



Development of Digital Libraries at Poznań Supercomputing and Networking Center

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What for ?

- Increasing amount of information
- Growing needs for faster and easier access
- New multimedia content
- New services



DL Developments at PSNC

- 1998 - start of pilot system development
- 1999 - pilot system finished, defining new design principles
- 2000 - second stage system developed



dLibra Features

- Extensibility
- Flexibility
- Standard based



Extensibility

- Use of CORBA middleware
- Extensible by adding new components using existing component's interfaces
- Extensible by adding new RDF schema attributes
- Extensible by adding new media types



Flexibility

- CORBA - programming language independent
- Java, servlets - platform independent
- Distributed design
- Scalability



Standard Based

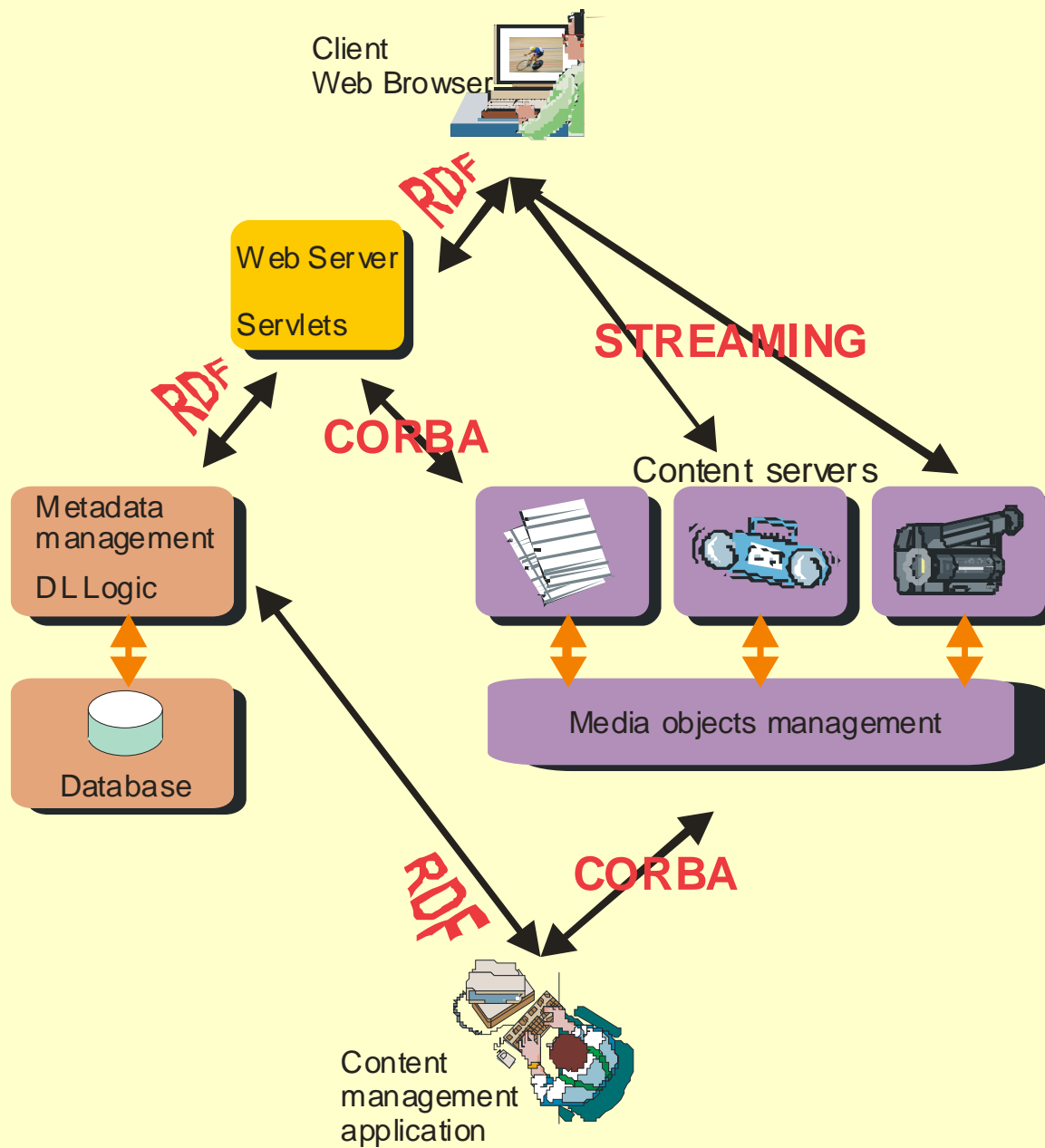
- OMG CORBA middleware
- W3C Resource Description Framework (RDF)
- Dublin Core RDF schema
- Java and servlets



dLibra Architecture

Four main components

- metadata management and DL logic module
- multimedia storage servers
- content management application
- web application for content presentation





Metadata Management and DL Logic

Database for storing:

- library structure
- document structure
- document metadata
- user privileges
- media type definitions including Java loaders



Multimedia Storage Servers

- Distributed storage
- Media type based servers
- Media dependent delivery (HTTP for files, streaming protocols for A/V)
- Easy addition of new media types (MPEG1, MPEG2, etc.)



Content Management Application

- GUI application for library content management
- Loading of new content from local files
- User privileges for distributed library management
- Easy method for update of library documents
- Metadata discovery
- New media types
- Java and Swing



The screenshot displays three overlapping windows from the dLibra system:

- dLibra - Directory Browser:** Shows a tree view of a digital library. The selected item is 'Test loadera' under 'Podpodtestowy'. Metadata for this item is shown on the right: Creator: PG&AS, Creation-date: 18.11.1999, Keywords: Test, Gilgamesz, Testy, Title: UNKNOWN, Creation-place: UNKNOWN.
- Document Editor:** Shows the editing interface for the selected document. It includes a menu with 'New chapter', 'New object', 'Attributes', 'Rename', 'Remove', 'Up', 'Down', and 'Close'. The document content area shows the same metadata as the directory browser.
- dLibra - Attributes editor:** A dialog box for editing document attributes. It has a table with two columns: 'Attribute' and 'Description'.

Attribute	Description
Creator	Keywords of document
Creation-date	
Keywords	
Title	Value for: Keywords
Creation-place	Test, Gilgamesz, Testy

 The 'Keywords' attribute is currently selected. At the bottom of the dialog are 'OK' and 'Cancel' buttons.



Web Application for Content Presentation

- Access to the library content using standard web browser
- Browsing library and documents
- Searching library using metadata
- Embedded RDF descriptions in HTML
- Java servlet



Browse Library - Netscape

File Edit View Go Communicator Help

dLibra


Current directory: [Testowa](#) | Test

[Browse](#)

[Search](#)

[Logout](#)

[About](#)



➡

- 📁 [New directory](#)
- 📁 [SubTest](#)
- 📖 [Niepelnosprawni](#)

Directory : Test

Creator	PSNC
Creation-date	2000-04-11
Keywords	digital library, test
Title	Test folder
Creation-place	Poznań, Poland

Document: Done



Search - Netscape

File Edit View Go Communicator Help

dLibra


Search

[Browse](#)

[Search](#)

[Logout](#)

[About](#)



Attribute name	Desired value	Ignore case
Creator	equals to <input type="text"/>	<input type="checkbox"/>
Creation-date	equals to <input type="text"/>	<input type="checkbox"/>
Keywords	equals to <input type="text"/>	<input type="checkbox"/>
Title	equals to <input type="text"/>	<input type="checkbox"/>
Creation-place	equals to <input type="text"/>	<input type="checkbox"/>

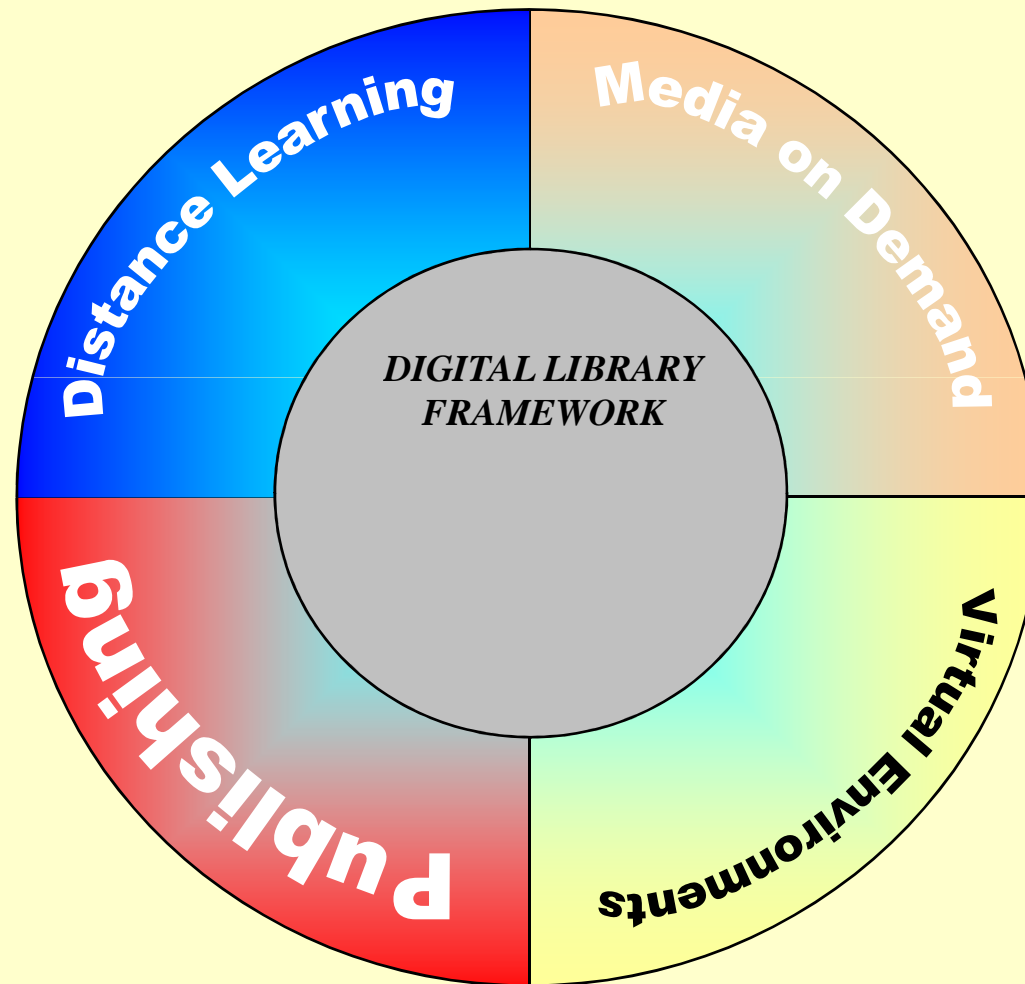
Search in:

Directories Documents Chapters Files

Document: Done



Digital Library Based Applications





Digital Library Based Applications

- Distance learning
- Media on demand
- Virtual environments
- Electronic publishing



Digital Library Based Applications

The main topics addressed are:

- The management of different types of data including stream based data
- The creation of multimedia publications
- The storing of documents and objects contained in these documents
- The possibility of describing objects and documents by simple metadata for searching
- Access control for content



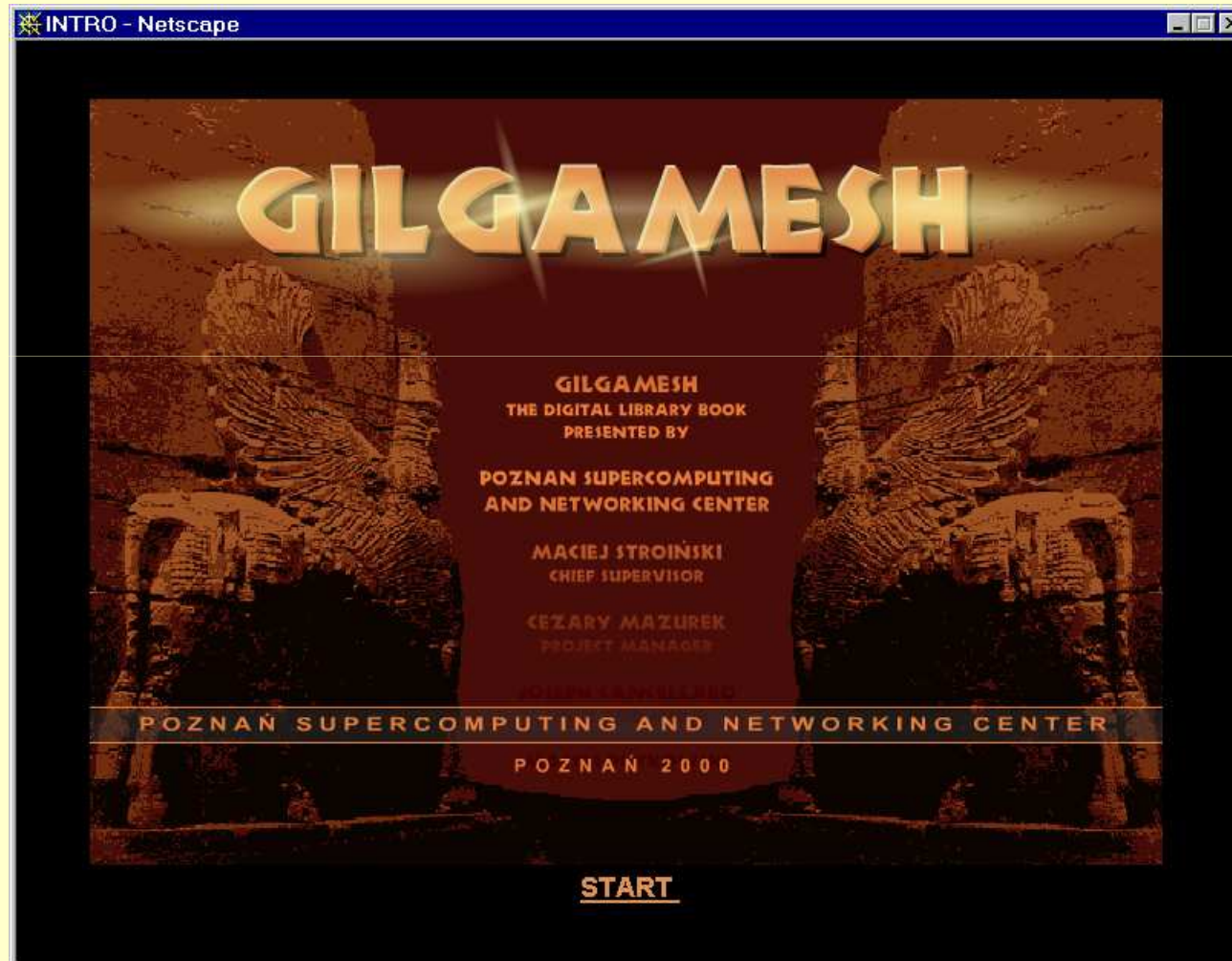
The Digital Edition of a Book

The Epic of Gilgamesh

- Multimedia publication created with the usage of the software tool dLibra
- Printed text form extended with parallel multimedia events
 - Graphics: Animated and Still - visual representation of the Epic of Gilgamesh
 - Audio: Animation support and synchronization - musical imagery/aesthetics
 - Voice: Reading of the book - lector recordings or background music played while self-reading



<http://gilgamesh.psnc.pl>





<http://gilgamesh.psnc.pl>





Future Work

Setting up of a common DL infrastructure as middleware for advanced network applications.

In particular such infrastructure will be developed for PIONIER - Optical Internet in Poland project .



Future Work

Research and Development areas:

- persistent URL's
- security
- metadata storing and processing
- interactive user assistance
- quality of service
- electronic publishing support



Future Work

Distributed DL R&D areas:

- resource discovery
- resource indexing
- content exchange
- content caching
- metadata exchange
- query and results routing



Future Work

Software design principles

- Service based digital library
 - Independent services:
 - content storage
 - resource indexing
 - metadata management
 - etc.
- Java or Web applications using these services



Contact

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