AN EDUCATIONAL INTRANET FOR A FORMATION IN MANAGEMENT AND TECHNOLOGY OF INFORMATION SYSTEMS

Jean-Pierre Giraudin[1], José Celso Freire Junior[2]

Abstract ¾This paper presents an Intranet System used in a postgraduate training in Management and Information Systems Technology. This training delivers four diplomas of which an European one and applies to students originating from different countries and very varied background, registered in one of seven educational establishment, four universities of the Rhone-Alps French region and three of Switzerland. The system presented must ensure the spreading of a complete intranet that combines administrative, educational and research information in order to provide an efficient organization that reinforces the traditional teachings and to ease the initiation to research of the registered students. Those follow teachings on four geographically distant sites (Grenoble, Annecy, Geneva and Lausanne) and the access to an educational server should allow them to strengthen the educational classroom activities, the research initiation and to carry out the organizational tasks more easily.

Index Terms ¾ Intranet System, Distance learning, Frameworks, New Information and Communication Technologies for Education.

INTRODUCTION

In the seventies, considering the spatial domain, one could imagine that by the end of the twenties century, it would be possible to spend a weekend on the moon; some began to value its price. At the beginning of this new century, it is still quite far! Thereafter, should the "Virtual University" considered as such a new myth? Concerning the virtual university, things are a lot more complex than in spatial domain, because most progress have not to be mainly technical and logistical but much more behavioral: individual behavior of a student facing his personal and professional project, teacher-student relation and so on.

Five universities of the southeast of France (Joseph Fourier University, Pierre Mendès-France University, Stendhal University, National Polytechnic Institute in Grenoble, and the Savoie University) understanding the numerous interests but also the difficulties to spread out solutions based on the new information and communication technologies in the educational domain - ICTE, opened in 1999 the Grenoble Open Campus, the GreCO structure [7] to federate means (human, technical, financial, etc.) and to encourage, in a coherent manner, the emergence and diffusion of projects using in an efficient manner the new

information and communication technologies in the educational domain. The challenge is that, using these new technologies, the universities improve significantly the success of students, give access to training relieved from place or time constraints, and help better professional insertion, etc. In order to achieve such goals, GreCO organized itself in two types of activity projects placed under the control of an inter-academic piloting board: strategic projects and operational projects. Eight GreCO strategic projects were defined as essentially inter-academic actions aiming to propose coherent solutions to transversal problematics such as the training in ICTE of the teaching, administrative and technical staff, the authors copyright and royalties concerning educational on line documents, the hardware and software infrastructures necessary to build the general information access, common portals, etc. The GreCO operational projects are educational projects whose framework is more limited. They concern mainly integration of new products or new services based on the ICTE within existing paths or the organization of new training especially in continuing education. Until January 1st, 2001, 64 operational projects were financed globally amounting approximately 1 million euros.

In the setting of this GreCO structure, we started the **@-matis project**, an operational project. We started from the basic idea that in the educational domain, the organization of the educational or administrative information is still inadequate for various reasons: lack of suitable tools, nature of information, etc. The notion of capitalizing this information as databases, which is totally integrated in Enterprise IS, has to be organized for educational system using all the information technologies (digital information supports, internet access, messaging, etc.).

@-MATIS INTRANET

The @-matis project is an Intranet System used in a postgraduate teaching in Management and Technology for Information Systems. This training corresponds to several diplomas, for example, Information Systems DEA (*Diplôme d´Etudes Approfondies*) and European curriculum MATIS. The training concerns students of very varied origins and curricula, registered in four universities of the Rhone-Alps region of France (Joseph Fourier University, Pierre Mendès-France University, National Polytechnic Institute, all in Grenoble and the University of Savoie) and three Swiss establishments (University of Geneva, Federal Polytechnic

---

[1] Jean-Pierre Giraudin, UPMF, LSR-IMAG, BP. 72, 38402, Saint Martin d'Hères Cedex, France – Jean-Pierre.Giraudin@imag.fr

[2] José Celso Freire Junior, UNESP/FEG/DEE, CP 205, 12516-410, Guaratinguetá, SP, Brazil – Jose-Celso.Freire@feg.unesp.br

Institute EPFL Lausanne, High Business Institute HEC Lausanne), with one of two main training background, management and computer science, the MIS (Management of Information System) and TIS (Technology of Information System), respectively GSI and TSI in French

The developing information system, must ensure the spreading of a complete intranet associating all information, administrative as well as educational or about research in order to implement an efficient organization that reinforces the traditional teaching in presence of students and that eases an initiation to research for the students at master's level which follow such training. These students, who are located in Rhone-Alps french region or in Switzerland, follow teachings on four distant geographical sites (Grenoble, Annecy, Geneva and Lausanne, max distance 300km). So, such access to an educational server should allow strengthening the synchronous activities, the research initiation and ease to perform organizational tasks.

From the organizational point of view, the intranet coordinates a set of administrative information as well as the management of lectures. Such information concerns in priority the remote public. So a tenth of descriptive cards have been created to treat those aspects: student cards, teacher cards, registering cards adapted to the various institutional structures, laboratories cards, etc.

In relation to the educational contents, the intranet includes several information, documents and references concerning the lectures given in order to allow students to prepare and follow the traditional teaching. This material is very important considering the public heterogeneity, the contents of lectures and the geographical scattering of the pupils. To accomplish its function, the system includes, for each teaching module, various types of contents: preparing elements to improve the pre-training of student, the leveling of background knowledge in order to provide a better understanding at lecture time, complementing elements to the courses, and global material enabling to postpone the attendance to lecture and allowing a asynchronous attendance subsequently. According to this context, educational elements have been identified as basic blocks, a tenth too, defined for engineering every on line module of the training.

In relation to research initiation perspective, the intranet must ease for each student, first his appropriation of a domain survey and second a good insertion in the research problematic. Therefore, two types of concrete actions are developed: the complementing of lectures for better domain appropriation and strengthening of the role of the student's research initiation projects, as an introduction to research practice in a teambased relationship.

GENERAL MODEL OF THE @-MATIS INTRANET

The study, specification and design of the @-matis intranet are based on the frameworks technology. A framework is semi finished software generic macro-architecture that provides an expandable canvas to develop families of applications within a same domain [1]-[5]. This @-matis framework is structuring about thirty elements pertinent for the intended trainings. Those elements are grouped according to three facets: organization, pedagogy and research initiation. Framework is detailed in Table I.

TABLE I
GENERIC EDUCATIONAL INTRANET FRAMEWORK

The objective of the @-matis framework is the spreading of a complete intranet associating administrative information as well as educational and research one, for the various actors of the MATIS training environment.

A - Organizational facet:

The educational intranet must permit to coordinate administrative information manage teachings, teachers and students which is a critical task considering the remote public concerned. The descriptive cards used for this organizational task are:

A1 - Teaching modules descriptive cards
A2 - Students descriptive cards
A3 - Teachers descriptive cards
A4 - Descriptive cards of the administrative structures in charge of students registration
A5 - Descriptive cards of the laboratories and research support teams hosting research training projects
A6 - Courses diary (date, place, teachers).
A7 – Aliases to address the various students groups and options,
A8 - Aliases grouping teachers address
A9 - Electronic cupboard.

B - Educational contents facet:

For every teaching module it is necessary to organize and load the server with the necessary information to back up the traditional teaching in its prerequisite, during its presentation and the extension of its scope. This action is very important due the public heterogeneity, the postgraduate level of teaching and the geographical scattering of the audience. Therefore we propose to develop three types of elements for each module: support to student course preparation (B1 - B3), help to attendance (B4 - B6), course complements and help to asynchronous study (B7 - B9); they are presented below:

B1 – Self-Pre-Evaluation documents
B2 – URL of sites (or direct contents) describing prerequisite (course, case study, etc) for the course
B3 – Research papers introducing to module (or URL)
B4 – The on line course (texts, slides, etc)
B5 – The on line bibliography for module
B6 – The on line course pictures specific of module (simulation, case study, etc)
B7 – CD-ROM containing videos sequences of the critical parts of the module
B8 – Self-Evaluation material (MCQ, tests archives…)
B9 – A forum per module.

TABLE I (continued)

C – Research initiation facet:

Use of ICTE has to ease the appropriation by each student of a domain survey and its good insertion in his research domain. So, we intend to develop two types of concrete actions: appropriation actions on course scope (G1 - G4), strengthening actions to sustain the role of the research project as initiation element to research (S1 - S5). They are described below:

G1 – Domain glossary for each module
G2 - General glossary for the teaching
G3 - Graph of concepts of each module
G4 - Graph of concepts of the whole teaching
S1 – Descriptive cards of research proposals of projects
     send by the hosting research teams
S2 – A students -project tutors assignment table.
S3 – A projects forum
S4 – A box of suggestions (papers authoring
     recommendations, conferences announcement, etc)
S5 - Videos of academic dissertations.

Each element of this main framework has to be explained and can be refined by a specific adaptation. Table II is an abstract sample of the adaptation framework of Table I - S1 " Descriptive cards of research proposals of projects send by the hosting research teams". Table III is a concrete sample of the adaptation framework of Table I - A1 "Teaching modules descriptive cards" to a specific module.

TABLE II
GENERIC RESEARCH PRO JECT DESCRIPTIVE CARD

* Hosting research center
  - Research team
  - Head
  - E-mail
* Subject
  - Title
  - Abstract
  - Index terms
* Results
  - Theoretical results
  - Practical results
* Work plan
* MIS or TIS option?

TABLE III
SPECIFIC MODULE DESCRIPTIVE CARD

* Title of the module
  Semi -formal Modeling of Information Systems
* Head:
  Jean-Pierre GIRAUDIN (UPMF)
* Educational team
  Jean-Pierre GIRAUDIN (UPMF) & Dominique RIEU (UPMF)
* Promoting site
  UFR-IMA, Grenoble

* Common module or MIS/TIS optional module?
Common module
* Semester (1st –2nd)
1st semester

* General objective
Information Systems Engineering is based on a large variety of representation models. Some, very formal one, are intended for expert use, the semi-formal one being defined to encourage communication between users and designers of Information Systems (IS). Those models are based on concepts that help to apprehend various views of reality. Every actors involved now in IS study or design has to master the strength and limits of the object orientated approach. Therefore, one has to connect object oriented techniques to other semi-formal IS modeling techniques, to introduce professionally significant methods, to define the fundaments of object oriented approach and to give some perspectives in terms of norms and evolution of those models and methods. This course develops this whole IS modeling and engineering approach, while giving research prospects and remaining independent of any particular software technology.

* Main bibliography
  "Object Engineering- concepts and techniques", joint work edited by C. Oussalah, InterEditions, 1997.
  "Information Systems Engineering", joint work edited by C. Cauvet & C. Sabroux, Hermes, February 2001.

* Duration of traditional teaching in presence of students
5,5 days: 4 days courses, 1 day of projects talk, 1/2 day exams.

* Plan and object of course sessions (optional)
  1. Introduction to models, methods and techniques,…
  2. Definition of a conceptual object oriented modeling,…
  3. Practicing an object oriented approach,…
  4. Conclusion,…

* Type of the personal work required (optional)
A cooperative work is required for this module. An individual work is required at the end, in order to prepare an individual research-oriented examination.

* Organization of the cooperative work (optional)
Analysis of an IS and synthesis of the semi-formal modeling work required. This is achieved by 3 or 4 students groups, mixing both options MIS and TIS. This work amounts to about 25 hours per student with the writing a 20 to 25 pages wide report and the oral submission of it during course time.

* Assessment model of the module (exam, written personal work, written group work, expositions, etc.)
An exam concludes this module. It is based on personal work, analyzing of one or more research papers.
Ratios for the final individual assessment = document (3) + presentation (2) + examination (5)

ASSESSMENT AND PERSPECTIVES

To summarize, we can mainly characterize our project by the following elements:

- This project does not replace traditional teachings in presence of students but complements them,
- It is a joint project for a whole community -students, teachers and administratives,
- The major educational guidance is of asynchronous tutorial type,
- Partial self-training is achieved by self-assessing elements, bibliography, etc,
- The offer of educational resources is mainly textual and hypertextual.

The setting up of this intranet [6] was started in October 2000 and shall be finished in 2002. The realization is based on the Lotus Learning Space platform [8], which frames a technical unifier element for numerous GreCO projects. The defined frameworks correspond to structural diagrams of information organization stored for common use within the intranet: it is mostly organized with semi-structured texts. We have been able to experiment concretely that the general and specific frameworks propose a reusable architecture dedicated to the realization of intranets of homologous nature.

The main interest of the developed system concern the experience of the complete spreading of an intranet that associates strongly the department offices, the teachers and the students although distributed on several sites. Nowadays, the whole general framework has been put in place and two specific modules have been developed.

In relation to the students, the intranet showed all its worth in terms of information access and internal communication for groupware. Motivation of students for this intranet has been concretized in the specific modeling work done as an assessment of the "Semi-formal Modeling of Information Systems" module; this module is described in Table III, illustrating the specific framework A1.

Administrative and educational staff expressed more contrasted views. These staff still doesn't have the necessary time or technical training to enable them to update the intranet directly. So they often had to wait several days or even weeks to update the site. Such delays obviously greatly decreased sometimes the interest of the environment.

The @-matis project brings a concrete answer concerning integration of the ICTE in tomorrow universities thanks to the numerous advantages offered (information organization, information retrieval, training help, etc.), but raises questions linked to the fears about new technologies evolution (apprehension often due to a lack of training and information), to the evolution of teacher's profession, and to the evolution of the teacher-student relation, etc.

To achieve such project in a satisfactory way, it is necessary to associate expertise of three main domains: education, organization and computer sciences. Our educational team had this expertise, but at the beginning, we did underestimate the evolution of the administrative staff in an educational organization necessary to integrate the new information and communication technologies.

In terms of research, we wish to refine this framework first to ease multilingualism and second to coordinate the activities of the various actors of this type of intranet development.

Considering the necessary coordination at development time, we value the complementarity of both approaches by "patterns" and "frameworks". Fowler and Gamma showed all the interest of the patterns approach in information system engineering and design of software [2]-[3]. Johnson proposed the use of patterns to document the frameworks [4].

It is still necessary to develop catalogs of specific patterns for the "pedagogical engineering" domain and for educational intranet. This domain of interest combined with the multilingualism is part of our research actions within the French-Brazilian STIMULI project (CAPES/COFECUB project): we are preparing courses elements on databases and Information Systems Engineering to be put on line both in French and Portuguese.

ACKNOWLEDGMENT

REFERENCES

[1] Booch G., Rumbaugh J., Jacobson I., "The Unified Modeling Language User Guide", *book*, Addison Wesley, 1998.

[2] Fowler M., "Analysis Patterns - Reusable Objects Models", *book*, Addison Wesley, 1997.

[3] Gamma E., & al.., "Design Patterns, Elements of Reusable Object-Oriented Software", *book*, Addison Wesley, 1995.

[4] Johnson R.E., "Documenting Frameworks Patterns", Proceedings OOPSLA'92, ACM Press, 1992

[5] D'Souza F., Will A.C., Objects, "Components Frameworks and UML with - the CATALYSIS approach", *book*, Addison Wesley, 1998.

[6] http://DiplomeMatis.unige.ch/

[7] http://greco.grenet.fr

[8] http://www.lotus.com/home.nsf/welcome/learnspace