Towards the European digital library: management of cultural heritage in the national libraries

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Abstract

European memory institutions possess valuable cultural heritage collections that contribute to research and education, social and cultural integration of the European countries and regions. Bringing cultural heritage online is a multilayered activity, a mix of political, technological, managerial and other decisions. The aim of this paper is to concentrate on technological and management issues of cultural heritage in the European national libraries. Technological aspects of cultural heritage management determine their level of preparedness to implement large-scale digital library initiatives. Management aspects reveal their potential for the European collaboration and networking. This paper is based on the survey of cultural heritage management in the European national libraries that was performed in the context of TEL-ME-MOR project (http://www.telmemor.net/), funded by the European Commission under the 6th Framework Programme. There are several major findings. Strategic priorities of the national libraries are in line with the European information policy. Differently from the common opinion about possible gaps between the EU "oldtimers" and new member states, the later are well-developed and equal partners for implementation of the large-scale digital library initiatives. One of the obstacles on the way to the European digital library is the lack of the digitized content in the national libraries. National libraries also should collaborate more actively with users while building digital libraries.

Introduction

The European Digital Library is both a vision and an emerging reality. Since the end of 2005 the European Union (further in the text – EU) institutions have announced series of strategic documents related to the European Digital Library which is envisioned as an open and attractive virtual space for cultural heritage access. The communication *i2010: Digital library* (2005) and *Recommendation on the digitisation and online accessibility of cultural material and digital preservation* (2006) provided a basis for the development of strategic and operational framework which would help to bring the vision of the European Digital Library to life.

Emphasis in the EU strategic documents is put on deploying an existing technological infrastructure for creation of the European Digital Library (further in the text – EDL). In this light, the national libraries are important contributors to EDL. Moreover, it is agreed that the European Library portal (TEL, http://www.theeuropeanlibrary.org/) which currently contains treasures from the European national libraries will become a starting point for the development of EDL. National libraries are institutions which are responsible for

safeguarding and providing access to cultural heritage of the nations; they are also in-country centres for librarianship that act as a vehicle for diffusion of innovative practices in management of cultural heritage. These facts inspire to explore the current state-of-the-art concerning management of cultural heritage and ICT in these institutions.

The **aim** of this paper is to concentrate on technological and management issues of cultural heritage in the European national libraries. Technological aspects of cultural heritage management determine their level of preparedness to implement large-scale digital library initiatives. Management aspects reveal their potential for the European collaboration and networking. This paper is based on the survey of cultural heritage management in the European national libraries that was performed in collaboration with the Czech National Library in the context of TEL-ME-MOR project (http://www.telmemor.net/), funded by the European Commission under the 6th Framework Programme.

1. Survey of the European national libraries: objectives and methodology

In the context of TEL-ME-MOR project a survey of the national libraries members of CENL (Conference of European National Librarians) was performed (Manžuch & Knoll, 2006). The **main objective** of the survey was to create a European panorama of cultural heritage and ICT activities, achievements and challenges in the national libraries. For this purpose a questionnaire was distributed to the national libraries by email. The questionnaire was designed to collect data on the following topics:

1. **Strategic approach** to management of cultural heritage in the digital environment. The set of questions in this category was designed to analyze the strategic commitment of the national libraries in the domain of cultural heritage and ICT. It included availability of long-term strategies, major strategic priorities, and statistics of participation in relevant international projects.

2. Availability of appropriate **technological infrastructure**. In this area, it was aimed 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.

3. Activities related to **building digital libraries and digitization**. In this section, it was important to investigate experience of national libraries in running and maintaining digital libraries, their capacity to produce digitized materials, and quality of digital cultural heritage services the respondents provide. Taking into account ambiguity of some concepts in the field several definitions were developed to assist analysis of the data. For the needs of current survey **digital library** is defined as an organized searchable collection of materials (digitized or/and born-digital) available for usage on-line (Manžuch and Knoll, 2006). Despite the narrowness of the proposed concept, it is appropriate for defining a threshold separating a digital library from other ICT-based applications as electronic catalogues, bibliographic databases etc. Several working definitions of concepts, related to the quality of digital library services, were developed. These were accessibility, usability and quality of library services. **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/her goals effectively, efficiently and satisfactorily exploiting a particular tool in specific context of use (Glosienė, Manzuch, 2005). **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).
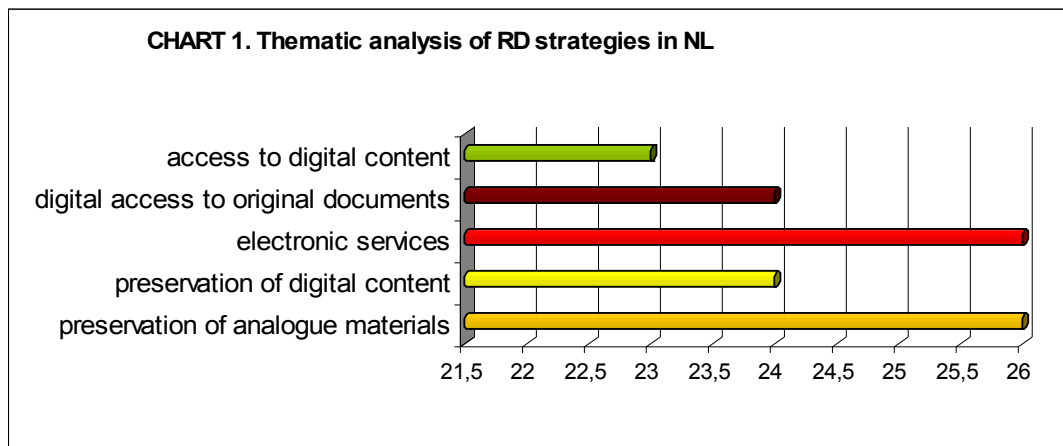
39 of 45 national libraries responded to the questionnaire. The percentage of answers (87%) is very high and makes the results of the survey valid. For the purposes of comparative analysis, all respondents were divided into three groups:

- **EU-15 countries + EEA+CH** covered the EU old member states, the countries of the European Economic Area, 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. The total number of responses in this group was **13 completed questionnaires**.
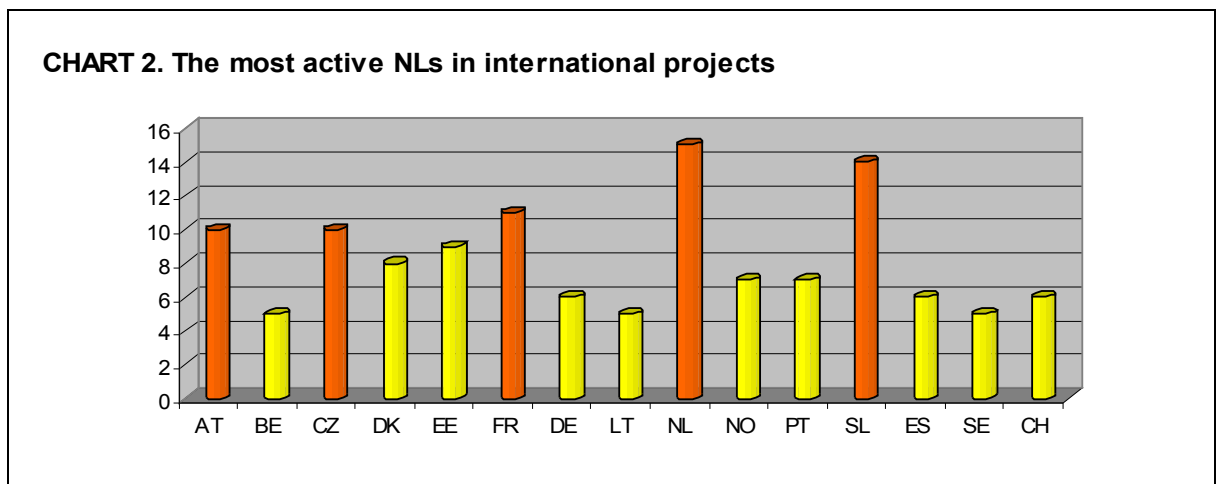
Methods of statistical and comparative analysis were applied for processing collected data. On the charts abbreviated names of respondent countries are represented (see the list of country codes in the annex).

2. Strategic approach to management of cultural heritage in the digital environment

The European national libraries (further in the text – NL) demonstrate high commitment to management of cultural heritage in the digital environment. This position is reflected in the strategic documents of the national libraries. The majority of respondents (79%) reported having a long-term research and development strategy in the field of cultural heritage and ICT. 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 specific areas. The most popular strategic areas are electronic services (84%) and preservation of analogue materials (84%). Analogue preservation is crucial for NLs because traditional analogue carriers constitute the main part of their collections. However, NLs are concerned with the new ways of serving users in the digital environment; therefore, there is an interest in electronic services as well as in the digital access to original documents (see CHART 1).

CHART 1. Thematic analysis of RD strategies in NL

Category	Value
access to digital content	~23
digital access to original documents	~24,1
electronic services	~26
preservation of digital content	~24,1
preservation of analogue materials	~26

21,5   22   22,5   23   23,5   24   24,5   25   25,5   26

Strategic commitment of NLs to the development of solutions in the field of cultural heritage and ICT is reflected in the rate of participation in the international projects (see CHART 2, see country codes in the ANNEX).

CHART 2. The most active NLs in international projects

Country	Value
AT	10
BE	5
CZ	10
DK	8
EE	9
FR	11
DE	6
LT	5
NL	15
NO	7
PT	7
SL	14
ES	6
SE	5
CH	6

The comparative analysis reveals that EU-15+EEA+CH countries have in general the most experience of participation in some kinds of projects. 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 2).
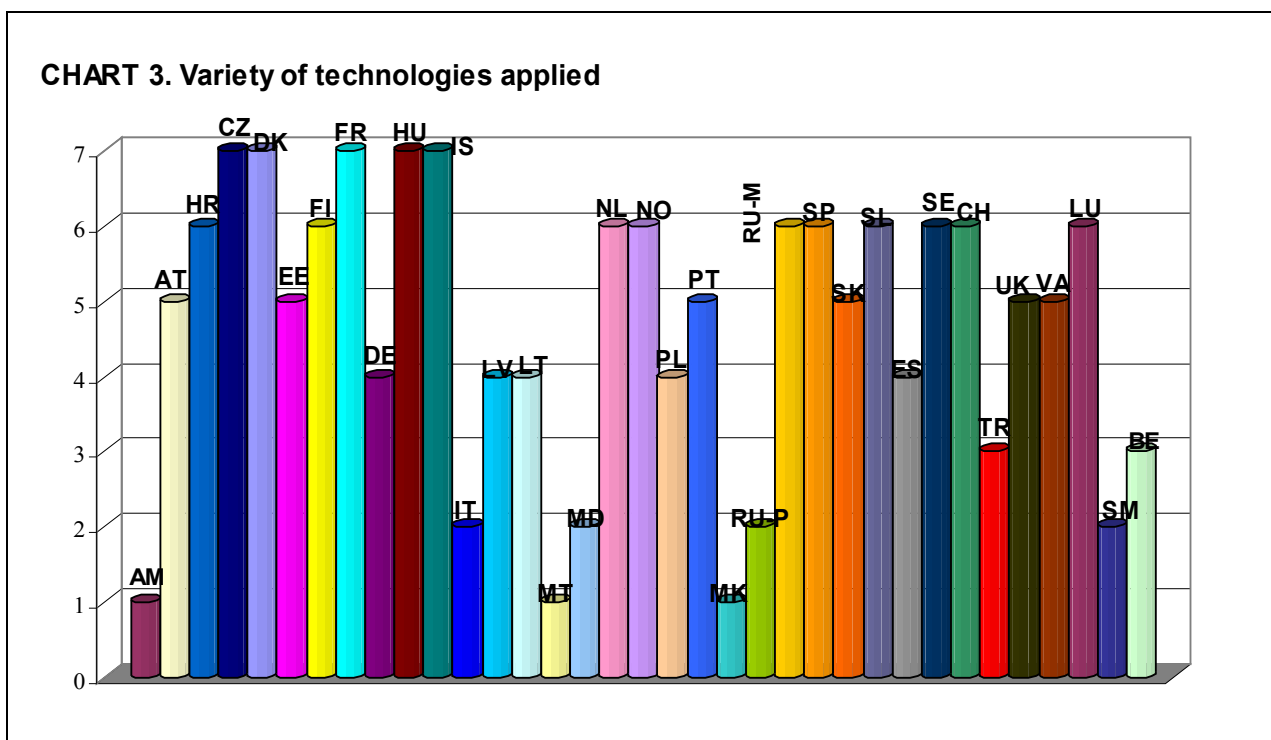
The strategic priorities of NLs coincide in general with the major European trends. European and international initiatives are favoured by NLs not only in EU member states but also in non-EU countries. It indicates that NLs are willing to participate in the sound research initiatives that have a wide impact. On the other hand, this intention may identify the willingness of all NLs to become visible players in the international area.

3. Technological infrastructure

The highest internet 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, and other more complex technologies.

CHART 3. Variety of technologies applied

From the five NLs with the maximum variety of technologies (see CHART 3, country codes are in the ANNEX), 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.

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.

4. Activities related to building digital libraries and digitization

Digital libraries are at an early stage of the development in the European NLs. Although quite many NLs claimed having a digital library in place, not all of respondents

are really running a digital library (after analysis of digital library websites according to minimum set of criteria established for the purpose of research the number of digital libraries decreased from 41 to 33). 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.

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. 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**. Comparative analysis of the European NL-leaders in the production of digitized materials with other national libraries worldwide allows seeing a wider perspective of the position of Europe on the international digitization arena (see CHART 4).
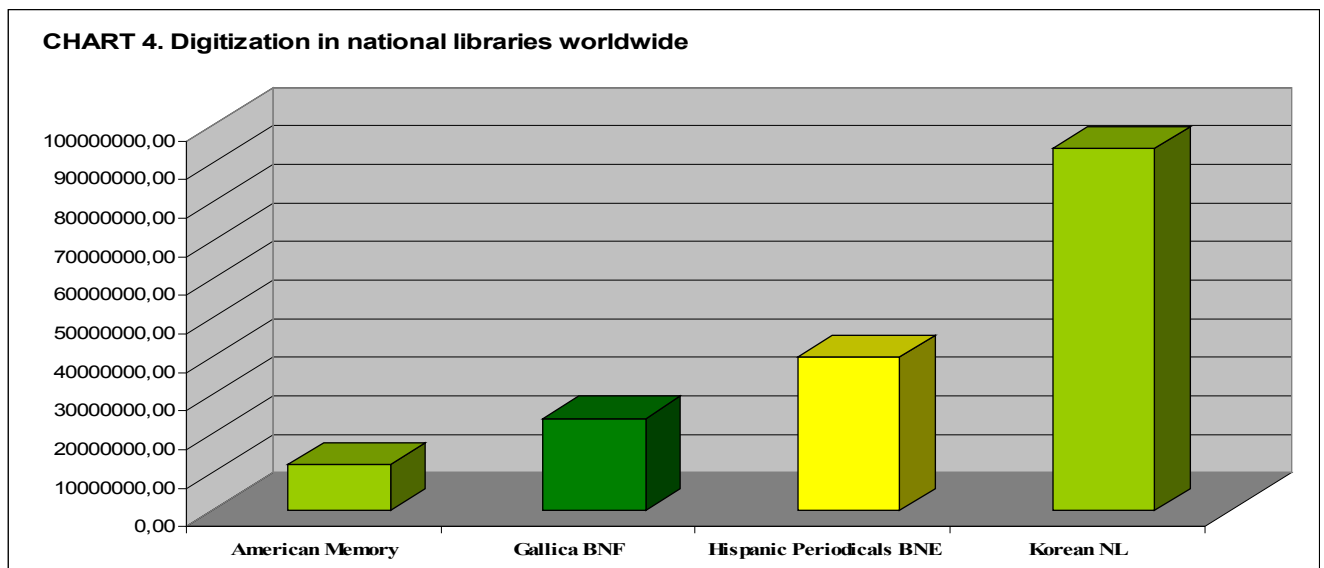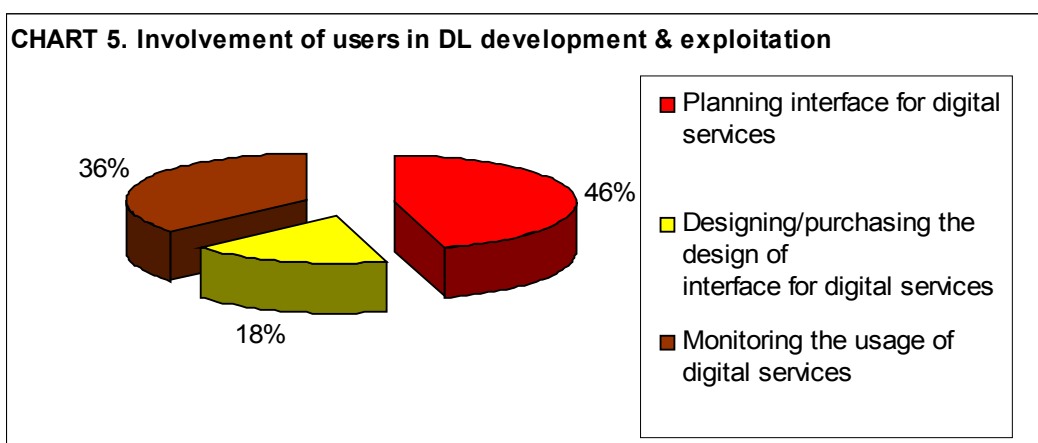

CHART 4 shows the volume of digitized materials in US Congress Library (American Memory, approx.12 millions of digitized items), national library of France (Gallica BNF, approx. 24 millions of digitized items), national library of Spain (Hispanic Periodicals BNE, approx. 40 millions of digitized items) and Korean national library (approx. 93 millions of digitized items) (Knoll and Manžuch, 2006).

Digital libraries or services are not user-oriented. Still in many cases NLs do not consider user opinions (48% of NLs haven't performed a user survey recently) and wishes when designing digital library applications. 47% of 11 NLs which run a digital library involve users into different stages of digital library development and exploitation (these stages include planning of digital library interface, interface design and monitoring of usage of digital library services). 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 5.

CHART 5. Involvement of users in DL development & exploitation

Legend:
- Planning interface for digital services
- Designing/purchasing the design of interface for digital services
- Monitoring the usage of digital services

(36%, 18%, 46%)

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.

Standards of quality interaction and access in digital environment (i.e. usability, accessibility and service quality standards) are not widely known and they are interpreted ambiguously. Only 10 of respondents running a digital library stated that they apply usability standards. However, 3 answers were erroneous (see comparison of true and false answers in CHART 6), confusing usability with image standards (JPEG/TIFF), general recommendations for preservation of cultural heritage, and metadata standards (e.g., Dublin Core). In comparison with usability, the accessibility standards are known better – the answers include only one erroneous statement (CHART 6). 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 or communication protocols.
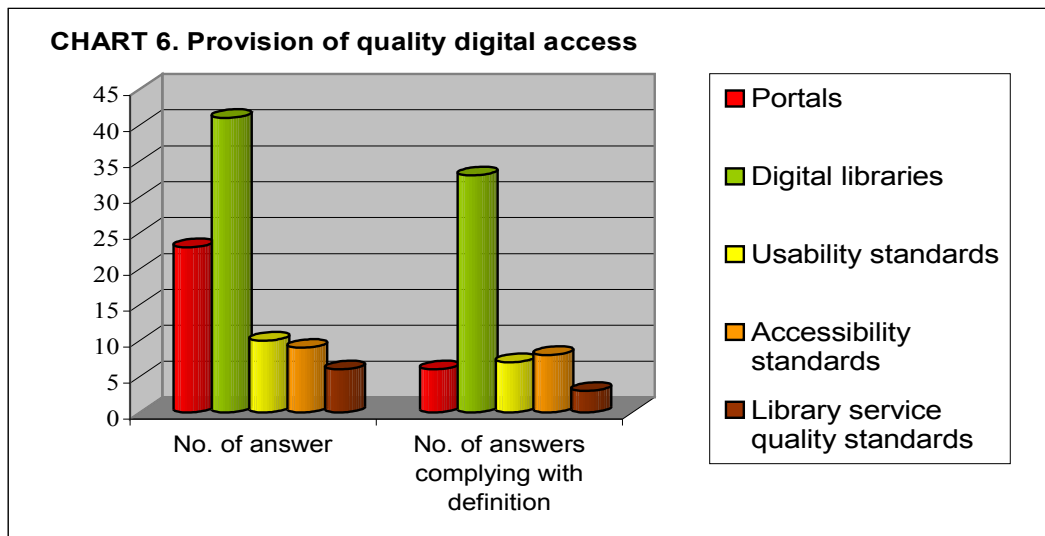
CHART 6. Provision of quality digital access

CHART 6 reveals that 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

Conclusions

This research was the first attempt to comprehend the potential, achievements and challenges in cultural heritage and ICT 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 in national libraries. This research cannot therefore provide a precise benchmarking tool but rather establishes general trends in cultural heritage and ICT.

Strategic priorities of the national libraries are in line with the European information policy. This allows assuming that the national libraries are ready to participate actively in the implementation of the European Digital Library and face issues of digitization, digital preservation and others.

From the point of view of management activities in the field of cultural heritage and ICT, the existing EU-funded networks of competence should consider and exploit the knowledge and experience available in the national libraries of the New EU Member States. These networks should be enriched by the new member states' NL where appropriate. There are no gaps between the EU-15 members, EEA states and the New Member States who are equal and competent players on the European arena.

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. The 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. 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.

User-centred solutions, collaboration with users and raising their awareness about potential benefits of digital cultural heritage services should become important criteria for national libraries and those who provide funding to the international projects. 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 as to the value of cultural heritage and relevant digital services. It will make these services much closer to actual user needs. 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 digital libraries.

Acknowledgements

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ANNEX. List of countries and codes*

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)