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ENRICH

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eContentplus

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a multiannual Community programme to make digital content in Europe more accessible, usable and exploitable.

¹ OJ L 79, 24.3.2005, p. 1.

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2 Project Objectives

The aim of the ENRICH project was creating a base for the European Digital Library of specific historical cultural heritage consisting of manuscripts, incunabula, early printed books, historical archival materials, etc. The project objective is integration of existing but scattered electronic content under the existing Manuscriptorium (<http://www.manuscriptorium.com>) digital library interface through the way of the metadata enrichment and coordination between heterogeneous metadata and data standards as well. The main innovation of ENRICH is in a common easy-to-use interface which enables concentration of dispersed resources into a unique research environment and retrieval of data from distant servers. The repository owners (libraries, archives) can use their own existing platform. The application of this approach throughout the 24 months of duration of ENRICH project practically verified the possibilities of using the existing (mostly image) data from remote servers for seamless access. The Manuscriptorium platform now enables sharing of data repositories (distributed storage) and detailed metadata and search from a single access point without a need to switch to other websites with different interfaces made in different languages. Thus, a very complex subset of a European Digital Library can be created for specific group of documents and specific target user group.

The main objectives of ENRICH were:

1. **creation of European digital library research environment** for specific historical cultural heritage consisting of **manuscripts, incunabula, early printed books, historical archival materials, maps, etc.**
2. adaptation of existing Manuscriptorium platform for accessing, use, re-use and data **harvesting of digitized manuscripts** held by libraries, museums and archives in EU Member States, Associated States, Candidate Countries, and other European countries which will enable interoperability between digitized objects and collections
3. adaptation of existing Manuscriptorium platform enabling **interoperability of existing partner systems** for authorizing the use of the digital content
4. **implementation of multilingual ontologies enabling** search in local languages, retrieval of data in source languages, enabling personalized indexing and creation of personal collections and presentations

Contribution to eContent+ programme objectives

Working together with national-level cultural institutions, ENRICH made a step toward a Single European Information Space where content held at national and local levels can be accessed **interoperably**. The potential for **cross-border use** has been greatly enhanced by provision of a **single access point and common top level navigational interface** providing a European view of cultural resources ‘where they live’ and also according to their theme, across different regions. The partners in each country are in a strong position to advocate and support implementation and roll-out of the service and have specific experience of the application through research and pilot projects.

The activities to be carried out within **ENRICH** project aim to contribute to the EU framework policy in the domain of information technologies, particularly i2010, and are based on experience and recommendations acquired within eEurope 2005 action plan. In particular ENRICH will contribute to the Communication on **European Digital Library**.

Among the significant challenges identified in i2010 for the Single European Information Space to which ENRICH will contribute are:

- rich content: increased quality of digitized resources and related metadata
- interoperability: for the use of data external to Manuscriptorium, there are tools for accessing and sharing metadata in standard formats (UNIMARC, MARC21, MASTER, TEI P5...) via standard communication interfaces, Z39.50, OAI-PMH.
- re-usability: ENRICH platform will enable creation of personal collections and sets of documents and metadata
- multilingual approach: ENRICH provides an environment for multilingual search and automated translation of metadata

By working together with national libraries and memory institutions which are involved in initiatives such as CENL and The European Library (TEL), ENRICH will be well placed to achieve synergies with these key initiatives for EDL. Manuscriptorium has been cooperating closely and successfully with TEL and this cooperation will continue. Therefore EDL will directly profit from the enhancement of the digital content realized within ENRICH project.

The results of ENRICH project will increase quality of life of citizens in the area of cross-border multilingual access to a specific type of cultural heritage the access to which used to be a privilege of a small group of researchers. ENRICH will thus contribute to complement and support the objectives of European Union action in the field of **cultural heritage preservation and education**.

3 Consortium

The consortium of ENRICH project was coordinated by **National Library of the Czech Republic, Prague, Czech Republic (NKP)**, a world leading institution in digitization and presentation of digitized manuscripts. NKP in cooperation with the technical coordinator AIP Beroun developed the original version of Manuscriptorium, which was a basis for the whole ENRICH project. National Library of the Czech Republic is also the most important content provider with more than 900 000 pages of digitized documents. National Library of the Czech Republic combined 3 roles within the project – the coordinator (assisted by Cross Czech a.s. and AIP Beroun s r.o.), the member of technological group applying its experience within the Manuscriptorium development and participant in the tools development and implementation and the content provider, using the developed tools for improving the quality, quantity and accessibility of maintained digital content. NKP was leading WP1 and WP2.

Cross Czech a.s., Prague, Czech Republic (CCP) was the administrative coordinator of the project. CCP has monitored the overall project development, fulfillment of established deadlines and assurance of the quality of the project results. CCP participated in dissemination activities and administrated the project webpage. CCP also cooperated on several technical WPs related to the research of end-users needs and multilingual accessibility of the digital content.

AiP Beroun s r.o., Beroun, Czech Republic (AIP) has been the developer and administrator of Manuscriptorium for many years since its foundation. In frame of ENRICH project AIP holds the position of Technological Coordinator. AIP was involved in all technological WPs, leading the WP5. AIP cooperates with all content partners, provides them consultations during the preparation phase of their infrastructures, data and metadata. After agreement of the way of cooperation AIP assures the integration of partners' data into Manuscriptorium clone (and later to regular Manuscriptorium). AIP was also leading partner in the development of the new functionalities and tools created under WP4 and WP5.

Oxford University Computing Services –The Research Technologies Service, Oxford, UK (OUCS) was one of the core technological partners, bringing its know-how in the field of harvesting metadata, TEI P4/TEIP5 platforms, MASTER platforms, METS containerization and UNICODE treatment. OUCS was the leader of WP3. It also valuably contributed to other technological work packages, mainly to WP4 and WP5.

Københavns Universitet - Nordisk Forskningsinstitut, Copenhagen, Denmark (KU) is a combined partner, delivering to the ENRICH project valuable digitized content and experienced expertise in the area of digitization of historical documents and data/metadata processing, contextualization etc. KU cooperated on WP3 leadership with OUCS. It participated in all WPs by technology and content development.

Universita degli studi di Firenze - Media Integration and Communication Centre, Florence, Italy (MICF) focused on user personalization of virtual digital collections and implementation of intelligent search engines working above accessible metadata. MICF was the leader of WP4, cooperating with PSCN.

Institute of mathematics and informatics, Vilnius, Lithuania (IMI) was focusing on testing and validation of developed tools and services. The strong cooperation with all partners was necessary to ensure successful completion of this task; apart of the definitions of methodology and strategy for evaluation the realization of the planned, certain organizational efforts were also necessary.

SYSTRAN S.A (SYS) is the world leading company in automated translation tools development and implementation, cooperating with numerous institutions around the world. Its main responsibility within ENRICH project was development and implementation of multilingual access tools, with the use of VICODI ontologies for the contextualization of the digital content previously developed within other EC funded project.

Computer Science for the Humanities - Universität zu Köln – UZK has considerable experience with web based servers of cultural heritage material and focuses concretely on the question of general interfaces for the provision of the MASTER (or now TEI P5) exchange via OAI. It is a technological contributor in all fields of web based services, as well as liaising between technology and the Cultural Heritage sector. Furthermore, UZK provides reasonable amount of digitalized documents to be accessible through Manuscriptorium platform.

Instytut Chemii Bioorganicznej PAN - Poznańskie Centrum Superkomputerowo-Sieciowe – Poznan Supercomputing and Networking Center (PSNC) is the last member of technological group. PSNC was the leader of tasks related to its research on distributed dynamic collections and "grid publications" in digital libraries. PSNC was responsible for the development of the Enrich Garage Engine tool.

The National Library of Spain, Madrid (BNE) was the leader of Dissemination and Exploitation activities. It was responsible for the creation of promotional materials, cooperated on the design of the webpage and preparation of Dissemination Plan. BNE organized the final ENRICH conference in Madrid in November 2009. BNE also contributes with substantial amount of digital content to the Manuscriptorium digital library.

Content providers

The remaining partners can be characterized as „**content providers**” making their digitized documents available through Manuscriptorium platform. All of them also carried out the standard dissemination activities within their countries and in the frame of consortium international activities. The content partners of ENRICH project are as follows:

- **Biblioteca nazionale centrale Firenze, Florence, Italy (BNCF)**
- **Vilniaus universiteto biblioteka, Vilnius, Lithuania (VUL)**
- **University Library of Wroclaw, Poland (ULW)**
- **Stofnun Árna Magnússonar í íslenskum fræðum, Reykjavík, Iceland (SAM)**
- **Diözese St. Pölten, Austria (DSP)**
- **The National and University Library of Iceland, Reykjavík, Iceland (NULI)**
- **The Budapest University of Technology and Economics National Technical Information Centre and Library, Hungary (BUTE)**

4 Project Results/Achievements

The main result of the project is the recently launched new **Manuscriptorium platform** available at <http://www.manuscriptorium.com>. It contains the data aggregated from 12 regular and 13 associated content partners of ENRICH project.

Country coverage of Manuscriptorium partner libraries in November 2009:

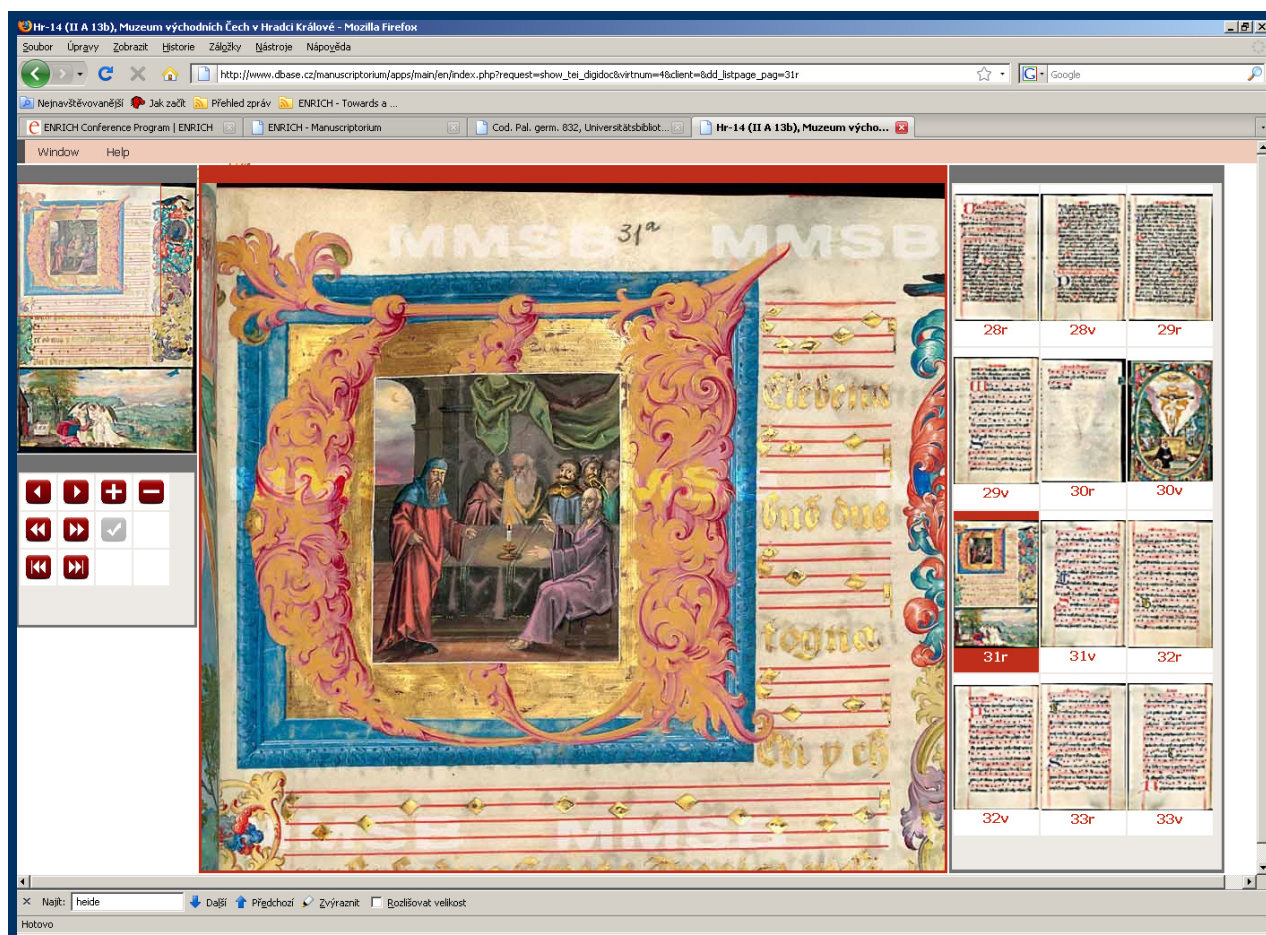


Manuscriptorium now brings together more than 4 500 000 pages of digitized manuscripts located around the world, many of them of unique historical value and most of them in outstanding technical quality. Number of sophisticated tools and features developed during the 24 months of project realization were implemented into the new platform and are now available to various types of end-users.

New Manuscriptorium Platform

A new Manuscriptorium platform is based on the TEI P5 schema and it brings new search possibilities and utilities, especially search with diacritical tolerance (e.g. c = ç = ć = ĉ = ċ = č etc.) and graphical alternatives (e. g. /evangelium/ = w /ewangelium/ = u /euangelium/ = uu /euuangelium/ etc.). The platform processes only the metadata while the image data are maintained in their original location, which makes the whole process much simpler and faster, while the final representation of the manuscript is created by the client's browser. It also brings improved search engine based on the research of end-user needs and completely new environment for displaying of selected manuscripts, allowing easy manipulation with the images.

Representation of the selected manuscript by the new Manuscriptorium platform:



TEI P5 ENRICH schema

TEI P5 ENRICH schema is an application of the TEI P5 standard for digital libraries like Manuscriptorium, i.e. digital libraries providing manuscripts and other historical documents. It enables to interconnect descriptive and structural metadata for creation of both centralized and distributed compound digital documents. The TEI P5 ENRICH schema has been developed in close cooperation with the TEI community. It has a potential for an extreme wide implementation. The TEI P5 ENRICH schema is already used as the Manuscriptorium internal standard and it will be also used for any conversion of data from Manuscriptorium partners.

ENRICH Garage Engine

ENRICH Garage Engine is a tool for conversions between metadata standards. It covers the descriptive metadata standards that are mostly used in memory institutions, such as libraries, archives, and museums. It is a very important interoperability tool that enables easy collaboration with partner content providers using these standards. It will be regularly used in process of collaboration with current and future partners.

Gaiji Bank

Gaiji Bank is a tool to deal with non-Unicode characters. The possibility of easy use of non-Unicode characters is a crucial issue for work with historical documents and/or texts for data creators and users as well, because manuscripts and other historical documents require strict correctness in use of historical scripts and consequently in use of appropriate electronic

characters/fonts. The method how to do it was developed in close cooperation with the TEI community. The Gaiji Bank will be hosted by the Manuscriptorium service. In the near future, the best practice of work with the Gaiji Bank will be evaluated in order that metadata creators can prepare descriptive metadata as well as full texts of primary documents in an appropriate way.

M-Tool online

M-Tool online is a new version of the former stand-alone M-Tool application. It enables creation of descriptive and structural metadata in conformity with the TEI P5 ENRICH schema. It will be implemented as a regular service into the new Manuscriptorium platform. It will be complemented with the new Manuscriptorium for Candidates (M-Can) environment for further checking and editing of distributed compound digital documents created with M-Tool Online.

Virtual Documents

Virtual documents can be created in the M-Tool Online. This feature allows the en-user to create virtual document from the selected fragments of various digital documents, even physically locate in different digital libraries. For example, the document showing the various representations of 15th century fashion can be created. This tool can very well be used for educational purposes. Each virtual document has its unique link and can therefore easily be shared in many ways (sent by e-mail, published as link on the webpage or any social network etc.)

Virtual Collections

Creation of virtual collections is one of utilities of the new Manuscriptorium platform. It has been developed in process of personalization of Manuscriptorium services. There are two types of virtual collections:

Static collections: These are created by the user by manual adding of the documents into selection. The collections can be saved in the user profile.

Dynamic collections: The dynamic collections are based on search queries. It is therefore assumed that this feature shall be used for more complicated search queries, but the use for simple queries is of course also possible. The search query is saved in the user profile and applied on request (by clicking). Therefore the dynamic collection always contains the most up-to-date documents fitting the given search criteria (for example. documents originating in certain country, from certain century etc.)

Each virtual collection has its unique link and can therefore easily be shared in many ways (sent by e-mail, published as link on the webpage or any social network etc.)

Multilingual services

The multilingual web service <http://enrich.systran.fr/> was integrated into Manuscriptorium platform. SYSTRAN Translation Stylesheet was developed according to the content partners' requirements and TEI P5 ENRICH specifications. SYSTRAN Web service had been adapted for all Enrich-specific translation engines, offering also the possibility to tag automatically the name entities introduced after the Vicodi ontology instances and Medieval ontology instances.

The formal results of the project in a form of public project deliverables can be found at the dedicated part of project website: <http://enrich.manuscriptorium.com/index.php?q=products-and-deliverables>.

5 Target Users & their Needs

ENRICH user groups are as follows:

Content owners/holders use the ENRICH platform for providing access to their digital collections without a need of buying or creating their own platform. Manuscriptorium, adapted to needs of different types of content owners, will enable creation of metadata, indexing and searching from the central ENRICH database. However, the source data and files can remain in their original location.

Libraries, museums, archives. The platform enables creation of collections without borders which can be organized by language, topic, time period, material, etc. Set up of these collections and sharing of repositories will enable further exploitation of European heritage.

Researchers & Students can benefit from the ENRICH platform by having free access to almost all digitized manuscripts in Europe. The platform enables them to create their own collections, notes, metadata and presentations which can be used for demonstrations for teaching purposes. A personalised way of further exploitation and harvesting of data brings a radically new way of research. ENRICH enables working with large documents such as maps in an easy way, while the handling of large file size have already been solved in existing Manuscriptorium platform. Search can be performed in local languages thanks to exploitation of VICODI project results in the area of multilingual ontologies.

Policy makers in all the Members States as well as in Associated and Candidate countries are involved in creation of national digital libraries and contribution to EDL. ENRICH very much complies with these initiatives and can be used as a pilot for development of research environment and platforms handling other types of repositories of a specific nature.

General interest users can easily search and access documents which would otherwise be completely inaccessible for them as most of ENRICH original repositories are normally accessible only for researchers. ENRICH opens access to all this type of European heritage to wide public regardless of their profession, education and mobility. Many documents in Manuscriptorium illustrate and will illustrate local and European history and as such they can be used in any type of education.

According to the above described structure of end-users, the user related aspects as they are understood in the frame of the ENRICH project are twofold: the aspects concerning users-partners (full and associated partners as well) and those concerning end users-researchers, teachers, students and general public (end users).

The most important issue in relation to the users-partners is method of aggregating documents. There are three basic ways how to do it:

- The first way is harvesting via communication protocols, especially OAI-PMH. The metadata profiles that are the most appropriate for the connection between partner's repository and Manuscriptorium are agreed and then the harvesting is carried out on the regular basis.
- The second way is off-line processing of metadata exports. For both the above ways an individual connector i.e. technical tool that performs metadata conversions according to individual partner's collection properties, its metadata content, structure

and formats. The specific connector must be created for each individual partner due to high heterogeneity of the individual digitization approaches.

- The third way is the use of a special tool (M-TOOL) that enables partners having data (images) without metadata to create the missing metadata information. The new M-TOOL online is now available at the Manuscriptorium webpage.

The Manuscriptorium strictly applies individual approach to each partner digital library. The initial analysis is carried out with each partner and the best way fitting the needs of both Manuscriptorium and content contributor is selected and applied.

The most important issue in relation to the end users – researchers, students and interested public is making the aggregated content accessible under the single interface of Manuscriptorium platform. The survey was carried out in order to find out their preferences related to creation of personalized collections, which resulted into definition of requirements for the creation of personalized virtual digital libraries“. The tools enabling creation and use of individual virtual collection and virtual document were integrated into standard Manuscriptorium after their testing and final approval by the technical coordinator. The search engine has also been modified according to the needs of target users as collected during the initial survey made in WP4, which was dedicated to the personalization of Manuscriptorium to user needs. All these tools were described in the previous chapter and can be tested at <http://www.manuscriptorium.com> .

6 Underlying Content

The digital content aggregated in the Manuscriptorium by the end of ENRICH project coming from regular and associated partners is summarized in the following table:

Name of the library	City/Country	Number of image files	Nr. of compound digital documents
Biblioteca Nazionale Centrale di Firenze	Florence, Italy	214 882	1 588
Národní knihovna ČR	Prague, Czech Republic	1 061 782	3 460
Institute of mathematics and informatics	Vilnius, Lithuania	1 223	56
Københavns Universitet, Nordisk Forskningsinstitut	Copenhagen, Denmark	1 572	16
University Library Wroclaw	Wroclaw, Poland	78 404	989
University Library Vilnius	Vilnius, Lithuania	2 510	1 085
Stofnun Árna Magnússonar í íslenskum fræðum	Reykjavík, Iceland	25 607	238
St. Pölten Diocese Archive	St. Pölten, Austria	93 593	51 197
The National and University Library of Iceland	Reykjavík, Iceland	140 059	518
Biblioteca Nacional de Espana	Madrid, Spain	367 997	2 312
The Budapest University of Technology and Economics	Budapest, Hungary	7 903	45
Universität zu Köln	Cologne, Germany	643 434	1 741
ENRICH regular partners total		2 638 966	63 245
Heidelberg University Library	Heidelberg, Germany	882	882
Holy Trinity-St. Sergius Lavra	Sergiev Posad, Russia	2 845	2 845
National Library of Romania	Bucharest, Romania	109	109
The National Library of Belarus	Minsk, Belarus	51	51
University Library in Bratislava	Bratislava, Slovakia	142	142
Národní pedagogická knihovna komenského	Prague, Czech Republic	30	30
Lund University Library	Lund, Sweden	69	69
Knihovna Národního Muzea	Prague, Czech Republic	3	3
Moravian Library	Brno, Czech Republic	173	173
Toruń University Library	Toruń, Poland	346	346
Zielona Góra University Library	Zielona Góra, Poland	203	203
Patrimonio Nacional	Palacio Real, Madrid, Spain	76	76
Complutense University of Madrid	Madrid, Spain	1 656	1 656
ENRICH associated partners total		1 873 261	6 585
TOTAL		4 512 227	69 830

The content of the Manuscriptorium digital library will be continuously enriched as the digitization projects of the partner libraries will continue and as more digitized manuscripts and early prints will be available in their digital libraries, regularly harvested by Manuscriptorium.

The overview of the digital content more focusing on the “qualitative dimension” and cultural heritage value is summarized below.

NKP – National Library of Czech Republic

The National Library of the Czech Republic has digitized its large historical collections since 1995 and therefore we can draw upon quite a large experience on this field. The Manuscriptorium system and its user interface were launched in 2003. The core of the Manuscriptorium digital library is created by the database of identification records. Nowadays there are about 180.000 of records fully accessible for public. The digital library consists also of six Thousands of fully digitized complex documents when some of them are supplemented by full text editions, and the amount is still growing. The access to the images is mostly licensed. The core of this virtual collection was created by the digitized collections of medieval manuscripts coming from the Czech National library. Among them we can find especially codices once possessed by the Charles University in Prague and by several important Bohemian monasteries. Nowadays there are also many digitized documents coming from other institutions from the whole Europe and even some Asian countries. Users can study all kinds of historical documents like illuminated manuscripts, Incunabula, Early printed books, historical maps, etc. The Manuscriptorium user interface provides various (simple or advanced) searching possibilities enabling relatively easy work with this historic material.

The natural challenge of such a kind of digital library is to integrate various types of sources from various institutions in single user interface. Therefore projects like the ENRICH project are so important for our work. It helps not only to enlarge the digital library and increase the number of provided digitized documents but it especially enables to establish real cross-border cooperation and to start a real work on integration of various sources. Many concrete problems with aggregating of different formats (both of images and of metadata) could be (and has been) solved during the project.

The name of the project (ENRICH) was not chosen accidentally. The final aim of such projects really is to *enrich* provided virtual research environment. A real enrichment is possible only thanks cooperation of institutions from various parts of Europe what is the only way how to make accessible digital documents coming from various European regions. The easiness to study diverse sources normally being dispersed throughout the whole continent is one of the biggest advantages of Manuscriptorium digital library. Its virtual research environment opens new challenges for all scholars working with historical documents. Considerable speed-up of heuristic work and new searching possibilities enable to deal with themes and solve problems which would be unthinkable using classical research methods. The most marked examples of possible outcomes are various comparative studies overwhelming classic natural discourses and approaches. Besides these new study opportunities Manuscriptorium digital library very well presents the richness and variety of European written culture to wider public.

The ENRICH project belonged to rather larger projects on this field of activities. Works on the project joined together people from 18 partner institutions from 12 countries, set up links among them and created colorful international work group. Also the results of this effort are interesting and users of Manuscriptorium digital library will have the opportunity to gain from them very soon. We can just hope we will have the opportunity to continue with this common work to improve and enlarge its fruits.

BNCF - Central National Library of Florence, Italy

The Central National Library of Florence (hereafter referred to as BNCF) has its origins in the 30.000 volumes of the private library of Antonio Magliabechi, according to his will bequeathed in 1714 to the city of Florence. To increment the growing Library in 1737 it was decided by a mandatory decree that the new Library acquired a copy of all the publications printed in Florence and after 1743 in the entire Grand Duchy of Tuscany. In 1747 it was opened to the public for the first time with the name of Magliabechiana. In 1861 the Magliabechiana was unified with the Biblioteca Palatina (created by Ferdinand III of Lorraine and continued by his successor Leopold II) and assumed the name of National Library and from 1885 of Central National Library of Florence.

From 1870 any publication printed in Italy must be submitted to the BNCF by legal deposit. In its early days the Library had its headquarters in rooms belonging to the Uffizi and only in 1935 it moved to the present building. From 1886 to 1957 the BNCF published the "Bollettino delle pubblicazioni italiane ricevute per diritto di stampa", which in 1958 became "Bibliografia Nazionale Italiana" (BNI) (The Italian National Bibliography). The BNCF is also the pilot center for the creation of the National Library System (SBN), whose main aims are the automation of library services and the constitution of a national index of the collections of Italian libraries.

The main contribution provided by the BNCF to the ENRICH project was to supply digital contents of digitized manuscripts and books from its historical collections and to fix a technical framework to reach this goal (an ENRICH profile of metadata was created for the harvesting of data via OAI). The crucial core of this contribution can be identified in the Galileo Galilei's manuscripts, since it is a real unique collection in the history of science, world-wide studied and requested to the BNCF.

To summarize, the BNCF supplied the ENRICH project with the following digitized collections:

1) Galileo Galilei manuscripts (98650 images, 307 bibliographical units): almost the complete collection of Galileo Galilei manuscripts.

2) Galileo Galilei printed books (81678 images, 256 bibliographical units): books belonging to the private library of Galileo Galilei.

3) Online manuscripts (3865 images, 137 bibliographical units): the rarest and most consulted manuscripts owned by the BNCF (i.e. the Messale Ottoniano of the X Century, the Palatino 556, also named Lancelot, Filarete's treatises on architecture, etc.).

4) Geographical maps (3998 images, 947 bibliographical units): printed geographical maps, charts and military maps (XVII-XIX Century); handwritten maps and portolani (XV-XVII Century) and the handwritten maps of the cartographer Luigi Giachi (XVIII Century).

5) Bibliotheca Universalis (223361 images, 560 bibliographical units): manuscripts and printed books of English and French travellers in Tuscany (XVII-XIX Century), concerning topics related to the *Grand Tour* theme.

6) Magliabechi (211618 images, 52096 bibliographical units): partial digitizations (cover, title page, table of contents and variable significant pages) of printed books, mainly of XVI, XVII and XVIII century, for about 1/3 of the bibliographical units of the whole Magliabechi collection.

DSP - Diocese Archives St. Pölten (Austria)

The Diocese Archives St. Pölten contains a small stock of manuscripts and incunabula and furthermore coordinates and manages the most important digital library of European charters, Monasterium.Net.

Therefore the implementation to the Manuscriptorium platform in the frame of ENRICH comprises these three types of archival documents.

Manuscripts and Incunabula

The collection of manuscripts covers 300 books from the beginning of the 13th to the 19th century – about 120 dating from the Middle Ages – and represents an important holding of the Diocese Archives St. Pölten. They originate from the former Augustinian monastery in St. Pölten, from several parishes and other monasteries in Lower Austria and consist especially of Biblica and Liturgica. Most of them are richly illustrated (e.g. Hs 1, Antiphonar from 1486, which contains illustrations of monks of St. Pölten) and therefore of historical and art historical value. Some of the books also contain Hebraic fragments (see the project of the Austrian Academy of Sciences: <http://www.ksbm.oeaw.ac.at/hebraica/>).

Furthermore the Diocese Archives keeps 386 incunabula and early printed books which mainly cover liturgical, historical, philosophical and canon law issues; they date from the 1470s to the 16th century. Over 270 incunabula are preserved in their original binding which make them singular for scientific studies.

The descriptions of the manuscripts and incunabula were available in Word-documents and therefore the bibliographical data were imported in Manuscriptorium via M-Tool. While digital images will only be allocated for the 120 medieval manuscripts, the metadata of all manuscripts and incunabula maintained in the archives will be integrated in ENRICH.

Charters

The charter collections selected for ENRICH are part of a larger collection of charters within the Monasterium-Project (www.monasterium.net).

The approximately 45.000 charters with about 50.000 images to be part of Manuscriptorium originate to a great extent from monastery archives in Lower Austria, Vienna and Upper Austria but there are also charters kept by the state and federal state archives which come from former monasteries. They range chronologically from the 9th to the 18th century and are important sources for the early history of the mentioned regions. Detailed information on each object of the collection is available, including images and/or secondary data like text summaries, full texts and glossaries.

The integration to the Manuscriptorium portal was realized by developing an OAI interface for data harvesting and converting the CEI schema of the charters to the TEI-P5.

VUL - Vilnius University Library, Lithuania

Vilnius University Library (VUL) is one of the oldest and richest academic libraries in Central and Eastern Europe. Established in 1570, it is a valuable resource both for the University and research community world-wide. Today VUL has a status of a research library of state significance with holdings of over 5,4 mln items. The most valuable collections (over 269 000 manuscripts and documents, over 172 000 rare books, 2237 old atlases and over 10 000 maps, collection of graphic arts of about 91 000 items etc.) are stored in specialized departments.

A small collection of parchments of the VUL Manuscript Department includes less than a hundred items. It includes single land privileges or other privileges, land and estate selling documents, etc. signed by Lithuanian Grand Dukes and Polish kings. It also contains knighthood documents of individuals, popes' bulls and indulgences or assignments, documents of different monkshoods or their property, manuscripts of early European music

VUL Manuscript Department autograph collection consists of over 300 storage items. Collection embraces autographs of outstanding foreigners, famous rulers of Poland and Lithuania: Sigismundus the Old (1519–1526), Sigismundus Augustus (1562–1566), Stephan Bathory (1580–1583), and other kings, noblemen and their relatives; as well as Polish writers and public figures: A. Mickiewicz, J. Slowacki, and many others; French writers and artists, scientists: A. Decamps, Victor Hugo, P. Beranger, R. Chateaubriand, Voltaire, and others, Russian writers, historians, statesmen: G. Derzavin, F. Dostojevskij, A. Gercen, S. Glinka, I. Turgenev, Ekaterina II and others. Value of documents is not the same; however each document may be useful for researchers as an authentic material to witness the history or the fact of life.

Representatives of rich and influential noble families of the Grand Duchy of Lithuania, later Rzeczpospolita (from XVII c. also noblemen of Prussia) – the Radvilos and the Sapiegos – served as the highest political statesmen – voivode, chancellor, hetman, marshal, Church officials. These noble families possessed castles, manors and residences all over the territory of the Grand Duchy of Lithuania. VU Library Manuscript Department holdings include archival material of their domains. It consists of documents of property managing, domain administration, economic activities legal processes, as well as personal and business correspondence; there are also documents related to their official responsibilities.

Collection of photographs consists of photos by Lithuanian photographers and photographers of other countries. Józef Czechowicz's photograph collection is especially important to Lithuanian culture history. He (about 1819–1888) is an outstanding Lithuanian photographer of the second half of XIX c. No less interesting is the Suprasl Orthodox Monastery photograph collection. Historians might be also interested in the Album of photographs from the Russian Tsar Nicolay II coronation ceremony in Moscow published in 1896 by Polish photographer Jan Mieczkowski

V. Mincevicius (1915–1992) – a priest, journalist, translator and collector, who lived in Italy, donated his collection of maps to the University Library. It consists of 331 storage item. The greater part of his collection contains old cartography. They are items of great value of XVI–XIX c. world, Europe, regional maps and city plans created by world-famous authors and publishers of that time such as C. Ptolemaeus, W. J. Blaeu, G. Mercator, S. Münster, A. Ortelius, J. Hondius and others.

Herszek Leibowicz, a well known XVIII c. portrait engraver of Lithuania was an artist at Nieswiez, a Radziwill family castle in the Grand Duchy of Lithuania. Throughout 1745–1758 he forged in copper engravings, one hundred and sixty five portraits of the Radziwill family that were hanging in the art gallery of Nieswiez castle. VUL possess Radziwill portraits on separate pages published in Petersbourg.

ULW - University Library Wroclaw , Poland

The University Library Wroclaw as the content partner in the ENRICH Project made much of a contribution to the development of Manuscriptorium Digital Library by providing access to many interesting manuscripts and old printed books from its special collections.

The digital collection of ULW provides access to reach collections of the manuscripts preserved in Department of Manuscripts (Special Collections Library located in the Library Building on the Sand Island in Wroclaw). There is the biggest collection of Silesian and Lusatian manuscripts in the world. Amount of the manuscript is: 12,532 library units, among them: Medieval manuscripts with fragments – about 3000, Oriental manuscripts – about 340, Greek manuscripts – 41, Cyrillic manuscripts – 11, Collection of the autographs – over 17,000.

The oldest fragment of the manuscript is from the 5th century (the fragment of the Chronicle of Eusebius, however the oldest codex is from the 9th century (Herbarium). The very important parts of that collection are illuminated codices, e.g. Psalterium nocturnum, Missale or Commentarius super Apocalypsim with the marvellous miniatures. Besides, there is a great collection of modern manuscripts (in Latin and German as well), among others can be found opus Topographia Silesiae by F. B. Wernher with many drawings of the monuments on Silesia from the 18th century. Our Library provided also in digital form the manuscripts from the former University Library in Frankfurt (this collection is called 'Viadrina') and other important items, like for ex. "Topographia Silesiae" by Wernher.

The digitized early printed books are from Department of Old Printed Books (Special Collections Library). This is the collection of more than 300,000 books, published from 15th till 18th century, including 3,200 incunabula, which is the largest collection of old books in Poland. They are of different provenance: the main part is the pre-war collection of the former City Library in Wroclaw and former University Library in Wroclaw. The large part of the books originates from different historical collections, like: Bibliotheca Rudolphina, Bibliotheca Piastorum Bregensis and Bibliotheca Ecclesiana S. Petri et Pauli Legnicensis. The character of the collection is universal, it contains all the fields of science. They distinguish themselves by the large number of the prints, published by the most famous printers of Europe. Anyway the special feature of the collection is local, Silesian typographic production. So called Silesiaca are the rich and exceptional source for extensive scientific research on history of Silesia. Many old books present in Manuscriptorium are also Silesian books, e.g. Olsnographia by Johannes Sinapius, published in Frankfurt am Main in 1707 – the valuable source for studies on Silesian history, especially Olesnica. There is also another interesting book, written by the Silesian astronomer women, Maria Cunitz, published under the title: Urania propitia, published in Olesnica in 1650. The German-Polish manual from 1688 "Vierzig Dialogi" by Nikolaus Volckmar may be interesting for linguists. There is also a large number of occasional prints published because of funerals or weddings. They are also a valuable source for studies on history of Silesian families in 17th or 18th century. Within the framework of Enrich Project a large part of so called "Viadrina" collections are also digitised. These are old books from the former University Library from Frankfurt /Oder. Most of the digitized books are published in 17th or 18th century.

In Manuscriptorium there are also the manuscripts and old prints from Music Collection Department of ULW. The majority of them are from former St Elizabeth Church collection. There are the instrumental & vocal scores with a religious contents written down by Johan Carl Poshner, who was a cantor in that church. To Manuscriptorium Digital Library are provided also many old prints from Silesia – Lausitz Cabinet of ULW, where there are ca. 10,000 titles of so called Wratislaviana, i.e. collection concerning the history and life of city of Wroclaw. Majority of those old prints are unique and are the only source of history of the city. In the framework of ENRICH Project our Library ensure the access to 250 digital documents of that kind.

UZZ – University of Cologne, Germany

The corpus of early printed books on the subject of archaeology and the classics provided by the Forschungsarchiv für Antike Plastik and its database project Arachne for the ENRICH project stems from three different sources and is by no means complete, as it will grow in the next two years to thrice the size which is now available via ENRICH.

Begun in 2006, the Forschungsarchiv has a cooperation with the Winckelmann Society and the German Archaeological Institute in Rome to digitize and make available all the early printed books in these collections. Originating in the close partnership between the Forschungsarchiv and the Chair for Computer Science for the Humanities, which is an ENRICH partner, the Forschungsarchiv decided to make this ongoing effort available for harvesting by ENRICH.

The books are all fine examples on the reception of antiquity in the 16th to 17th century, and most of them are artfully illustrated. All in all, the Forschungsarchiv now (Oct. 2009) provides 300 early printed books with around 46'000 pages with an additional 600 books with around 100'000 pages to come in the next two years.

The Rara Library of the Archaeological Institute at the University of Cologne

As a young archaeological institute at a German university, the library and the collection of rara present in Cologne had to be brought retrospectively after the creation of the institute in 1928.

Where old institutes like Göttingen or Bonn were able to buy the books at the time they actually were imprinted, the Cologne institute had to get theirs from auctions, book dealers and collection sales. This had one advantage: most of the books are on the focal matters of the Cologne institute: collection history, Roman sculpture and architecture, topography and reception history.

The Collection of the Winckelmann Society

The Winckelmann Society's main focus of research is the life and works of Johann Joachim Winckelmann (1717-1768), the founder of scientific archaeology. Most of the rare books in the collection of the Society deal with art and architecture which Winckelmann himself had known and the imprints are often contemporary or shortly after the life of the patron of this collection.

The Collection of the German Archaeological Institute in Rome

The library of the German Archaeological Institute in Rome is the biggest archaeological library in the world. It houses more than 210'000 volumes on the subject of archaeology and related disciplines, as well as incorporating the Bibliotheca Platneriana, whose main interest lies in the development of Italian towns. The library has a very rich collection of books on archaeology from the 16th to the early 19th century, which is being subsequently digitized.

The Arnamagnæan Manuscript Collection

The Arnamagnæan Manuscript Collection derives its name from the Icelandic scholar and antiquarian Árni Magnússon (1663-1730) – Arnas Magnæus in Latinised form – who, in addition to his duties as secretary of the Royal Archives and, from 1702, professor of Danish Antiquities at the University of Copenhagen, spent much of his life building up what is by common consent the single most important collection of early Scandinavian manuscripts in existence, nearly 3000 items, the earliest dating from the 12th century. The majority of these are from Árni Magnússon's native Iceland, but the collection also contains many important Norwegian, Danish and Swedish manuscripts, along with about one hundred of continental European provenance. In addition to the manuscripts proper, the collection contains about 14000 Icelandic, Norwegian (including Faroese, Shetlandic and Orcadian) and Danish charters, both originals and first-hand copies (apographa). The manuscripts are predominately written in Icelandic, Norwegian and Danish, with a smaller number in Swedish, Faroese, Latin, German, Low German, Dutch, Spanish, Italian and Basque. Vellum manuscripts make up about 20% of the collection, the remainder being on paper. Older bindings contemporary with the manuscripts themselves are few in the collection, and the majority of the manuscripts are in preservation bindings of recent date. Lavishly illuminated manuscripts are relatively rare in the collection (because rare among Scandinavian manuscripts generally), although some quite fine examples can be found among the manuscripts with religious or legal content. Upon his death in 1730 Árni Magnússon bequeathed his collection to the University of Copenhagen where it was preserved until its division. Even before its constitutional separation from Denmark in 1944 Iceland had begun petitioning for the return of the Icelandic manuscripts in Danish repositories and it was eventually agreed, in May 1965, that roughly half the items in the Arnamagnæan Collection (1666 items, in addition to all the Icelandic charters and apographa), should be transferred to the newly established manuscript institute in Iceland, along with a smaller number of manuscripts (141) from the Royal Library (Det Kongelige Bibliotek) in Copenhagen. The first two manuscripts were handed over immediately after the ratification of the treaty in 1971 and the last two in June 1997, the entire process of transfer thus taking 26 years. The manuscripts transferred to Iceland have retained their original shelfmarks, and the two institutions which jointly act as custodians of the collection, the Arnamagnæan Institute (Den Arnamagnæanske Samling) in Copenhagen and the Árni Magnússon Institute for Icelandic Studies (Stofnun Árna Magnússonar í íslenskum fræðum) in Reykjavík, work closely together to ensure the long-term preservation of and access to the manuscripts in the collection.

KU – Copenhagen University, Nordisk Forskningsinstitut (Denmark)

Nordisk Forskningsinstitut (Department of Scandinavian Research), is part of the University of Copenhagen, Denmark. Its members of staff conduct research in the fields of Early Scandinavian language and literature, manuscript studies, Danish dialectology and socio-linguistics, onomastics and runology. For the Enrich project 1601 images, taken from 16 manuscripts have been provided so far.

SAM - Stofnun Árna Magnússonar í íslenskum fræðum (Iceland)

The Árni Magnússon Institute for Icelandic Studies is an academic research institute within the University of Iceland, operating on an independent budget and answering directly to the Ministry of Education. The 40.000 images from 400 of the manuscripts in the Stofnun Árna Magnússonar í íslenskum fræðum made available through the Enrich project represent only a part of the multi-faceted content of the Icelandic manuscripts in the collection. First and foremost the manuscripts of the famous Icelandic sagas are presented, with samples of manuscripts of other content.

BUTE – Budapest University of Technology, Hungary

The National Technical Information Centre and Library of BME^{Chyba! Zázložka není definována.} is the largest library for natural and technical sciences in Hungary which was established in 2001 by the integration of two libraries of more than a 100 years history. The Library and Information Centre of The Budapest University of Technology and Economics was founded on 9 May 1848 by the donation of Baron József Eötvös, the Hungarian Minister for Culture and Religion. First it served only lecturers and students of the University, after the First World War it started to operate as a public library. The National Technical Information Centre and Library had developed from the library of the Museum of Technology and Industry, established by Ágoston Trefort, Minister for Culture and Religion on 24 June 1883. As an additional activity, the Museum undertook the task of maintaining a scientific library in order to provide sufficient materials to readers with industrial and technical interest.

The library contributes to the Enrich project by supplying metadata of old and rare publications mainly in Latin, German and Hungarian. In the collection there are 3 incunabula in Latin and one in German, i.e. early printed books printed before 31 December 1500. As for the old and rare books, 6 publications are presented from the 16th century, 2 publications from the 17th century, and the others were printed in the 18th century. Besides the books we provide the metadata of articles of the first ever published architectural journal in German: *Sammlung nützlicher Aufsätze und Nachrichten die Baukunst betreffend*, Berlin 1797-1806.

There are a wide range of subjects in the collection we contributed to the Enrich project, including geometrics, arithmetics, astronomy, mining, agriculture as well as theology, chemistry, mineralogy.

The items listed below might be of interest.

From world history

Hartmann Schedel: *Register des Buchs der Croniken und Geschichten mit Figure und Pildnussen von Anbegin der Welt bis auf dise unsere Zeit*² (Nürnberg, 1493) edition in German

Székely István: *Chronica ez vilagnac yeles dolgairól*³ (Krakko, 1559) the first world history in Hungarian.

On the subject of Caring For and breeding silkworm:

Stephan Frendel: *Die Kunst Seide zu erziehen...*⁴ (Bratislava, 1795)

Rövid oktatás az eperfák neveléséről, és szaporításáról nem kölömben a selyem-eresztő bogaraknak hasznos tartásáról és az ugy nevezett galétának gyarapításáról⁵ (Eszék, 1798)

On hunting, falconry:

Reliqua Librorum Friderici II. Imperatoris, de Arte Venandi cum avibus cum Manfredi Regis additionibus⁶ (Augsburg, 1596);

Albertus Magnus: *De falconibus, asturibus, et accipitribus*⁷ (Augsburg, 1596)

On thermal waters in Hungary

Torkos Justus János: *Thermae Almasienses quoad earum situm...*⁸ (Pozsony, 1746);

Torkos Justus János: *Schediasma de Thermis Pösthensiesibus*⁹ (Pozsony, 1745)

Theology:

Werböczy István: *Decretum oder Tripartitum opus, der LandtsRechten unnd Gewonheiten des Hochlöblichen Königreichs Hungern*¹⁰ (Wien, 1599) A German translation of the originally in Latin. The codification of Hungarian law served as his country's basic legal text until 1848.

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- 2 Chronicles and stories with illustrations, from the beginning of the world up to our time
 - 3 Chronicle on notable events of the World
 - 4 The art of breeding silkworms...
 - 5 Short instruction on the growing of mulberry trees and the culture of silkworms
 - 6 The remains of the books of Emperor Frederick II. on the art of hunting with birds
 - 7 On the falcons, the hawks and other birds of prey
 - 8 Of the favorably located thermal waters of Dunalmás
 - 9 Thoughts on the thermal springs at Pöstyén (Hungary)
 - 10 Decretum or Tripartitum opus, the right under the law of the Hungarian kingdom.

NULI-The National and University Library of Iceland

The Manuscript collection holds the largest collection of Icelandic manuscripts to be kept in one place roughly 15,000 items. The National and University Library of Iceland resulted from a merger from 1994 of the National Library, founded 1818 and the Library of the University of Iceland from 1940. It is now the leading and by far the biggest library in Iceland. The Library's manuscript department was originally a part of the National Library. A collection of at a least five generation of learned men, 3 bishops and a clergyman (the eldest born 1665) formed the basis for the National Library's manuscript collection. At the death of the bishop Steingrímur Jónsson in 1845, one of the founders of the National Library, this collection consisting of 400 manuscripts was bought from his family. In 1877 and 1901 the library purchased two more collection of 1337 and 1876 manuscripts respectively. The National Library's manuscript collection has grown steadily ever since to the 15000 items of today. Individual manuscripts and collections have been acquired through donation and, occasionally, purchase. These manuscripts contain sagas, poetry, historical records, folktales, diaries and genealogical material both in original and copies. It represents the written part of the cultural history of Iceland. A lot of the material is what would be in printed books in other countries as the printing did not really have breakthrough in Iceland until in the middle of the nineteenth century. The tradition of copying became very strong in Iceland and the old literature the Sagas and alike of the golden age of Icelandic literature is preserved in numerous copies in the National libraries manuscript collection. Paper manuscripts from the seventeenth, eighteenth and nineteenth century represent a very important element in the collection. The ones from the nineteenth century are most numerous. The twentieth century papers and letter collections of another personal papers from both societies and individuals, authors and other notable people.

Amongst important items from earlier centuries are five complete vellum manuscripts, some hundred vellum fragments and eighty two legal documents written on parchment. There is a small collection of pictures, photographs and paintings, although the accumulation of such materials does not represent a priority within the department.

One very special fragment should be mentioned. This is a leaf dated to around 1260 from a Norwegian Kings saga, Olaf the saint from the book *Kringla* by a thirteenth century scholar Snorri Sturlason. The manuscript was destroyed in a great fire of Copenhagen in 1728. This is the only leaf to survive and was in a mysterious way kept in the Royal Library in Stockholm and presented to the Icelandic people in 1975 by the Swedish king. The images of manuscripts The National and University Library in Iceland adds to the Manuscriptorum portal from its collection to be available through the Enrich project are all from the category of the Icelandic sagas. The heroic and legendary family sagas of Icelanders, the settlers and the first few generations written mainly from the end of the 12th century to the end of the 14th century, being preserved in endless copies down to the twentieth century along with the printed versions.

BNE-Biblioteca Nacional de España (Spain)

More than 300 digital objects are already accessible through ENRICH Project. We found among them some of the most important manuscripts of our library. It is expected this number will grow soon to more than 3000 with the addition of the complete collection of Incunabula and the autographs and first editions of the main plays of Spanish Golden Age theatre. This important achievement provides access to the documents held in one of the most valuable libraries in Western Europe. The National Library of Spain was founded by Philip V in 1712. In 1836 it changed its denomination from Biblioteca Real to Biblioteca Nacional, and its management moved from the King to the Government. More than 70.000 documents came from the expropriation of the holdings kept in Convents, Churches and Cathedrals executed by Mendizábal in 1837. Some others came from different collectors. Nowadays, the main sources of the rise of the collection are auctions, direct acquisition from antiquarians, and donations. The collection of the National Library of Spain is the country's most important one. Not only because it receives three copies of everything published in Spain by Legal Deposit, but, specially, because it holds the most of the national written heritage. One of the aims of the National Library is the dissemination of this heritage and the free access to the whole of the collection to researchers and users from everywhere in the world, anywhere they are. Working with a parallel server to Biblioteca Digital Hispanica (institution's digital library), and with a conversion from our MARC21 records to the TEI scheme, some of the most valuable manuscripts are accessible through the ENRICH frame. It includes manuscripts often excluded from in-library use due to its value or to conservation reasons. We can find, for instance, the *Book of Hours* of Charles VIII, King of France; the will and testament of Elizabeth, the Catholic Queen; or the first epic poem in the Spanish Language, *Poema del Cid*, just to mention. Researches and scholars are able to work on books that were only accessible through microfilm, slides or photocopies. The digital version provides a reproduction of more quality and free for the user who can study it from home in a more comfortable way. Besides, the scholar has not only the images but also a lot of tools for his/her study at his/her disposal thanks to the work made in user personalization. Concerning the technical requirements, our way of cooperation was discussed directly with Tomas Psohlavec, from Aip Beroun. After completing a survey about the quantity and quality of the digitised documents available for the project, we worked on the way of sharing the data, and, as mentioned before, we created a parallel repository with the images accessible via ftp. The folder structure would have the images in one hand, and the XML descriptions in the other. This procedure allows the images to be open within the M-tool framework. The documents available dates from the 1047 to the XIX Century, including an important collection of handwritten maps, but more documents are on the way and the Incunabula will be soon included with text recognition added.

7 Summary of Activities

The project realization in general followed the Description of Work. The project results have been achieved, although some problems appeared during the realization of the project and the work plan had to be modified in some aspects – which is quite usual situation for the IT project of this size, especially when developing and implementing the unique product, which creates the new standard for the digital libraries of manuscripts and early prints worldwide.

The technical works have been carried out under continuous supervision of AIP Beroun. The new tools and features developed during the realization of the project were tested in the Manuscriptorium Clone. The clone replaced the original Manuscriptorium service in January 2010 and is now available at <http://www.manuscriptorium.com>. The new Manuscriptorium platform therefore contains all the data aggregated from regular and associated project partners and allows to access them from the single point through the new user interface based on the research of user needs and allowing sophisticated research work. The Manuscriptorium platform offers variety of the newly developed tools such as improved search engine, M-Tool online for creation of ENRICH TEI P5 conformant metadata, Gaiji bank for the treatment of non-Unicode characters, Enrich Garage Engine for metadata transformations, Static and Dynamic Personal Collections or tools for automated translations.

In order to achieve the project goals, number of various activities has been carried out. Data and metadata standards used by the partners were identified and summarized and work on definition of metadata standards was carried out in frame of WP2 and missing metadata regarding digital objects have been created by the content partners.

The **TEI P5 ENRICH schema** and its documentation were prepared in frame of WP3 under leadership of OUCS and the decision was made to fully apply the ENRICH schema within the Manuscriptorium presentation platform. It was discovered that because of the developments in the TEI P5 ODD Specification created for the ENRICH project, and the adoption of this Specification for the internal Manuscriptorium Scheme, that the use of METS inside Manuscriptorium was not only now unnecessary, but undesirable. Conversions of available metadata into TEI Specification for ENRICH were developed. This set of web is called the **ENRICH Garage Engine** and is available through the Manuscriptorium platform. This includes not only migration from legacy formats but transformations of ENRICH data to and from other applications such as MSWord. Another outcome of the project is **Gaiji Bank**: a tool to deal with non-Unicode characters. The possibility of easy use of non-Unicode characters is a crucial issue for work with historical documents and/or texts for data creators and users as well, because manuscripts and other historical documents require strict correctness in use of historical scripts and consequently in use of appropriate electronic characters/fonts. The method how to do it was developed in close cooperation with the TEI community. The Gaiji Bank is now hosted by the Manuscriptorium service.

Analysis of user requirements realized in WP4 lead to the development of **Static and Dynamic Collections** features. These tools enable to prepare personal collections and common collections and are easily accessible when browsing any digitized manuscripts available in Manuscriptorium. The Manuscriptorium platform now allows more variable **deep searching** through the digital libraries of all partners based on the survey of end-user needs and preferences. The new searching system should allow more simple and comfortable searching with better results.

The **M-Tool service** was launched as an on-line service. It supports all the requirements that arose during WP2 – these are above all the possibility to use a variable number of plug-in forms and flexible generator of structural metadata with the possibility of manual update. The M-Tool produces documents valid according to TEI P5 ENRICH schema.

The **multilingual web service** <http://enrich.systran.fr/> was created in frame of WP6. Based on the feedback of the content partners SYSTRAN constructed the SYSTRAN **Translation Stylesheet** according to the content partners' requirements. The **implementation of SYS API** into the Manuscriptorium platform was completed by AIP. The multilingualism of the Manuscriptorium environment is significantly improved by dynamic translations of the available content and use of the VICODI ontologies.

The main results were **tested and validated** in the last phase of the project and the feedback from end-users and project partners was taken into account when finalizing the versions of the individual tools and features. The results were tested against 5 main Quality Criteria: Interoperability, Adaptability, Usability, Security and Multilinguality. The criteria were applied to objects, tools, processes and repository. 205 respondents in total cooperated on the evaluation of project results. The evaluation results were rather positive as summarized in the deliverable D 7.2. The highest level of satisfaction was observed within the results of WP5 (83 %), while the worst results, still very good, were achieved during evaluation of the results of WP6 (66 %). In addition, the external reviewers were asked to check the most important project results delivered in WP3 and WP5 and their opinions were quite positive. Some of the recommendations of the reviewers of WP3 were taken into account when preparing the final versions of the EGE and Gaiji bank.

The variety of dissemination and awareness actions was carried out under WP8. The national workshops were organized in each country during the year 2009 and the final conference took place on 5. - 6. 11. 2009 in Madrid. The national workshops introducing the project results were organized in all participating countries. The dissemination activities related to acquiring additional potential content contributors and making them associated project partners were quite successful due to active approach of ENRICH partners. At the moment the relations were established with more than 40 libraries worldwide. The dissemination activities will continue even after the end of the project funding as the results have to be delivered to the public now, when they are available. All the project partners are responsible for further promotion of the Manuscriptorium service in their countries while the National Library of Czech Republic will continue in its effort to promote Manuscriptorium as European Digital Library of Manuscripts and to allow also access to the digital content through Europeana.

8 Impact & Sustainability

Until November 2009, ENRICH project and Manuscriptorium digital library as well were disseminated in many European and non-European countries: Austria, Belarus, Croatia, Czech Republic, Denmark, Georgia, Germany, Hungary, Iceland, Italy, Kazakhstan, Korea, Latvia, Lithuania, Macedonia, Moldova, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Ukraine. At present the ENRICH/Manuscriptorium network is represented by more than 100 memory institutions. Moreover some important contacts were found in France, Portugal and the UK that should enable further dissemination also into these countries.

Impact of the ENRICH project and the ENRICH network has been and will be probably very deep and large because of three grounds:

- 1) it uses TEI P5 standards (TEI P5 ENRICH specification) so that it is oriented to the worldwide disperse TEI community
- 2) it is based on interoperability between mostly used descriptive metadata standards so that it can be easily used by all types of memory institutions
- 3) it provides several on-line tools for meta/data creation and content adaptation so that it is very user friendly. In this point of view the network created by ENRICH is very easy extensible in the near as well as remote future.

Sustainability of the ENRICH project must be ensured through two parallel ways.

The first way is based on organizational arrangements consisting of establishment and activities of **Manuscriptorium Advisory Committee**. The Committee is planned to be established in the near future, after the Manuscriptorium partners' agreement. NKP and AIP elaborated the basic idea and further steps are now under negotiation.

According to current propositions, the **Manuscriptorium Advisory Committee** should be composed of eight members: two founding members, i.e. expert guarantor (NKP) and technical guarantor (AIP), five common committee members and a secretary.

Expert guarantor is responsible for the general direction of Manuscriptorium, adherence to the current norms, harmony with European policy on the preservation of cultural heritage; Co-ordinates the activity of Manuscriptorium Advisory Committee with the goal of achieving the highest possible durability of aggregate data; Is responsible for maintaining the openness of the forms of data in use; is responsible for maintaining the openness of the forms of data in use; is responsible for adherence to European legislation in respect of Manuscriptorium; ensures that Manuscriptorium adopts a methodology which meets the requirements of the relevant EU activities in the sphere of cultural history and are compatible with them.

Technical guarantor is responsible for the technical direction of Manuscriptorium, adoption of the current technical norms and harmony with European policy in respect of the preservation of cultural heritage; Co-ordinates the activity of Manuscriptorium Advisory Committee with the goal of achieving the highest possible durability of aggregate data; is responsible for maintaining the openness of the forms of data in use.

As founder members of Manuscriptorium Advisory Committee, EG and TG are permanent members of Manuscriptorium Advisory Committee (ex officio).

The Secretary is a representative of NKP. Presents, as required, verbal or written statements in accordance with the recommendations of the Committee and the strategy of Manuscriptorium; participates in the promotion and popularization of Manuscriptorium among the professional and lay public; Represents Manuscriptorium and participates in Committee meetings; the Secretary has no voting rights in Manuscriptorium Advisory Committee.

The remaining five members of the committee will normally be elected from the most active Manuscriptorium Partners (taking into account numbers of documents, their importance, the demand for them, their quality and level of support) and also possibly from the prominent Manuscriptorium users.

One of the members of the Committee will act as a “Chairman”. In the initial phase it is proposed that this function will be carried out by the representative of National Library of Czech Republic, Mr. Adolf Knoll. In the subsequent years, the function can be carried out by another member of the Committee selected in elections according to the exact rules which will be agreed by all partners.

Main roles of the Manuscriptorium Advisory Committee will be:

- 1) to contribute to the development of the content of MNS and the acquisition of new Partners
- 2) to facilitate integration into wider information structures (Europeana and world-wide initiatives)
- 3) to explore new sources of funding for Manuscriptorium and related activities; 4) to promote Manuscriptorium and related activities.

The Chairman, the EG and the TG are entitled to invite experts to Manuscriptorium Advisory Committee negotiations as consultants. Additionally, any two Manuscriptorium Advisory Committee members may propose experts to the Chairman. The Chairman has the independent right to decide whether to invite a nominated expert. If the Chairman does not agree to invite the proposed expert the proposers may approach other members and if five Manuscriptorium Advisory Committee members make a proposal the Chairman is obliged to accept it.

Secondly sustainability of the ENRICH project/Manuscriptorium must be ensured by multi-resource funding. The National Library of Czech Republic is continuously monitoring the possible financial resources for operation and development of the services.

At the moment, the following main sources have been used/planned to be used:

- 1) funding by the Czech government through the budget of the National Library as a state institution
- 2) financing from the European projects
- 3) license fees paid by end users (although the data of the ENRICH partners will be provided for free without license, there are other Manuscriptorium partners that are not members of the ENRICH network)
- 4) potential financial contribution paid by partners. There are several possibilities, e.g.
 - a) all partners pay the same amount
 - b) fees according to the size of the institution
 - c) fees according to the amount of data provided for Manuscriptorium
 - d) fees according to the budget of the institution

- e) fees according to the index of the material level of the country
- f) only those pay who vote in the Manuscriptorium Advisory Committee

This type of financing is at the moment just in stage of “idea” and will be further analyzed, mainly by the members of the Manuscriptorium Advisory Committee. It is clear that it will be very difficult to find some common agreement about this type of financing, therefore the routine service of Manuscriptorium cannot depend on this type of financing in the next period.

- 5) partners do not pay any fee but they work
 - a) as sub-aggregators,
 - b) in development of the Manuscriptorium.

The above outlined strategies should assure not only the “surviving” of the Manuscriptorium service, but also its further development in order to stay on the top of the digital libraries in the worldwide scale.

Further Information

8.1 *The current list of associated partners of ENRICH project and potential Manuscriptorium contributors:*

- Royal Library – National Library, Stockholm Sweden
- National Library of Moldova, Kishinev, Moldova
- National Library of Kazakhstan, Almaty, Kazakhstan
- National Library of Serbia, Belgrade, Serbia
- University Library Carol I, Bucharest, Romania
- Serbian Academy of Science and Arts, Belgrade, Serbia
- National and University Library of Macedonia, Skopje, Macedonia
- Faculty of Natural Sciences and Mathematics, Skopje, Macedonia
- National Library of Romania, Bucharest, Romania
- National Library of Latvia, Riga, Latvia
- National Library of Turkey, Ankara, Turkey
- Library of the Lithuanian Academy of Sciences, Vilnius, Lithuania
- University Library Budapest, Hungary
- National Széchényi Library of Hungary, Budapest, Hungary
- University Library Bratislava, Slovakia
- Central Library of the Slovak Academy of Sciences, Bratislava, Slovakia
- Lyceum Library Kežmarok, Slovakia
- National Library Warsaw, Poland
- Regional Library, Cracow, Poland
- National and University Library Zagreb, Croatia
- National and University Library Ljubljana, Slovenia
- Odessa State Research Library, Odessa, Ukraine
- CIMEC, Bucharest, Romania
- Regional Research Library, Brasov, Romania
- University Library Szeged, Hungary
- National Library of Korea, Seoul, Korea
- University Library Heidelberg, Germany
- Patrimonio Nacional - Real Biblioteca, Madrid, Spain
- Universidad Complutense – Biblioteca, Madrid, Spain
- University Library Minsk, Belarus
- National Library of Belarus, Minsk, Belarus
- University Library Toruń, Poland
- University Library Lund, Sweden
- University Library Debrecen, Hungary
- Latvian Academic Library, Riga, Latvia
- University Library Zielona Gora, Poland
- National Centre of Manuscripts, Tbilisi, Georgia
- Biblioteca Medicea Laurenziana, Florence, Italy
- National Library of Lithuania, Vilnius, Lithuania