

Wielkopolska Digital Library – project: cooperation of regional libraries in creation and management of digital resources

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Abstract:

The concept of a regional digital library: project authors, aims, principles and basic functions.

Digital library as an organizational and technological platform.

Participants of the project: Wielkopolska libraries: academic, other scientific libraries, public libraries and invited cultural institutions.

Resources of digital library - four basic collections and their size:

- 1) scientific–didactic library – a collection of basic course books and lecture texts for students and pupils;
- 2) cultural heritage library – a collection including the most precious pieces of writing of wide cultural meaning, including regional (special collections: manuscripts, cartographical collections, Polish historical documents, free masons’ collections, Jewish texts, history of technology works, etc.);
- 3) documents of social life library – a collection of leaflets, posters, bills, exhibition and fair catalogues, especially from the Wielkopolska region in its historical boundaries;
- 4) musical requisites – scanned copies of scores, in the future mainly of composers from Wielkopolska.

The application of *dLibra* software for building Wielkopolska Digital Library. Background and basic software functions, XML format. *dLibra*: a tool designed for managing multimedia collections in the digital library, metadata and digital objects. *dLibra* as a tool used to circulate the stored resources of the library. *dLibra*: support of the whole publication processing (author and editor works, introduction of an item into the Internet, etc.)

Resource management: combining digital versions of library resources with catalogues of the automated library system Horizon; searching digital resources of Wielkopolska libraries using a distributed catalogue.

Perspectives – an agreement between regions: Wielkopolska (Poznań), Malopolska (Cracow), Kujawsko-Pomorski region (Torun) and Pomorski (Gdansk). Range of agreement: creating digital resources, combining digital versions of regional library resources with their catalogues (Horizon, Virtua), coordination and management of searching.

Keywords:

cultural heritage collection; digital resources; *dLibra* software; documents of social life collection, interregional agreements; musical requisites; project authors; project participants; regional cooperation; resource management; scientific-didactic collection; search management; software functions.

I. The idea of a regional digital library

I.1. Authors (1994 – 2001)

The concept of a regional digital library, first for Poznań, and then for the area of Wielkopolska, was born as a collective initiative of the academic community in Poznań:

- 1) first and foremost, the Poznań Collegium of Rectors (scientists - authors, researchers and management officials);
- 2) directors of Poznań academic and scientific libraries, and
- 3) regional Computer College and Council of Users of POZMAN computer network (Poznań Metropolitan Area Network).

Proper technical conditions have been available since 1993 when the Center of Science of Polish Academy of Sciences was opened in a new building at 17/19 H. Wieniawskiego St., housing also Poznanskie Centrum Superkomputerowo-Sieciowe (Poznań Supercomputing and Networking Center (PSNC, est. 1993) [1].

In 1994 the librarian community, acting following the resolution of Poznań rectors, created a common program and published it as “Automatyzacja bibliotek naukowych miasta Poznania: project” (“The automation of scientific libraries of Poznań: a project”) [2]. The program has been accepted by the rectors as a declaration, which says, “we have decided to create a computerized regional library network indispensable for proper intellectual development of our society, and to establish a foundation called Scientific Libraries Consortium of Poznań to carry out the project” [3].

For procedural reasons, the foundation was registered in court as Poznańska Fundacja Bibliotek Naukowych (Poznań Foundation of Scientific Libraries, PFSL) on May 6, 1996. Ass. Prof. Bogdan T. Maruszewski became the president of the foundation and Dr Eng. Jan Andrzej Nikisch chairman of the board. The foundation has formulated three tasks “for today and for tomorrow”:

TASK 1 - “for today” - automation of library processes in regional and interregional cooperation (aim: mutual help and reduction of delay), which has been put into practice since 1996,

and “for tomorrow” (at present already “for today”):

TASK 2 - effective access to electronic scientific information resources

TASK 3 - conversion of some of printed resources from Polish libraries into electronic ones, following the worldwide trend of digitization of information resources [4].

The project of “Community Digital Library” was accepted by the Poznań Collegium of Rectors in April 2001 and presented for the first time by its authors on May 23, 2001 at the 5th anniversary session of PFBN [5]. As a result of a community library discussion and work on the project, the name has been changed to Wielkopolska Digital Library (WDL) and the project itself accepted for implementation and supported by rectors of Poznań universities.

I.2. Aims of Wielkopolska Digital Library

In 2002 it could be said that, “in short, the utilitarian goal of a digital library is to provide a broader and more common access to written resources of Wielkopolska libraries and, at the same time, decrease usage of printed items. The research and development purpose of a digital library is to enable computer programmers to develop appropriate software and for teams of librarians and human scientists to choose and compile texts and iconographic resources [6].

According to the authors of the project, “the main goals of the library are:

1. increasing access to most popular textbooks and lecture texts;
2. increasing performance of university and school textbooks;
3. facilitating access to chosen scientific texts (particularly monographs) to Polish and foreign researchers;
4. facilitating or enabling access to information sources in libraries and archives, made available to few for safety reasons;
5. making digital copies of the most valuable works kept in libraries and archives;
6. decreasing the cost of access to information sources in libraries” [7].

I.3. Principles of activity and functions of the Wielkopolska Digital Library

Wielkopolska Digital Library (WDL) is affiliated with the Poznań Foundation of Scientific Libraries (PFSL) and can be reached at <http://www.wbc.poznan.pl> since October 1, 2002.

The following principles of functioning are binding at the present stage of development [8].

1. WDL is an organizational and technological platform for accessing digital information sources of educational and scientific character.
2. WDL software and hardware is a functional part of particular scientific and academic libraries of Poznań.
3. Supervision of WDL software and hardware is managed jointly by PFSL and PSNC.
4. Collection and compilation of WDL resources is managed by PFSL.
5. The WDL Program Council decides on the range of resources and WDL development directions, both in terms of functions and activity principles.
6. Rendering information sources accessible by WDL does not limit publication both in printed and digital form.
7. On owner’s request, access to WDL publications can be limited by a password or IP number.
8. Possible fees for authors or publishers are the subject of separate agreements.

9. WDL storage time, presentation and introduction of changes are the subject of separate agreements with publishers or authors.
10. Bibliography is written in the following international formats: Dublin Core, MARC 21 and according to Polish cataloging regulations.
11. WDL acts in accordance with Polish copyright and publishing regulations.
12. WDL does not have legal status and is represented by PFSL.

The main functions of WDL are as follows:

- 1) metadata search;
- 2) searching the publication text;
- 3) navigation inside the work;
- 4) possible protection of files against unauthorized copying and printing;
- 5) searching WDL collection using existing library catalogs. The user and the librarian have a well-known interface at their disposal. Searching is done by means of an Internet interface of the Horizon library system integrated with WDL software for data input, text and graphic file editing and viewing;
- 6) using a cataloging module of the library system for WDL resource cataloging.

I.4. Digital library as an organizational and technological platform

Digital library:

- 1) is understood as information resources common to all the libraries of Poznań and Wielkopolska, software and hardware, and all organizational, research and training activities;
- 2) is the third stage of construction of the so-called technological and organizational platform, which has been designed to provide information for the Wielkopolska academic community; each library can use the platform in the way it considers best for its users and itself, provided the activity does not clash with other libraries' interests;
- 3) provides wider access (via the Internet) to digital versions of textbooks, monographs, and valuable regional and national resources;
- 4) is gradually integrated with the following stages of the platform; i.e. access to the Poznań libraries metadata via the Internet and access to electronic journals in the libraries.

The organization process was initiated in 2001. Most importantly, the participants accepted the timetable for 2002 and first electronic works were published the same year. The Program Council (chaired by Ass. Prof. Stanisław Sierpowski) was created to examine the condition of resource digitization in the region. The creation of the Council was preceded by a several-month-long community discussion and a seminar on "Digitization of resources in Poznań libraries", organized on October 23, 2002 by Polish Academy of Sciences Library in Kórnik and Polish Librarians Association (Poznań branch administration). Directors of scientific libraries, as standing members of the Council, began organizing digitization teams in their libraries.

I.5. Project participants

The participants of the project are:

- 1) all academic libraries in Poznań: Adam Mickiewicz University Library in Poznań (Biblioteka Uniwersytecka w Poznaniu) est. 1919, The Library of Academy of Fine Arts (Biblioteka Akademii Sztuk Pięknych) est. 1919, The Main Library of Physical Education Academy (Biblioteka Główna Akademii Wychowania Fizycznego) est. 1919, The Main Library of Poznań University of Economics (Biblioteka Główna Akademii Ekonomicznej) est. 1926, The

Main Library of Poznań University of Technology (Biblioteka Główna Politechniki Poznańskiej) est. 1945, The Main Library of Academy of Music in Poznań (Biblioteka Główna Akademii Muzycznej) est. 1946, The Main Library of Poznań University of Medical Sciences (Biblioteka Główna Akademii Medycznej) est. 1952, The The Main Library and Scientific Information Center of Agricultural Academy (Biblioteka Główna i Centrum Informacji Naukowej Akademii Rolniczej) est. 1953;

- 2) other scientific libraries: Polish Academy of Sciences Library in Kórnik (Biblioteka Kórnicka Polskiej Akademii Nauk) est. 1828, Raczyński Library (Biblioteka Raczyńskich) est. 1829, The Library of Poznań Society of Friends of Arts and Sciences (Biblioteka Poznańskiego Towarzystwa Przyjaciół Nauk) est. 1857, The Library of the Institute of Molecular Physics of the Polish Academy of Sciences (Biblioteka Instytutu Fizyki Molekularnej Polskiej Akademii Nauk) est. 1975.

Other institutions and libraries have been invited to cooperate: public libraries such as Pedagogic Public Library (Publiczna Biblioteka Pedagogiczna) est. 1925, Provincial Public Library and Culture Animation Center (Wojewódzka Biblioteka Publiczna I Centrum Animacji Kultury) est. 1948 and other libraries (e.g. libraries of new non state-owned universities e.g. Poznań School of Banking), also archives and museums, Scientific Information Committee of the Polish Academy of Sciences, Poznań branch (Komisja Informacji Naukowej Polskiej Akademii Nauk, Oddział w Poznaniu) est. 1973, non-profit organizations and publishers from Poznań and Wielkopolska.

The idea of Wielkopolska Digital Library is that all the scientific and cultural institutions would take part in the initiative.

II. Digital library resources

The WDL project is a plan to create four main collections.

II.1. Scientific and didactic library

– a didactic collection that consists of basic schoolbooks and lecture texts, monographs and other materials, including journals, that are a necessary companion for a college syllabus, within the range of humanistic and social, economic, natural and exact sciences, as well as technology and engineering.

It means they are:

- collections of digital versions of printed documents, especially not easily accessible on the market, suitable for the subject;
- if necessary, digital versions of didactic materials or exam papers with comments, the accessibility of which is consulted with lecturers.

It is planned to place in the scientific and technical library approximately several tens of titles for each subject chosen from the collections of the libraries-participants of the WDL project [9]. Some parts of the collection are protected by copyright and they are published according to the terms of contracts drawn up with the authors or publishers.

There were 31 works in the collection on 15th April 2004 concerning automation, information science, scientific information and librarianship, chemical technology, transport and others.

II.2. Cultural heritage library

- a collection of the most valuable literature relics from Poznań collections, some historical works and belles-lettres published mostly in the 19. century

(e.g. Biblioteka Pisarzy Polskich). These are manuscripts, incunabula and old prints from after 1500, cartographic resources, Polish historical documents, freemasons' collection, Jewish historical documents etc. which are mostly kept in the Polish Academy of Sciences Kórnik Library, Adam Mickiewicz University Library in Poznań and Raczyński Library and in The Library of Poznań Society of Friends of Arts and Sciences.

There are also prints from the 19. century and earlier concerning the history of technology. The Main Library of Poznań University of Technology has prepared a list of the most valuable items, which should be included in the WDL collection. The main pieces to be preserved are Polish Literature works from the second half of the 19th century written in Paris during the period of activity of societies of Scientific Help and Exact Sciences in Paris (towarzystw Naukowej Pomocy i Nauk Ścisłych) and published in Paris and in Krakow at the expense of count Jan Działyński (1829-1880), the former owner of the Kórnik Library. They are items from the collection of The Main Library of Poznań University of Technology, PAN Kórnik Library and The Library of Poznań Society of Friends of Arts and Sciences.

There were 321 items in the collection on 15th April 2004.

II.3. The library of social life documents /regional materials/

- is a collection of documents from the 19th century and times of the First Republic of Poland. These are guides, registers and statements, tourist guides, advertising leaflets of companies from Poznań, posters and bills, theater and music performance programs, leaflets and catalogs of exhibitions and fairs, statutes of associations from Poznań, calendars, election leaflets and so on. All of them concern Poznań and Wielkopolska in its historical boundaries.

There were 301 items in this collection on 15th April 2004.

II.4. Musical requisites

– collection of music scores and literature concerning music kept in the libraries of Wielkopolska, in the future to become the output of composers from Wielkopolska. It contains especially music collections of the Library of the Musical Academy and the music department of the Library of Poznań University.

The collection is prepared for digitization. There are 3 items in the collection now.

On 15th April 2004 the total number of publications in WDL was 656 items. The scientific and didactic collection is 4,73% of the collection, the cultural heritage collection is 48,93%, social life documents 45,88% and musical requisites 0,46%. The collection increases each week by 10 to 20 items. Each day approximately 180 users access the library.

Information about the digitized resources is published in the Polish electronic journal *Elektroniczna Biblioteka EBIB*, which notes also other initiatives of Polish libraries concerning the digitization of their collections [10].

The Main Library of the Poznań University of Technology has formulated the principle:

- 1) for all digitized publications in the WDL resources to have links from the web page of the library;
- 2) an item to be shown on the web page of the library before it is ready to be published by WDL [11].

Digitization teams have been working in Poznań libraries since 2002. The employees have been trained in the field of digitization and received proper

certificates. It should be noticed that some of the publications are very big, contain many pictures and illustrations and need time-consuming technical processing. Our experience shows that “we can receive <<pure>> electronic text within a short time. But annotation of the text requires much more time (we use XML Spy and Authentic software from Altova). The complexity of the document (formulas, tables, non-Latin alphabet symbols and so on) has a big influence on the duration of the process of annotation”... Nowadays, a program for conversion from MS Word format to XML is being implemented, which will speed up the whole process of digitization. The digitization teams have separate computer stands, flat scanners, scanner for microfilms, CD-ROM recorders and software such as Fine Reader Office, Adobe Photoshop and XML Spy [12].

III. Use of *dLibra* platform for digital library creation

Why *dLibra*?

At the turn of the 20 century Polish scientists developed a program called PIONIER / PIONEER (Polski Internet Optyczny – Zaawansowane Technologie, Usługi I Aplikacje dla Społeczeństwa Informacyjnego / Polish Optical Internet - Advanced Applications, Services and Technologies for Information). The program has been accepted by the State Committee for Scientific Research and scheduled for implementation in 2001-2005. Its main assumptions were presented many times by Ass. Prof. Jacek Rychlewski (died 2003 in Poznań), the chairman of the Council of Users of PSNC from 1993-2003. One of the main elements of the PIONEER structure is the system of digital libraries [13].

III.1. About the project

In 1999, a team of computer specialists from PSNC started a research project within the PIONIER framework, the *dLibra* software as a tool for managing multimedia content in digital libraries. The authors of *dLibra* wrote in 2001: “the system has been created to help in building and managing information services like multimedia books, digital publications, e-learning, media-on-demand and other services found in digital libraries. *dLibra* can help everyone to build a digital library containing documents composed of text, sound, video, pictures, animation objects etc.” [14].

The representatives of the team presented the results of their work on *dLibra* application at the national April conference at the International Poznań INFOSYSTEM 2003 Fair. The results were the effect of their difficult, time-consuming work that demanded a lot of consultations [15].

III.2. Main functions of the program

dLibra application is the framework for digital documents management and it:

- 1) gives support to the readers, authors and publishers;
- 2) helps the electronic publication processes (such as placing new publications and updating the old ones, publication versions management and resources circulation, namely searching and browsing);
- 3) ensures protection against unauthorized access to the library resources.

III.3. Architecture of the *dLibra* system

dLibra system consists of six basic modules and each of them performs specific library functions:

- **metadata module** – stores information about publications, their bibliographies, structure, definitions of metadata collections and exhibitions schemes,

- **users module** – contains data about the library users, their access rights and group membership;
- **search module** – searches for publications (full text and according to metadata);
- **content module** – stores and delivers the content of a publication;
- **event module** – enables communication between the modules;
- **services management module** – is the access point to the system and performs the rest of its functions.

The client applications using the modules enable all system operations:

- **administrator application** – managing the library structure, users, access rights and collections, definition of metadata schemes;
- **editor application** – introduction of new publications, versioning, publishing;
- **reader application** – browsing and searching the library using WWW browser [16].

III.4. Access rights management

We can differentiate three groups of library users: administrators, editors and readers. Each of them has specific access rights to the library contents. Managing the rights is performed by the administrator application. Such a flexible system enables distributed library resources management [17].

III.5. Multimedia, metadata and digital objects management

The editor application is used for data input and update in *dLibra* system. The library contents are organized into a hierarchical directory structure where the directory consists of subdirectories and single publications. An electronic publication (digital object) represents some definite content: a text (a book, report, article), illustrations (pictures), tables, statistics, other graphical forms, formulas (chemical) and also sound, video, animations etc. Publications have a varied and changeable structure, consisting of a single file (e.g. PDF, MS Word,) or a set of files with their history (HTML, Djvu).

Each item in the directory can be described by means of a specified set of attributes, so-called metadata schemes. The administrator defines metadata schemes and defines languages to describe attribute values. What is more, publications are also grouped into so-called collections of the same character. For each collection, separate metadata scheme can be defined. WDL uses only one of those: *Dublin Core* [18]. Such approach makes it possible for one publication to be attached to several collections. The information included in the publication description (metadata) can be exchanged automatically with other systems through Resource Description Framework (RDF) [19].

dLibra enables storage of different versions of a publication in the database (the so-called versioning system). Versioning can be applied on two different levels:

- 1) on object level – it enables adding new elements to existing publications,
- 2) on publication level – it enables the creation of a new edition using new source material and each publication can have an unlimited number of editions created from different versions of the same objects or from various objects.

Servers of multimedia content are used to store publications and digital objects included in the publications. They deliver data using suitable protocols, e.g. video using stream protocol or text using HTTP protocol. *dLibra* system can use various types of existing servers and is prepared to adapt others by proper program module adding.

III.6. Circulation of publications collected in digital library

An end user takes advantages of the Wielkopolska Digital Library using the reader application, i.e. a web browser. The internal hierarchical structure of library directories is not visible to the reader. The content of the library is presented as a set of publications grouped into collections. The user can search the collection in several ways. *dLibra* system enables building of search expressions based on the elements of publication description (i.e. attribute sets like author, title, keywords, publisher, and so on) or/and the text of the publication. (full text search). The search can be performed in the whole library database or limit it to a specific collection, in which case the time needed is shorter and the output file is smaller. The indexes are helpful in building search expressions and browsing the whole library or a chosen collection.

dLibra framework contains mechanisms that enable access rights management according to the copyright protection.

Access management can be limited in two ways:

- 1) user system and user categories system – limits of the user access to particular WDL resources, catalogs or publications;
- 2) limitation of access through particular domains – based on user computer IP.

Additionally, at an author's request, the publication can be protected against unauthorized copying or printing. For each publication, a usage statistics is gathered. It is possibility to choose interface language.

III.7. Graphical processing support

The software supports the work of an author and an editor. The author can use special graphic interface to place new publications in the database and edit the old ones or their parts. The advanced versioning system allows for placement of different versions of the publication in the database. The publisher can also manage the whole content, modify the database structure, give access rights to resources and hide or publish items kept in the database using the same interface.

III.8. XML format

Digitized objects placed in WDL can have various formats (e.g. PDF, Djvu, MS Word, HTML and others). One of the challenges for programmers working on the *dLibra* project is to ensure the possibility of placing publications in the XML format. The benefits of XML are numerous and the most important are:

- 1) the possibility of conversion of the works to other formats (HTML, PDF) using special style sheets – the publications are stored in one format but can be shown in other formats and various hardware platforms;
- 2) differentiation of the elements of the publication (titles, paragraphs, definitions, statements, bibliographies, drawings, tables and so on) which makes it possible to divide the publication into smaller parts presented then as a result of the query (instead of the whole publication) or grouped into exhibitions;
- 3) facilitation of communication with other similar systems.

IV. Resources management and growth perspectives

IV.1. Resources management

When we say resources management we mean among other things the connection between electronic resources digitized by the libraries with catalogs of library systems (such as Horizon or Virtua). It is possible thanks to MARC 21 format, used by library systems, and especially the 856 field which contains information about the location of an electronic publication (URL). It is also possible to search

for the resources by means of the Distributed Catalog of The Polish Libraries KARO [20] and in the future the same activity will be enabled by The National Union Catalog NUKAT [21]. The more printed resources with descriptions in library catalogs will be digitized and published in WBC, the more often the user of the library catalog will be guided directly to the electronic version of the publication.

IV.2. Perspectives

Finally, we would like to comment on the concept and establishment of the Polska Biblioteka Internetowa (PBI) / Polish Internet Library. The library was opened on 21st December 2003 and provoked a lively discussion. At a conference in Poznań in April 2003 (INFOSYSTEM Fair) a question was posed: "Regional libraries and PBI – coexistence?" I would like to answer the question using the authors' own words: "Yes, but... we need funds. Yes, we have to create a Polish national program, which could cover the cost of creation of regional digital libraries by means of a granting system and support of the biggest centers. In the future the libraries would make up a distributed but coherent national digital library cooperating close with the central library (PBI). The libraries or consortia, which would decide to cooperate within the project, should:

- settle on uniform source and metadata formats,
- agree on standards of circulation and exchange of files,
- create the main consortium to coordinate work on the national level" [22].

As we know, the projects of digital libraries are being implemented in a few regions. Therefore, it is possible to come to the agreement between the regions of: Wielkopolska (Poznań), Małopolska (Kraków), Kujawsko-Pomorski (Toruń) and Pomorski (Gdańsk). The first talks and consultations are being conducted to:

- 1) create digital collections without source duplication,
- 2) connect digital resources of particular regions with their catalogs (Horizon, Virtua and others),
- 3) manage and coordinate search.

We hope that rapidly growing Wielkopolska Digital Library will serve well the knowledge society.

Poznań, 15th April 2004

V. NOTES

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