

# Educational Web Portal based on personalized and collaborative services

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## Abstract

*The Educational Web Portal presented here has been developed in the context of an ambitious project called “Cartable Electronique®” project (“electronic schoolbag”). The objective is to design and develop an open source, dynamic and adaptive Web Portal with flexible collaborative work features. In this paper, we describe the context of this project; we detail the objectives and then we present the platform. Finally, we relate the first results of current experimentation.*

## 1. Context

The Educational portal presented here is developed in the context of an ambitious project called “Cartable Electronique®” project (“electronic schoolbag”).

Today, we are witnessing a mutation of education practices: students have quite different learning curriculums, with a mixture of distance and traditional teachings. We have to offer a unique environment able to take into account the different needs of each individual, their various backgrounds and the variety of courses they follow. Moreover, during all their scholarship, the student belongs to different communities: institutional, cultural, sports, organizational, etc. The new education tools have to address this, allowing the creation of multiple communities, giving users the power of introducing and assigning roles to participants.

The Educational Web Portal project is supported by the French National Education Ministry and by the Technology Executive, the regional council of Rhône-Alpes, the Savoie General Council and the University of Savoie.

## 2. Objectives

Our main objective is the design and development of an open source, dynamic and adaptive Web platform, using Web standards.

This includes the development of integrated services: unique authentication, notice board, nomad access to communication tools (Webmail, Webchat, Webforum),

community creation and management, private or group organizational tools (time table, agenda, ...), course publication facilities, ...

This requires also the access to adaptive content and services from anywhere, anytime, to give users activity regulation tools and the integration of the platform in the information system of the educational institution.

## 3. The developed platform

The regulation concerns the social aspects of collaborative work. It can enable compromise between the interests of the group and those of the individuals, between the dependencies that stem from relationships among individuals and their autonomy.

The main contribution of our work is to take this social aspect into account in CSCW (Computer Supported Cooperative Work), and to propose a participation model [1].

### 3.1. Regulation

We propose two levels of regulation: the regulation at the Portal level, and the regulation into the groups.

At the Portal level, that means that a group of people could parameterize the Portal, for instance in determining for each user role the available services associated.

At the group level, an authorized user can choose the “group policy”. He can, for instance, chose between *open* or *closed* group (an open group allow any user to ask for his integration), *reachable* or *non reachable* (a reachable group can receive anything from anyone in its publication space), etc.

### 3.3. Implementation: Zope, a very well-adapted development framework

Zope (Zope Object Publishing Environment) [2] is an open source framework for building web applications, initially developed by Digital Creation. Instead of publishing HTML files, Zope publishes objects which are able to publish themselves. Zope is multi-platform and

extendable. A very active community works to improve the available components, called products.

The Zope server plays the role of a Web server, everything is an object, from document to methods. It contains an object oriented database, it runs as an ORB (Object Request Broker), a plain text search engine is proposed, and the administration is done via the Web.

One of distinguished features of this framework is the availability to define local roles associated to each object. We mainly use these local roles to organize the CSCW: it is the basis of the regulation in the shared workspaces.

Local roles give an API to the regulation of the collaborative work. We want to extend them, to allow users to define self-position to their own activity and to others group participants. We want also to propose a way to define hierarchical places in the group.

The Zope architecture is presented in [3]. We have worked on several products that we have adapted. The Portal Tool Kit (PTK) is the basis of our development. The cornerstone of security is the LDAP connection to a LDAP server, via a LDAP connector.

No external files are stored in the ZODB, but in the local servers. This reinforces the robustness of our Portal.

## 4. Experimentation

Today, this platform is being experimented in Université de Savoie with more than 500 students and teachers. Not all the services are proposed in the prototype under test, however, the main ones figure.

We have first of all created a “use observatory”, made up of psychologists, specialists of the study of information and communication and computer scientists. In each entity where the platform is in use we have at least one pedagogical manager and one technical manager.

From the method point of view we have two strategies with regards to the different objectives. We have developed an integrated bug report tool, which captures the errors automatically and stores them with meaningful information. For the use testing part, we are defining a method based on a grid and on interviews [4].

The experiments are too recent to allow us to present final results. However, the few sets of services proposed in the experimental platform are today really and intensively used (100 000 LDAP hits for portal connection only per month). The volume of document

exchange and storage is also very high. The electronic “notice board” has replaced the mural one. Many thematic groups have been created by end-users.

## 5. Conclusion and future work

The current success of the use of the Educational Web Portal developed reinforces the choices we have made, particularly the flexibility offered in the personalization of the environment and in letting users create communities and define the organization of the work in these communities. On the technical side, the implementation choices, using the Zope framework, lead to a Web open source platform, easy to install, maintain and extend.

The next step consists in a large deployment of this solution. This deployment requires a model of generic portal components and distributed/replicated objects.

This last point is a challenge. At this time, we are putting our efforts into ZEO (Zope Enterprise Objects). Zeo extends the Zope Object DataBase by taking into account distributed DataBases. It also manages the information replication, using intelligent caches.

Finally, even if the student can access their educational environment from anywhere, anytime, we have not yet proposed functionalities for off-line work.

## 6. References

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