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A Design Framework for Collaborative Browsing

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Outline of the Presentation

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- **The Web: Present and Future**
- **Some Already Existing Proposals**
- **System's Components & Functional Structure**
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- **Conclusions and Future Work**

Introduction

- In this work we perform an analysis of the actual state of the *Web*, focusing our interest in the new ways that can be used to enhance its operation.
- Our main interest is originally focused on *Collaborative Browsing (CB)*, and we are currently working on the definition of the model to be used for the implementation of such kind of systems.
- Our efforts are currently oriented to the definition of a system devoted to Tele – Learning, but we think that several other areas could be improved by the implementation of the *CB* paradigm.

The Web: Present and Future

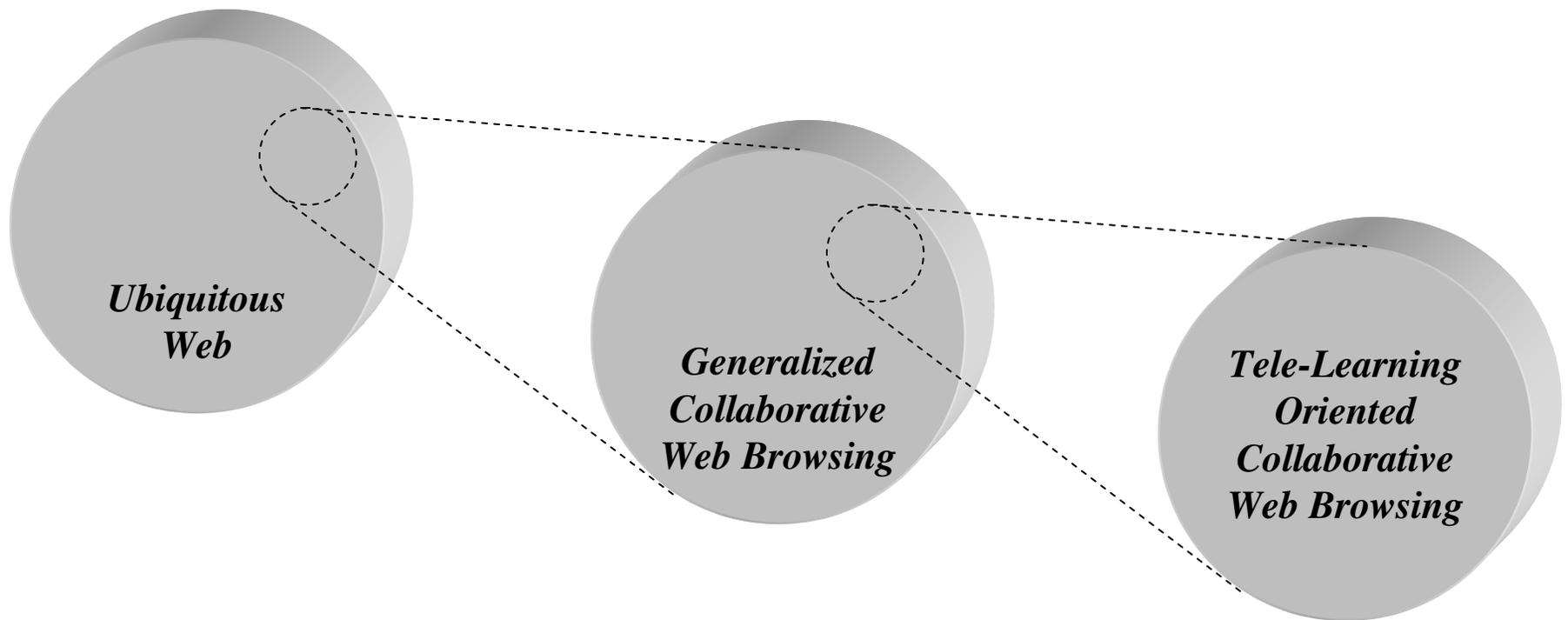
- ***Browsing***, in general, consists in:
 - “Information search that is opportunistic, reactive and unplanned, and for which the goal may be fuzzy and dynamic” [1].
- Until today, the *Internet Browsing* activity is performed isolated, and is isolating.
- Our goal: Define a new, easier, more open, more flexible, allowing collaborative environments, *Web* paradigm!

[1] G. Marchionini.



The Web: Present and Future

- The development of the Web is constantly growing, and it is getting more popular everyday. If this tendency continues, Web could become an ubiquitous resource.



The Web: Present and Future

- In general, we see *CB* as an extension to the traditional *Web* browsing, providing groups of users with a mutual consciousness of the group presence and tools to interact and communicate among them.
- The *CB* concept aims therefore to extend the multimedia interactive document access and visualization to group of users where a subset can communicate through synchronous/asynchronous communication tools, in a distributed co-presence.



Some Already Existing Proposals

Some existing applications for *CB*:

- Library document research and indexing.
- Web tours.
- Distance learning.
- Entertainment.
- etc.



Some Already Existing Proposals

- **Some implemented tools to support *CB* solutions:**
 - **The use of persistent public and private places.**
 - **The use of several synchronous & asynchronous communication capabilities:**
 - ↳ **Chat.**
 - ↳ **Voice chat.**
 - ↳ **Audio and Video conferencing.**
 - ↳ **Blackboards.**
 - ↳ **etc.**

Some Already Existing Proposals

- **Some implemented tools to support *CB* solutions:**
 - The sharing of both, data and applications.
 - Presentation splitting according to the capacities of the devices sending or receiving a particular presentation.
 - Providing several types of awareness:

Activity.	Availability.
Process.	Perspective.
Environment.	



Some Already Existing Proposals

- **Some implemented tools to support *CB* solutions:**
 - **Access control, since this kind of systems is multi-users.
Some proposals are:**
 - ↙ **Individual and Group access rights assignment.**
 - ↙ **Role-Based Access Control (*RBAC*).**
 - ↙ **Weak/Strong – Positive/Negative rights.**
 - ↙ **Multiple and dynamic user roles.**
 - ↙ **etc.**

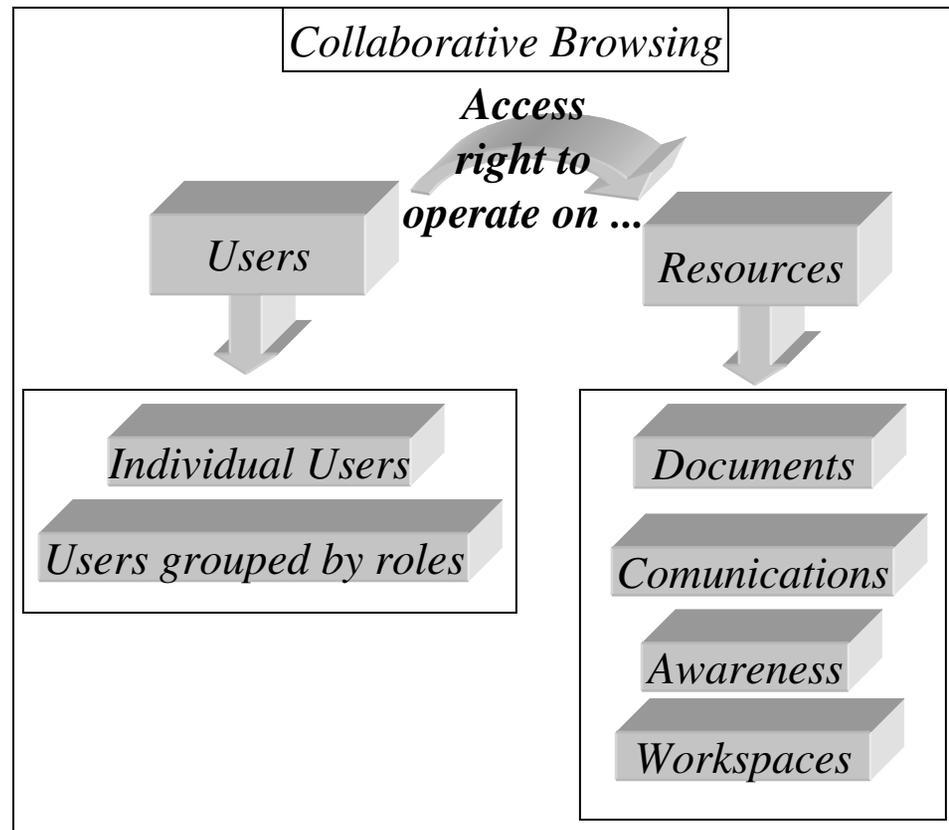
Some Already Existing Proposals

Classification criteria according to existing solutions

Dimension	Consists of ...
Place and group modeling	Places, virtual rooms
Communication and sharing	Chat, Blackboard, Voice chat, Annotations, Videoconferencing, Application, Presentation and Document sharing, File transfer, etc.
Access control	Role based, User based, On type of object, On specific object, etc.
Awareness	Type: (Activity, Availability, Process, Perspective & Environment). Delivering: (Active/Passive, Customized/Fixed, (Un)Differentiated, Focal/Peripheral, Within/Among application & (Un) Accessible anywhere).
Technology	Open: Proxy servers & Java Applets. Closed: Proprietary implementations

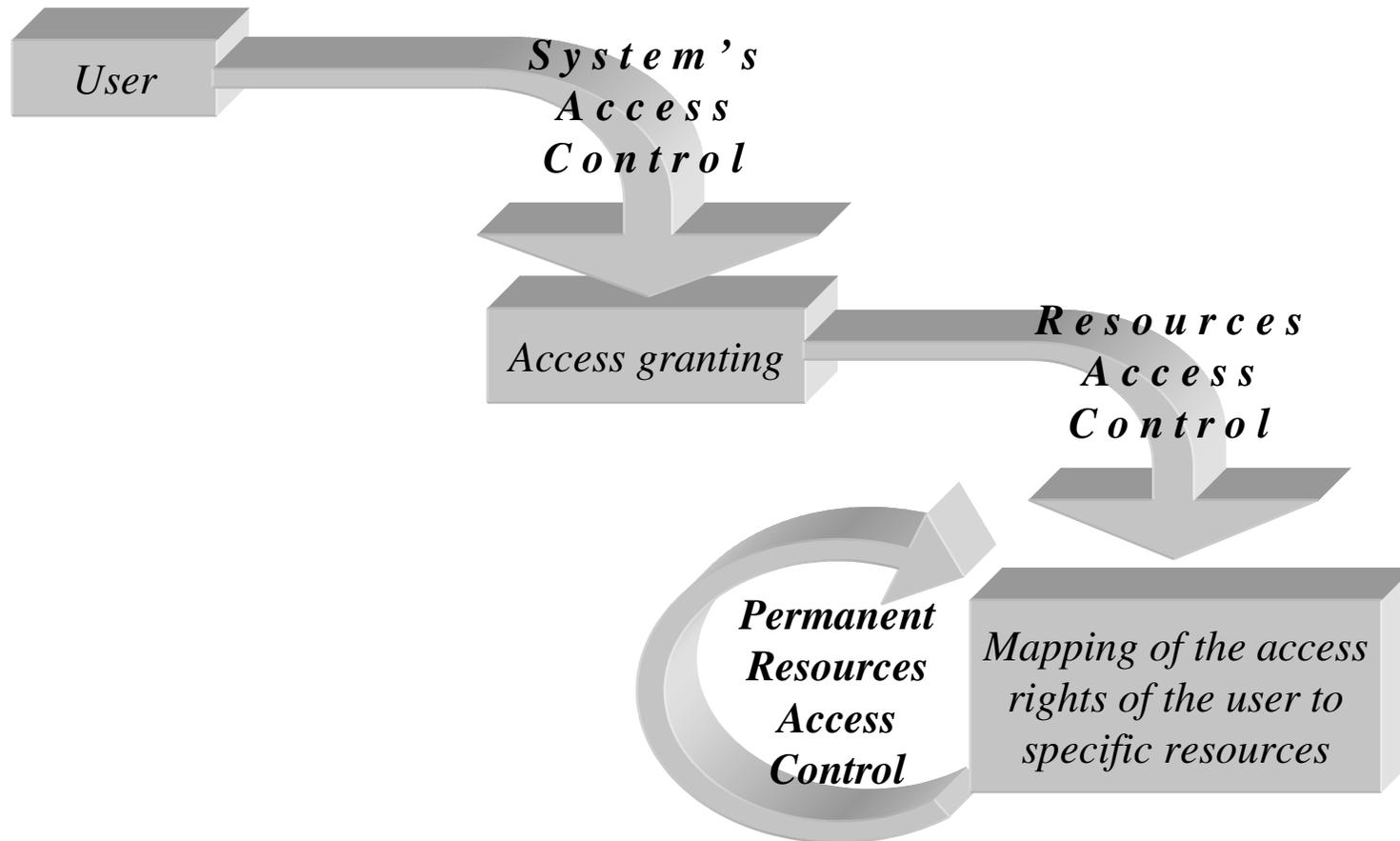
System's Components & Functional Structure

- Our proposal is based on the definition of a ***Flexible & Dynamic Access Control Scheme***, through which it should be possible to conditionally (dis)able access of users, based on their role and on causal, temporal and spatial constraints, to operate on the available resources.



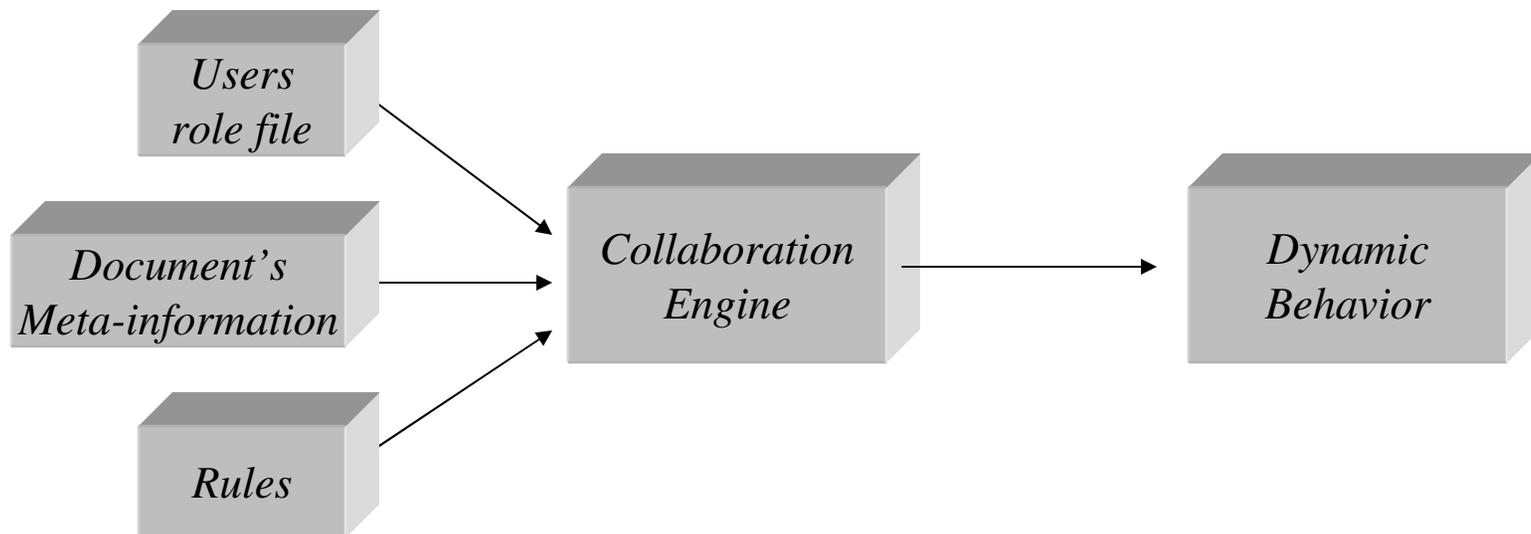
System's Components & Functional Structure

USERS



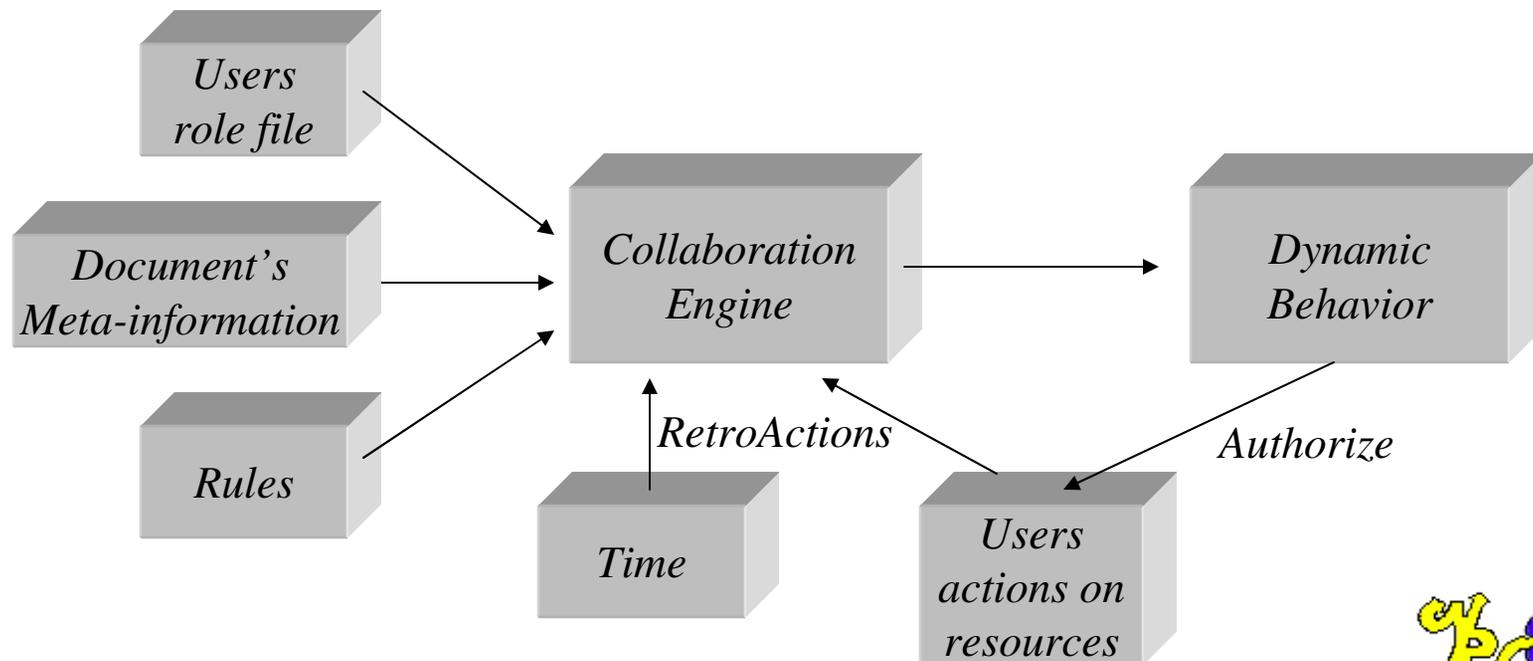
System's Components & Functional Structure

- To start the *CB* Activity the initial group of users, the documents information, and the initial set of rules should be defined.



System's Components & Functional Structure

- The different elements (users and resources) involved will respectively influence the *CB*, according to their structure, organization and their joint evolution in time. Time itself, in fact, can be a factor of modification of the behavior of the *CB* itself.



System's Components & Functional Structure

Access Control Rules

- Given all the previously described components, it can be stated that the behavior of the system will be defined by a cartesian product:

Users' Role

⊗

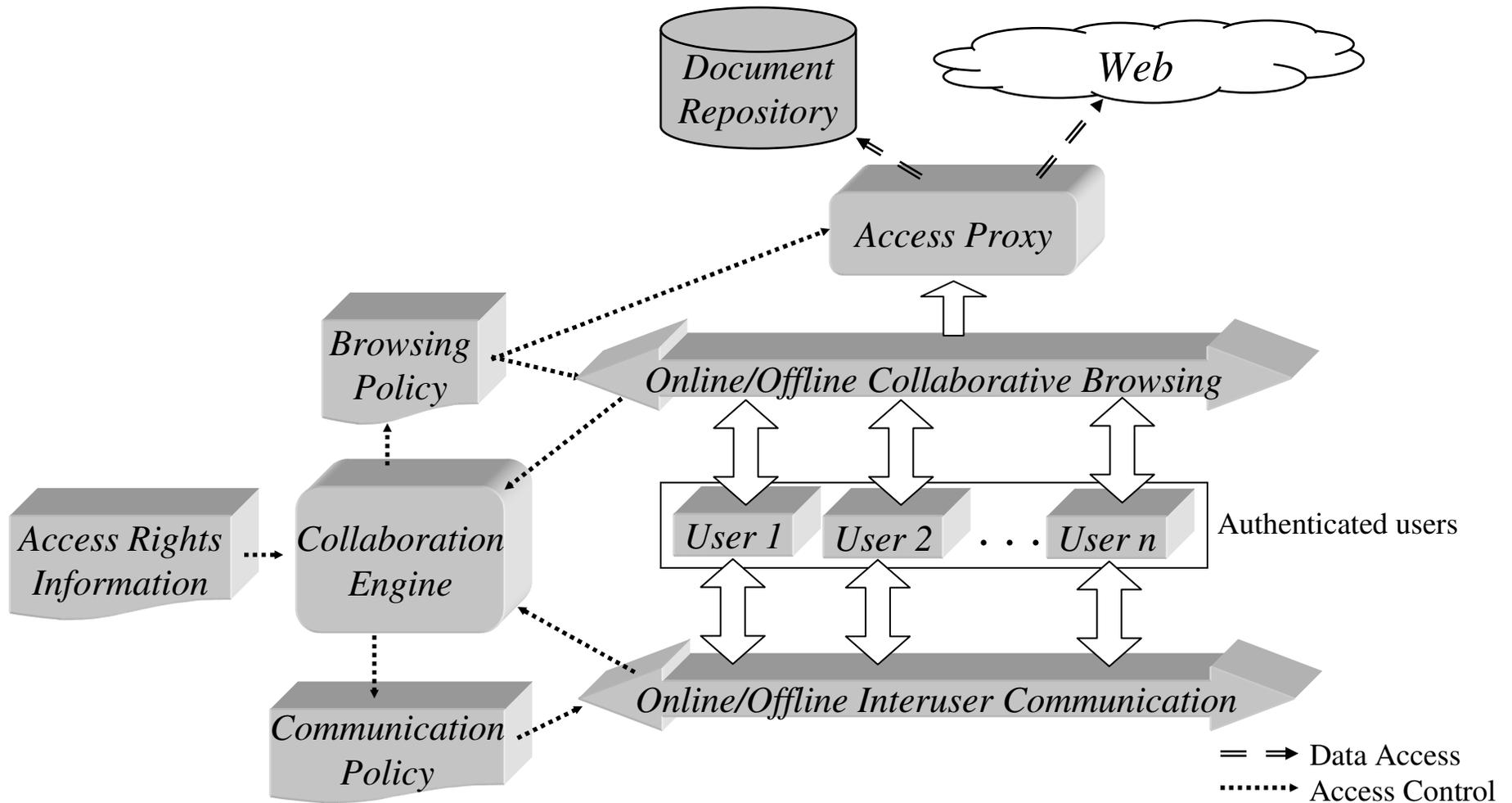
Access Control Rules

⊗

Documents Information

System's behavior

System's Architectural Structure



Implementation-related Aspects

- In terms of the implementation of our system, we have some guidelines to base our work:
 - We wish an open system. Implementation based in a Client (*Java Applets*)-Server (*Proxy Server*) architecture, possibly using *JSDT*^[1].
 - It should use a programming language permitting to attach semantic meanings to data. That is the case of *XML*.
 - Agent technology is a good candidate for implementation (*FIPA*^[2]).

[1] *Java Shared Data Toolkit*

[2] *Foundation for Intelligent Physical Agents*



Conclusions



- **Although emerging, this area is a promising due to the current tendencies of the *Web*. We see that this is the natural way to extend the current *Web* capabilities.**
- **This kind of work could evolve until the construction of *Web*-based societies (*Web-Communities*), which would lead to the *Web-Community-Ware* concept.**

Future Work

- Continue to work in the development of the principles and architecture that will guide our work, orienting our efforts to the implementation of a Tele-Learning oriented system, but without losing generality.
- Define the way different events will affect the *CB* Activity (causal, temporal, spatial, etc.).
- Define the metainformation to be included inside documents, and the way to express *Collaboration Rules*.
- Find and define new application scenarios for *CB* paradigm.
- etc.

The End

Thank you...