Virtual digital libraries: The DILIGENT Project

Donatella Castelli
ISTI-CNR, Italy
The DLs evolution

Dynamic Universal Knowledge Environment

Repository of digital texts + search service

1996

2005

Large institutions

Virtual organizations

GARR-05 Conference, 10-18th May 2005
New information objects

- a fixed text
- a pollution map
- a table summarizing data from millions of observed satellite measures
- a graph reporting an analytical trend of certain information extracted from a great amount of observed data

Live documents
In order to satisfy this demand we need:

- New DL systems able to provide innovative services, especially capable of supporting multimedia and multi-type information objects
- Fast and unexpensive DLs development models, based on sharing and reuse of resources

Which technology?
The Grid technology

- Large processing and storage capabilities for handling the wide variety of multimedia and multi-type information objects
- Controlled sharing of resources

DILIGENT

A Digital Library Infrastructure on Grid Enabled Technology
Participants

- Italian National Research Counil - ISTI (Italy, Scientific Co-ordinator)
- European Research Consortium for Informatics and Mathematics (France, Administrative Co-ordinator)
- University of Athens (Greece)
- Swiss Federal Institute of Technology Zurich - ETH Zurich (Switzerland)
- Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V. - IPSI (Germany)
- University for Health Informatics and Technology Tyrol (Austria)
- University of Strathclyde (United Kingdom)
- Engineering Ingegneria Informatica SpA (Italy)
- Fast Search & Transfer ASA (Norway)
- 4D SOFT Software Development Ltd. (Hungary)
- European Organization for Nuclear Research (Switzerland)
- European Space Agency - ESRIN (Italy)
- Scuola Normale Superiore (Italy)
- RAI Radio Televisione Italiana (Italy)
DILIGENT objective

Create a test-bed Digital Library Infrastructure that will allow members of dynamic virtual research organizations to create on-demand transient digital libraries based on shared computing, storage, multimedia, multi-type content and application resources.
The high computing and storage capabilities will be obtained by relying on the Grid infrastructure.

The DILIGENT project will develop the knowledge management services and the services that are needed to handle them.
DILIGENT functional view

**Application specific functionality**
- Portal Generator
- Feature Extraction
- Visualization

**Process Management**
- Process Execution & Reliability
- Process Design & Verification
- Query Process Optimization

**Index & Search Management**
- Search
- DataFusion
- Content Source Description & Selection

**Content & Metadata Management**
- Annotation
- Metadata Broker
- Metadata Management
- Content Security
- Content Management
- Content Wrapper
- Storage Monitor
- Dynamic VO Support

**DL Creation & Management**
- Keeper
- Broker & MatchMaker
- Information Service
- DL Generator

**Personalization**
Architectural View

DILIGENT will

- **Adopt** gLite as middleware
- **Exploit** gLite as software
- **Join** the EGEE infrastructure
DILIGENT- gLite relationship (1)

- **DILIGENT adopts** gLite as Grid Middleware

  The DILIGENT application will be composed by

  - services provided by the DILIGENT project
  - services provided by the gLite distribution

  Both DILIGENT and gLite services will be deployed on the DILIGENT test-bed infrastructure
DILIGENT-gLite relationship (2)

- **DILIGENT exploits** gLite services, components, or modules

  DILIGENT services can be designed to include or wrap “pieces of gLite software”
The DILIGENT infrastructure joins the EGEE infrastructure.
Our users (1): Environmental researchers

Implementation of Environmental Conventions

Objective: DLs for supporting the scientists in protecting the environment against pollution

Focus: the control of the marine environment of the Mediterranean Sea

Activities:
- producing reports
- prepare conferences
- analyze data about the environment in case of accidents
Our users (1)

- Large variety of content types (e.g. maps, satellite images, reports)
- Large amount of data
- High processing required to produce useful outcomes

Participants

- European Space Agency
- Ministero Italiano dell’Ambiente e altri uffici di Guardie Costiere europei
- REMPEC - the Regional Marine Pollution Emergency Response Centre (Malta)
- UNESCO IOC (Intergovernmental Ocean Committee) (Paris)
- ITOPF, International Tanker Owners Pollution Fed. Ltd. and MOIG, Mediterranean Oil Industry Group
- ICRAM, Istituto Centrale per la Ricerca scientifica e tecnologica applicata al mare

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ARTE Project

Objective: DLs for supporting the work of teams of researchers working on the humanities domain
Focus: to collaboratively investigate the usage of images and texts in ancient books and to establish semantic relationships among them
Activities:
- Organization of courses
- Exhibitions
- Conferences
Our users(2)

- Many multidisciplinary archives
- Strong need of texts, images and videos semantic analysis and search across this heterogeneous documents
- Few resources

Participants
- Scuola Normale Superiore
- Rai Radiotelevisione Italiana
- Brown University - Department of Italian studies
- Centre de Recherche en Histoire des Sciences et des Techniques
- Universidade da Coruña - Research Team on Hispanic Emblematic Literature
- University of Glasgow - HATII
- Università di Pisa - Facoltà di Lettere e Filosofia - Corso di Laurea Cinema Musica e Teatro
- Studio Azzurro Produzioni

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Conclusions

- The eInfrastructure is the means that will allow to construct Dynamic Universal Knowledge Environments serving a large number of research communities.

- The experience and the services developed by DILIGENT can be exploited by other knowledge-based applications.

- The DILIGENT system can serve as a basis for many other applications: e-learning, e-health, e-goverment.
Contacts

www.diligentproject.org

- Donatella Castelli (CNR-ISTI, scientific co-ordinator)
  donatella.castelli@isti.cnr.it

- Jessica Michael (ERCIM, administrative co-ordinator)
  jessica.michel@ercim.org