

**DiLAS**

**DiGITAL LiBRARY ANNOTATION SERVICE**



# **Design, Implementation and Evaluation of Multimedia Annotations for Users' Collaboration**

DELOS WP1 - Task 1.5

DELOS WP4 - Task 4.10

DELOS All Task Meeting  
Paris, January 30, 2006

# Outline

- ▶ Project description;
- ▶ DiLAS system description;
- ▶ Project work progress;
- ▶ Conclusions and next steps;
- ▶ Dissemination and publications.

## People

### Coordinators:

- ▶ Maristella Agosti (UNIPD): Task 1.5 Coordinator;
- ▶ Emanule Panizzi (ROMA1): Task 4.10 Coordinator;

### Partners:

- ▶ *Fraunhofer IPSI, Germany* (**FHG/IPSI**): Ulrich Thiel;
- ▶ *Institute of Knowledge Sharing, Denmark* (**IKS**): Hanne Albrechtsen;
- ▶ *Risø National Laboratory, Denmark* (**RISOE**): Annelise Mark Pejtersen;
- ▶ *Swedish Institute of Computer Science, Sweden* (**SICS**): Preben Hansen;
- ▶ *University of Rome "La Sapienza", Italy* (**ROMA1**): Emanuele Panizzi;
- ▶ *University of Duisburg-Essen, Germany* (**UNIDUE**): Norbert Fuhr, Ingo Frommholz;
- ▶ *University of Padua, Italy* (**UNIPD**): Maristella Agosti, Nicola Ferro, Nicola Orio.

## Digital Library Management Systems

The third DELOS Brainstorming Meeting, held in Corvara, Italy, in July 2004, pointed out that:

- ▶ digital libraries had to become more user-centred;
- ▶ digital libraries should not be just passive repositories but require more active collaboration and communication tools;
- ▶ there is a need for more general purpose digital library management systems.

## DiLAS Goals

- ▶ to implement an annotation DLMS service,
  - ▷ based on design guidelines and existing partners available tools, and
  - ▷ accessible from different DLMSs;
- ▶ to integrate it into two different systems,
  - ▷ the DAFFODIL and BRICKS systems;
- ▶ to evaluate its use
  - ▷ as a new way to interact with a DL,
  - ▷ for cooperation among DL users and stakeholders, and
  - ▷ performing a study of users behaviour, of the system usability, and of the impact on the DL development and use.

# Why Annotations?

- ▶ a very well-established practice and widely used;
- ▶ a way for merging personal contents with the information resources provided by DLs;
- ▶ a means for improving collaborative work practices;

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@inproceedings{AgostiFerro2003,
  author={Agosti, M. and Ferro, N.},
  title={Annotations: Enriching a Digital Library}},
  pages={88--100},
  editor={Koch, T. and Sølvberg, I. T.},
  publisher={Lecture Notes in Computer Science (LNCS) 2769, Springer, Heidelberg, Germany}},
  year={2003},
  booktitle={Proc. 7th European Conference on Research and Advanced Technology for Digital Libraries (ECDL 2003)}}
  
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**BibTeX Item**

## Annotations: Enriching a Digital Library

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**Abstract.** This paper presents the results of a study on the semantics of the concept of annotation. It specifically deals with annotations in the context of digital libraries. In the light of those considerations, general characteristics and features of an annotation service are introduced. The OpenDLib digital library is adopted as a framework of reference for our ongoing research, so the paper presents the annotations extension to the OpenDLib digital library, where the extension regards both the adopted document model and the architecture. The final part of the paper discusses and evaluates if OpenDLib has the expressive power of representing the presented semantics of annotations.

### 1 Introduction

This paper reports on a study on annotations conducted in the context of the *Technologies and Services for Enhanced Content Delivery* project, which is also known as *Enhanced Content Delivery*<sup>1</sup> (ECD). ECD is a research project launched by the Italian National Council of Research (CNR) in 2002 with the aim of developing methods and technologies for the enhanced delivery of contents to final users. Several academic, research, and industrial partners are participating nationwide on the project.

The final target of this research is to face in general the concept of annotation focusing on digital libraries services. General findings are then adapted to a specific digital library, such as OpenDLib, to demonstrate their use and validity.

The presentation of findings is structured as follows: Section 2 presents considerations on the semantics of the concept of annotation, this section constitutes the conceptual basis for the definition of the annotation service to be developed. Section 3 illustrates what are the aspects to be considered in annotating digital libraries. ~~In Section 4 we briefly present OpenDLib, which is the reference digital library of ECD. Section 5 presents our proposal of extension of OpenDLib to support built-in annotation functionalities.~~ Section 6 presents the architecture and the characteristics of the prototype annotation service. Finally, Section 7 reports some conclusions on the work.

<sup>1</sup> <http://www-ecl.cnuce.cnr.it/>

See also

See [CastelliPagano!](#)

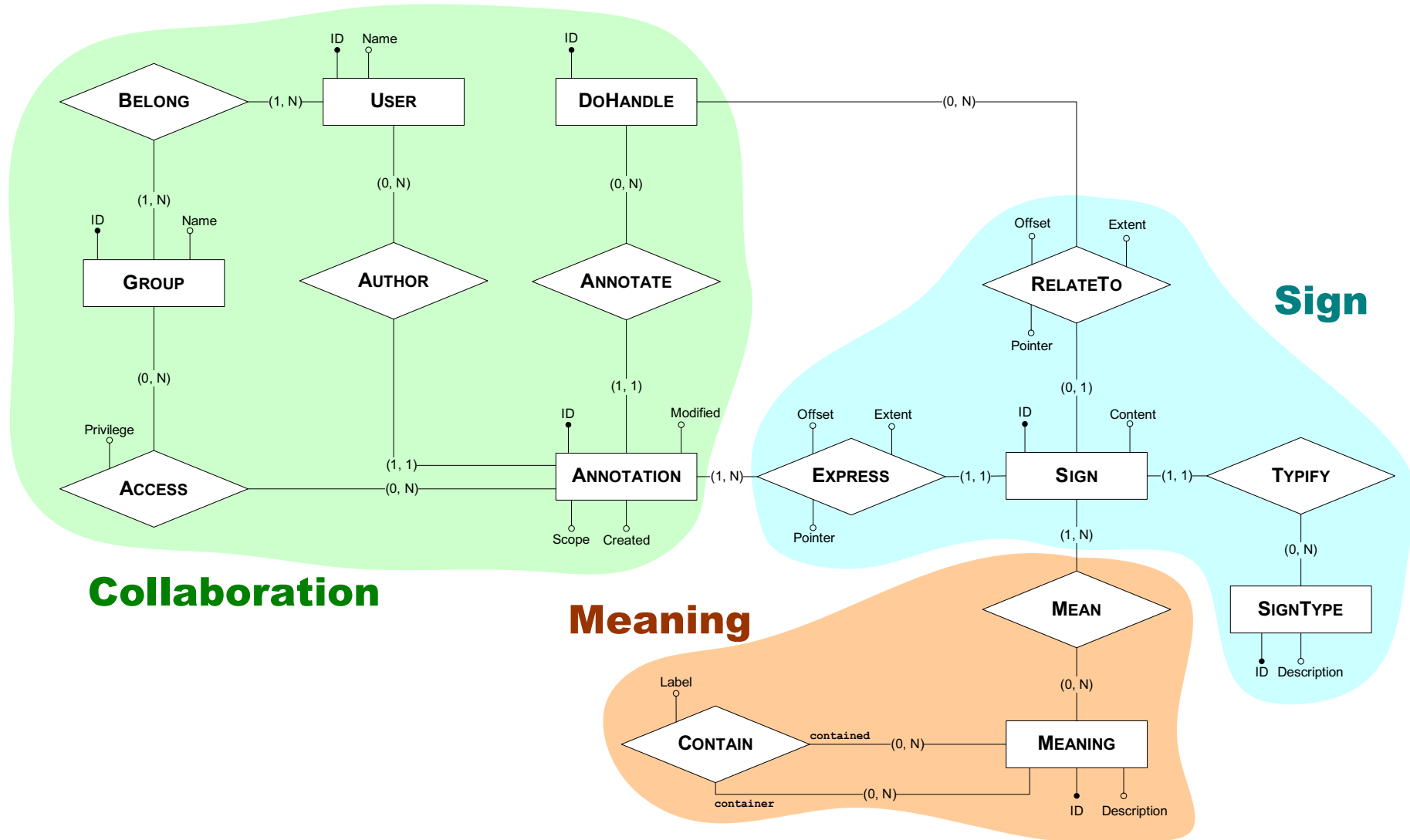
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## Research Background

- ▶ Design and development of DL annotation systems:
  - ▶ COLLATE - Collaboratory for Annotation Indexing and Retrieval of Digitized Historical Archive Material (**FHG/IPSI**);
  - ▶ DAFFODIL - Distributed Agents for User-Friendly Access of Digital Libraries (**UNIDUE**);
  - ▶ FAST - Flexible Annotation Service Tool (**UNIPD**);
  - ▶ IPSA - Image Archive of the Paduan School (**UNIPD**);
  - ▶ MADCOW - Multimedia Annotation of Digital Content Over the Web (**ROMA1**);
- ▶ Empirical evaluation of DL annotation systems:
  - ▶ COLLATE (**IKS, RISOE**);
  - ▶ Large software company in Europe (**SICS**).

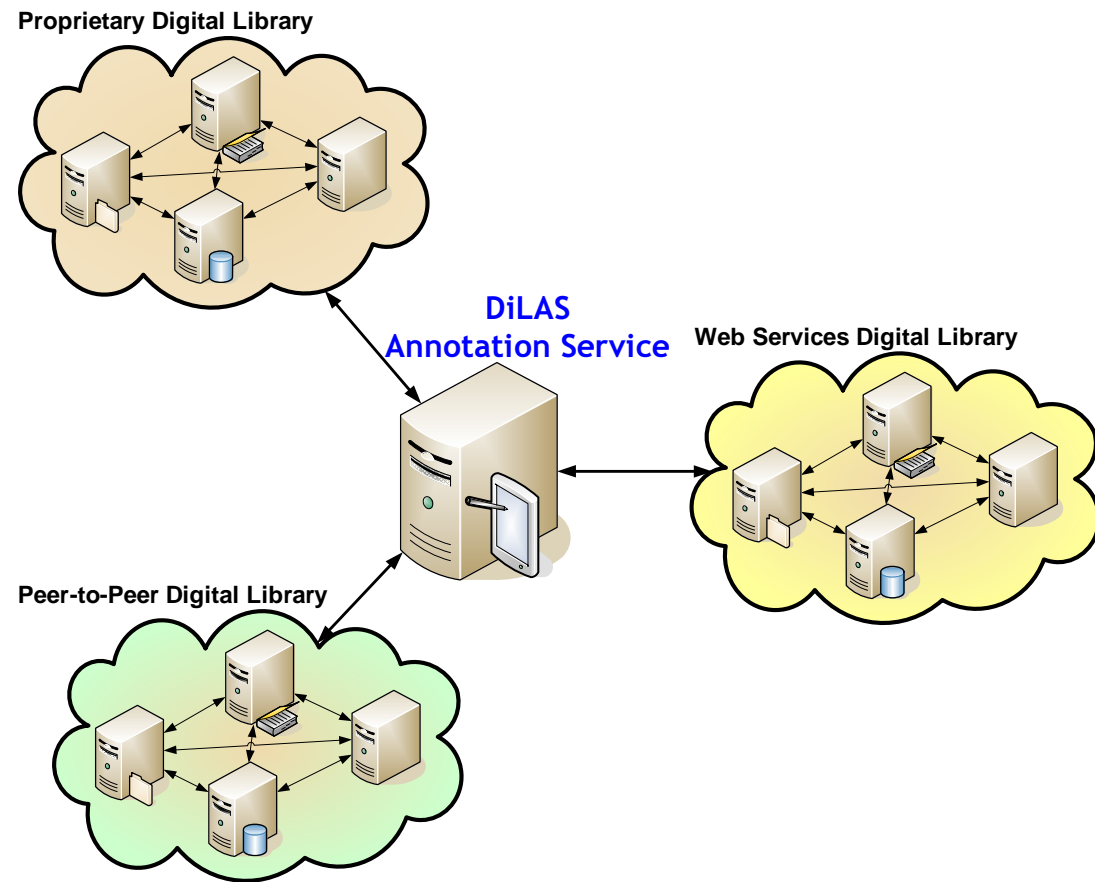
# Annotation Model



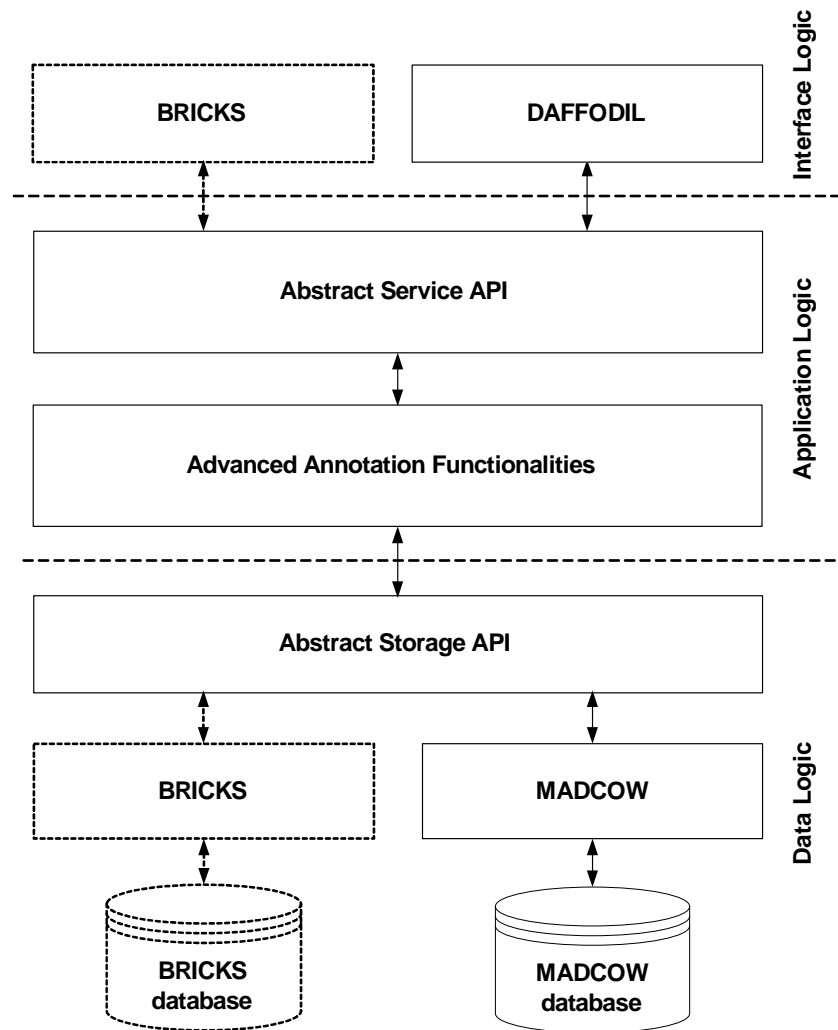


# DiLAS Design Choices

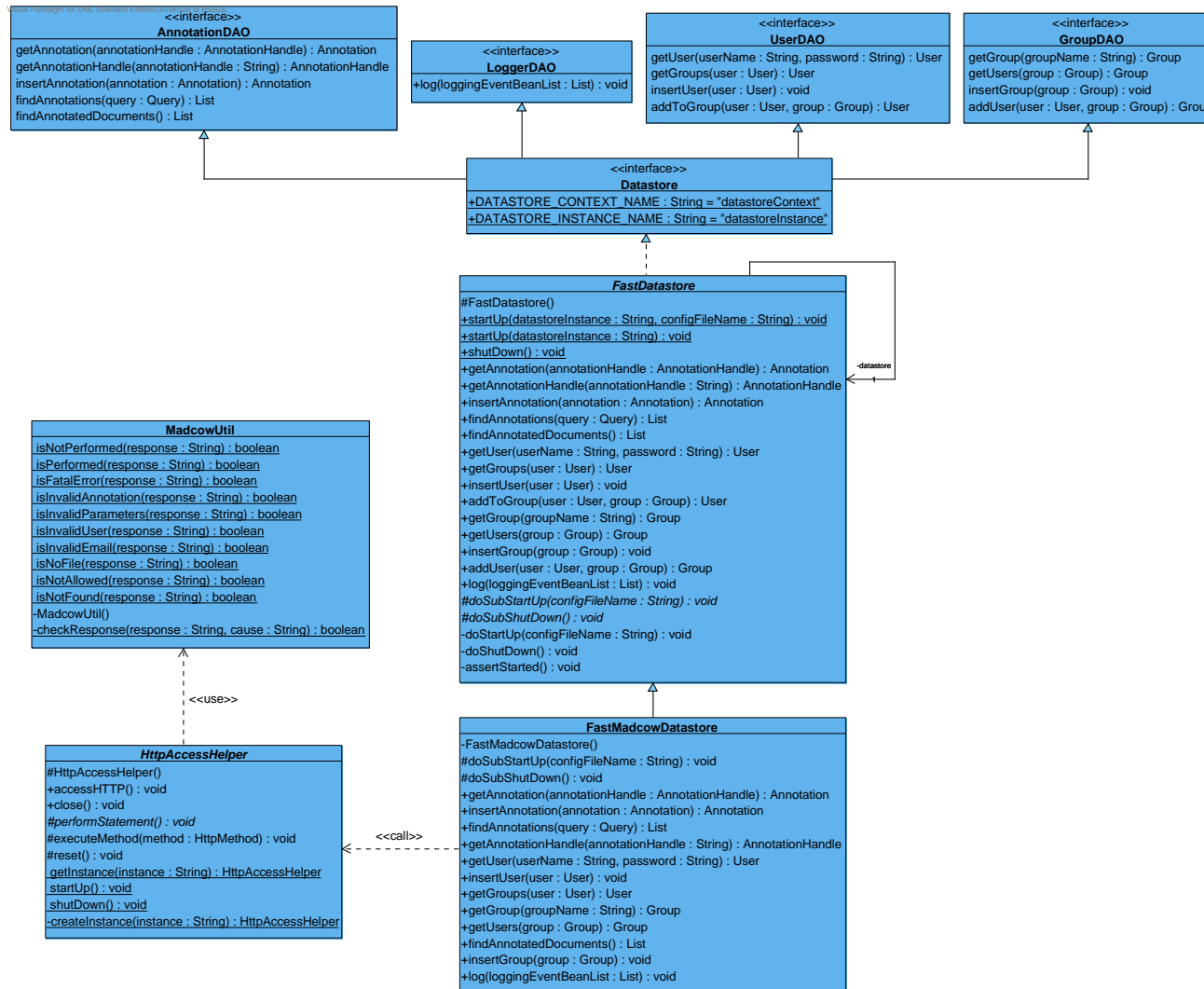
- ▶ objectives:
  - ▷ flexibility;
  - ▷ modularity;
  - ▷ integration with different kinds of DLMS;
- ▶ motivations:
  - ▷ paradigm of interaction with DLMS;
  - ▷ documents and annotations hypertext characteristics;
  - ▷ search functionalities.



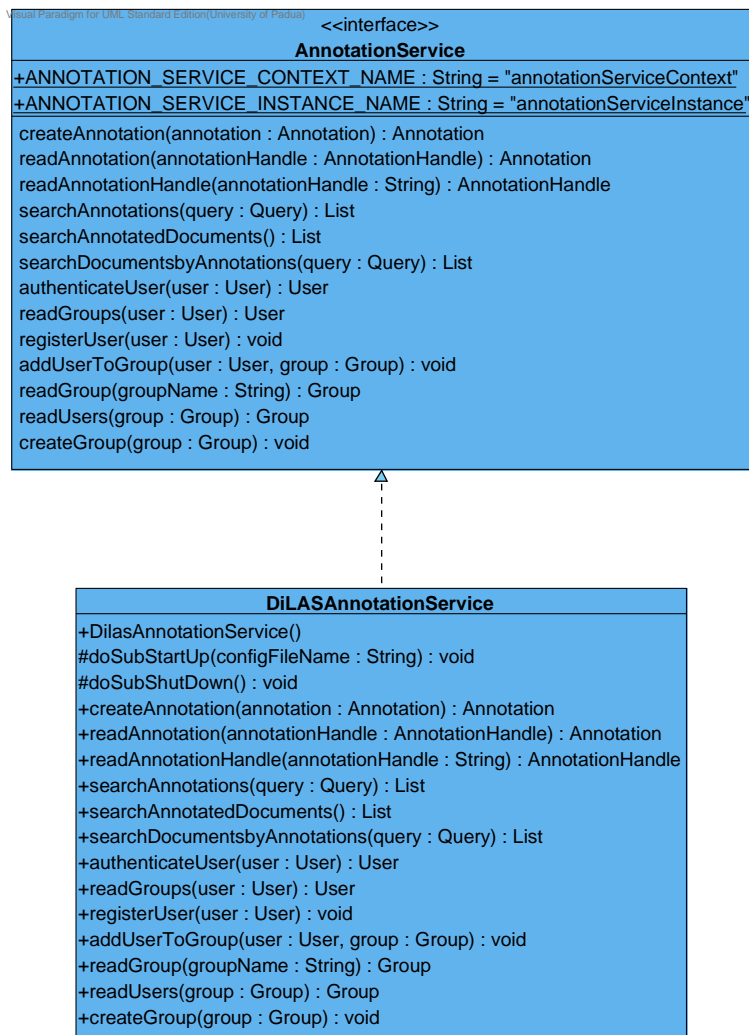
# DiLAS Architecture



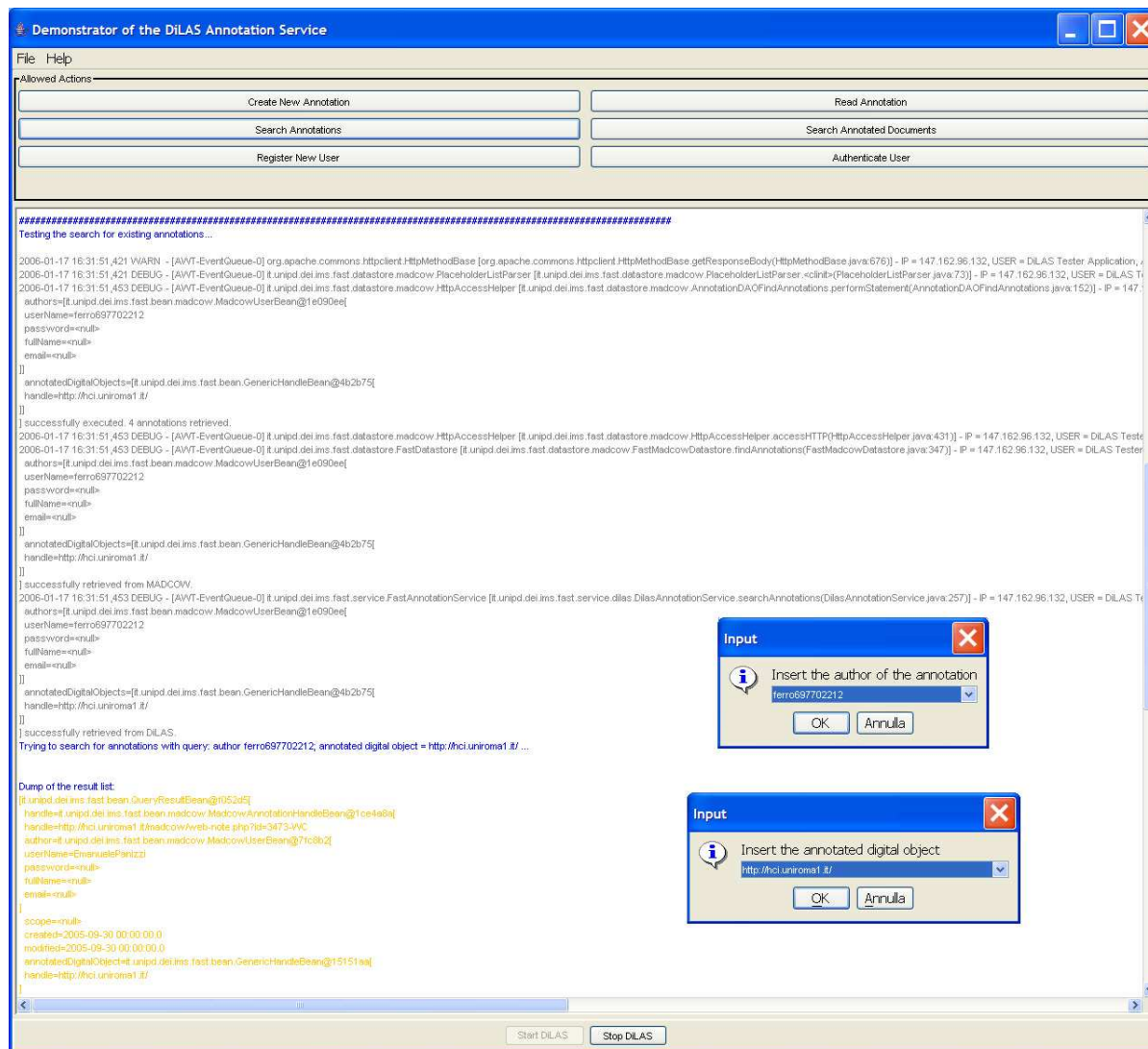
# DiLAS Storage API



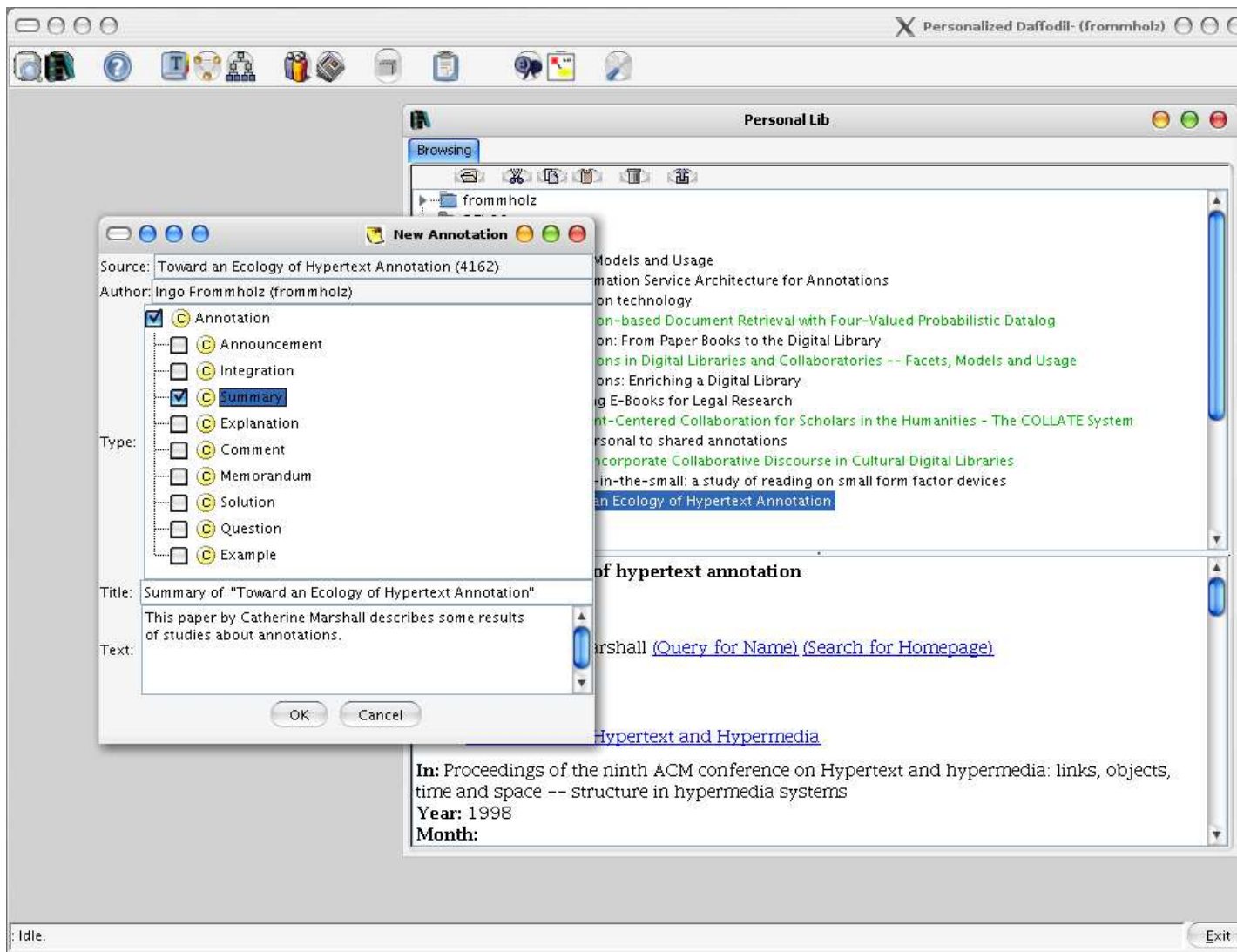
# DiLAS Service API



# First DiLAS Demonstrator Prototype



# Ongoing Integration of DAFFODIL



## Conclusions and Next Steps

- ▶ An architecture for the DiLAS system has been proposed (FHG/IPSI, ROMA1, UNIDUE, UNIPD);
- ▶ A first prototype of DiLAS, which integrates FAST and MADCOW, has been implemented (DELOS researcher exchange between UNIPD and ROMA1);
- ▶ Integration of DAFFODIL into DiLAS is currently ongoing (UNIDUE);
- ▶ Better understand DL-users use of annotations will be achieved through an empirical evaluation (IKS, RISOE, SICS);
- ▶ Missing features for real users will be identified through an empirical evaluation (IKS, RISOE, SICS).

## Publications (1/3)

- [Paris2005]** M. Agosti, H. Albrechtsen, N. Ferro, I. Frommholz, P. Hansen, N. Orio, E. Panizzi, A. M. Pejtersen, and U. Thiel. DiLAS: a Digital Library Annotation Service. In J.-F. Boujut, editor, *International Workshop on Annotation for Collaboration. Methods, Tools, and Practices*, pages 91-101. Paris, November 24-25, 2005.
- [Colis2005]** M. Agosti and N. Ferro. Annotations as Context for Searching Documents. In F. Crestani and I. Ruthven, editors, *Proc. 5th International Conference on Conceptions of Library and Information Science – Context: nature, impact and role (Colis5)*, pages 155–170. LNCS 3507, Springer, Heidelberg, Germany, 2005.
- [DELOSWS2005]** M. Agosti and N. Ferro. A System Architecture as a Support to a Flexible Annotation Service. In C. Türker, M. Agosti, and H.-J. Schek, editors, *Peer-to-Peer, Grid, and Service-Oriented in Digital Library Architectures: 6th Thematic Workshop of the EU Network of Excellence DELOS. Revised Selected Papers*, pages 147–166. LNCS 3664, Springer, Heidelberg, Germany, 2005.



## Publications (2/3)

- [DELOS2005]** M. Agosti, N. Ferro, H. Albrechtsen, I. Frommholz, E. Panizzi, and U. Thiel Design, Implementation and Evaluation of the Use of Digital Multimedia Annotations in DL Interaction and DL Users Collaboration. In C. Thanos, editor, *DELOS Research Activities 2005*, pages 47–48. ISTI-CNR, Gruppo ALI, Pisa, Italy.
- [JCDL2005]** M. Agosti, N. Ferro, and N. Orio. Annotating Illuminated Manuscripts: an Effective Tool for Research and Education. In M. Marilino, T. Sumner, and F. Shipman, editors, *Proc. 5th ACM/IEEE-CS Joint Conference on Digital Libraries (JCDL 2005)*, pages 121–130. ACM Press, New York, USA, 2005.
- [AVIVDLib2005a]** M. Agosti, N. Ferro, and N. Orio. Annotations as a Support to Research Users. In T. Catarci, S. Christodoulakis, and A. Del Bimbo, editors, *Proc. 7th International Workshop of the EU Network of Excellence DELOS on Audio-Visual Content and Information Visualization in Digital Libraries (AVIVDiLib'05)*, pages 117–120, Centromedia, Viareggio, Italy, 2005.

## Publications (3/3)

- [DNIS2005]** P. Bottoni, R. Civica, S. Levialdi, L. Orso, E. Panizzi, and R. Trinchese. Storing and Retrieving Multimedia Web Notes. In S. Bhalla, editor, *Proc. 4th International Workshop on Databases in Networked Information Systems (DNIS 2005)*, pages 119–137, LNCS 3433, Springer, Heidelberg, Germany, 2005.
- [AVIVDLib2005b]** P. Bottoni, R. Civica, S. Levialdi, L. Orso, E. Panizzi, and R. Trinchese. Storing and Retrieving Multimedia Web Notes. In T. Catarci, S. Christodoulakis, and A. Del Bimbo, editors, *Proc. 7th International Workshop of the EU Network of Excellence DELOS on Audio-Visual Content and Information Visualization in Digital Libraries (AVIVDiLib'05)*, pages 111–116, Centromedia, Viareggio, Italy, 2005.
- [IPM2005]** P. Hansen, and K. Järvelin. Collaborative Information Retrieval in an information-intensive domain. *Information Processing & Management*, 41(5):1101–1119, 2005.