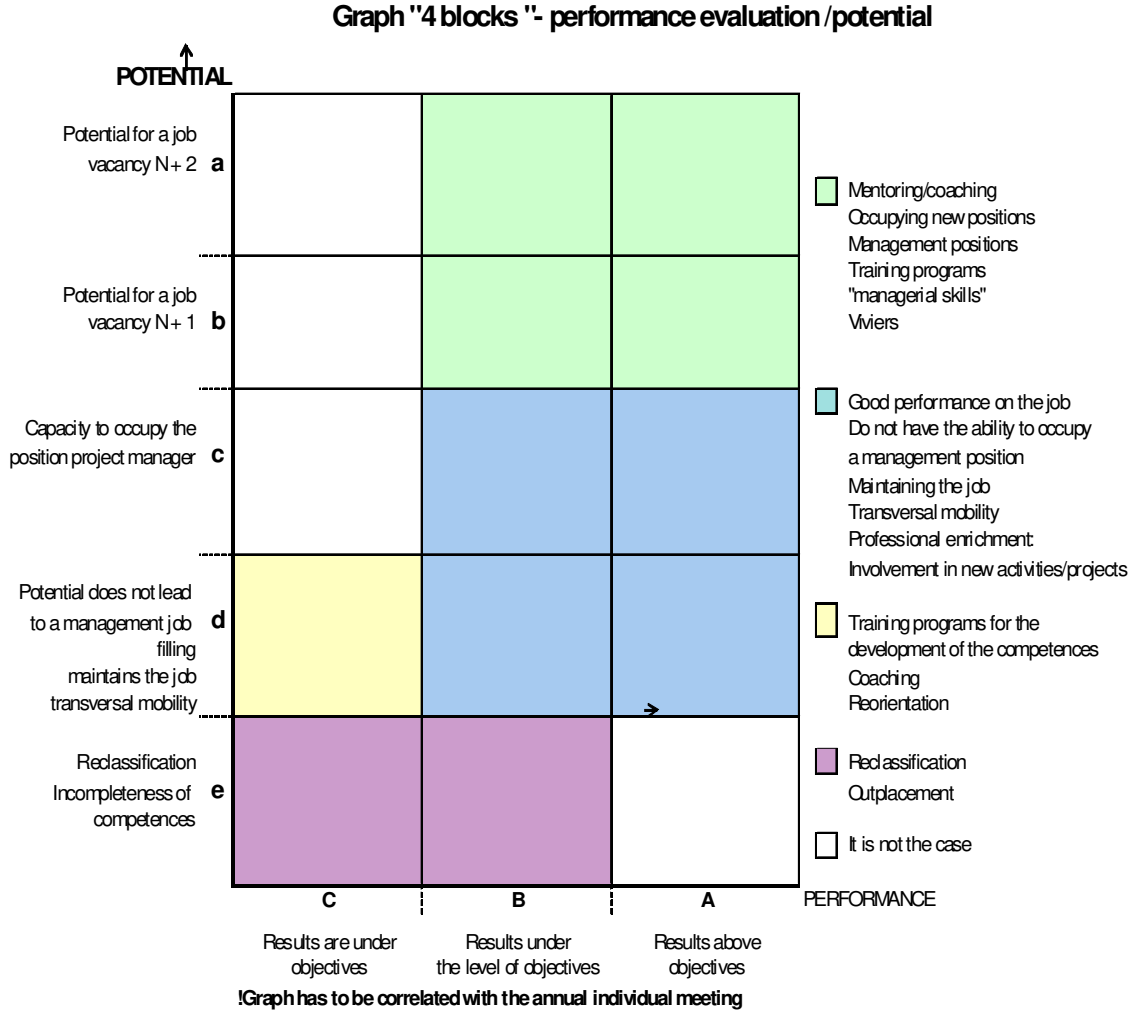
Classification;

- Career Committee country;
- Career Committee industrial;
- Career Committee inter-factories/ departments;
- Career Committee department/factory;
- Individual management committee.

All these committees have a professional evaluation form. According to the policies of the enterprise, every collaborator (white collars) has to be discussed at least once a year in an individual management committee (according to a standardized procedure).
The aimed population are the first level managers with a higher level of responsibility.

The objectives of such a committee are:
- Evaluation of the collaborators / potential (graphic"4 blocks"[1]);
- Proposing orientation and mobility plans (correlated with EI) ;
- Identifying viviers for management positions (e.g.: CUET);
- Discussing the situation of the collaborators who occupy the same position for more than 5 years;
- Discussing the collaborators who did not achieve their objectives and accompanying them.

[1] Labour instruction Dacia Group, Career Management, Explotation/ Management



Particularities of the "high performance" career management

The awareness of starting a new job inspires enthusiasm and fear at the same time; therefore one has to design a "Plan".
The most important elements are:

- Very clear explanations of what is going to be accomplished– the definition of the goal. It is a helpful element in focalising the efforts of managing high performances, representing and insurance against some wrong interpretations in the future;
- an honest and objective evaluation of the business environment– it is a very important element; the certainty of knowing each element and of its validity limits can also be related to the success or failure, as any other element;
- key critical objectives– taking too many tasks from the beginning of an activity represents a higher risk for a performing management. A special strategy in this situation is the identification and solving of 3-4 key objectives which are considered to be critical for the success of the new employee.
- Mentor – the most familiarized person with all functional elements of the company; the one who can offer a wide range; he will prepare the path for the new comer making the connection between him and the suitable persons/activities.

Successful practices in the debut at the beginning of a new activity:

- organisation, of some activities which will register a fast success rate, so that the new employee could have a good start, having also the possibility of getting significant successes in the first weeks of work;
- carrying out the job form, with clear standards for performance; a well conceived description which should be focused on expected results and on their measuring systems;
- providing the employees who have higher positions with the necessary time to learn, study, plan the activity before taking major responsibilities;
- trying to overcome the resentments of the employees with seniority who think they are not granted the proper attention. Any company has to be prepared to fight against these manifestations and to minimize the impact/obstacles;
- providing the necessary support to the new employee and avoiding the subtle confrontation with the internal decisions.

The ability to train:

In order to gain the desired results the training process has to be planned and systematic. The development of training is carried out in four stages:

- Conditioning, or determining the trained person to accept what he or she is being taught, before starting the activity (what he will learn, what he needs this training). Knowing the situation than the person can learn faster and understand better;
- Communication, the trained person cannot copy his ”mentor” in detail; an activity can be learned only through close observation. Therefore one has to: describe what is going to be discussed; to exemplify those activities step by step; to make the employee execute the operation and to explain the accomplishment method step by step; if the trained person does not accomplish to adapt to the requested requirements, that person should repeat the training.
- Managing the activity, after the training the employee should be left to carry out the tasks by himself, to practice what he learned, even in he made some mistakes....he has to be checked at regular intervals;
- Conclusions, because there is the tendency to modify what has been learned, the conclusions have to be stated; these can be positive or less positive. Some stages/procedures may be eliminated and the people might not be aware of the negative modifications.

The training is carried out most of the times by a supervisor but it would be better if this training was carried out by more persons, experts in certain fields. These persons are chosen according to the persons who are going to be trained. An efficient instructor is more than a person who knows how to do his job. He has to fulfil some factors which are necessary for the completion of a training process.

This person has to have:

- Personal characteristics, patience, empathy and flexibility;
- Knowing the training techniques in order to develop the abilities; the instructors also need to take up some training courses;
- A positive attitude related to work and company; a personal dissatisfaction towards the company can be send as a virus to the trainee;

Advices for the success of a mentor:

- Knowing the work, review of the fundamental elements, remembering the encountered problems and the ways to approach this; to be prepared for any questions regarding the responsibility field;
- Knowing the company, one has to overcome the inherent of not being familiarized and the favoured policies;

- Knowing the"student", offering him time to gain work experience, goals, ambitions and personal preoccupations. Observing the personality and the way of expressing;
- Learning how to teach, collecting indications about the best teaching methods from the well-known instructors;
- Learning to know how to teach others, any new teaching technique is very important;
- Learning how to be patient, this is the key of professional success;
- Being tactful, well intended, courteous, amiable but decided in his attitude towards the "student";
- Having to fear in taking risks, sending challenging tasks to the trainee even if it is impossible for him to accomplish them;
- Knowing the joy of the personal success and of the trainee sharing this with the others;
- Encouraging the trainee to become a mentor.

Training is a unique action process; the information leave from the trainer to the trainee but the instructor or trainer also needs to develop some skills.
The difference between training and learning is that training involves a single sense of acquiring knowledge; learning involves memorizing information and at the same time knowing the ways of identifying the inherent risks.

Career planning involves[2]:

- Identifying the qualities, the motivations, th interests and the future plans of the employees;
- Identifying the agreeable/accepted options of the employees in order to achieve the goals of the company and the personal objectives of the employee;
- Evaluation of the completion of the tasks in the trial period; redirecting these when the results are under expectations.

The individual has to identify his aspirations and abilities/competences and through evaluation and counselling he has to understand what are the necessary efforts or training and development requirements.

The organisation has to identify the needs and opportunities, to plan the staff and to provide its employees with the necessary information for the development of the career, which means that the organisational needs cannot be achieved if the individual needs are neglected.[3].
Career planning is a key process in career management because it uses the data and information regarding the organisational needs and opportunities as well as the potential or performances of the employees which are transposed in career development projects.
This is not only an essential component of career management but also a basic process for the systematic staff planning and development[4], which allows for a better understanding of its mobility as well as for the avoidance of the inappropriate decisions from this field of activity, as much as the dynamic character of the staff problems complicate the career planning problem.

The planning may be divided in:

- Voluntary planning for the employees who want promotion or a new orientation of their activity;
- Imposed planning, necessary in order to overcome some crisis situations. This has to take into account some of the following aspects[5]:

[2] D. Torrington, D. T. Hall, Personnel Management : HRM, Action Pretince-Hall International, London, 1995, p.437/ A. Nicolescu, Human Resource Management, 1111, pg 363.
[3] A.Manolescu, Human Resource Management, Economica Publishing House, Bucharest, 2007, pg.386 ;
[4] P.Rudiger, Personal Management, Wiesbaden Gabler, 1990, p 280
[5] A.Manolescu, Managementul RH - M.Armstrong, Personel Management Practice, Koga Page, London, 1991, 485

- The members of the organisation have to be recognised and treated as individuals with unique needs, aspirations and skills;
- The individuals are more motivated in an organisation which fulfils their aspirations;
- The individuals can adapt, change and discover new action directions if they are shown the opportunities or if they are encouraged and guided.

The planning career models where the whole personnel of an organisation can be included[6] are:

- The chance and luck model– in order to get to the right position, it relies only on chance and blind luck. In order for this model to be used, the individual has to persevering and he must not lose any opportunity in order to be in the right place at the right time; this model is followed by a high number of individuals and has a high rate of disillusion.
- The model"organisation knows the best" – the employee moves from one position to another, according to the needs of the organisation. The model can be accepted by some young people who depend on adults from all points of view; but for an adult the effects are generally negative and have consequences on a psychically due to the perception of the employee that the organisation abuses the employee. If the employee is expected from the organisation to find him or to identify and name him, he has to know the strategic orientation and to move to that direction.
- The self-oriented model– leads to performance and satisfaction. The employees set their own path for their career development using the assistance offered by the organisation. The employees are the main responsible for the implementation, control and evaluation of their career.

Discussions regarding the career development strategies

For the ambitious persons willing to promote in an organisation, any promotion opportunity represents a motivating factor.

Stating the promotion offer from the beginning of the career can improve the performance of the organisation.

The career development plan has a double role: it offers a chance for promotion to the best employees and it ensures the requirements of the company to expand and adapt to the market requirements.[7]

Conclusions:

Career management is a function of the human resource department[8] where there is or there should be a specialized staff in supporting the career planning or development through counselling or in helping the employees avoid uncertainties or dissatisfactions or middle age crises which may appear when those employees see that the development of their career does not correspond to their own aspirations.

The managerial theory and practice in the field of human resource point out the fact that the development of new values and requirements in the field of career has led to a higher range of individual options and the employees are showing a certain restraint regarding their career planning by others. This means that the employees pass through the filter of their own personality, adopting the right aspects which suit them best.

[6] R.L.Mathis et. al, Human Resource Management, Economica Publishing House, Bucharest, 1997, p141

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[8] A.Manolescu, Human Resource Management, Economica Publishing House, Bucharest, 2007, p394 - L.A.Klatt, R.G.Murdick, F.E.Schuster, p383

According to the current managerial practice, career planning is carried out with the help of a complex and systematic appraisal/ and re-evaluation process; this is a process where the individuals identify the stages in order to achieve the goals of their career[9].
The organisation has to be aware that the set objectives cannot be achieved without satisfying the individual/personal needs of the employees; so the accomplishment of a detailed plan is imposed where the evolution of the professional career of each employee has to be presented.

In other words, career planning promoted a freedom of individual choice which can be accomplished by designing some open systems where the employees can choose among different types of jobs or different training programs in order to achieve the objectives of their career.

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The Importance of Teaching Efficacy for Information Literacy Instructors

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Today there is a growing and shared recognition that librarians must be actively engaged in information literacy instruction. This century is marked as the most challenging time ever to be an instruction librarian. The body of information that a good instruction librarian must learn and apply has never been more plentiful. Today IL instructors must have a wide variety of knowledge and skills in their repertoire.They must have a thorough understanding of what they are teaching (domain knowledge & skills). They must also know how to teach and they must be aware of individual differences in the way people learn (pedagogical knowledge and skills), Furthermore, instruction librarians must feel confident and competent in using these knowledge and skills (information literacy and pedagogy) in order to employ them effectively.

Teaching efficacy is defined as teachers' belief in their ability to affect student performance and achievement, and has a strong relationship with teaching effectiveness. Teaching efficacy, as a motivational construct, affects; the amount of effort a teacher will expand in teaching situation; persistence shown in the face of obstacles, such as a student in a failure situation; and resilience shown in the face of adverse situations.

Teachers' sense of teaching efficacy may influence several significant educational variables, such as student achievement, student motivation, students' own sense of efficacy, teacher's' teaching behaviours, teachers' enthusiasm, teachers' commitment, teachers' attitude toward innovation, and teachers' classroom management strategies.

Teaching efficacy is believed to be one of the most significant social-psychological factors influencing teachers' work. No other teacher characteristic has demonstrated such a consistent relationship to student achievement. Teaching efficacy is subject specific; a teacher may have a high level of personal efficaciousness in the science domain (disiplinary efficacy), yet feel inefficacious in pedagogical issues (instructional efficacy)

In this paper, findings of a research which was conducted on 66 IL instructors from university libraries in Turkey will be presented. The level and strength of the instructors' teaching efficacy beliefs (both disiplinary efficacy and instructional efficacy) will be explored.

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The Impact of Cloud Computing in Information literacy

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Abstract- As the awareness among the people is increasing the people is becoming keener to learn diverse fields of knowledge every day. This requirement can only be fulfilled with the assistance of vast database network. With the growing popularity of this network, people in everyday life get accustomed to access necessary information through the Internet. Meanwhile, as people continue to improve information literacy network, the network services also put forward higher requirements. As the internet has to handle large amount of data every day, the face of such heavy data processing: how to process the data quickly and easily that provides the users with personalized web services becomes a great challenge. It is in the context of this demand, that caused the birth of a new network computing model called Cloud Computing. It is based on distributed computing, user-centered: the data being present in the sea of clouds, you can get at anytime, anywhere to a safe and convenient way to access it or share it with others. Cloud Computing leads the internet into each data storage center and data computing center. Its introduction will enable users to move the desktop as the core, the core to Web-use Network Storage services. Cloud computing led us into a new era of information.

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