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The European Library: Modular Extensions for Mediating Online Resources

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Integrating and Strengthening the European Research Area

Deliverable 1.3

Research Activities of the European National Libraries in the Domain of Cultural heritage and ICT

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EXECUTIVE SUMMARY

National libraries are vital players in implementing the vision of the European digital library, which would integrate the wealth of knowledge and cultural assets preserved in memory institutions of Europe and make them accessible, attractive and useful for citizens. The year 2005 was notable for strategic documents that began to develop the concept of the European digital library into a strategic plan for action. The documents concerned were the communication *i2010: Digital Libraries*, announced by the European Commission in September 2005 and the Dynamic Action Plan that extended the Lund Action Plan in November 2005.

TEL-ME-MOR (*The European Library: Modular Extensions for Mediating Online Resources*), a Support Action activity funded by the European Commission's Information Society Technology Programme, contributes to achieving the vision of the European digital library by expanding digital access to European cultural heritage resources to include assets of the new EU member states held in their national libraries. The project also aims to encourage participation of the national libraries of new member states in research and development initiatives. For this purpose an analysis of the current state-of-the-art in research and development in the national libraries of the EU new member states was performed. It resulted in the report *Analysis of Research Activities and Requirements of the National Libraries of the New EU Member States* (Deliverable 1.1).

The current report, *Research Activities of the European National Libraries in the Domain of Cultural Heritage and ICT* is an extension of the earlier work. It covers all European libraries as agreed during the expert evaluation of TEL-ME-MOR project that took place in 12 October 2005 in Tallinn. The main aim of this report is **to evaluate the current state-of-the-art in the domain of cultural heritage and ICT in the European national libraries**. The report puts a focus on research and development (hereafter referred to as R&D) as a crucial activity that shapes the potential of an institution to develop and apply innovative cultural heritage and ICT solutions and become competitive in the European arena.

The report stresses the need for a constant dialogue on the vision of the European Digital Library between European policy-makers, national authorities and national libraries. It addresses the demand to raise awareness of all these stakeholders about the latest trends of the European policies in the domain of cultural heritage and technologies. For this purpose, the report additionally provides an analysis of the general trends in the European cultural heritage policies in ANNEX A.

In order to analyze current R&D trends, a survey of the European national libraries was performed. As agreed at the meeting of the Conference of European National Librarians in September 2005 in Luxemburg, all national library CENL members were asked to fill in the questionnaire which is a modified and shortened version of the initial one, used in the first survey. The questionnaire is divided into several thematic sections: R&D framework, underlying technologies, preservation and access, and digital libraries.

45 questionnaires were distributed by email to all the CENL members. 39 respondents returned completed forms. For the purposes of a comparative analysis, all respondents were divided into three groups: 1) EU-15 countries + EEA+CH that covered the EU old member states, the countries of the European Economic Area, and Switzerland; 2) EU-10 countries that covered the new member states; 3)

Non-European Union countries that included countries of the Eastern and Southern Europe that are not members of the European Union.

Based on the analysis of questionnaire, conclusions and recommendations were formulated. The authors emphasize that this research was the first attempt to comprehend the potential, achievements and challenges in cultural heritage and ICT R&D in the national libraries of Europe and provide a panorama of the state of the art. It cannot therefore provide a precise benchmarking tool but rather establishes general trends in cultural heritage and ICT R&D. Perceived imperfections in the present work will, we hope, serve as a stimulus for further investigation of this area.

Many problems discovered at the first stage of the research when only the national libraries of the ten new member states were investigated are relevant for most national libraries of Europe. It is disturbing that there are still several national libraries which due to the absence of a favourable political environment and financial support are not able to take part in the European R&D initiatives. Still the main challenge is recognition of the importance and the nature of R&D in the national libraries.

Recommendation 1. Libraries and other memory institutions should be acknowledged as R&D players on the European level. The European Commission should take an active role in convincing national governments to adopt this approach by making this issue visible on the European level.

Variety of approaches, standards and often absence of exploitable solutions are the criteria which distinguish the application of technologies from routine automation activity into dynamic R&D initiatives aimed at developing quality and sustainable cultural heritage systems and tools. Management of R&D input, output and overall quality should become a routine practice for national libraries R&D operators.

Recommendation 2. Transparent and sound methodology for monitoring the quality of the R&D activities of the national libraries (and other memory institutions) and registering achievements should be established on the European level and promoted in all member states. The framework for such recommendations may be created by exploiting existing methodologies and guidelines (namely so-called Frascati and Canberra manuals aimed at evaluating RD activities).

Empirical research revealed that there are no gaps between the EU-15 members, EEA states and the New Member States. In certain areas New Member States and Non-EU countries outperform the group of EU-15, EEA countries and Switzerland and may be considered the European centres of competence in certain areas of expertise.

Recommendation 3. Existing networks of competence should consider and exploit knowledge and experience available in the national libraries of the EU New Member States. These networks should be enriched by the NMS NL where appropriate.

Despite availability of adequate technological infrastructure, management of born-digital heritage as well as digitization are not performed on a mainstream basis in all European national libraries. The position is unsatisfactory.

Recommendation 4. It is necessary to draw attention to the absence of a critical mass of digitized cultural heritage content on the European level with then aim to persuade the national authorities and libraries to take appropriate actions.

Insufficient quantities of digitized and born-digital materials may be closely related to insufficient experience and absence of proved solutions of handling digital content, which may produce digital preservation problems in future. Additionally, many national libraries are struggling with challenges in analogue preservation that may postpone any significant achievements in digital access and preservation far into the future.

Recommendation 5. There is a need to promote existing and new R&D initiatives and networks aimed at increasing knowledge and providing new skills and appropriate training on modern strategies for access and digital preservation in professional communities of memory institutions.

Further evolution of access solutions in the digital environment is inhibited by a split between libraries and their users. User-oriented solutions are only slowly finding their way into library practice. As a consequence many national libraries lag behind modern developments in major access tools as portals and digital libraries. There is an urgent need to develop a culture of collaboration with the users in the national libraries.

Recommendation 6. User-centred solutions, collaboration with users and raising their awareness about potential benefits of digital cultural heritage services should become important criteria for evaluating and funding R&D initiatives.

INTRODUCTORY NOTES

National libraries are vital players in implementing the vision of the European digital library, which would integrate the wealth of knowledge and cultural assets preserved in memory institutions of Europe and make them accessible, attractive and useful for citizens. The concept of the European digital library is rooted in early initiatives aimed at creation of a shared library space dating back to the Fourth Framework Programme and a wide range of strategic documents defining libraries as a part of the European information infrastructure. It also builds on the concept of a shared European cultural area as envisioned by Maastricht agreement. The year 2005 was notable for strategic documents that began to develop the concept of the European digital library into a strategic plan for action. The documents concerned were the communication *i2010: Digital Libraries*, announced by the European Commission in September 2005 and the Dynamic Action Plan that extended the Lund Action Plan in November 2005.

Building on results of the TEL (*The European Library*) project, TEL-ME-MOR (*The European Library: Modular Extensions for Mediating Online Resources*), a Support Action activity funded by the European Commission's Information Society Technology Programme, contributes to achieving the vision of the European digital library by expanding digital access to European cultural heritage resources to include assets of the New EU Member States held in their national libraries. In order to clarify the current state-of-the-art in research and development in the national libraries of the EU New Member States as well as to define their potential to participate in the European research, the report *Analysis of Research Activities and Requirements of the National Libraries of the New EU Member States* (Deliverable 1.1) was prepared under the *Workpackage 1: Analysis of research requirements* of TEL-ME-MOR project.

The current report, *Research Activities of the European National Libraries in the Domain of Cultural Heritage and ICT* is an extension of the report mentioned above. The extension of the previous research to cover all European libraries was agreed during the expert evaluation of TEL-ME-MOR project that took place in 12 October 2005 in Tallinn.

This report addresses the intention of the European Commission to pay special attention to “*the work of the national and deposit libraries, predominant actors and committed to contributing to a European digital library*” (*i2010: Digital Libraries*, p. 10) and aims to inform further strategic solutions by providing a panoramic view of the current situation in the national libraries concerning the application of technologies for management of cultural heritage. Thus, the main aim of this report is **to evaluate the current state of the art in the domain of cultural heritage and ICT in the European national libraries** (hereafter referred to as “NL”). The report puts a focus on research and development (hereafter referred to as R&D) as a crucial activity that shapes the potential of an institution to develop and apply innovative cultural heritage and ICT solutions and become competitive in the European arena. A survey of all European national libraries (CENL members) was undertaken using a shortened version of the questionnaire initially used in Deliverable 1.1. The main aims of this report are:

1. To map current achievements, challenges and tendencies in cultural heritage and ICT R&D in European national libraries.
2. To provide a comparative view and identify potential for R&D and fruitful collaboration between Members of the EU, including EU-15 and EU-10 members as well as Non-European Union countries.

3. To provide recommendations for further strategic action on the European, national and institutional levels.

Responding to the current discussion on the European Digital Library the report provides an analysis of the general trends in the European cultural heritage policies in ANNEX A.

The authors of the report believe that it would be useful for all of the several audiences that are responsible for strategic management of cultural heritage in the digital environment. These include 1) the European Commission officers being in charge for both policy development and practical implementation strategies for the European Digital Library; 2) policy-makers of European countries – including the EU Member and Non-Member states which intend to or are involved in European collaboration in the cultural heritage and ICT domain; 3) managers of the European national libraries, responsible for development of library research and development strategies, and 4) managers and partners in European research projects, engaged in formulating visions and strategies in the field of cultural heritage and technologies (e.g. MINERVA).

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I. METHODOLOGY OF THE SURVEY “Analysis of Research Activities of the European National Libraries”

This survey is an extension of the study *Analysis of Research Activities and Requirements of the National Libraries of the New EU Member States* (the report is available http://www.telmemor.net/docs/WP1_FinalReport_July2005.pdf) performed by the National Library of the Czech Republic. By extending the survey to all CENL members TEL-ME-MOR aims to create a European panorama of cultural heritage and ICT activities, achievements and challenges in the national libraries, putting particular attention to research and development.

As agreed at the meeting of the Conference of European National Librarians in September 2005 in Luxemburg, all national library CENL members were asked to fill in the questionnaire which is a modified and shortened version of the initial one, used in the first survey. The questionnaire is divided into several thematic sections: RD framework, underlying technologies, preservation and access, and digital libraries (see Figure 2).

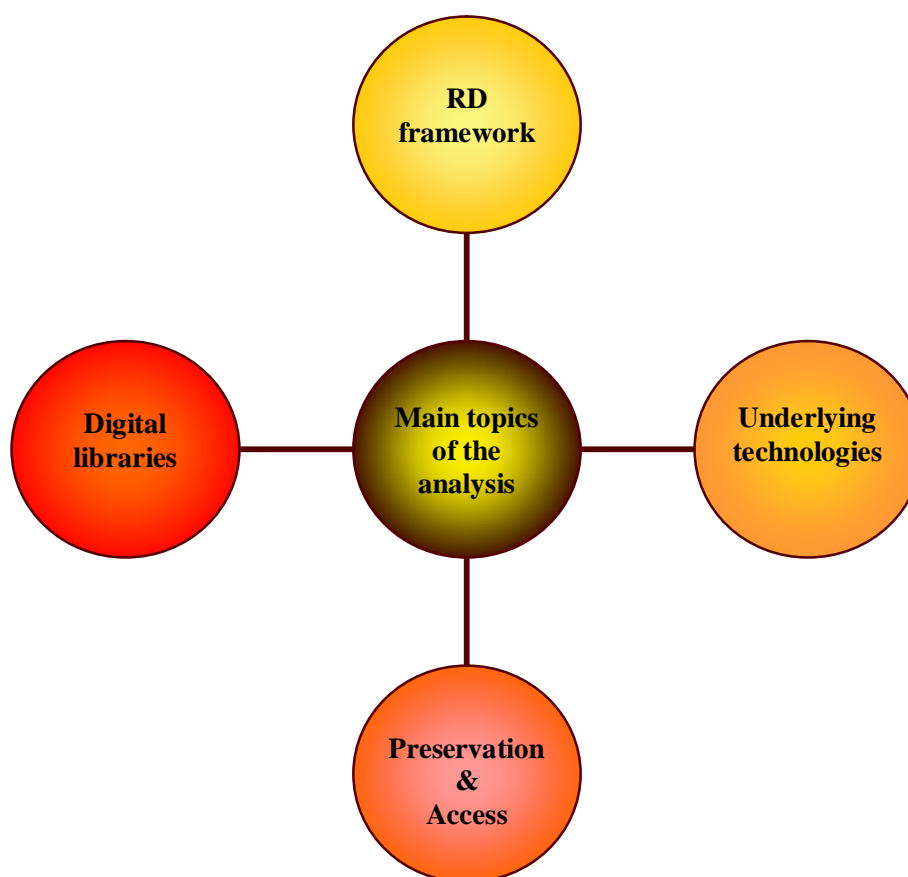


Figure 2. Conceptual model of the survey

R&D framework. The national libraries are important players both on the national and international R&D levels. Research and development activities are crucial for the national libraries in order to fulfil their main functions that consist in the preservation of and access to cultural heritage; thus, they enable them to act in some sense as national methodological centres of librarianship in some cases. The

success of the research and development work in national libraries and on the international level partly depends on national R&D policies and mechanisms, including confirmation of national libraries as participants in national R&D programmes and provision of a management framework (e.g., allocation of financial support, provision of measures for accountability, etc.). However, recognition of national libraries as R&D players mostly evolves from the inner situation in the national libraries themselves: their R&D visions and priorities, involvement in R&D projects, intellectual capital for R&D, etc. In the questionnaire, both the external and the internal R&D contexts of national libraries are addressed in **Part A: General state of the art and research and development framework**. Part A is divided into following subsections:

- *R&D involvement of the library* – concerns the basic data related to R&D implementation in national libraries: R&D operators, programmes, mechanisms for tracking R&D results.
- *Basic R&D data* – addresses the inner R&D capacities of national libraries, including human resources, and R&D expenditure.
- *International R&D co-operation* – it aims to show the experience based on participation in international and especially European R&D initiatives (including Framework programmes, EUREKA, eContent, etc.). Though eContent, eTen etc. are not defined as research programmes at European level, they often contain applied research, and for this reason these initiatives were listed as research programmes.
- *R&D strategy* – refers to long-term R&D commitment in national libraries and areas of R&D priorities.

Underlying technologies. The technological potential of an institution is one of the most important prerequisites for its successful participation in important technology-based R&D projects, especially as to possibilities of getting long-term financial support for selected R&D activities.

In the area of communication technologies, shared approaches are more and more important especially those based on high-speed network co-operation of various digital resources. Not only uniform access to on-line catalogues of big libraries through information gateways like The European Library, but also distributed storage of larger pieces of data are expected in this field. A digital library application will serve users with its metadata descriptions to select the binary data files he/she would like to consult for his/her research. These data files – usually images, but also audio or video files – can be stored in different data banks located physically on larger distances. However, their co-operation with the digital library access tools should be fast so that the user can have the impression of seamless articulation of related pieces of data, while his impression should be so that he is working as if accessing one homogeneous system. There are two ways how to achieve such seamless data flow:

1. high bandwidth of Internet and local connectivity;
2. optimization and decrease of the volume of accessed data files.

Libraries usually need to pay attention to both, while specialists from high-speed research networks prefer the solution based almost uniquely on fast connectivity. Nevertheless, the connectivity will not seem to be fast enough for some time in the future, as we always share the capacity of the network with other simultaneously working users. Thus, the speed of 200 Mbit/s means an opportunity to download 25 MB of data per second for one user, while for 700 users this means in average only 35 KB per user per second. Such user will then need 20 seconds to download a 700 KB image. **Part B. Underlying information and communication technologies** thus addresses the technological potential of national

libraries in accordance with contemporary requirements for connectivity, level of computerization, and spectrum of information systems, operated by national libraries.

Preservation and access. Access to and preservation of cultural heritage are essential functions of national libraries that accumulate and represent cultural identity and knowledge of the nations to the rest of the world. Novel approaches to management of cultural assets offered by the digital environment result into new preservation and access practices, methods, and issues in the national libraries. **Part C. Preservation and Access** is organized according to the practices and issues related to safeguarding of and providing access to particular type of objects:

- Written and printed materials;
- Analogue audio/film/video resources;
- Born-digital resources (including both on-line and off-line material).

The respondents were asked to provide data about current preservation issues and RD activities in the library aiming to cope with particular preservation problems (e.g., technological obsolescence, storage, etc.) both in the traditional analogue and digital environments.

The other subset of questions in this part considered access issues in the national libraries. The respondents were asked to provide information about availability of portals as a mean of integrated access to the digital materials. Taking into account ambiguity of the concept of “portal” and diverse opinions in the national libraries, for the purposes of the survey a portal was defined as a one-stop point of access to heterogeneous resources, including data on available content, portal software, and RD activities in the field. The report considers the vision of portal provided in the *Recommendations for the National Libraries regarding the creation of European Information Portals* (see <http://www.europeanlibrary.org>). Ongoing debates and diverse opinions about the concept of portal encourage highlighting the main points that were referred to while analyzing the answers to the questionnaire. Differently from the gateway, which aggregates links to external resources, the portal is a tool that provides a single interface and access point to enable simultaneous search in electronic resources both in the library hosting a portal and in other systems in other libraries or institutions in the country or worldwide. Services and functionalities of portals are usually enabled by specific software tools. Important feature of portals is its ability to address needs of diverse user groups.

Critical mass of digitized content is crucial for further development of information packages and services for users thus making the information resources contextualized, attractive and useful. Therefore, the respondents were asked to provide statistical information about digitization in order to evaluate the volume (number of pages, files digitized) and spectrum (in terms of document type and age) of these activities in the national libraries. Availability of materials on-line was considered an important step to increasing accessibility of the digitized cultural heritage.

The last **Part D, Digital libraries** is particularly topical in the age when the library is gradually transforming into a digital institution. The concept of digital libraries is complex and multilayered, including such dimensions as policy, services and architecture. However, this survey is intended to clarify the basic information about digital libraries, which otherwise might become a topic for a separate questionnaire and would require an in-depth analysis of digital libraries available on the web. Therefore, for the needs of the current survey digital library is defined as an *organized searchable collection of materials (digitized or/and born-digital) available for usage on-line*. Despite the

narrowness of the proposed concept, the authors find it appropriate for the work in hand, considering the nature of tasks posed by the research (to define a threshold separating a digital library from other ICT-based applications as electronic catalogues, bibliographic databases etc.) and limited opportunities for analysis of digital libraries (national languages, no background of digital library initiatives and related decisions etc.).

In order to provide quality services libraries need to exploit standards that regulate quality of user-computer interaction in the digital environment and regularly evaluate quality of services. Therefore, the respondents were asked if they apply standards or international recommendations on usability, accessibility of the digital libraries and if they employ library service quality standards. For the purposes of research authors developed several working definitions of these concepts. In the context of the digital environment and library work, **accessibility** refers to ability of users to approach/reach/use digital services regardless of diversity in their physical, cognitive etc. abilities (Iwarsson, Ståhl, 2003). While accessibility usually determines if a service is approachable or available for use, usability explores the nature of user interaction with digital tools supporting the service. **Usability** is defined as ability of a user to reach his goals effectively, efficiently and satisfactorily exploiting a particular tool in specific context of use (Glosiene, Manzuch, 2004). There are global and European initiatives, referring not only to ICT that encourage implementation of usability and accessibility standards (e.g. The European concept for accessibility, World Wide Web Consortium initiatives, etc.). **Quality of library services** is an important indicator of library performance and refers to the 'totality of features and characteristics of a product or service that bear on the library's ability to satisfy stated or implied needs' (ISO 11620, Information and Documentation – Library Performance indicators; cf. Derfert-Wolf, Górski, and Marcinek, 2005).

II. FINDINGS OF THE SURVEY

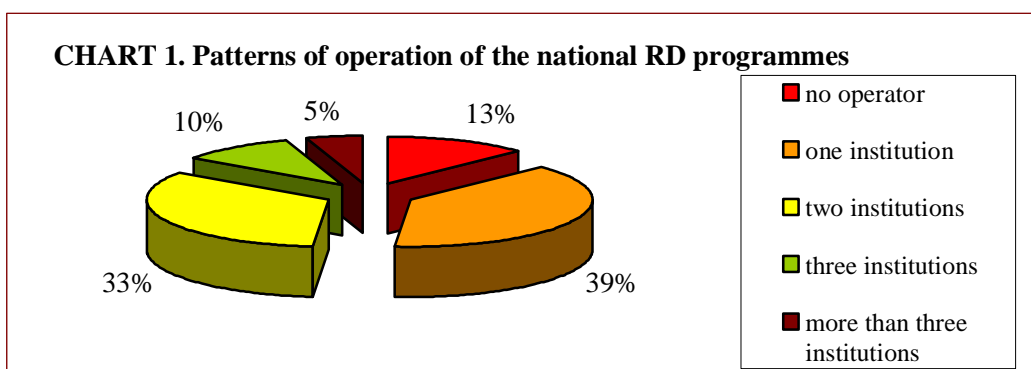
45 questionnaires (see the questionnaire form in ANNEX B) were distributed by email to all the CENL members. **39 respondents returned completed forms**; this is a rather high rate of return (87%) that makes the results valid. For the purposes of a comparative analysis, all respondents were divided into three groups:

- **EU-15 countries + EEA+CH** covered the EU old member states (Ireland, Greece, and Italy-Rome did not fill in the questionnaire), the countries of the European Economic Area (Iceland and Norway; Liechtenstein did not fill in the questionnaire), and Switzerland. This grouping was influenced by the similar political, legal, and economical environment in these countries, as well as the common patterns of behaviour and solutions applied in the national libraries. The total number of responses in this group was **16 completed questionnaires**.
- **EU-10 countries** covered the New Member States that joined the EU in 2004. The total number of responses in this group was **10 completed questionnaires**.
- **Non-European Union countries** included countries of the Eastern and Southern Europe that are not members of the European Union (from them, Romania, Ukraine, and Azerbaijan did not fill in the questionnaires). The total number of responses in this group was **13 completed questionnaires** (see the list of countries divided by groups in ANNEX C).

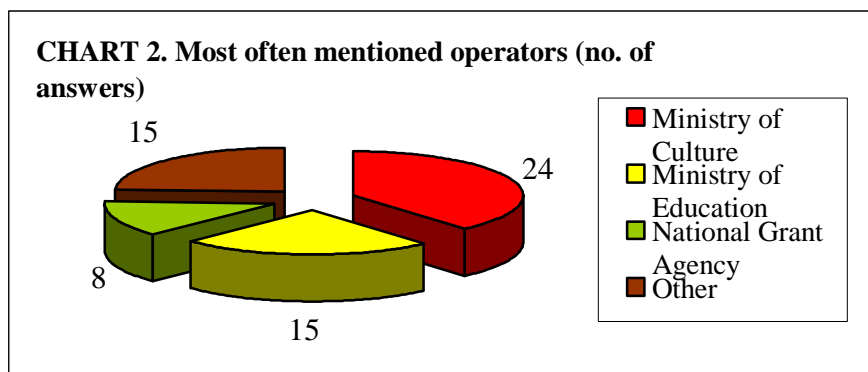
For convenience of display of charts the country names are abbreviated (see ANNEX D for the list of countries and abbreviations).

2.1 GENERAL STATE OF THE ART AND RESEARCH AND DEVELOPMENT FRAMEWORK

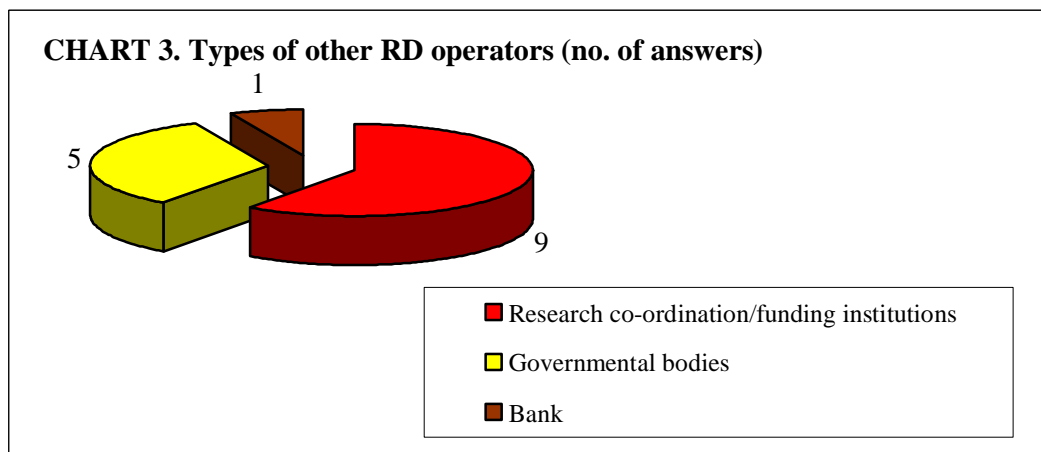
There are favourable conditions for R&D in NL in most European countries. 87 % of respondents indicated that national policies and instruments enable and support their R&D activities. In most countries the R&D of NLs is operated by governmental bodies, except 5 respondents (Bosnia and Herzegovina, Armenia, Malta, San Marino, and Vatican) who indicated no policy instruments for R&D and no operators (see CHART 1). Despite the fact that one institution for co-ordination of R&D programmes is still the most popular pattern, almost the same percentage of countries practice collaborative management of R&D activities in NLs. In most cases there are two institutions running R&D programmes in which the NL can participate, but there is a tendency for expansion of the number of the providers of R&D programmes – 15 % of respondents indicated three or more institutions involved in management of the national R&D programmes (see CHART 1).



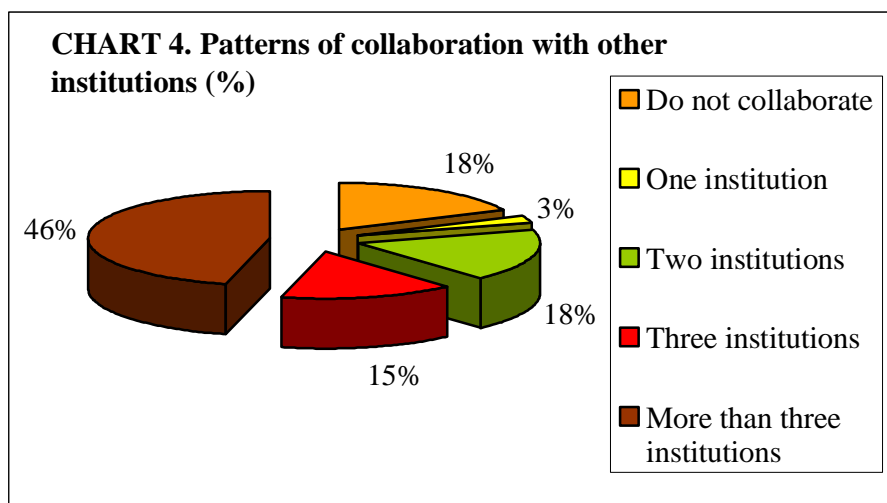
The majority of answers reveal that in the first line the NL is considered to be a cultural institution; therefore, the operator of R&D programmes most often mentioned is the Ministry of Culture (see CHART 2). The second place is held by the Ministry of Education. These institutions - offering R&D programmes in collaboration or separately - constitute a traditional model of management of R&D activities in NLs on the national level.



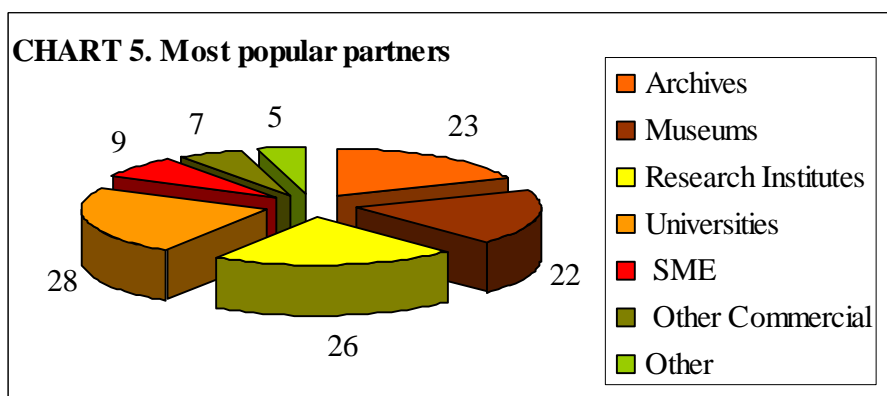
Besides the traditional players in R&D co-ordination, other bodies engaged in these activities were indicated by some respondents (15 or 38 % of respondents, see CHART 2). Most of these bodies are the institutions that perform research co-ordination or provide funding on the national level but in several cases they are commercial. Only one respondent mentioned a bank as another type of R&D operator (Sweden, see CHART 3).



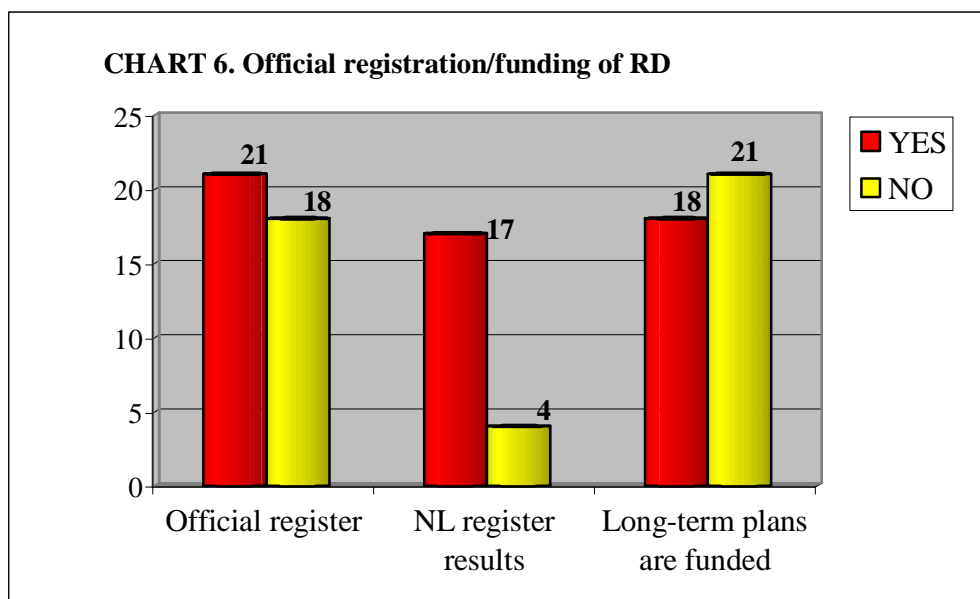
Most NLs are **highly collaborative institutions** and indicate experience of collaboration with diverse players in cultural heritage preservation and access. Most NLs practice collaboration with more than 3 types of different institutions and this seems to be the main trend. Other institutions mainly co-operate with three or two partners, except a number of NLs (15 %), which do not collaborate with partners from other institutions at all (see CHART 4). Only one respondent mentioned collaborating with only one institution.



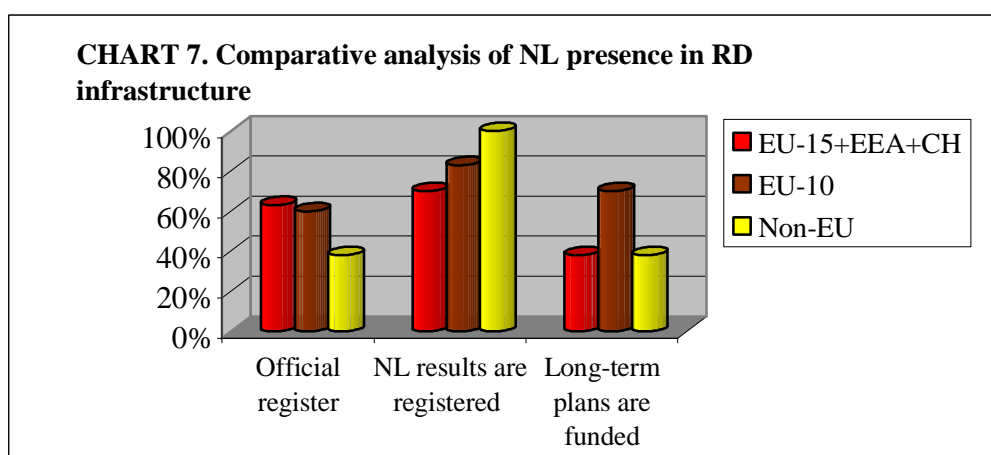
Most popular partners of NLs are universities; the second most popular score was assigned to research institutes. Archives and museums are also traditional partners of NLs. However, **NLs remain rather conservative in choosing partners** – co-operation rates with SMEs and other commercial enterprises are rather low (see CHART 5).



In more than half the countries that returned the questionnaires there is an official register for R&D results. NLs often add their results to official R&D registers, though the number of such NLs (17 NLs register their results in R&D databases, 44 %) is slightly lower than the number of registers in countries (21 countries have a register, 54 %). However, quite a big number of countries have no official register to track R&D activities at all (46 %, see CHART 6). The number of countries where long-term R&D plans are funded is slightly lower than the number of those where there is no funding for long-term plans. It may indicate that **support for long-term plans is not as popular as provision of funding** by the mechanism of R&D programmes. In some cases, this may be treated as a drawback considering the fact that some long-term R&D activities of NLs (that are of national significance) do not fit into temporal and thematic schemes of R&D programmes.

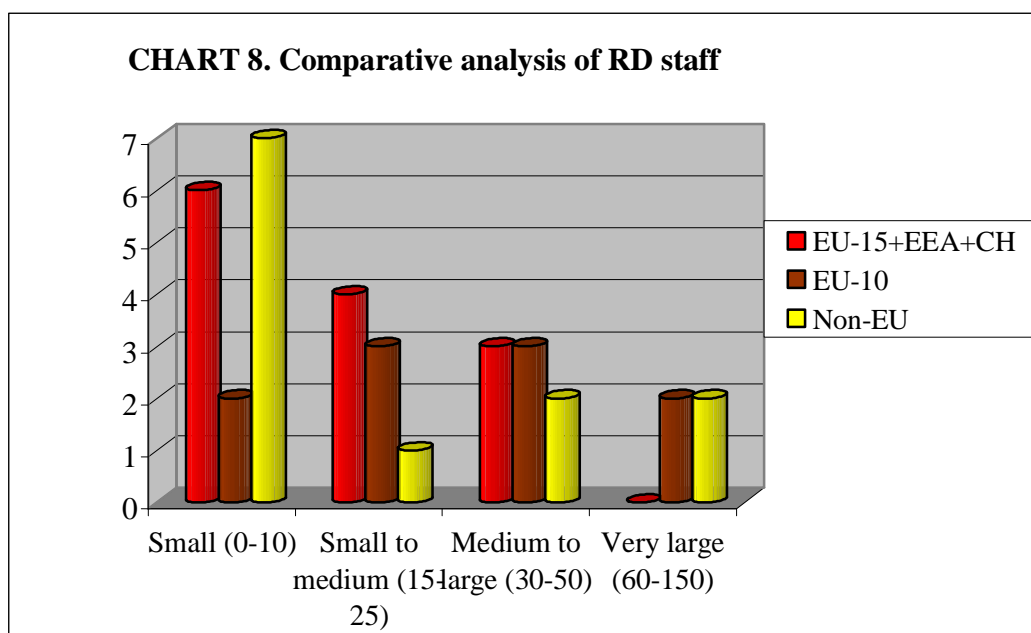


The acknowledgement of NLs as players in the **national R&D infrastructure seems to be a common concern in all countries**. The positive sign is that roughly half of the respondents indicated the availability of the national R&D systems and involvement in registration of R&D results, but still the same number of NLs are outside of the national R&D infrastructure, which, in many cases, is not sufficient (see CHART 7). **There is no difference between EU-10 and EU-15+EEA+CH in terms of general R&D infrastructures** (63% in EU-15+EEA+CH and 60% in EU-10 of existent RD registers cannot be treated as a significant difference). However, the data show that this does not guarantee NL participation in the process of enriching the variety of the national R&D results. The worst situation is in Non-EU countries, where there is a lack of general R&D infrastructure (only 38 % reported that an official register exists). However, as it is shown in CHART 7, the existing R&D infrastructure is better exploited in Non-EU countries. State support for long-term plans seems to be more a tradition in the New Member States (see CHART 7) than in EU-15+EEA+CH and Non-EU where fewer long-term plans are funded.



15 respondents of the 17 NLs which register R&D results have provided the number of results registered (Russia (Saint-Petersburg) and Spain did not indicate the number of results). The leaders are the NL of the Czech Republic (128) and Bulgaria (99). However, the **rating of the libraries according to the registered results is not fully objective because there are different methodologies of tracking R&D results** in various countries. Thus, the NL of Bulgaria commented that their registered results include dissertations and published researches, while in other cases there may be only research projects.

16 respondents (except Bulgaria and Russia (Saint-Petersburg)) of 18 with funded long-term plans provided numbers. Among the leaders according to the number of long-term plans supported by the state are Latvia and Hungary. The average of funded plans is about 3.



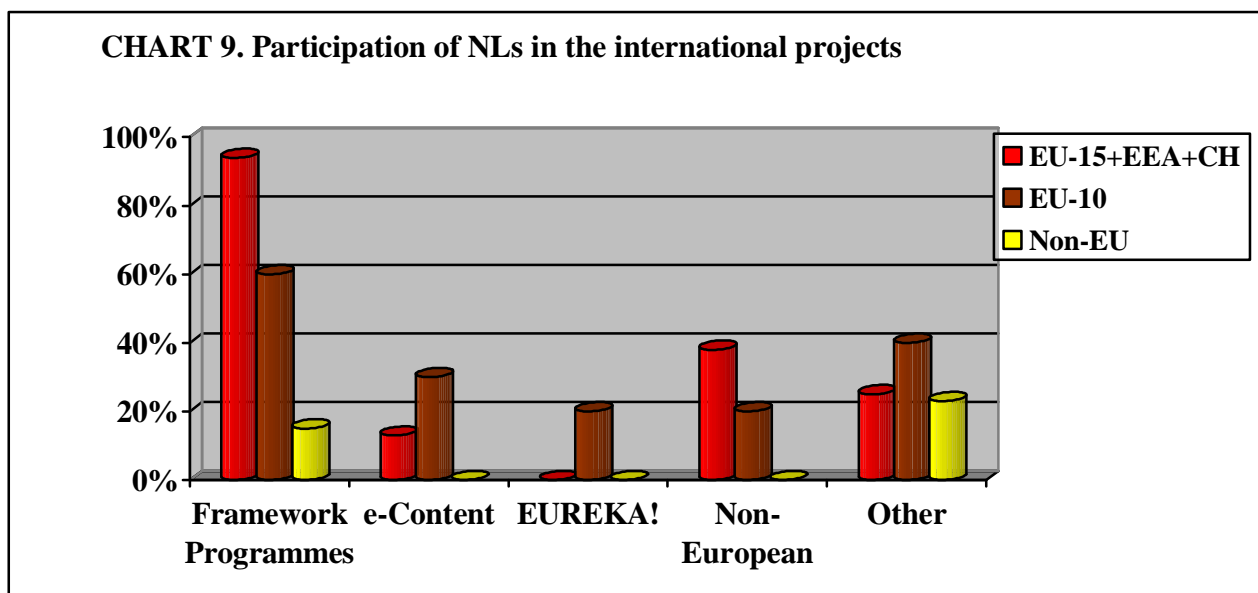
36 respondents provided data on staff involved in R&D activities. The largest number of staff performing R&D is indicated by the Russian NLs (Moscow - 150 and Saint-Petersburg – 100) as well as Poland – 100 members of personnel. Several NLs have no research staff at all due to limited institutional capacities; these are Bosnia and Herzegovina, Cyprus, San Marino, and Malta. When excluding NLs with extreme number of staff (both the highest and the lowest) the **average number of R&D personnel is 20**. The comments reveal a tendency in some NL to decrease the number of R&D staff and outsource selected R&D services.

Patterns of expenditures/EUR	Zero to minimum		Low to medium		Medium to high		Highest	
	<i>Bosnia and Herzegovina</i>	0	<i>Switzerland</i>	20000	<i>Lithuania</i>	245000	Netherlands	1000000
	<i>Cyprus</i>	0	<i>Hungary</i>	25000	<i>Germany</i>	250000	Poland	1000000
	<i>Malta</i>	0	<i>Serbia</i>	30000	<i>Latvia</i>	288706	Sweden	1000000
	<i>San Marino</i>	0	<i>Slovakia</i>	65000	<i>Estonia</i>	342256	Czech Republic	1507130
	Albania	3000	France	90000	Russia (Moscow)	370000		
	Macedonia	5000	Portugal	91059	United Kingdom	400000		
			Croatia	100000				
			Armenia	101870	Iceland	500000		
			Slovenia	144000	Finland	600000		
		Russia (Saint-Petersburg)	161764	Denmark	800000			
		Austria	177869					

TABLE 1. Patterns of RD expenditures in NLs (2004, EUR)

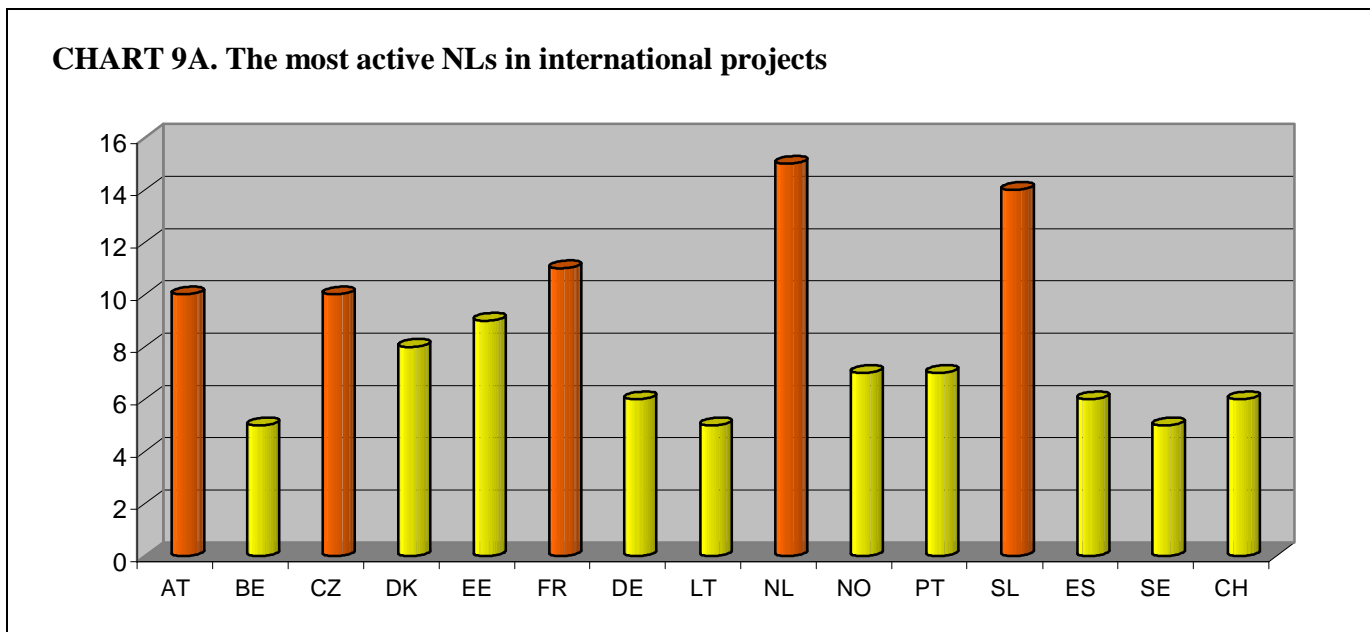
30 respondents provided data about their expenditures in 2004. Some respondents could not provide exact data because of impossibility to separate R&D expenditures from overall budgets. The data show two extremes – 0 expenses for R&D in Bosnia and Herzegovina, Cyprus, Malta, and San Marino; as well as minimum expenses in Albania (3,000 EUR) and Macedonia (5,000 EUR); and maximum expenses in Czech Republic (1,507,130 EUR) and high expenditure figures in the Netherlands (1,000,000 EUR), Poland (1,000,000 EUR), and Sweden (1,000,000). According to the money spent, all NLs fall into four groups representing **patterns of expenditures: 1) zero to minimum, 2) low to medium, 3) medium to high, and 4) the highest level of investments in RD** (see TABLE 3). The comparative analysis of the presence of EU-10, EU-15+EEA+CH, and Non-EU states was done. The data shows that there are no significant differences between EU-15+EEA+CH and EU-10, except the extreme situation in Cyprus and Malta. In other cases, **the New EU Member States show rather high financial commitment to R&D**. Non-EU countries exhibit a wide spectrum of spending on R&D ranging from 0 to 500,000 EUR.

All 39 respondents provided data about participation in international, EU and non-European R&D projects. In general, there is a high rate of participation in R&D projects; however, the involvement in non-European projects is significantly lower in comparison with the indicators related to the EU R&D projects. These answers reveal the **willingness of NLs to become visible on the international level and to collaborate with partners from other countries**.



This chart considers percentage of NLs participating in certain type of projects

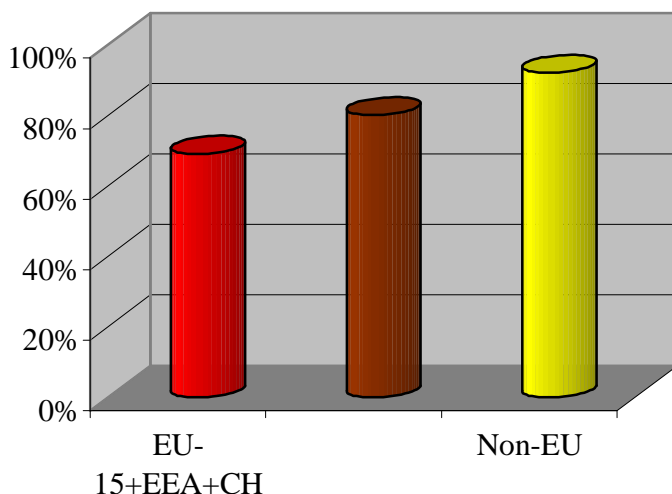
The comparative analysis reveals that EU-15+EEA+CH countries have in general the most experience of participation in some kinds of R&D projects analyzed. There is a **gap between EU-10 and EU-15+EEA+CH in the rates of participation in European Framework R&D**, but when analysing the data from individual libraries, in several cases, there are also high participation rates on EU-10 side (e.g. participation in e-Content, EUREKA! and other R&D initiatives; see CHART 9A and detailed information on participation of NLs in international projects in ANNEX E).



This chart shows only the NLs that have participated in 5 or more international projects.

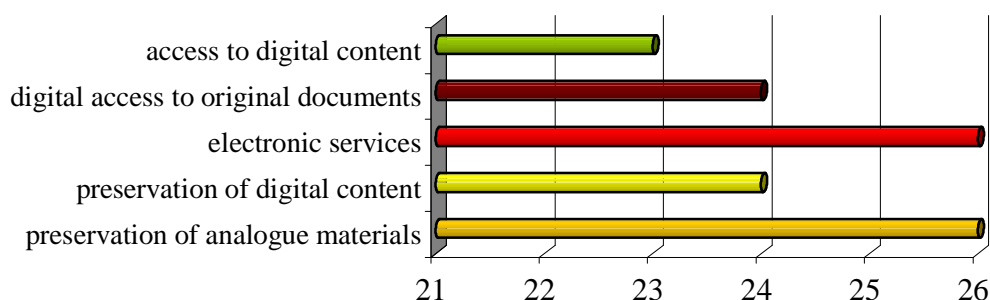
The comparative analysis confirms the general trend of decreasing interest to non-European projects in all NLs.

CHART 10. Long-term RD strategy in NL: comparative analysis (%)



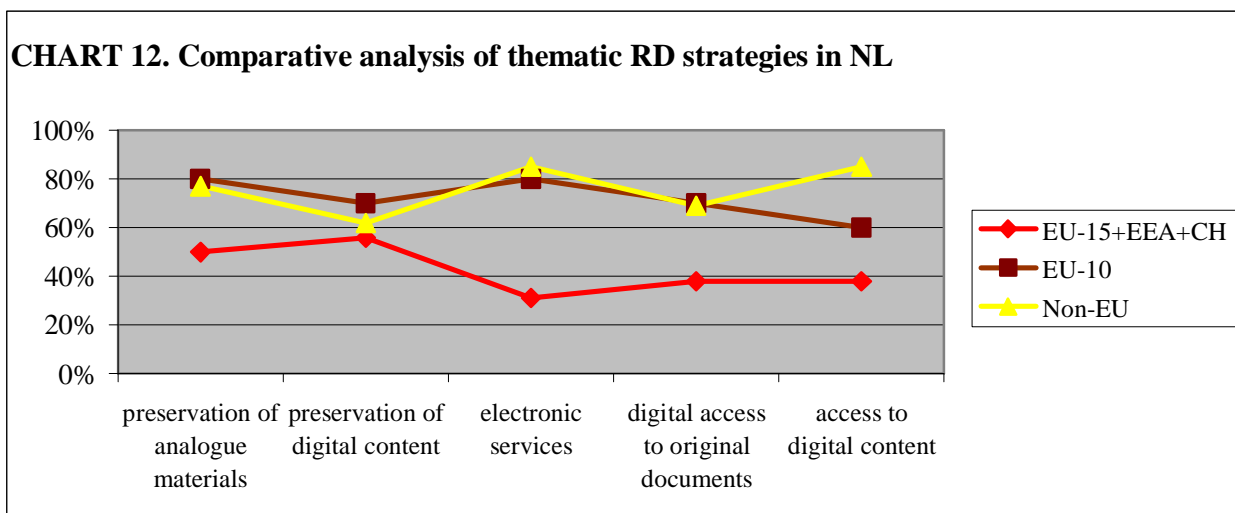
The majority of respondents (79%) reported having a long-term R&D strategy. From the comparative point of view there are no gaps between EU-15+EEA+CH, EU-10 Member States and Non-EU countries at this point. However, the notions of what strategy is may vary from country to country ranging just from an expression of interest to long-term commitment with documented statements or action plans for R&D in specific areas.

CHART 11. Thematic analysis of RD strategies in NL



The majority of NLs are interested in most of indicated areas and identified them as a part of long-term R&D strategies. However, the **most popular areas are electronic services** (84% of respondents) and **preservation of analogue materials** (84% of respondents). NLs continue their research in analogue preservation as traditional analogue carriers constitute the main part of their collections. However, NLs are concerned with the new ways of serving users in the electronic environment; therefore there is

interest in electronic services as well as in the digital access to original documents. NLs are increasingly involved in the management of digital content and they explore the preservation issue. The most untouched area is ways of providing access to digital content; however, it also found a place in NL R&D strategies.



The comparative analysis reveals that **EU-15+EEA+CH, EU-10 and non-EU countries have different views on formulating strategic priorities** in R&D. The Non-EU countries and EU-10 Member States show higher interest in all domains of R&D strategy, in particular electronic services, access to digital content, and preservation of analogue materials. In contrast to the non-European Union and EU-10 countries, EU-15+EEA+CH are not so active in - and are mostly not so concerned with - the preservation of digital content so much as they are in the preservation of analogue materials. The development of electronic services is of less interest to the EU-15 respondents. **The only field of common view is preservation of analogue materials** which occupies the second position on the scale of R&D priorities.

Conclusions:

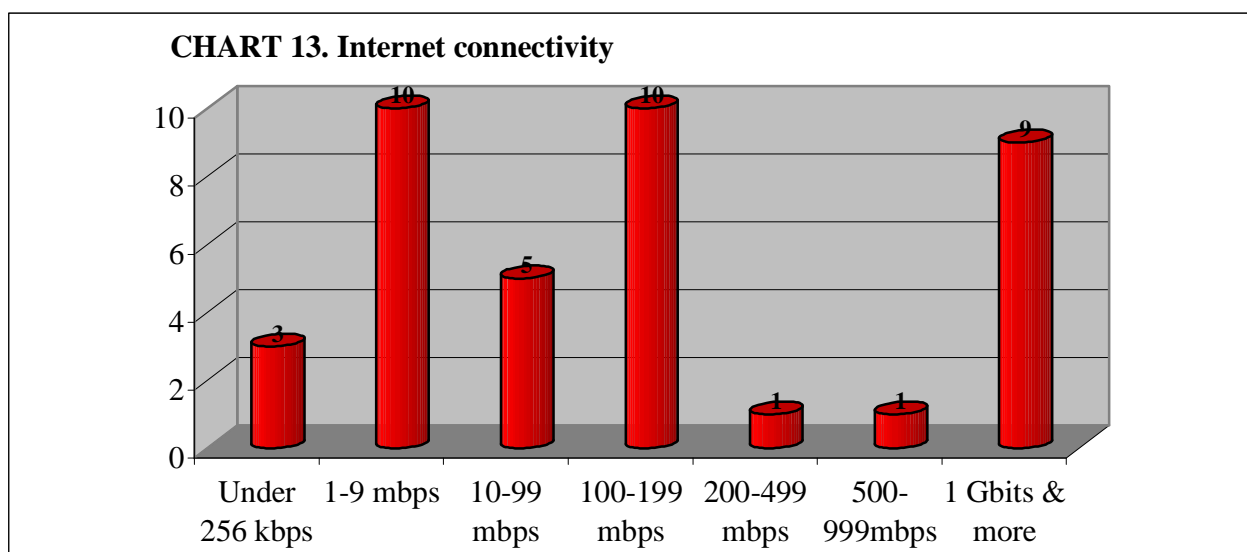
1. The network of operators, co-ordinating and funding R&D activities in NLs, seems to be expanding to include new players. This could be treated as a positive sign of making **different aspects of NLs visible and acknowledged on the national level**.
2. In spite of the high rate of collaboration with other institutions, **the spectrum of partners is rather narrow** and NLs mostly avoid commercial partners. In the context of wide networks of both players from public and commercial sector promoted by the European R&D it may be a serious drawback. A little experience of co-operation with business may indicate the absence of a co-operation culture in this domain.
3. **The registration of R&D results is still a problem in all countries** and EU-15+EEA+CH and EU-10 are in the same position. This problem occurs because of the lack of general infrastructure for tracking R&D activities. However, there is a positive trend of recognition of NLs as R&D players in those countries which have developed a general R&D infrastructure.

Still there are different views on the national level about quality management of R&D and methodology for it (which, for instance is quite clear in varying RD staff numbers) and there are diverse funding models. These factors limit the potential of comparative data analysis in this domain.

4. European and international R&D initiatives are favoured by NLs not only in EU member states but also in non-EU countries. It indicates that NLs are willing to participate in the sound research initiatives that have a wide impact. On the other hand, this intention may identify the **willingness of all NLs to become visible players in the international area.**
5. The strategic priorities of NLs coincide in general with the major European trends. However, from the comparative view, **there are differences in opinions of NLs as to the importance of R&D priorities.** In spite of the intensive development and implementation of technological innovations, the preservation of analogue materials is one of the major strategic R&D priorities in all NLs.

2.2 UNDERLYING INFORMATION AND COMMUNICATION TECHNOLOGIES

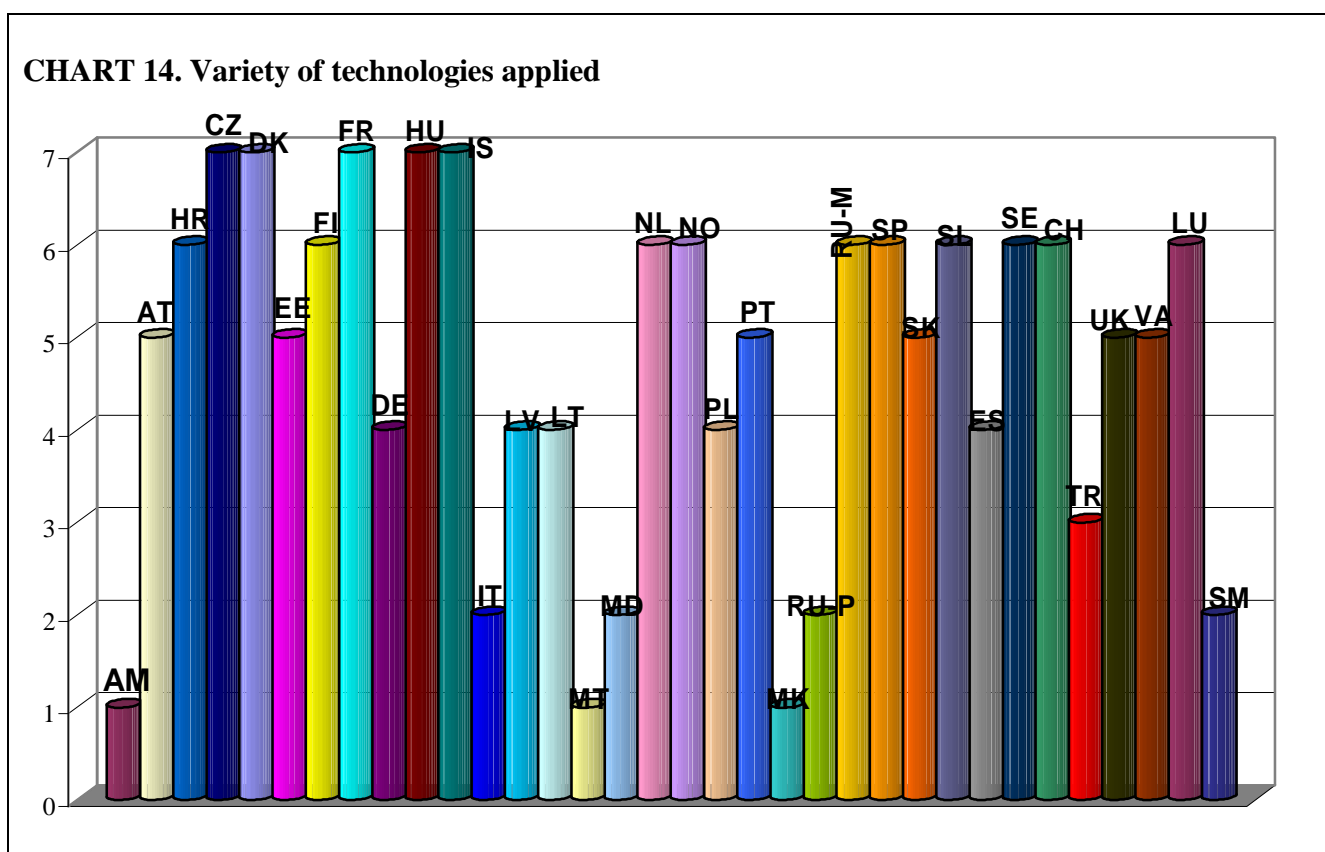
In this area, we were interested to find out how fast the Internet connectivity of the European national libraries is and which technologies – besides the usual automated library information system - they have been operating.



From the analysis undertaken and the particular libraries in the connectivity groups (see CHART 13), it may be said that the highest connectivity of 1 Gbit/s or more is available at 9 NLs, of which two are the new EU member states (CZ and HU) and two the non-EU members (Russia-Moscow and Serbia), while Cyprus has the speed in the bandwidth 500-999 mbps, and Austria in the bandwidth 200-499 mbps. At the other extreme, Albania, Armenia, and San Marino have a speed under 256 kbps, but speed in the bandwidth of 1-9 mbps is available at 10 NLs of which three are the old EU members (Belgium, Portugal, and Italy-Florence) and one is a new EU member state NL (Poland); speed in the bandwidth of 10-99 mbps is available in such well-known NL as GB, DE, CH, and LV.

Several old EU member state NLs do not have extraordinarily fast Internet connectivity, while the newcomers or outsiders may have the fastest one.

The technologies whose availability was investigated were the following: operation of a Union Catalogue, digitization production facilities, digital libraries, automated internal administration systems, mass preservation storage systems, web harvesting and archiving, sophisticated portals (a closer analysis has shown that they are less in number than declared), and other more complex technologies. We suppose that a greater variety requires more skilled people, larger R&D activities, and a better basis for further international co-operation.



Altogether, there were eight different technologies, from which the maximal availability achieved was 7 different technologies operated in one NL. These technologies encompassed union catalogue, digitization facilities, digital library applications, administration and mass storage systems, web harvesting and archiving technologies and search/retrieval gateways (see ANNEX B. Questionnaire form). From the five NLs with the maximum variety of technologies (see CHART 14), two are the old EU member states (DK and FR), two the new EU member states (CZ and HU), and Iceland. From the second group of 9 NLs with six different technologies, three are the old EU member states (FI, NL, and SE), one is a new EU member state (SL) and the rest – besides Norway and Switzerland – are the non-EU members. The greater part of the remaining NLs operate 5 or 4 various technologies.

Conclusions

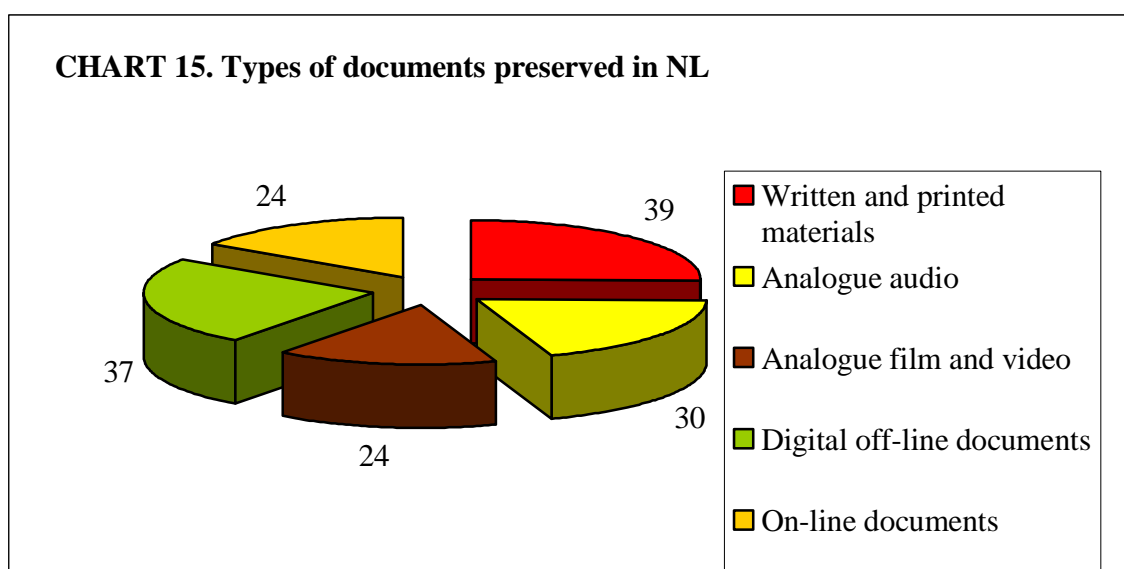
1. From the data analyzed, it is evident that **as to variety of operated technologies and possibility of fast Internet connectivity, Europe cannot be divided into EU and non-EU** and EU cannot be divided into old and new members. The technologies are here and they penetrate everywhere independently of any classification of countries into groups of less or more developed countries.

2. Combining the two parts of the analysis, it seems evident that **the variety of technologies matches mostly with fast Internet connectivity**, as it is the case of France, Czech Republic, Hungary, Finland, or the Netherlands. From the non-EU, South or Eastern Europe, the two leaders are surely Russia-Moscow and Serbia, being on the same level as the more-advanced above-mentioned EU members in this area.

2.3 PRESERVATION & ACCESS

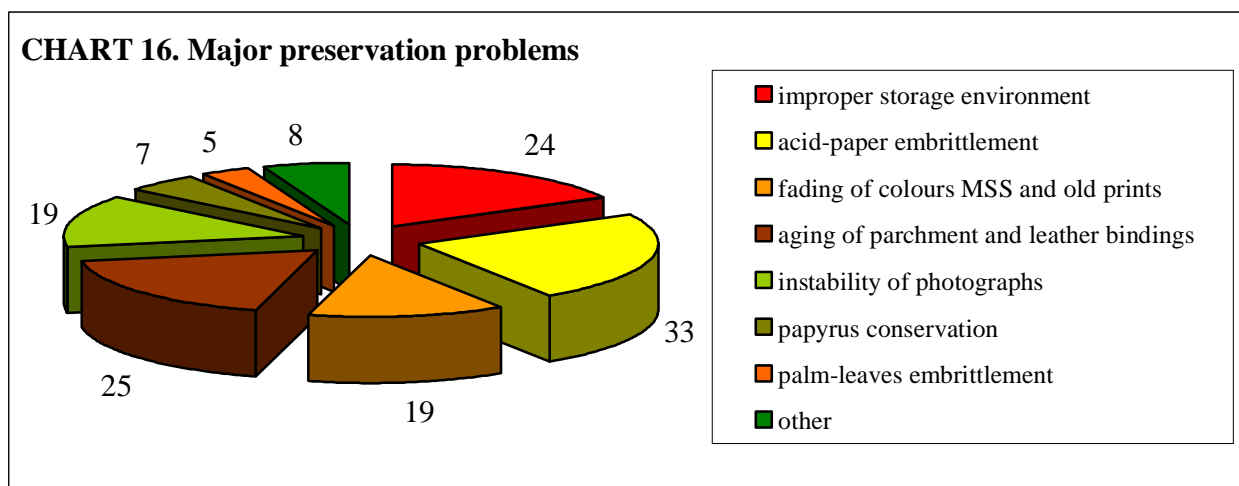
The Preservation part of section C: concentrates on the **types of documents collected and preserved and preservation problems** faced by NLs.

Although a variety of content is preserved, the worst coverage is of on-line documents and analogue film and video documents. Whilst in many countries film and video are collected by other institutions than the NL, the indication that only ca. 60% of respondents are responsible for the preservation of on-line electronic documents may be considered as alarming (see CHART 15). On the other hand, almost all NLs that preserve classic document formats also preserve off-line digital documents on physical carriers. This fact may be explained by the fact that the NLs regard electronic off-line documents as physical collection objects. We fear that this does not mean in itself that the data (for which the collected objects are the carriers) are subject to thorough digital preservation treatment, as this is the most difficult group of documents for any reasonable preservation behaviour. Traditionally, analogue audio documents are also preserved by most NLs.



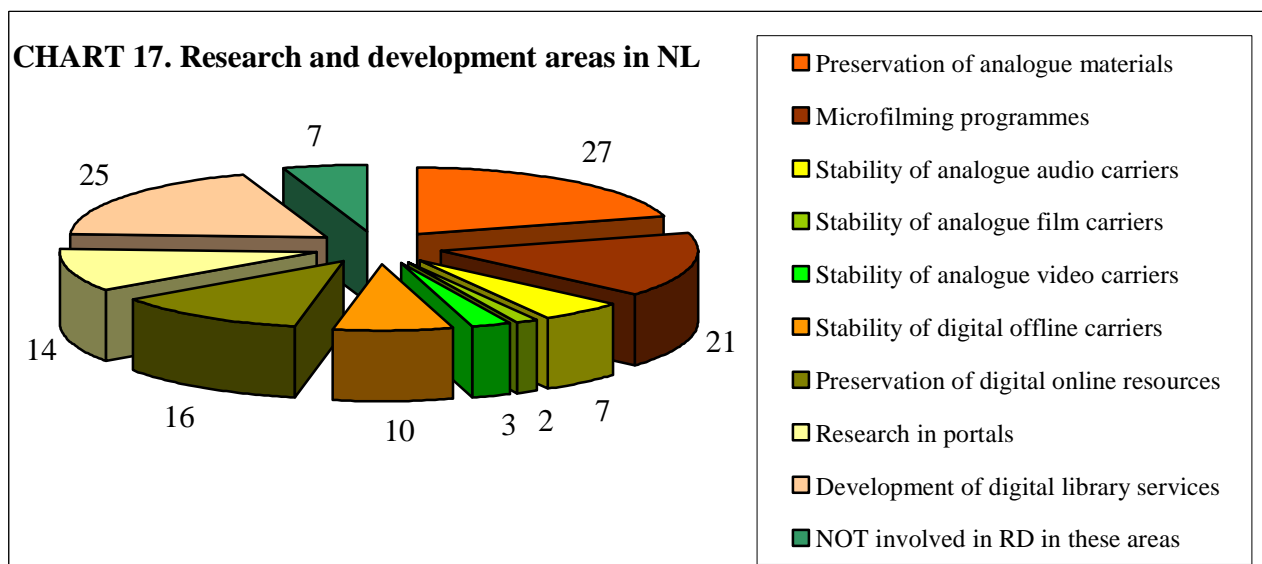
It may be inferred from the above data that the most acute preservation problem is digital preservation, as it is not performed in many institutions. The reason for this statement is also the fact that many NLs preserve analogue audio materials whose preservation future lies only in the digital domain.

The analysis shows that there is **not enough awareness raised in European NLs in the area of digital preservation** or they do not have practical knowledge of these questions. This may be why they have not yet started practical digital preservation work.



On the other hand, the NLs declared that **the most serious analogue preservation problems concern acid paper and the manuscript and old printed book collections** (aging of parchment and leather bindings, see CHART 16). An alarming result is that 21 NLs declare that they **have improper storage environment for their holdings**. The acid paper problem combined with an improper storage environment is a real danger for safeguarding of cultural heritage, and it seems that an urgent solution is needed. Such a solution can consist only of large scale and early mass digitization activities that do not exist in European NLs or are only being tested (FR and UK). Other analogue preservation problems concern special types of documents or information carriers (photographs, papyrus, and palm-leaves).

The research and development activities of NLs revealed that both preservation and access solutions are being explored in order to ensure long-term access to cultural heritage material for future generations.



The graph shows the distribution of R&D activities in NLs. A lot of attention is paid to analogue preservation including microfilming, but also to digital library services (see CHART 17). R&D

activities concerning digital preservation are not so common. 16 NLs are responsible for the preservation of digital on-line resources, while only 10 NLs have done some R&D work on the stability of off-line digital carriers.

From all the above data, two important areas are emerging and the work should concentrate on them:

- fast mass digitization production
- digital preservation

The existing slow development of both menaces our cultural heritage both in the digital and analogue domains. If no radical changes happen, a great part of our cultural heritage – digital and analogue – will disappear forever.

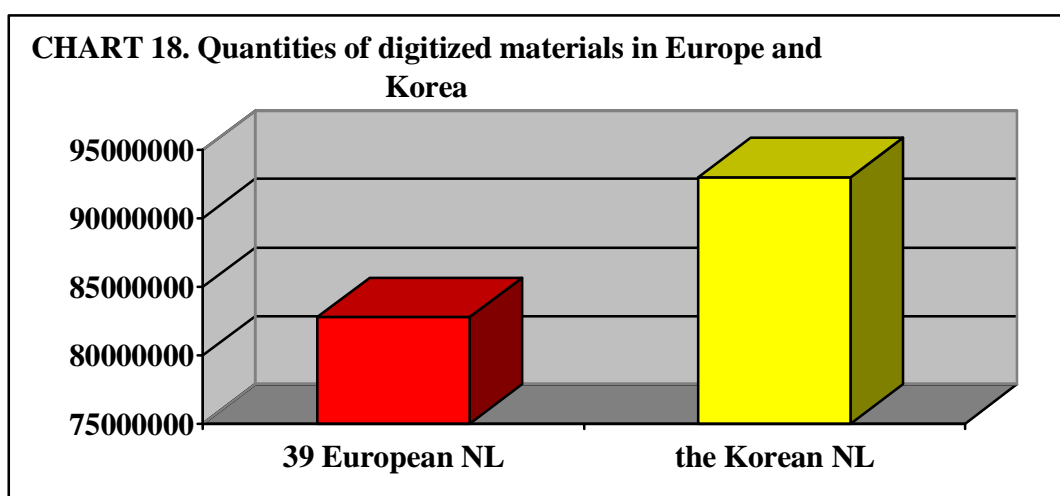
To ensure wide access to cultural content it is necessary to develop modern solutions for access, representation, retrieval of, and manipulation of data. **Portals** are a wide-known way to provide access contained in distributed repositories that provide users with comfortable and easy-to-learn tools for access. In order to analyse the current state-of-the-art in the development of portals in NLs the following definition was formulated: the portal is a tool, which provides a single interface and access point to enable simultaneous search in electronic resources both in the library hosting a portal and in other systems in other libraries or institutions in the country or worldwide. 24 NLs claimed they are running such a portal or a catalogue similar to The European Library. However, an analysis of the URLs showed that only 7 matched the definition (**CZ, FI, HU, LU, RU, SK, and SE**). The urls concerned are listed in table 2 below In most cases, NLs provided URLs of the library websites, union catalogues, and databases of NL on-line resources. Perhaps may of the NLs which provided definitions that did not comply with the definition of a portal believe it means large websites.

Country	URL of a portal
CZ	http://www.jib.cz
FI	http://www.nelliportaali.fi
HU	http://nektar.oszk.hu
LU	http://portail.bn1.lu
RU	http://www.ribk.net/
SK	http://www.kis3g.sk/
SE	http://samsok.libris.kb.se

TABLE 2. URLs of portals hosted by the European NL

Digitization. So far European NLs **have digitized altogether almost 83 million analytical data files** (mostly page images, but also some audio or video files) so it is possible to talk about an equivalent of ca. 83 million pages digitized. 77% of these files were produced in/for the National Library of Spain (40.6 million pages) and the National Library of France (24.1 million pages). These two libraries are followed by the British Library (3.2 million pages), the Austrian National Library (3.2 million pages), and the National Library of the Czech Republic (2.7 million pages). More than 1 million pages have also been reported by Iceland and Russia-Moscow. The Italian National Library of Florence is scanning title pages and parts of documents. If these partial scans are counted, then this NL also reports more than 1 million digitized pages.

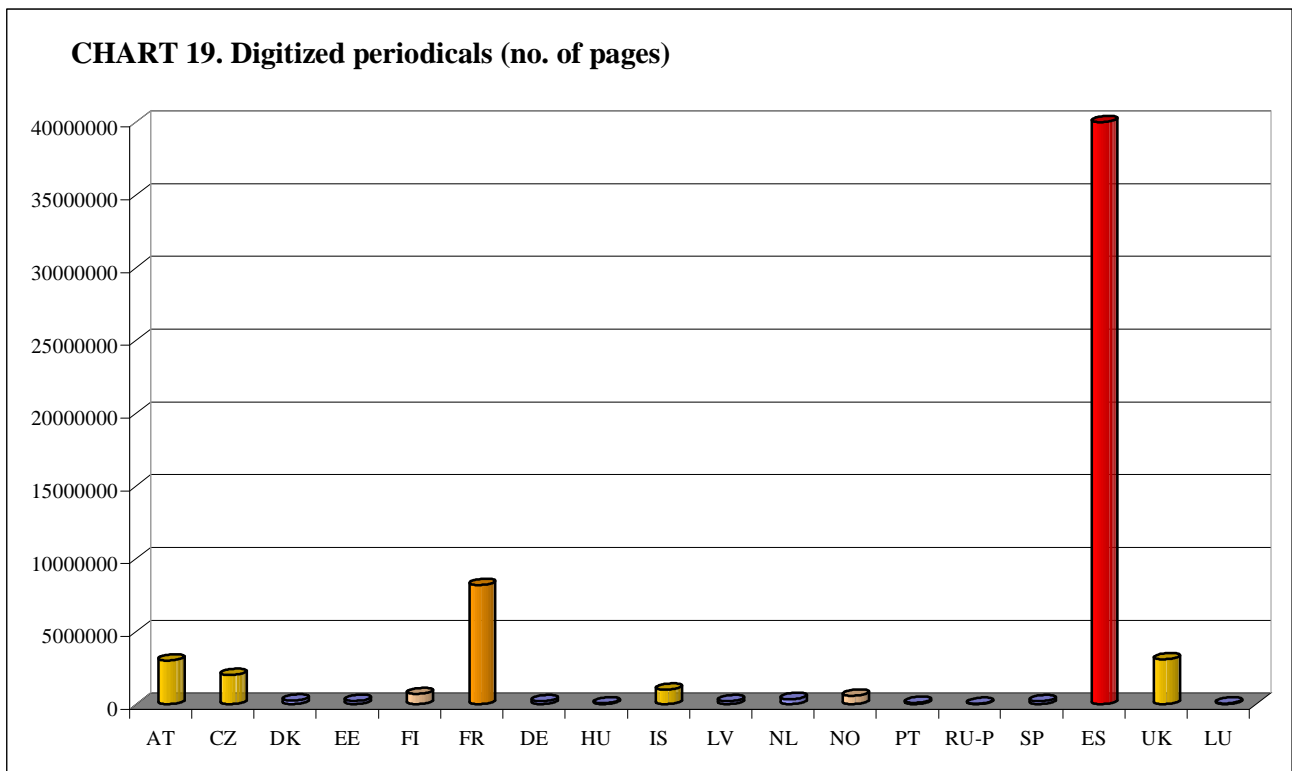
The digitization part of the questionnaire was also sent to the Korean National Library in Seoul to compare its digitization production with European digitized resources. Their answer tends to cast grave doubts on the wisdom of the European countries in funding activities such as R&D and related applications rather than large scale digitization itself. The Korean NL has reported more than 93 million digitized pages of various materials, all done in about four years. **Consequently this one library has more digitized content than all the European NLs put altogether** (see CHART 18). The Korean example shows how the availability of a larger mass of content attracts related solutions: Europe finances various projects that concentrate on how to interconnect all the material possessed by memory institutions and other players, while Koreans consider it normal to have everything on-line and, in addition, they are serving as a copyright clearing house for access to copyrighted items.



The analysis also shows a variety of preferences as to types of document digitized:

- **Periodicals**

Most attention is given to digitization of periodicals, where the leader is the National Library of Spain with ca. 40 million digitized pages available on site. Remote on-line access is not possible due to copyright restrictions (see CHART 19). The National Library of France has 8.2 million pages, while the NL in Austria and Great Britain ca. 3 million pages, the NL of the Czech Republic 2 million pages and the NL of Iceland 1 million.



The libraries with more than 20,000 pages digitized mentioned here.

- **Printed books**

Another two large areas of digitization are books both published prior to 1800 and after that date. In both areas, the National Library of France is an evident leader. For some institutions this type of document is a high priority (see CHARTS 20 and 21). In this domain (effectively modern books) only the NL Russia-Moscow¹ has digitized more than one million pages (1.6 million).

¹ Russian State Library

CHART 20. Books printed prior to 1800 (no. of pages)

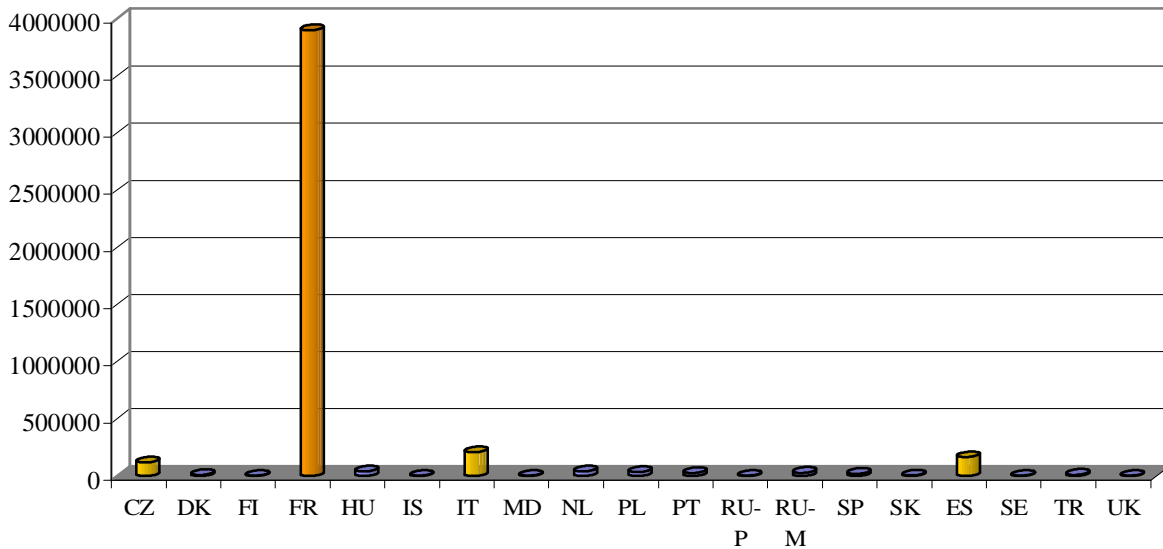
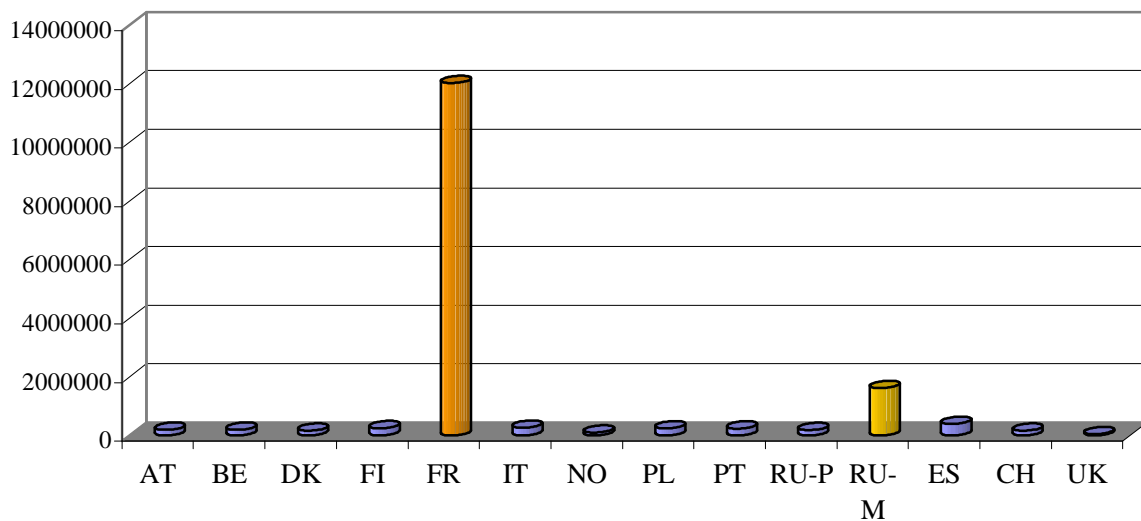


CHART 21. Books and other paper-based documents (no. of pages or sheets) printed since 1800

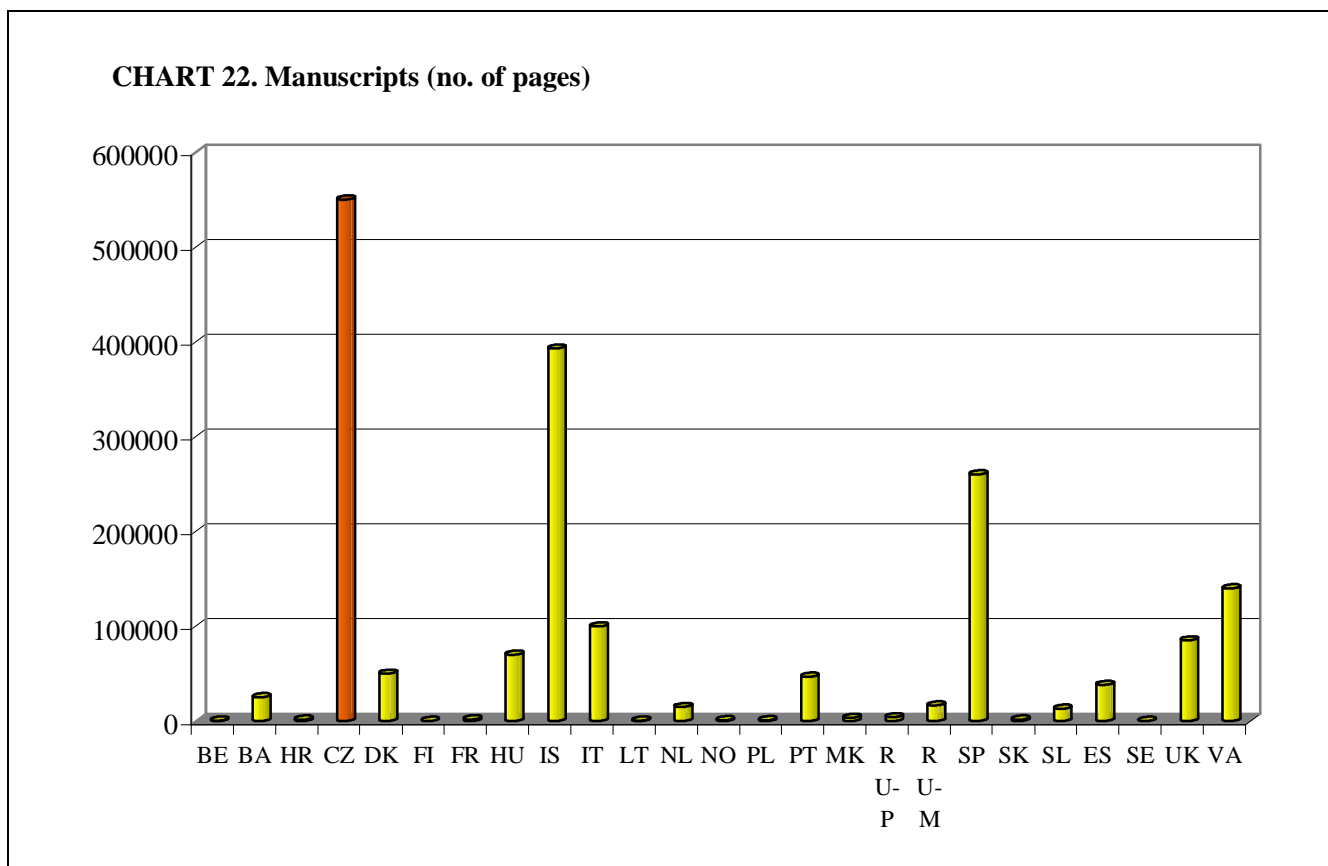


Only the libraries having more than 40,000 pages/sheets are mentioned here.

• **Manuscripts**

The digitization of manuscripts is a specific discipline that requires special technology and handling. The leader is the National Library of the Czech Republic, while a large number of pages have also been digitized in Iceland (almost 400,000 pages), Serbia (260,000), Vatican (140,000), and Italy-Florence

(ca. 100,000 pages). There is also significant activity in other countries (United Kingdom, Hungary, Portugal, Spain, Denmark, and Bosnia and Herzegovina, see CHART 22).



Altogether 1,716,535 pages from which NL CZ 32%.

- **Audio and video documents**

Substantial digitization of audio and video documents has been reported only from Norway (ca. 170,000 files) and Denmark (93,000 files). In the other libraries, such activities may exist, but they do not provide enough evidence that they are mainstream digitization activities.

Conclusions

1. **Since the European NLS have made little progress in** reformatting their analogue collections; a significant part of our documentary heritage is likely to be lost in the near future. If the digitization progress continues as at present and the rate of microfilming also does not increase, the European countries face the threat of significant loss. At national level [with some honourable exceptions] insufficient attention is paid to this question, while the EU, mindful of subsidiarity and other concerns, prefers to address only certain aspects of the problem such as access to existing digital data. These positions – if they continue – will create irreparable cultural losses.

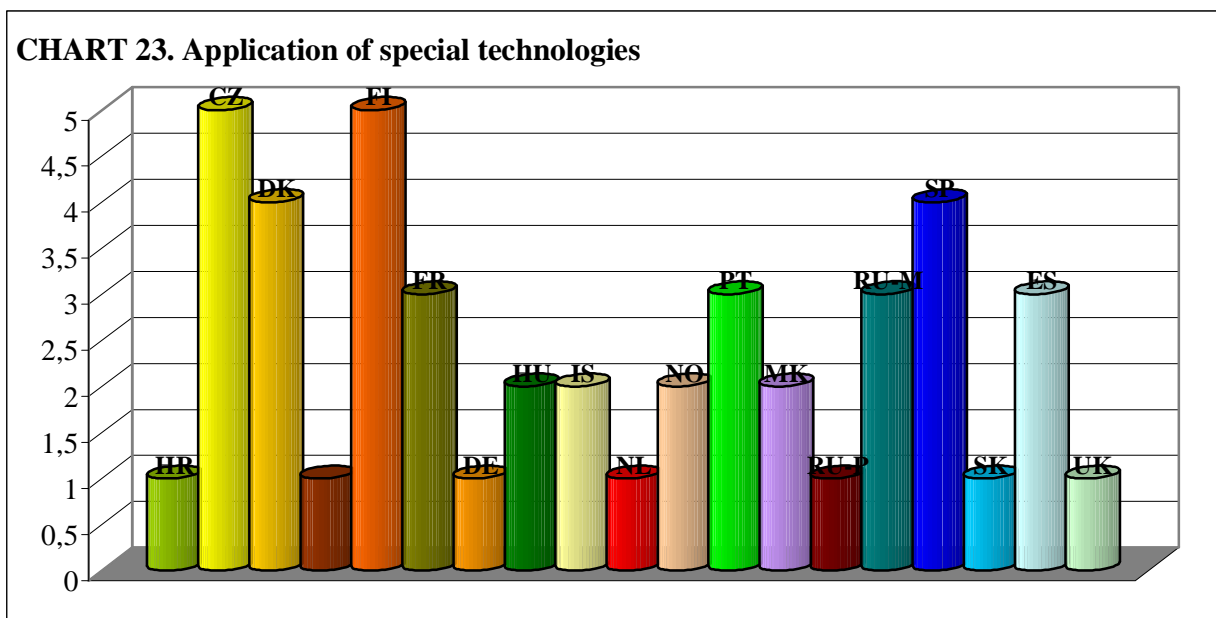
2. **There is an urgent need for microfilming and/or mass digitization of acid-paper materials.** Their stability is endangered both by their fragility and by the improper storage conditions.
3. Besides mass digitisation, there is a **need for digital preservation.** Although they are qualified in other preservation solutions, the European NLs have insufficient expertise and experience in this area.
4. There are **leaders at the European level in digitization of certain types of material.** They could become competence centres to share expertise and successful practice with other NLs on the European level. However, there is still **lack of expertise in digitization of analogue audio and video** materials in NLs. This knowledge exists in other memory institutions (special sound and/or video archives) with which collaboration is necessary.
5. **The portals for NLs are still quite a new area even in terms of basic functionalities** (single interface and information retrieval of diverse resources in heterogeneous databases). The modern web portal, including personalization features, services for on-line collaboration or real-time communication etc., as it is envisioned and implemented in the commercial sector does not exist in NLs. This limits users' opportunities to work with large aggregations of digital or digitized resources.

2.4 DIGITAL LIBRARIES

27 respondents claimed that their NL is running at least one digital library, 9 respondents indicated that they run 2 and more digital libraries. The total number of digital libraries indicated by the respondents is 41. However, having performed an analysis according to the minimum set of criteria, established for the purpose of this research (see the chapter *Methodology of the survey...*), the numbers have changed to 23 NLs hosting a digital library and 33 digital libraries, and 6 NL who run 2 and more libraries. Inconsistencies in answers were related to **inability of NLs to distinguish digital libraries from other automated library systems.**

In strict terms, **only a minority of respondents is running a digital library.** However, even treating digital library narrowly as an on-line searchable collection it is very difficult to distinguish where an exhibition or mere small number of digitized materials become a digital library. An issue of critical mass of resources required a digital collection to be defined as a digital library is not yet solved in the research community (Tedd, Large, 2005). **Many of analysed digital libraries were small thematic digitized collections** (e.g., in case of Macedonia, Slovenia, etc.). There was a huge variation in quality of represented material, tools enabling a user to explore it on-line, and mechanisms of information retrieval.

The extent of RD activities and the skills used in digital libraries were measured by five questions formulated in such a way to find out how far the advanced technologies have been considered and applied. These technologies concerned the **imaging area** (wavelet compression technology and application of image servers working on demand), implementation of complex SGML/XML document formats for compound digital documents and SGML/XML/TEI structuring of text in the **metadata area**, and operation of mass storage facilities important **for preservation of digital documents.**

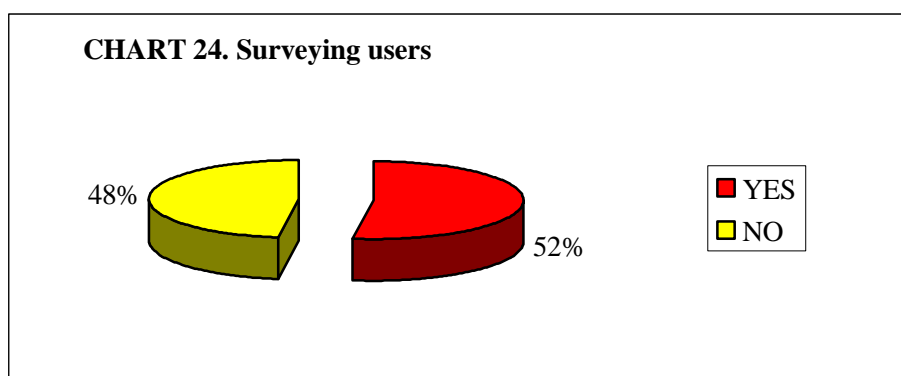


From the CHART 23, it is evident that all the five technologies are applied only in the NLs of the Czech Republic and Finland, while four of them in addition in the NLs of Denmark and Serbia, and Research Activities of the European National Libraries in the Domain of Cultural heritage and ICT. April 2006. Zinaida Manžuch & Adolf Knoll

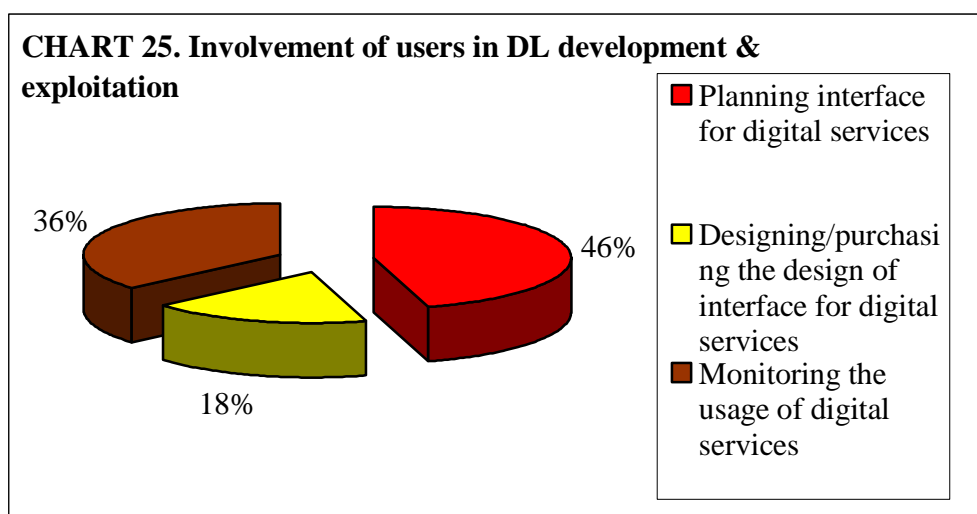
three of them in the NLs of France, Portugal, Russia-Moscow, and Spain. It is not encouraging that a greater part of libraries have implemented none of them, while 12 NLs have implemented only 2. This means that the real application of advanced technologies in digital libraries is rare. From those 12 NLs there are several New Member States or non-members (Czech Republic, Hungary, Iceland, Norway, Macedonia, Russia-Moscow, and Serbia). This proves again that old membership in the EU does not matter in implementation of new technologies.

Some collections are not available on-line. This is mainly due to **copyright restrictions** and also **unavailability of real digital library applications**.

Surveying users is still not an established practice in many NLs (see CHART 24). 48 % of NLs indicated that they had not performed a user survey lately. The topics of user surveys performed in 52 % of NLs (11) may be grouped into three main categories: user needs, usage statistics, and user satisfaction. Despite being a crucial indicator of quality of NL digital services, user satisfaction is the rarest survey topic in NLs. The most popular topic is usage statistics, followed by user needs.



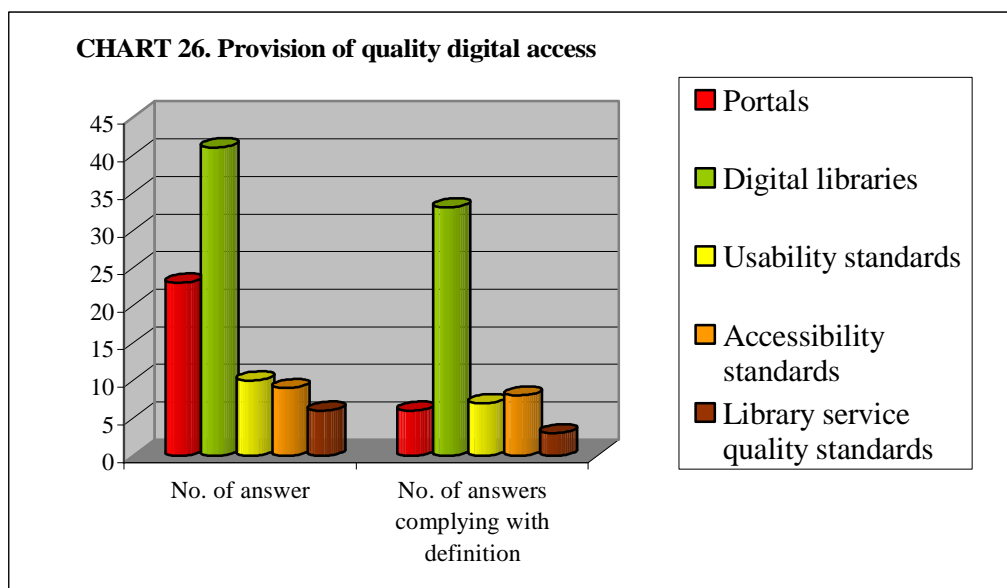
Only 11 NLs running digital libraries involve users into different stages of digital library development and exploitation. Most NLs **involve users either in the process of planning the interface** (46 %) or **monitoring the usage of digital services** (36 %). The idea that users are active participants in the actual process of designing/purchasing a digital library or a digital service (including creation, testing of prototypes, etc.) is not yet very widespread in NLs. Only 18 % of respondents involve users in this process, see CHART 25. Collaboration with users during all the three stages of the development and exploitation of digital libraries or a digital service seems to be a unique experience undertaken only by the National Library of Netherlands.



Usability, accessibility and library service quality standards (see Chapter I. on methodology of the survey for the definitions of these concepts) remain mostly an unexplored space in the NL practice. Only 10 of respondents running a digital library stated that they apply usability standards. However, 3 answers were erroneous (see CHART 25), confusing usability with image standards (JPEG/TIFF), general recommendations for preservation of cultural heritage, and metadata standards (e.g., Dublin Core). It means that in reality only 7 NL apply usability standards.

In comparison with usability, the accessibility standards are known better – the answers include only one erroneous statement. The application rates of accessibility standards are almost the same as usability – 8 NLs apply accessibility standards.

The least known and least applied group of standards is those dealing with library service quality. Only 3 NLs are currently applying these standards in practice. Half of respondents who reported an application of library service quality standards confused it with metadata standards (e.g., Dublin Core or UNIMARC) or communication protocols (Z39.50 or OAI). The ambiguity in terminology and inability to define or understand properly certain terms, such as digital library, portal, accessibility, usability, and quality of library services is a general trend in all NLs (see CHART 26).



Conclusions

1. **Digital libraries are at an early stage of the development** in the European NLs. This is a result of limited understanding of this phenomenon. The digital libraries instanced were often small exhibition-like collections. In contrast with the later evolution of the digital library concept from mere on-line collection to the environments offering digital materials and equipped with tools for exploration and interpretation of cultural heritage, digital libraries of NLs with few exceptions offer very basic functionalities.
2. The analysis shows that national **libraries have continued to concentrate too much on their traditional areas** (cataloguing and related systems) and have fallen behind in the field of modern imaging technologies. Only five NLs have implemented wavelet based imaging. The field of modern complex document formatting has also been neglected. This may be an important knowledge gap for future co-operation of NLs in larger information environments.
3. **Digital libraries or services cannot ensure quality access for users** and are not user-oriented. Still in many cases NLs do not consider user opinions and wishes when designing digital library applications. Practical implementation of international standards and guidelines for ensuring quality is also practiced by few NLs. Standards of quality interaction and access in digital environment are not widely known and they are interpreted ambiguously.

RECOMMENDATIONS

This research was the first attempt to comprehend the potential, achievements and challenges in cultural heritage and ICT R&D in the national libraries of Europe and provide a panorama of the state of the art. Naturally, obstacles had to be overcome caused by diverse understandings of general and specific terms and different approaches to planning, implementing and evaluating R&D activities in national libraries. This research cannot therefore provide a precise benchmarking tool but rather establishes general trends in cultural heritage and ICT R&D. Any perceived imperfections in the present work will, we hope, serve as a stimulus for further investigation of this area.

Many problems discovered at the first stage of the research when we investigated only the national libraries of the ten new member states are relevant for most national libraries of Europe. It is disturbing that there are still several national libraries which due to absence of favourable political environment and financial support are not able to take part in the European R&D initiatives. Still the main challenge is recognition of the importance and the nature of R&D in the national libraries.

Recommendation 1. Libraries and other memory institutions should be acknowledged as R&D players on the European level. The European Commission should take an active role in convincing national governments to adopt this approach by making this issue visible on the European level.

Variety of approaches, standards and often absence of exploitable solutions transforms the application of technologies from routine automation activity into dynamic R&D initiatives aimed at developing quality and sustainable cultural heritage systems and tools. By their nature, national libraries undertake research and development as a secondary objective. R&D is a practical activity which helps to produce specific solutions necessary for the creation and maintenance of quality services. From this point of view the national libraries are very similar to the commercial companies that work in the knowledge and research intensive sectors. R&D demands significant investment of human, material and financial resources and as a consequence requires a proper management of existent resources and planning of outcomes. Management of R&D input, output and overall quality is a new field of activities for the national libraries as well as for some national R&D operators. Both for the national libraries and R&D operators activities in monitoring R&D quality should become a routine practice.

Recommendation 2. Transparent and sound methodology for monitoring the quality of the R&D activities of the national libraries (and other memory institutions) and registering achievements should be established on the European level and promoted in all member states. The framework for such recommendations may be created by exploiting existing methodologies and guidelines (namely so-called Frascati and Canberra manuals aimed at evaluating RD activities).

Empirical research revealed that there are no gaps between the EU-15 members, EEA states and the New Member States. In certain areas New Member States and Non-EU countries outperform the group of EU-15, EEA countries and Switzerland and may be considered the European centres of competence in certain areas of expertise.

Recommendation 3. Existing EU-funded networks of competence should consider and exploit the knowledge and experience available in the national libraries of the EU New Member States. These networks should be enriched by the NMS NL where appropriate.

Despite availability of adequate technological infrastructure, management of born-digital heritage as well as digitization are not performed on a mainstream basis in all European national libraries. The position is unsatisfactory.

Recommendation 4. It is necessary to draw attention to the absence of a critical mass of the digitized cultural heritage content on the European level with then aim to persuade the national authorities and libraries to take appropriate action.

Insufficient quantities of digitized and born-digital materials may be closely related with insufficient experience and absence of proved solutions of handling digital content, which may produce digital preservation problems in future. Additionally, many national libraries are struggling with challenges in analogue preservation that may postpone any significant achievements in digital access and preservation far into the future.

Recommendation 5. There is a need to promote existing and new R&D initiatives and networks aimed at increasing knowledge and providing new skills and appropriate training on modern strategies for access and digital preservation in professional communities of memory institutions.

Further evolution of access solutions in the digital environment is inhibited by a split between libraries and their users. User-oriented solutions are only slowly finding their way into library practice. As a consequence many national libraries lag behind modern developments in major access tools as portals and digital libraries. There is an urgent need to develop a culture of collaboration with the users in the national libraries. Active participation of users during all stages of the development of digital library services will bring multiple benefits in terms of both raising awareness of the user about value of cultural heritage and relevant digital services and making these services much closer to actual user needs.

Recommendation 6. User-centred solutions, collaboration with users and raising their awareness about potential benefits of digital cultural heritage services should become important criteria for evaluating and funding R&D initiatives.

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ANNEX A. THE EUROPEAN VISION FOR CULTURAL HERITAGE IN THE DIGITAL ENVIRONMENT: GENERAL TRENDS IN THE EU STRATEGIC DOCUMENTS

The European Digital Library is both a vision and an emerging reality. The end of 2005 and the beginning of 2006 was a period of intensified attention to digital library issues on the European level. Almost simultaneously two important documents on the management of cultural heritage in the digital environment and the role of libraries were announced. These are the communication of the European Commission “i2010 Digital libraries” and the “Dynamic Action Plan”, a successor of Lund Action Plan initiated under the UK Presidency.

Constant dialogue between European policy-makers, national authorities and national libraries, which are all involved into creation and implementation of the vision of the European Digital Library is necessary. Often national authorities and national libraries are not so well aware of the European policy in management of cultural heritage in the digital environment. Discussion and critical approach to current vision of cultural heritage and ICT is crucial for success of the European Digital Library and R&D initiative in this area. **This chapter intends to highlight the latest tendencies and summarize some general trends in cultural heritage policies of the European Union.** “i2010: Digital Libraries” (the communication of the European Commission, 2005) and Dynamic Action Plan (produced by National Representatives Group, 2005) exemplify current thinking and provide material for further reflection about management of cultural heritage in the digital environment, as well as the positioning of national libraries in the whirl of associated changes. Content analysis* has been applied to key documents to track some general trends. The list of 13 documents chosen for analysis is available at the end of the text of ANNEX A . Most of them were discussed in TEL-ME-MOR Deliverable 1.1. *Analysis of Research Activities and Requirements of the National Libraries of the New Member States* (http://www.telmemor.net/docs/WP1_FinalReport_July2005.pdf). Content analysis was targeted at the main strategic topics such as the roles and collaboration of memory institutions and their major cultural heritage related functions – preservation and access. For the purpose of analysis documents are divided into: 1) general documents that had a decisive impact on development of cultural heritage strategies and 2) specific documents dedicated solely to cultural heritage issues. This analysis does not claim to be an in-depth investigation of trends, but rather provides material for discussion and reflection on what has been done and will have to be done in future to make a reality the European digital library or any other emerging visions encouraging effective use and preservation of cultural heritage in the digital environment.

The idea of the European Digital Library is not new. As early as 1984 the attention of the EU Member States was drawn to libraries and their role by the European Council resolution On the creation of a European Library (also known as so-called Schwenke resolution). This initiative encouraged subsequent strategic solutions and documents defined libraries as important part of the European information infrastructure. Having united the holdings of the libraries of the EU Member States, a European Library would make accessible the wealth of cultural heritage and knowledge to all European citizens. This vision turned into practical actions in the 3rd and 4th Framework Programmes which fostered library collaboration and networking with other memory institutions and commercial players and encouraged experimentation and application of information and communication technologies for practical library needs. Many of these projects have contributed to the growing visibility of cultural heritage resources on the European level.

* Content analysis is the scientific method aimed at quantitative and qualitative analysis of texts, where the units for analysis may become words, phrases, concepts and their synonyms as well as their position in the text. This method is widely used in social, communication studies and particularly mass media research.

Increased visibility of libraries in the European arena brought positive changes and developments. The European Commission drew attention to digital libraries and their role again in i2010, which updated the well-known Lisbon strategy in order to find new means to boost social and economic development of the European Union. In the context of expansion of digital services, digital libraries were considered as a factor of better quality of life and more inclusive society, because of wider access of cultural heritage resources to citizens. As a consequence “i2010 Digital libraries” emerged to identify the role, opportunities and challenges of digital libraries in the knowledge society. “i2010 Digital libraries” defines the vision – to expand access to European cultural heritage collections using information and communication technologies, to provide user with multilingual and multicultural environment and to make online resources more attractive to use. The vision of the digital library and issues concerning its implementation are closely related to digitization efforts across Europe. The value of digitization of cultural heritage was acknowledged in 2001 by Lund Principles and Lund Action Plan that emphasized the need for the European co-ordination of digitization activities and highlighted major issues to be solved. Based on the ideas of the Lund documents and emerging demands in the domain of cultural heritage and technologies, the “Dynamic Action Plan” was created, a new strategy for digitization of cultural and scientific resources. Besides maintaining the principle of European co-ordination in digitization and overcoming of fragmentation of efforts, this document concentrates on establishing relevant policies and funding models to ensure long-term access and sustainability of digitized cultural heritage and improving online access to the cultural resources of Europe.

Digitization of cultural heritage and digital libraries: the vision

Due to the sophisticated structure and organization of modern societies, it is impossible for people to interact with cultural heritage in direct manner, like it was in ancient times, when memory was constructed and experienced simultaneously by participating in community rituals. Modern cultures shifted from rituals and face-to-face communication of common memories to the sophisticated system of social institutes (memory institutions) which are responsible for collecting, preserving and providing access to cultural heritage and thus contribute to construction of cultural memory of contemporary societies. Historians and sociologists define this phenomenon as an “externalization of memory” (Olick & Robbins, 1998). By creating, processing, safeguarding and providing means for accessing collections memory institutions interpret what the cultural heritage of a particular society is. Long neglected in professional communities, the fact of interpretation while selecting items for long-term preservation, assigning them certain meaning during documentation processes (e.g. cataloguing in library case), as well as defining a sum of items as a definite collection, has belatedly been acknowledged in memory institutions. Often particular items become cultural heritage as a consequence of expert evaluation. This inevitably creates a gap between cultural heritage experts and citizens. Libraries, museums or archives do not safeguard memory in their holdings (Menne-Haritz, 2001); they do create a basis for constructing the memory of the community, nation or any other social system. Cultural heritage does not become a heritage in a full sense until it is acknowledged by the society (Čepaitienė, 2005). . However, in order to become a part of citizens’ identity and perceptions about the society they live in secondary products aimed at communication of cultural assets to broad public should be created. In other words, cultural heritage should become meaningful to citizens. Some scientists refer to “heritageisation” – the process when cultural objects/documents/records evaluated by experts as cultural assets are acknowledged by members of particular society as a heritage, i.e. become a part of their ideas, opinions about particular community, society or nation (Čepaitienė, 2005). Examples of such re-packaging of cultural heritage include films, tourism services, schools’ curricula, educational

services of memory institutions. There is a variety of players, including business, mass media, cultural and educational institutions that take part in these contextualization processes (see Scheme 1).

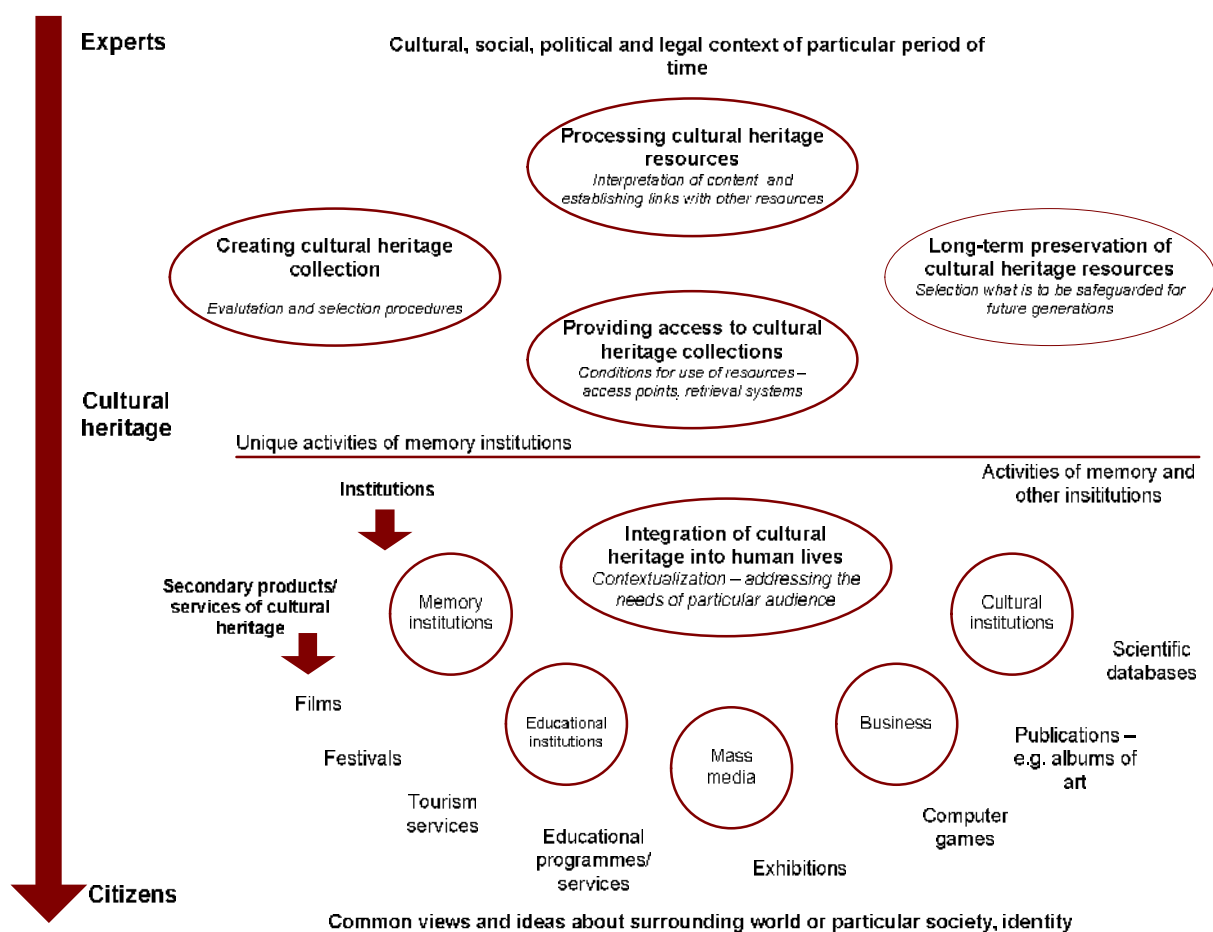


Figure 1. Cycle of communication of cultural heritage*

Treating the processes of distributing cultural heritage as a supply chain, many more players can be identified including ICT companies, publishers and copyright owners. Therefore, the current vision of providing better access and increasing the attractiveness of cultural resources stipulates a question of **how to position memory institutions in the cycle of communication of cultural heritage**. Will they remain content providers for other institutions and not participate in the development of the re-packaging and contextualization of cultural heritage? Or will they become equal players on the arena of distribution of cultural assets?

“i2010 Digital libraries” emphasizes the value of wide digital access of cultural heritage collections online. One of the major objectives of the “Dynamic Action Plan” also refers to “improving online access to European cultural content”. Without any doubt; this is a starting point for further action. However, **does access implies an ability of the user to appreciate cultural resources**, enjoying the

* Manžuch, Zinaida. Atminties komunikacija archyvuose, bibliotekose ir muziejuose. I dalis [doctoral thesis: part 1. draft]. 2006.

wealth and diversity of the European heritage? “i2010: Digital libraries” defines the role of memory institutions as content providers, but not as active players in the contextualization, bringing the “traditional model of library services based on lending of the physical items they own” (i2010: Digital Libraries, 2005: p. 6) to the digital environment:

Digitisation of their [libraries’] resources could considerably increase this [economic] impact. Once digitised, Europe’s cultural heritage can be a driver of networked traffic. It will be a rich source of raw material to be re-used for added-value services and products in sectors such as tourism and education (i2010: Digital Libraries, p. 5).

In the “Dynamic Action Plan” the position of memory institutions is not so clearly defined. On the one hand, the role of memory institutions and their services in creation, use and delivery of cultural heritage resources is recognized. On the other, it is not clear what the nature of these services is, though the passive position of “boosting eLearning and the Creative Industries” (Dynamic Action Plan, 2005: p. 6) by digitizing collections of cultural heritage may be observed.

Certainly diverse players that produce secondary cultural heritage products (e.g. tourism information packages) satisfy diverse needs of citizens.. Some of them are limited by presentation genre (film industry, theatres etc.), others by context of use (educational institutions) and finally, many of them are influenced by commercial goals. This bias is clearly seen in tourism services which usually provide a view of particular cultures that is far from reality. As tourism encompasses commercial services the view of cultural heritage is not dynamic and oriented to development and richness of particular culture but more a static view with selective features that satisfy tourists’ desires for exotic experiences. Therefore, memory institutions have a crucial role in presenting of a non-stereotyped panorama of the European cultural heritage, that allows exploration of cultural heritage from different, sometimes non-orthodox perspectives.

Cultural heritage: between information and cultural policy

As mentioned above, libraries, museums and archives construct the core of memory of certain societies (going beyond the limits of one nation) by creating and maintaining collections of cultural heritage. To form a collection is to establish a particular field of meanings because, as S. Pearce puts it “a collection is what somebody thinks it is” (Pearce, 1995). Therefore, “re-collection”, or a process of remembering is closely related to the panorama of cultural heritage offered by memory institutions. From this point of view, selection and appraisal practices, basing on expert criteria to define what are to be preserved for future generations are crucial for libraries, museums and archives. These criteria are formed in accordance to the type of memory institution (e.g. local or national) and served audience (e.g. professional, academic communities, citizens etc.). Selection is of crucial importance for the development of the European digital library; it allows determining what is to be digitized and later on what will become the subject for digital preservation. However, selection criteria associate with a certain cultural values. This inevitably leads memory institutions to the question what these values are. Traditionally, these issues are in the scope of cultural policy. Therefore, the position of cultural heritage is twofold: it reflects social bonds of particular society embedded in its culture – common ideas, approaches, values etc. (thus being an object of cultural policy), and it is also a particular form of expression of these ideas, using specific communication technologies (taking it broadly as a mix of

* Inserted by authors

particular means, mediums and channels for communication), thus being an information resource and in the scope of information policy. In this light there are different roles for each type of policy— one defines the vision and the direction for cultural heritage initiatives, while another develops ways and tools to exploit modern technologies to build a cultural communication environment. Cultural policy starting from the framework set in the Maastricht Treaty (1992) is based on the notion of “diversity in unity” or building the common European cultural space while respecting the cultural diversity of the EU members. In the modern Europe cultural dimension of the development of the EU becomes of critical importance. The primary reasons for political unity of the EU (e.g. the experience of World War II, threats of communist regimes as well as economical benefits of the European collaboration) are not sufficient reasons to maintain social and political cohesion in Europe today. The notions of cultural diversities and cultural identity of Europe are not so easy to define, taking into account enlargement of the EU and socio-cultural trends such as immigration and increased multiculturalism:

The common European cultural space cannot be firmly defined and delimited; its borders are necessarily open, not because of our ignorance, but in principle – because European culture, indeed Europe itself, is not a “fact”. It is a task and a process. What is European culture? What is Europe? These are questions that must constantly be posed anew. So long as Europe is of the present, and not simply the past, they can never be conclusively answered. Europe’s identity is something that must be negotiated by its peoples and institutions. Europeans can and must adapt themselves and their institutions, so that European values, traditions, and conceptions of life can live on and be effective. At the same time, the Union and its citizens must take their values endure as a basis of a common identity through ever-changing conditions (The Spiritual and Cultural Dimension of Europe, 2004: p. 8).

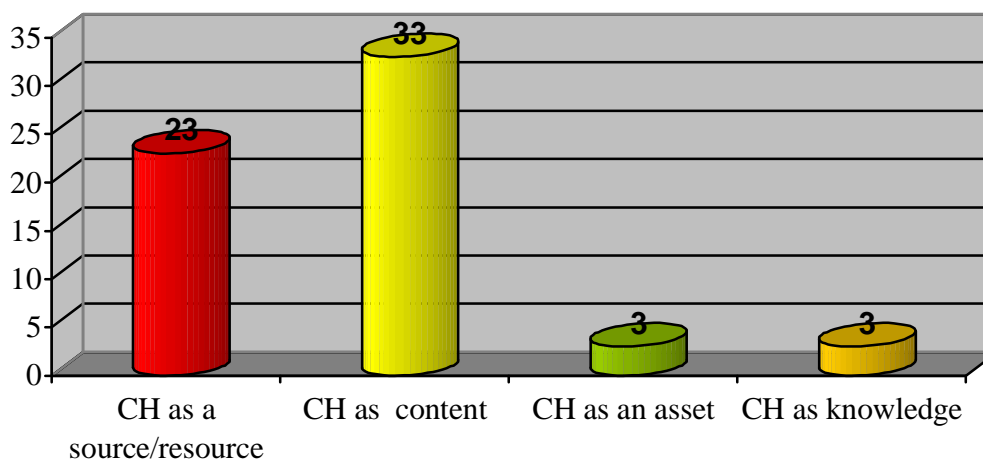
However, what is the role of memory institutions and cultural heritage in the ongoing European cultural project? Obviously, cultural heritage may become a link which enables us to understand diverse cultures and create tolerance and mutual understanding. The current situation in Europe increasingly demands this understanding in place between different religious and ethnic communities in the expanding Europe. The European institutions are involved in these activities in the context of cultural programmes, such as Culture 2000. However, other activities including research initiatives are involved in the creation of the European cultural space. These include, for instance, the FP6 priority area *Citizens and governance in a knowledge-based society*, which supports a wide spectrum of research including multiple projects associated with issues of European identity, the cultural dimension of the EU development as well as the role of diverse institutions in this process (CORDIS FP6: Citizens and governance in a knowledge-based society, 2006).

In the strategic documents focusing on cultural heritage issues cultural heritage is mostly seen as a resource/source or content. These words have many things in common: etymologically “source” refers to written work, information or evidence (this meaning has its origin in the end of 18th cent.), similarly to “source”, “re-source” identifies something, which is worth going back to once again*, and, finally “content” has a lot of common with “contain” referring to something held, enclosed or contained somewhere (Online Etymology Dictionary, 2001). As CHART 1 shows, cultural heritage documents concerned with digitization or management of born-digital materials emphasize only one side of heritage – particular means of communications or technology used to express, to shape and transfer human knowledge and ideas. Contrary, little attention is put to questions such as why, for what purpose and benefit heritage is transferred, what ideas it brings or makes visible. But several times “asset” that

* re-source also has a strong economic dimension – it refers to wealth or particular types of it (natural resources, intellectual resources etc.) (Dictionary.com, 2006)

implies value/valuable features and “knowledge” that refers to skills, learning, discovery and acquiring new experience (Dictionary.com, 2006) are mentioned.

CHART 1. Interpretation of cultural heritage in CH specific documents



Separation of content from the idea which should be embodied in it encourages raising some questions. Could the communication of cultural heritage remain separate from a vision informing it? In other words, could information policy in cultural heritage be separated from cultural strategies? These questions still remain open.

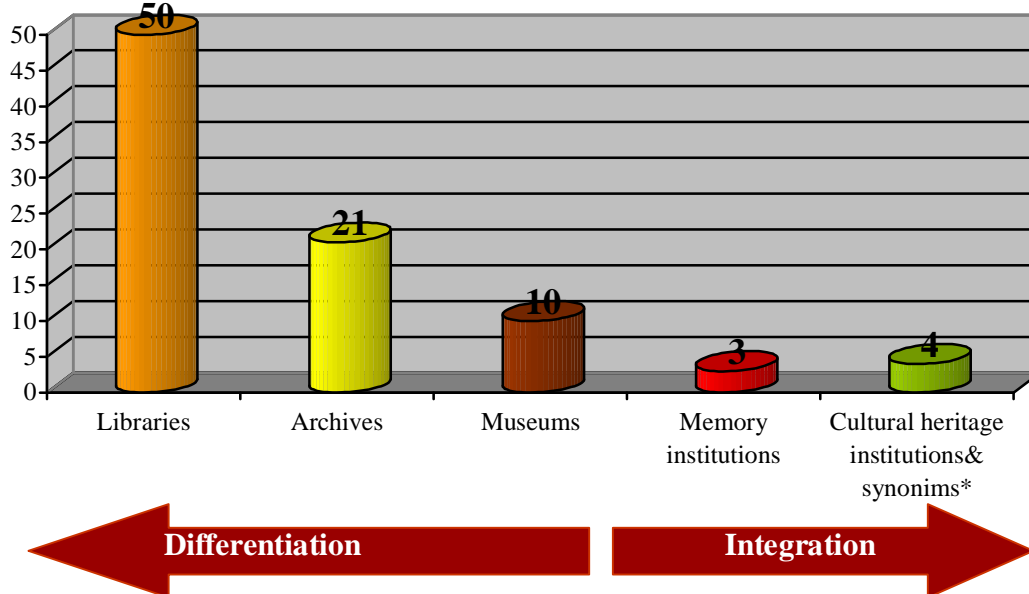
Memory institutions – a myth or real partnership?

The partnership between archives, libraries and museums is not a new phenomenon; these institutions collaborate for different purposes trying to serve best the needs of their users. However, the digital environment which swept away information management barriers and enabled presentation of all kinds of cultural heritage online, provided an opportunity to expand these collaborative networks enormously. From the users’ point of view memory institutions bring a lot of benefits by establishing a variety of links between their collections which in the past were isolated due to diverse handling practices. From the point of view of diverse professional communities, this collaboration demands a lot of effort to bridge different professional traditions, principles, practices and standards. On the European level the partnership between archives, museums and libraries started to be discussed as early as the benefits of digitization of cultural heritage were understood (mostly in the FP4). Integration of dispersed cultural heritage into one block of research programmes was a great achievement in the context of FP5, empowering joint exploration and discovery of cultural heritage digital management issues in memory institutions.

“i2010: Digital Libraries” is oriented towards libraries and archives, though it is pointed out that many issues discussed in the document are also relevant for museums. In the “Dynamic Action Plan” the audience is broader and includes libraries, archives, museums and even bodies responsible for environmental and natural heritage. However, the initiative of the European Digital Library is highlighted several times. This position implies further institutional isolation between museums, archives and libraries. Will cultural heritage initiatives represent fragmented institutional efforts? Co-ordination of digitization on the European level encompasses not only harmonization of regional or

national initiatives and activities but also cross-institutional collaboration. Current trends in collaboration of memory institutions and position of the EU could be seen using the content-analysis method. Content-analysis of major 13 strategic documents related to management of cultural heritage in the digital environment (see list of analyzed documents in the end of this chapter) discloses the tendency for domination of libraries and low visibility and presence of archives and especially museums.

CHART 2. Libraries, archives and museums in the strategic EU texts (word/no. of times mentioned)



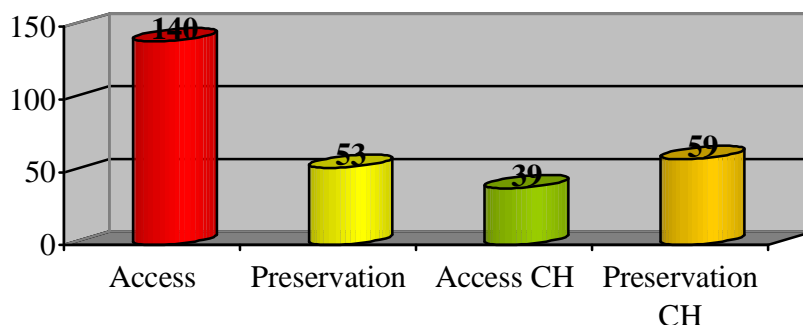
*Synonyms included variations: cultural (and scientific) heritage sectors, heritage institutions, cultural content holders

There is a tendency to separate but not to integrate memory institutions. Integrative concepts are less popular than terms tending to separate or make visible one type of institution (see CHART 2). In case of integration libraries, museums and archives are tend to be presented in the wider context of cultural institutions that may include wide range of non-profit and commercial players.

Access and preservation in the EU cultural heritage policy

Access and preservation are interrelated concepts in the practice of memory institutions. Access is impossible without proper preservation strategies, and preservation is meaningless without access. Digitization created enormous opportunities for access, making available digital surrogates of valuable and rare documents and artifacts to wide audience. On the other hand, digitization and emergence of born-digital material pose many challenges for preservation.

CHART 3. Visibility of access and preservation issues in the EU strategic documents



Traditionally, access is a more popular issue in general strategic documents of the EU that affect or provide a stimulus to cultural heritage-specific strategies (see CHART 3). It could be explained by the fact that access is not a monopoly of memory institutions particularly in the production of secondary contextualized heritage products and documents. Preservation is the function that makes archives, some types of libraries and museums unique institutions which provides pre-requisites or symbolic material for construction of certain memories. Preservation is discussed more than access in cultural heritage specific documents (see the list of both general and heritage specific strategies enclosed in the end of the chapter). Even the notion of access and accessibility is used to describe the function of preservation. “i2010: Digital Libraries” discusses access from different points of view, particularly highlighting digitization as a pre-requisite for access and the related challenge of intellectual property rights as an inhibitor of wide access. The communication particularly emphasizes the primary responsibility of the Member States for digital preservation, but provides for support actions such as funding appropriate research as well as non-research (applied) initiatives on the European level. By contrast, the Dynamic Action Plan places less attention to digital preservation emphasizing support to the implementation of appropriate policies and tools as well as persistent identification of cultural heritage resources. In fact, there are no well developed policies in digital preservation on the European level, this is acknowledged by the “i2010: Digital Libraries”:

At present, there is little experience with digital preservation, the legal framework is evolving, resources are scarce and the outcome of preservation efforts is uncertain. The problem deserves to be urgently addressed both by politicians and by the institutions most concerned (i2010: Digital Libraries, p. 7).

Growing information volumes become a challenge for both access and preservation as well, especially taking into account a wide variety of materials available to make accessible and preserved in the digital environment (e.g. forums, blogs, emails, personal webpages etc.). Collecting (that also means a starting point for digital preservation in case of “born-digital” documents) everything covered by a particular internet domain without any selection often becomes an appropriate solution for cultural heritage institutions because it is not complicated in technical terms. However, together with financial, organizational, legal and other challenges the issue of selection should become crucial both for

meaningful preservation and access. Otherwise, memory institutions are at risk of becoming cemeteries of memory, where the vast and ever growing volumes of information provided lose any sense.

Conclusions

Libraries and other memory institutions such as archives and museums are reaching a new stage of development marked by social, political, technological, economical and other changes. Having been a crucial part of human civilization for centuries these institutions inevitably evolved to meet the requirements and demands of the societies and environments they served. Current changes should be considered as multi-dimensional as they encourage libraries, archives and museums not only to explore new communication means and channels, but also place these institutions within new social context – dynamic and closer interaction between cultures, emergence of new strategic cultural unions as shared European cultural space etc. Obviously these two main dimensions will shape current and future directions for the growth of libraries. However, the present situation indicates the **detachment of social and communicational dimensions in the development of libraries and other memory institutions**. In the context of information policy the emphasis is put on the development of the new solutions for access and preservation of cultural heritage held by these institutions based on wide application of ICT. But while planning the directions of technological innovation **old and outdated models of roles of cultural heritage and memory institutions in the modern societies are applied**.

These models are mostly based on the assumption that visibility and long-term availability of certain collections of cultural heritage provide their users with a meaningful picture of surrounding world. These ideas have their origin in projects of the Enlightenment epoch such as Conrad Gesner's *Bibliotheca Universalis* and Gottfried Leibniz's universal encyclopedia of human knowledge. However, in the modern world of massive quantities of information, knowledge and interpretations this model is no longer relevant (Manžuch, 2005). **An image of what memory institutions are is based on the library model, while the underlying principles and philosophy of archives and museums are not explored**. This may become a cause for schism between professional communities of museologists, archivists and librarians, preventing a fruitful dialog that would shape the vision and roles of memory institutions in modern knowledge societies.

The digital environment prompts memory institutions to adopt the new role of interpreter and this interpretation function is guided by the social and cultural changes in societies – emerging bonds and links between communities and nations as well as new challenges – safeguarding cultural diversity while avoiding cultural isolation, ensuring tolerance in increasingly multicultural environment. However, currently these roles of memory institutions and the potential benefits from exploitation of ICT for defined cultural and social goals are not sufficiently explored.

LIST OF THE DOCUMENTS USED FOR CONTENT-ANALYSIS**General EU information policy documents that affected cultural heritage strategies**

1. Council resolution of 25 June 2002 on preserving tomorrow's memory – preserving digital content for future generations. *Official Journal of the European Communities*. 6.7.2002, C 162/4. Available http://europa.eu.int/eurlex/pri/en/oj/dat/2002/c_162/c_16260020706en00040005.pdf
2. Council resolution of 21 January 2002 on culture and the knowledge society. *Official Journal of the European Communities*. 5.2.2002, C 32/1. Available http://europa.eu.int/eurlex/pri/en/oj/dat/2002/c_032/c_03220020205en00010001.pdf
3. Council resolution of 21 January 2002 on the role of culture in the development of the European Union. 5.2.2002. Available http://europa.eu.int/eurlex/pri/en/oj/dat/2002/c_032/c_03220020205en00020002.pdf
4. *eEurope 2002: Information Society for All*. Action Plan prepared by the Council and the European Commission for the Feira European Council. 19-20 June 2000. Available http://europa.eu.int/information_society/eeurope/2002/action_plan/pdf/actionplan_en.pdf
5. *eEurope 2005: Information Society for All*. Action Plan to be presented in view of the Sevilla European Council, 21/22 June 2002. Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions. Available http://europa.eu.int/information_society/eeurope/2002/news_library/documents/eeurope2005/eeurope2005_en.pdf
6. *i2010 – A European Information Society for growth and employment*. Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the regions. Brussels. 1.6.2005. Available http://europa.eu.int/information_society/eeurope/i2010/docs/com_229_i2010_310505_fv_en.pdf
7. Lisbon European Council 23 and 24 March 2000. Presidency Conclusions. Available http://ue.eu.int/ueDocs/cms_Data/docs/pressData/en/ec/00100-r1.en0.htm

Cultural heritage specific EU documents and strategies

8. *Action Plan on coordination of digitization programmes and policies*. Follow up of Experts meeting. Lund, Sweden, 4 April 2001. Available ftp://ftp.cordis.lu/pub/ist/docs/digicult/lund_action_plan-en.pdf
9. *Charter of Parma*. Final version. 19 November 2003. Available <http://www.minervaeurope.org/structure/nrg/documents/charterparma031119final.htm>

10. *Dynamic Action Plan for the EU co-ordination of digitization of cultural and scientific content*. 15 November 2005. Available <http://www.minervaeurope.org/publications/dap.htm>

11. *i2010: Digital libraries*. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the regions. Brussels. 30.9.2005. Available http://europa.eu.int/information_society/activities/digital_libraries/doc/communication/en_comm_digital_libraries.pdf

12. *Position Paper on EU Added Value and post-Lund Strategy*. Version 1. 15 November, 2003.m Available <http://www.minervaeurope.org/structure/nrg/documents/positionpaper031115.htm>

13. *The Lund Principles: Conclusions of Expert meetings*. Lund, Sweden, 4 April 2001. Available ftp://ftp.cordis.lu/pub/ist/docs/digicult/lund_principles-en.pdf

ANNEX B. QUESTIONNAIRE FORM



Analysis of Research Activities of the European National Libraries

One of the most important goals of the TEL-ME-MOR project is to contribute to larger involvement of the national libraries in European projects. This survey is an extension of the study *Analysis of Research Activities and Requirements of the National Libraries of the New EU Member States* (the report is available http://www.telmemor.net/docs/WP1_FinalReport_July2005.pdf) performed by the National Library of the Czech Republic.

During the last CENL meeting in Luxemburg in September 2004, it was agreed (see the minutes) that... *all CENL members will be asked to complete a questionnaire... which can be used to influence the allocation of funding...*

The report aimed to develop a research agenda for the national libraries (NL) of the New EU Member States by clarifying current state-of-the-art in the research area and by evaluating NL potential to participate in the European IST programme. For this purpose achievements, challenges, and future directions in research and development activities of the NL in the New Member States were identified by survey.

This questionnaire is an add-on to the former *Analysis of Research Activities of the National Libraries CENL Members* and it **aims to define current state-of-the-art in research and development in the national libraries CENL members in the domain of cultural heritage and information and communication technologies**. This questionnaire is the modified version of the first survey. By extending the survey to all CENL members TEL-ME-MOR aims to create a European panorama of research and development (RD) activities in the national libraries.

The questionnaire is divided into several thematic sections. Section A is designed to obtain general information about RD opportunities for the national library; Section B looks at the technological infrastructure; Section C is intended to clarify specifically matters of preservation and access to diverse information sources and relevant RD activities; Section D is focused at digital libraries hosted by NL, their content, services and quality management. *Please, don't forget to provide statistical information where appropriate.*

Please, return the filled-in questionnaire by 1 February 2006 to adolf.knoll@nkp.cz

In case you have problems concerning the questionnaire, please write to adolf.knoll@nkp.cz

Thank you for co-operation!

Analysis of Research Activities of the National Libraries CENL Members

Identification of the National Library

Legal Name	
Address	
Main URL	
Contact Person for Filling in this Questionnaire	
His/Her Phone Number	
His/Her E-Mail Address	

A. GENERAL STATE OF THE ART AND RESEARCH AND DEVELOPMENT FRAMEWORK

Research and Development (RD) Involvement of the Library

Does your state RD policy and instruments enable your library to be involved in state supported RD programmes?	<input type="checkbox"/> YES <input type="checkbox"/> NO
If yes, who is operating such RD programmes?	<input type="checkbox"/> National Grant Agency <input type="checkbox"/> Ministry of Culture <input type="checkbox"/> Ministry of Education <input type="checkbox"/> Other, please specify
Specify if you collaborate with any of listed institutions in RD projects	<input type="checkbox"/> Archives <input type="checkbox"/> Museums <input type="checkbox"/> Research Institutes <input type="checkbox"/> Universities <input type="checkbox"/> SME <input type="checkbox"/> Other Commercial <input type="checkbox"/> Other, please specify:
Is there in your country an official register of RD results connected to the above-indicated state supported RD projects and plans?	<input type="checkbox"/> YES <input type="checkbox"/> NO
If so, do your researchers register their eligible results there?	<input type="checkbox"/> YES <input type="checkbox"/> NO
If so, how many registered results are there from your library?	<input type="checkbox"/> Please, specify the number..... <input type="checkbox"/> NONE
Are long-term RD plans ² of your library funded by state? If yes, indicate how many are being currently funded	<input type="checkbox"/> YES, specify number of funded plans <input type="checkbox"/> NO

Basic RD Data

How many staff members of your library are involved (even partly) in RD activities?	
How much was spent in your library for RD activities in 2004?	EUR

International RD Co-operation

Have you been participating in any international RD projects?	<input type="checkbox"/> YES <input type="checkbox"/> NO
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² We understand by the word *RD plan* a continuous activity in a certain RD area that has been approved officially in an evaluation process and it is regularly funded. Its duration is usually five or more years. This is different from a project, which is shorter and easier to target a precise goal.

<p>If so, provide the basic information</p>	<input type="checkbox"/> EU Frameworks Programmes <input type="checkbox"/> e-Content <input type="checkbox"/> Eureka! <input type="checkbox"/> non-European <input type="checkbox"/> Other please specify:
<p>In how many European RD projects have you been involved until now?</p>	

RD Strategy

<p>Does your library have a long-term research strategy?</p>	<input type="checkbox"/> YES <input type="checkbox"/> NO
<p>If so, which areas are covered?</p>	<input type="checkbox"/> preservation of analogue materials <input type="checkbox"/> preservation of digital content <input type="checkbox"/> electronic services <input type="checkbox"/> digital access to original documents <input type="checkbox"/> access to digital content <input type="checkbox"/> other, please specify

B. UNDERLYING INFORMATION AND COMMUNICATION TECHNOLOGIES

<p>What is the speed of the Internet connectivity of your library?</p>	<input type="checkbox"/> less than 256 kbit/s, please specify if so <input type="checkbox"/> 1 – 9 Mbit/s <input type="checkbox"/> 10 – 99 Mbit/s <input type="checkbox"/> 100 – 199 Mbit/s <input type="checkbox"/> 200 – 499 Mbit/s <input type="checkbox"/> 500 – 999 Mbit/s <input type="checkbox"/> 1 Gbit/s and more
<p>What systems are you running in your library? Please specify which ones</p>	<input type="checkbox"/> NONE <input type="checkbox"/> Union Catalogue <input type="checkbox"/> digitization production facilities <input type="checkbox"/> digital library/libraries of scanned or otherwise digitized content <input type="checkbox"/> internal administration systems(s) <input type="checkbox"/> mass preservation storage system(s) <input type="checkbox"/> web harvesting and archiving

	<input type="checkbox"/> sophisticated search and retrieval gateways/portals working simultaneously with various external resources <input type="checkbox"/> other special systems or applications; please specify:
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C. PRESERVATION AND ACCESS

Indicate which types of resources are being preserved in your library	<p>Analogue resources:</p> <input type="checkbox"/> Written and printed materials <input type="checkbox"/> Analogue audio <input type="checkbox"/> Analogue film and video
	<p>Born-digital resources:</p> <input type="checkbox"/> Offline resources (e.g. CD, DVD etc.) <input type="checkbox"/> Online resources (e.g. web pages)
Which major preservation problems affect your library collections?	<input type="checkbox"/> improper storage environment <input type="checkbox"/> acid-paper embrittlement <input type="checkbox"/> fading of colours and inks in manuscripts and early prints <input type="checkbox"/> aging of parchment and leather bindings <input type="checkbox"/> instability of photographs <input type="checkbox"/> papyrus conservation <input type="checkbox"/> palm-leaves embrittlement <input type="checkbox"/> NONE <input type="checkbox"/> other; please specify:
Is your national library running a portal for uniform access to heterogeneous resources or at least library catalogues similar to TEL?	<input type="checkbox"/> YES <input type="checkbox"/> NO
Provide the URL of your portal	http://
Indicate if you are involved in RD initiatives in the following areas	<input type="checkbox"/> Preservation of analogue materials <input type="checkbox"/> Microfilming programmes <input type="checkbox"/> Stability of analogue audio carriers <input type="checkbox"/> Stability of analogue film carriers <input type="checkbox"/> Stability of analogue video carriers <input type="checkbox"/> Stability of digital offline carriers <input type="checkbox"/> Preservation of digital online resources <input type="checkbox"/> Research in portals <input type="checkbox"/> Development of digital library services <input type="checkbox"/> NOT involved in RD in these areas
If your library digitizes the original	<input type="checkbox"/> manuscripts – number digitized

documents, please specify types of digitized resources available and indicate/estimate roughly the quantity of digitized material	pages..... <input type="checkbox"/> rare old printed books – number of digitized pages..... <input type="checkbox"/> old monographs published since 1800 – number of digitized pages..... <input type="checkbox"/> periodicals – number of digitized pages..... <input type="checkbox"/> maps – number of items..... <input type="checkbox"/> audio documents - number of archival files..... <input type="checkbox"/> video documents – number of archival files..... <input type="checkbox"/> 3D objects – number of digitized items..... <input type="checkbox"/> other; please, specify (incl. quantity):
Are these documents available on-line on Internet?	<input type="checkbox"/> YES <input type="checkbox"/> NO

D. DIGITAL LIBRARIES

Please fill the part E if you are running a digital library that is available on Internet. If no, skip this section. If you run more than one digital library, copy this table and fill it in for each digital library separately.

Specify the available content	<input type="checkbox"/> digitized <input type="checkbox"/> born-digital
Specify the origin of the content:	<input type="checkbox"/> your national library collections only <input type="checkbox"/> from other in-country libraries <input type="checkbox"/> from other in-country memory institutions <input type="checkbox"/> other, please specify
Provide the URL of this digital library:	http://
Have you implemented any of the listed technologies into your digital library?	<input type="checkbox"/> wavelet images <input type="checkbox"/> image servers processing images on demand (on-the-fly) <input type="checkbox"/> complex SGML/XML document formats ³ <input type="checkbox"/> SGML/TEI/XML structured texts <input type="checkbox"/> mass storage facilities
Have you done lately any user surveys of digital library services?	<input type="checkbox"/> YES <input type="checkbox"/> NO If yes, specify the topic of survey (-s):

³ The document format is a format that is larger than a bibliographic record, as it describes and structures all physical and logical levels/units of the document incl. provision of reference to data files (images, audio, video ...) and other types of information, incl. the technical one. MARC formats have not this character.

Specify if you involve users in the following processes:	<input type="checkbox"/> Planning interface for digital services <input type="checkbox"/> Designing/purchasing the design of interface for digital services <input type="checkbox"/> Monitoring the usage of digital services
What international standards/ do you apply to ensure quality of your digital services	<input type="checkbox"/> Usability standards/guidelines, specify: <input type="checkbox"/> Accessibility standards/guidelines, specify: <input type="checkbox"/> Library service quality standards/guidelines, specify:

Please, return this questionnaire electronically as attachment to:

Mr Adolf Knoll
 Director for Science, Research, and International Relations
 National Library of the Czech Republic
 Klementinum 190
 110 00 Prague 1
 Czech Republic

adolf.knoll@nkp.cz

phone: +420-221663274

ANNEX C. NATIONAL LIBRARIES/COUNTRIES DIVIDED INTO GROUPS FOR THE PURPOSES OF RESEARCH

EU-15+EEA+CH	EU-10	Non-EU
Austria	Czech Republic	Albania
Belgium	Cyprus	Armenia
Denmark	Estonia	Croatia
Finland	Hungary	Bosnia and Herzegovina
France	Latvia	Bulgaria
Germany	Lithuania	Moldova
Iceland	Malta	Republic of Macedonia
Italy	Poland	Russia (Moscow)
Luxemburg	Slovakia	Russia (Saint-Petersburg)
Netherlands	Slovenia	San Marino
Norway	Total: 10	Serbia
Portugal		Turkey
Spain		Vatican
Sweden		Total: 13
Switzerland		
UK		
Total: 16		

ANNEX D. LIST OF COUNTRIES AND ABBREVIATIONS

No.	Country	Abbreviation
1.	Albania	AL
2.	Armenia	AM
3.	Austria	AT
4.	Belgium	BE
5.	Bosnia and Herzegovina	BA
6.	Bulgaria	BG
7.	Croatia	HR
8.	Cyprus	CY
9.	Czech Republic	CZ
10.	Denmark	DK
11.	Estonia	EE
12.	Finland	FI
13.	France	FR
14.	Germany	DE
15.	Hungary	HU
16.	Iceland	IS
17.	Italy/Florence	IT
18.	Latvia	LV
19.	Lithuania	LT
20.	Luxemburg	LU
21.	Malta	MT
22.	Moldova	MD
23.	Netherlands	NL
24.	Norway	NO
25.	Poland	PL
26.	Portugal	PT
27.	Republic of Macedonia	MK
28.	Russia*	RU
29.	San Marino	SM
30.	Serbia	SP
31.	Slovakia	SK
32.	Slovenia	SL
33.	Spain	ES
34.	Sweden	SE
35.	Switzerland	CH
36.	Turkey	TR
37.	United Kingdom	UK
38.	Vatican City	VA

* Number of countries do not coincides with number of respondents because there are two national libraries that represent Russia (Moscow and Saint-Petersburg)

ANNEX E. PARTICIPATION OF NLS IN INTERNATIONAL PROJECTS

NLs by country	EU Framework programmes	e-Content	EUREKA!	Non-European	Other	No. of European projects
AL	X					4
AT	X	X				10
BE	X					5
BG	X					2
CZ	X	X	X	X		10
DK	X	X		X		8
EE	X	X			X	9
FI	X				X	4
FR	X			X		11
DE	X			X		6
HU	X				X	3
IS	X			X		1
LV	X					2
LT	X			X	X	5
LU	X					2
NL	X					15
NO	X				X	7
PT	X				X	7
MK	X				X	2
RU-P					X	0
RU-M					X	0
SP	X					4
SL	X	X	X		X	14
ES	X					6
SE	X			X		5
CH	X				X	6
UK	X			X		4

**ANNEX F. NUMBER OF PAGES (INDIVIDUAL FILES) IN THOUSANDS OF UNITS
 DIGITIZED IN NLS BY FEBRUARY 2006**

Country	No. of digitized pages/files
Spain	40609
France	24106
United Kingdom	3223
Austria	3190
Czech Republic	2671
Russia - Moscow	1665
Iceland	1413
Finland	949
Norway	842
Italy - Florence	573
Denmark	564
Serbia	481
Netherlands	416
Portugal	391
Latvia	351
Poland	279
Russia - St. Petersburg	258
Estonia	220
Germany	219
Hungary	170
Switzerland	162
Sweden	38
Slovenia	28
Slovakia	26
Bosnia and Herzegovina	25

Only the NLS with more than 25,000 pages are mentioned here.