

E-GENERATION – A NEW MODEL FOR EDUCATIONAL INTRANETS

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The adoption of ICTs in the higher education is a slow and complicated process, which depends of many factors. Despite de technical and technological issues, the motivation of teachers and students are the most relevant factors of success. The Escola Superior de Tecnologia e de Gestão (ESTIG) of Instituto Politécnico de Bragança, develops in 1999 an e-learning platform named Domus, with similar characteristics like WebCT or Learning Space. After two years of usage, the number of teachers that adopt the platform in their classes was very low.

With the objective to stimulate the use of ICTs in learning, teaching and management, it was designed a new model for an educational Intranet, integrating technologies like e-learning, e-management, groupware, workflow and agents. The main objective of this Intranet is to dispose a unique Web environment for all pedagogical and administrative tasks.

This paper presents the framework developed to support the Intranet, integrating several services and using new technologies for the interoperability between information systems. The integration of the sector-based data marts in the Intranet was made passing to a data warehouse philosophy, using agents to replicate data. The integration of e-learning in this process was made developing the most important services for teachers and administrative staff, having in mind the postulate that the necessity lead to the usage.

KEYWORDS: Intranet, e-learning, e-management, agents

1 Introduction

The high education institutions are, similarly to the other organizations, in great instability. For the first time in the history, in the last two years, the supply is superior to demand in vacancies to universities and polytechnic institutes are concerned, what originates, before hand, not only some preoccupation but also thinking again about the educational and administrative strategies of these educational superior institutions, in favor of a qualified, modern and competitive education.

Adding to this scenery, itself very constraining, we put in perspective, and at short date, deep transformations which shall result from the implementation of instructions related to the Bolonhe agreement, which proposes changes in the curricular organization in favor of a competitive and equal education.

So, the basis for the competitiveness, as far as the educational high institutions are concerned, is given and they must have the same economics postulates of supply and demand law, where the quality takes the place of the price.

Having the written in mind, there are some questions to which it is urgent to give answers:

What strategies should we adopt having in mind the competition and the quality of education system?

What are the right models and pedagogic instruments?

What might the implications be as far as organizational models are concerned?

Which should the role of the technology changeableness be?

Without wanting to know before hand, any kind of solution, we ought to refer that the high education institutions must adapt themselves to this new reality of changeableness mainly as far as the strategic vision is concerned; of models and new pedagogic tools; of new administrative process; of the use of the technologic potential actually available towards the integrated informatics platforms, which help the global aims of the organization.

2 Changing the Education Paradigm

The education is the most important concern and must be seen in the teaching and learning perspectives. The adoption of information and communication technologies is assumed for everybody that can improve the efficiency of the learning process, even facilitate the teaching process.

Although the recognized advantages, their use is not very common even in high education institutions and the justification can be done by several reasons: the low ratio of computer/student, the deficient knowledge of teachers in ICTs, or even the teacher's resistance to the change of the educational paradigm.

Branson [3] presents the evolution of the educational paradigms through three models: traditional model, present model and future model.

In the traditional educational model the student receives the message from the teacher in a passive way; he does not take part in the knowledge construction.

In the present education model the teacher goes on using the acquired experiences and knowledge, but that knowledge can only be acquired by the students if the teacher gives it to them. That is what we can see on figure 1.

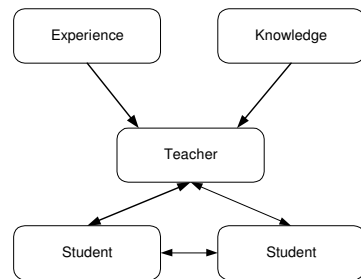


Figure 1: Educational model of the present
(Adapted from Branson)

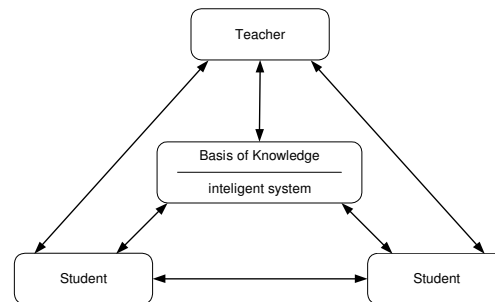


Figure 2: Educational model of the future
(Adapted from Branson)

The educational model of the future (fig. 2), presented by Branson, suggests that the information and the management systems are the center of all educational activity. This model is still far from being adopted and the future of information technologies in the learning process depends of that.

The development of technological platforms easy to use and very useful for teachers and students, can change the paradigm like Branson defend on the educational model of the future.

3 The Intranet Framework

Taking as case-study the reality of Escola Superior de Tecnologia e de Gestão de Bragança (ESTIG), it can be checked that its structure has the course/department type centralized in the relational division of human resources, namely teacher staff, but not efficient as far as extra-curricular functions management are concerned, like: Investigation and services.

As far as the component of information system is concerned, the school has an assemblage of informatic applications that, although it's utility, were thought in a separated way, as an attempt of giving answers to the necessities of the day-by-day organization.

This scenery of evolution is very common in many other schools of high education and the information systems are normally developed in a non aggregate vision.

The applications are like islands in the middle of the information systems of the organization, what makes the integration of new application modules, the aggregation vision of data, and the difficult of adoption of new technologies.

After a study done in the operative context of the Institution, it can be concluded that the informatic systems of ESTIG considers a small assemblage of applications which help the process of making timetables, management of summaries, registration of expenses of the cost centers and giving the information about evaluation of the teachers.

The Instituto Politécnico de Bragança has an information system which integrates the modules: Personal management, stewardship, treasure, accountancy and academic services which have the responsibility of all the Institution management.

The exchange of information between the management organ of schools and the central organization is not always efficient, that is why it can be opportune to promote a high level of information decentralization without damage of the data and human resources. These were the premises which were in basis of the Intranet.

To solve this problem, a new information system was designed, having in basis the Intranet philosophy which will allow a better storage, making up and diffusion of all the information of ESTIG, in a technological unified platform.

The ideal Intranet had in basis a structural perspective of organization and it was developed according to the Stafford Beer's practicable model systems [1].

The VSM-ESTIG considers three systems of level 1: Formation; investigation; services which are administered by a management system that supports the executive activities by the administrative staff and thought under strategic systems.

According to this point of view, the definition of useful informative systems to the organization objectives was done.

In figure 3 are represented the several systems that were integrated in the Intranet. The complexity of integration can be found on the variety of applications, the use of different technologies and the compatibility between the data sources. There are several databases in the different services, like SQL Server, Oracle, MySQL and Access.

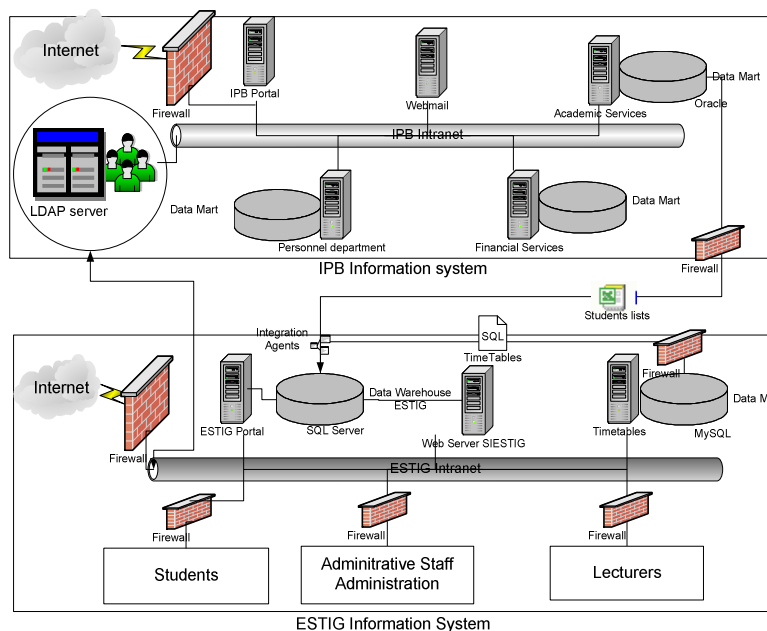


Figure 3 – The Intranet Framework

The main problem detected in the system design was the appearance of inconsistent data between the several systems. The integration of the relevant data of these sources to build a Data Warehouse was the challenge encounter in the specification of the framework.

The framework is based on agents developed using ASP (Active Server Pages), witch has the mission to evaluate the information on the data source and make it complaint with the specifications of the Data Warehouse. With a programmed schedule each agent collects the information, analysis the differences with the main information system and sends the data using SQL queries.

This solution is now been improved using PHP (PHP Hypertext Preprocessor) and Web Services (SOAP – simple object access protocol), having the PHP the advantage of be a multiplatform language and the XML for interoperability.

The other problem that was resolved with this framework was the integration of an LDAP server to authenticate centrally all the users with the different profiles, using the same login and password for all the applications.

The actual Intranet framework is mainly based on HTML and ASP. In the near future all the solution will be migrated to XML, PHP and SOAP. This new framework will lead a new level of integration of the Intranet with the Portal and the flexibility of XML will facilitate the development of Multilanguage Interfaces and multiplatform versions for PDA's and cellular phones.

The access to the Intranet is based on profiles. These profiles are: student, lecturer, administration, administrative staff and coordinators of departments and courses. Each user as permissions to do the tasks related to his profile. The lecturers profile is associated to the department witch the coordinators as access to all the information related to the students, subjects and lectures belonging to his department. The same philosophy is applied to the course director and the presidents of the several organisms in the school.

In figure 4 is represented a lecturer profile were all the information related to his scientific and pedagogic can be managed. It as access to the e-services of the school and all the information related to his department. In the same environment has access to e-learning tools for contents management, communication services, resources and pedagogic administration.

The screenshot shows a web interface for a lecturer's profile. The header includes 'Sistema de Informação' and 'Escola Superior de Tecnologia e de Gestão de Bragança'. The navigation menu on the left lists various sections like 'O meu currículo', 'Dados pessoais', 'Publicações', etc. The main content area features a form titled 'Inserir palestra, comunicação ou outro evento:'. The form fields are as follows:

Tipo de evento:	Conferência *
Tipo de Participação:	Assistente *
Nome do evento:	<input type="text"/> * (Nome da conferência, seminário...)
Título da comunicação ou palestra:	<input type="text"/>
Local:	<input type="text"/> * (Instituição)
Cidade:	<input type="text"/> *
Pais:	<input type="text"/> *

Figure 4 – Lecturer view of the Intranet

4 Results and conclusions

After a short period of usage, the main objective of the integration of all administrative tasks with the learning process in a unified platform was achieved. This can be seen in table 1, with the interest for the use of ICTs in learning, increasing significantly from the only five percent of lectures using the e-learning in that period, to sixty five percent that use now regularly the Intranet.

Domus – e-learning platform	
Analysis period	15/03/2000 to 26/05/2003
Nº of disciplines	20
Nº of lecturers	9
Nº de students	202
Total of users	958

ESTIG Intranet	
Analysis period	05/03/2003 a 26/05/2003
Analysis period for students	05/05/2003 a 26/05/2003
Total of lecturers	165
Nº of lectures that use the Intranet	108
Total of students	2284
Nº of students that use the Intranet	248
Nº of files	121

Table 1: Results of Intranet usage compared to e-learning platform

The migration of the actual framework to XML and PHP is now in an advanced state of development; make it possible the interoperability between the portal and all the others applications and services.

In the future the Intranet may integrate a personalization system of time-tables, online print manager, new Data Mining tools to generate reports of the quality of education and services, and the possibility to doing all administrative and pedagogic process online.

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