ASSESSMENT OF A DIFFICULT VOYAGE IN "PENTAGONIE" -EVALUATION OF A PEDAGOGICAL INTRANET PROJECT-

Jean-Pierre Giraudin[1], Monique Chabre-Peccoud [1], José Celso Freire Junior[2], Mhamed Saidane [1], Slim Turki[3]

Abstract *¾ This paper presents an assessment without kindness of our concrete experiment of deployment of the @-matis Intranet Teaching System.*
This training delivers four diplomas of which an European one and applies to students originating from different countries and very varied background registered in seven universities of Rhone-Alps French region and Switzerland. The system evaluated 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.
We can make a mitigated assessment of this intranet teaching system. We use the metaphor of the pentagon to situate some difficulties related to some actors and relationships between actors.

Index Terms ¾ Intranet Systems, Distance Learning, Frameworks, New Information and Communication Technologies for Teaching.

INTRODUCTION

We do not intend to present here a report of an unspecified cultural mission in Patagonia in the extreme south of Argentina, neither to the Pentagon in Washington, but quite simply to draw the attention on the real difficulties of deployment of the ICTT (Information and Communication Technologies for Teaching) in our universities. In this paper we will establish an assessment without kindness of our concrete experiment of deployment of the @-matis Intranet Teaching System. *Pentagonie (cf. figure 2) is an imaginary country whose five major summits are related by communication roads that have still to be explored and marked out*.

Just a year ago, in Oslo, at the ICEE-2001 congress we presented our project @-matis [9]. The objective of this Intranet project is to capitalise and disseminate all information, administrative as well as educational or concerning research to improve the effectiveness of an educational system that corresponds to a post graduate formation in Management and Technology of Information Systems. This formation is addressed to students of very varied origins (about ten nationalities), registered in seven universities of the Rhone-Alps region in France and Switzerland, in two specialities, Management and Computer Science. In Oslo we presented the first phase of this @-matis project started during 2000. This first technical phase of development was structured according to a framework created on the Lotus Learning Space [12] platform, then directly on Lotus Notes [13] in its second version.

Today, after two years of experiment, we can make a mitigated assessment, even of a relative failure, covering the deployment of such a tool. In this article we wish to highlight that after a technical success, such a project encounters difficulties, which correspond to a rather general situation in the information systems domain. We use the metaphor of the pentagon to locate these difficulties as much in terms of actors than of relationships between actors.

@-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 Institute EPFL Lausanne, High Business Institute HEC Lausanne), with one of two main training background, management or 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 – a class-based teaching – and that eases an initiation to research for the students which follow such training at master's level. From the organizational point of view, the intranet coordinates a set of administrative information as well as the management of lectures. In relation to the educational contents, the intranet includes several information,

[1] Jean-Pierre Giraudin, Monique Chabre-Peccoud, Mhamed Saidane, LSR-IMAG, BP. 72, 38402, Saint Martin d'Hères Cedex, France – (Jean-Pierre.Giraudin, Monique.Chabre-Peccoud, Mhamed.Saidane) @imag.fr
[2] José Celso Freire Junior, UNESP/FEG/DEE, CP 205, 12516-410, Guaratinguetá, SP, Brazil – Jose-Celso.Freire@feg.unesp.br
[3] Slim Turki, CUI, Université de Genève, Suisse - Slim.Turki@cui.unige.ch

documents and references concerning the lectures given in order to allow students to prepare and follow the class-based teaching. 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.

The study, specification and design of the @-matis intranet are based on the frameworks technology. A framework is a semi finished software generic macro-architecture that provides an expandable canvas to develop families of applications within a same domain [1]-[2]. 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. The 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 facet 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 to offer to the students a way to prepare and follow a class-based teaching. 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 the module (or URL)
- B4 – The on line course (texts, slides, etc)
- B5 – The on line bibliography for the 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.

C – Research initiation facet:

The use of ICTE should 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) and 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 proposals of research projects sent 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 framework. Table II is a concrete sample of the adaptation framework of Table I - A1 “Teaching modules descriptive cards” to a specific module.

TABLE II
SPECIFIC MODULE DESCRIPTIVE CARD

*** Title of the module**
Semi-formal Modelling 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 GSI/TSI optional module?**
Common module

*** Semester (1^{st} –2^{nd})**
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 have to master the strength and limits of the object orientated approach. Therefore, one has to connect object oriented techniques to other semi-formal IS modelling 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 modelling and engineering approach, while giving research prospects and remaining independent of any particular software technology.

*** Main bibliography**

"Ingénierie objet - concepts et techniques ", joint work edited by C. Oussalah, InterEditions, 1997.

"Ingénierie des Systèmes d'Information", joint work edited by C. Cauvet & C. Sabroux, Hermes, Feb. 2001.

*** Duration of class based teaching**

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 modelling…
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 modelling work required. 3 or 4 students groups, mixing both options MIS and TIS, achieve this. 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, analysing of one or more research papers.

Ratios for the final individual assessment = document (3) + presentation (2) + examination (5)

THE COMPUTATIONAL VIEWPOINT OF THE @-MATIS INTRANET

This project was leaning at first on the Learning Space infrastructure (version 3.0) [12] from Lotus Notes [13] (R5 Solaris version). This package allows managing electronic libraries, discussions groups and virtual classroom, allowing also the creation of questionnaires and on line quiz. In addition of being for us free of costs (Lotus Note Switzerland offered us a free license), this solution was interesting by its easiness of use and the consequent implementation speed, although its adaptation capabilities in remained very limited on account of the offered parameters : the design details of the documents bases is inaccessible for obvious copyright reasons. Thus, we didn't have any mean to design and adapt new documents bases for example to extend intranet functions and we were unable to open our intranet to others. Another limit was related to the intranet interface that we could not evolve.

Therefore, we choose to abandon Learning Space and to implement an home made intranet. Therefore, we decided to continue with Lotus Notes and we built in parallel various Notes bases : one for the administrative part of the intranet, other to play the role of a server of documents, in order to manage the documents more easily than with Learning Space.

The next phase of the project was the database implementation to ease information handling inside the intranet and to conform to the new standards in electronic documents. At first we were seduced by the Tamino platform from Software AG [14]. We created a base where the information was stored as XML documents. To access data from the web, we used an IIS server with PHP [9]. IIS being a privileged target for hackers, we decided to change for an Apache server [10] with PHP.

We also had to redraw completely the design of the formation site : the interface ergonomics has been extensively improved and the proposed information pages became dynamic. We were then satisfied with the results of this new intranet version and we thought it stable. But it was without taking into account the Tamino's plateform youth. This product proposed very recently on the market (we have a free license) was not well finished and badly documented. We found big problems in relation to data management : some data values changed without known reason and suppressed information was not erased and automatically reappeared.

We opted then for the final solution presented in figure1. This architecture uses well assessed products of the market for each of the intended intranet function : Oracle [11] for data storage and Apache/PHP for the web interface. We began in January 2002 to prepare this new version that we hope to become final.

In the end, will so integrate course and administrative servers in the same platform, and we intend to propose new classes or categories in order to personalize each intranet users space. We have also to create new categories to help a better use of the site.

During the development of this new intranet, due the Tamino software problems, we promoted the use of the "Tamino version" only for the students and with a minimum service : list of students, of teachers, of modules, etc. As we intend to evolve shortly for another technology, several developed functionalities (automatic planning generation, last minute news, e-mail warnings, etc.) were not offered to the users on the actual version.

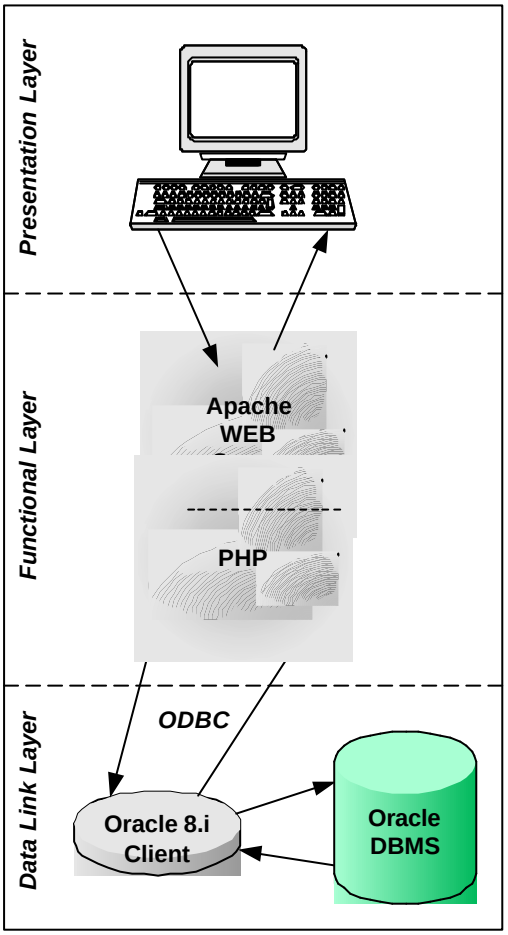

FIGURE 1: @-MATIS INTRANET SOFTWARE ARCHITECTURE.

In relation to the course server, we tried to offer a simple and accessible service with a minimum of resources, as well to teachers as to students. We didn't succeed in putting enough on line educational documents on this server, not for computer design reasons but essentially for organizational and cultural reasons.

AN EDUCATIONAL INFORMATION SYSTEM (EIS) FRAMEWORK

Actually the implementation of an Intranet concerning with the whole of a formation changes the role of the ICTT significantly. We evolve from a “pioneer” work (of a teacher or a team of teachers) that works out a web-based teaching in a specific discipline to a more comprehensive framework that encompasses a true Teaching Information System (TIS).

Our teaching environments were very rich of such pioneer's work that gave excellent results concerning the effectiveness of knowledge transmission, the evolution of the teacher-student relation, the evaluation of new forms of tutorship based on the asynchronous communication, etc. This work was generally limited to the coordination of three types of actors : the teachers who transform their courses and their relations with the students in a web-based form, the students who change their apprenticeship modes and knowledge access and the technicians who bring their assistance for the use of new tools.

The passing over to a TIS changes the framework, which is not limited to the informational dimension but also integrates organisational and decisional dimensions. Thus a few projects take into account the five categories of TIS actors : students, teachers, administrative staff, technicians and coordinators of the formations. These five categories of actors are the five summits of the pentagon, which we propose to use as a TIS reference framework. Such a pentagon reveals ten inter-actors relations and not only the two obvious teacher-student and teacher-technician relations (cf. figure 2).

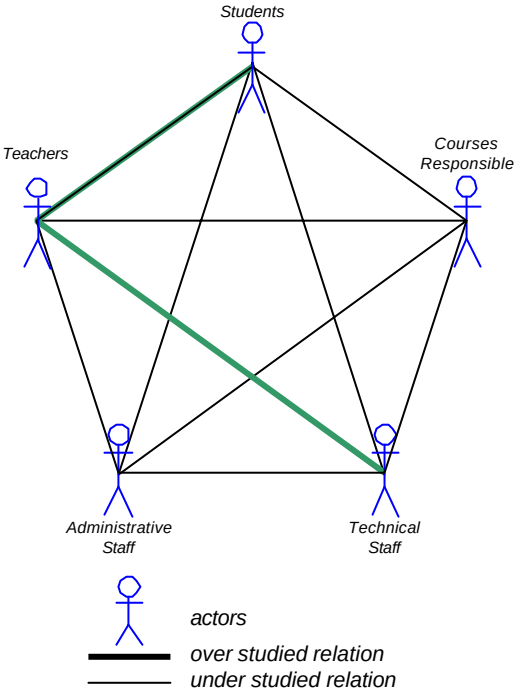

FIGURE 2: EIS FRAMEWORK.

Practically, most experiments of ICTT do not take into account the administrative staff summit and the coordinator 's one nor the eight complementary relations and the corresponding workflows. Even if the ICTT allowed a liberation of the educational system and a revival of pedagogical practices and of the teacher-student relationship, it is important to note that they can be source of confusion, disorganisation and shifting of goals.

There are significant risks to loose the effectiveness of shared tasks and teamwork or of "osmosical" apprenticeship.

Electronic mails and/or forums take these elements only partially into account. Such loss is not unavoidable and remote collaborative workgroup techniques can help to keep clear of it. But to succeed, such techniques should still be implemented according to a true information system approach, combining effectively the technical information system with the organisational and the decisional one. With this work, we intend to highlight the validity of such assessment, using our concrete experience on the @-matis Intranet where the five categories of actors and the ten inter-actors relations will be valued and valorised in a last phase of our project.

ASSESSMENT AND PERSPECTIVES

Our experiment in the implementation and spreading of an educational intranet allows us to establish a first balance as much technical as educational and organizational using the five summits of our EIS framework.

In relation to the technical aspects, the balance remained mitigated. Indeed we cannot speak of success or technical failure. Through the development of various versions, the intranet ripened and we became aware of the imposed constraints and the needs to satisfy. The computer choices between the on the shelf and open solutions remain sensitive. However a constraint imposes itself ; the teacher must be able to publish freely or to deposit his/her course elements in the intranet with the tools that she/he is in the habit of using : word, excel, powerpoint, etc.

The teacher's role remains essential for this intranet that implements functions of capitalization and sharing of educational information, information that without the intranet would stay closed in the teachers' personal files. The main teacher's difficulties are related to the lack of time to prepare the educational elements to be integrated in the intranet, and some times also copyright problems reduce their enthusiasm.

Concerning the students, the intranet reached the objectives originally expected "to accompany" and not replace the traditional teaching. This @-matis intranet has been consulted more than 2500 times over 2 years. A students request has been that they would like to dispose of more self-evaluation items in the intranet.

Today, the partial failure of our intranet is especially related to two other actors (administrative staff and the person in charge of the courses) because it is a tool that changes fundamentally the work organization and the decision power. At this level, we made the mistake of not integrating these actors from the start of the project, in a cell of the @-matis project administration. These actors maintained the use of electronic mail or traditional paper communication to send information to the students and teachers. Thus, the intranet didn't carry out efficiently its role of capitalization and diffusion of the pedagogic and administrative information of the formation @-matis. In the next phase of our project, we will be therefore very careful considering the three relations, students-administrative staff, students-course responsible and teachers-administrative staff.

A qualitative assessment would require a real satisfaction investigation to measure the adhesion of the different actors to our intranet. We would like to highlight that the @-matis intranet is a project developed in an academic environment that wishes on the one hand to improve the efficiency of the educational system and on the other hand to use the new technologies vector to propose reflection space to their students. Thus, the intranet construction generated subjects that led to information systems dissertation of very good quality at the university of Geneva.

In the same way as a company performances are conditioned by the quality of relations between its working entities, we are convinced that the resumption of this project according to the reference framework proposed in this paper (cf. figure 2) will place it under the sign of a "better star".

ACKNOWLEDGMENT

This work is supported by the French regional GreCO project (Grenoble Open Campus [7]) and by a French-Brazilian project (CAPES-COFECUB 321/00), named STIMULI.

REFERENCES

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

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

[3] Fowler Mr., "Analysis Patterns - Reusable Objects Models", Addison Wesley, 1997.

[4] Gamma E., & all., "Design Patterns, Elements of Reusable Object-Oriented Software", Addison Wesley, 1995.

[5] Giraudin J-P. Freire Junior J.C., "An educational intranet for a formation in management and technology of information system", International Conference one Engineering Education, ICEE 2001, Oslo, August 2001.

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

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

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

[9] PHP: Hypertext Pre-processor, http://www.php.net

[10] The Apache Software Foundation, http:/www.apache.org

[11] Oracle, http:/www.oracle.com

[12] LearningSpace, http:/www.lotus.com/home.nsf/welcome/learnspace

[13] Lotus Notes, http:/www.notes.com

[14] Software AG, http:/www.softwareag.com