SUPERVISING AND MANAGING PROJECTS THROUGH A TEMPLATE BASED E-PORTFOLIO SYSTEM

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Abstract: We report an integration process that involves the Moodle learning management system and an in-house developed e-portfolio system - SPD – and the institution information system. SPD is a system developed to create, evaluate and maintain digital portfolios assigned and assessed by a jury to keep a high quality level of the projects registered. The SPD system uses information imported from Moodle's database, in order to fill in its own database for users and courses and for propagating the existing session between systems. It also keeps projects ordered by development phases, determining whatever can be done and by whom, making them available for consult only after being accepted by the jury. To aid the rapid creation of projects and development of its documentation a set of pre-defined templates are made available.

1 INTRODUCTION

Since the beginning of our school life, we have been assigned to all kinds of work. But where is all that work now? How many people have had access to this coursework or can consult it in order to improve their own future work? Some, eventually, have had their work published on the school classrooms. What about the others? Until now only the teacher read and evaluated it, probably keeping it away, afterwards where no one would ever access it.

The initiative "ePortfolio for all" (EIfEL,2010), hosted by the ElfEl community, is a concrete european project whose mission is to promote innovative practices using eportfolios, to define standards, provide support and assistance in the creation and dissemination of ePortfolios in Europe

SPD (César Ferreira, 2007) is a web-based system that allows students to create "portfolio projects" and submit them for evaluation. The system features special accounts for the assessment role to be performed with the aim of publishing only the best projects, and maintaining a high quality level in the institution portfolio.

By using SPD, students can publish their work on a system where it can be consulted by everyone after it's been accepted. This way, the coursework can even cross the school frontier, helping other students or any other person who might be looking for information related to that project's subject.

Together with Moodle and the institution information system holding a database of users, SPD adquires a new dimension, where students are assigned to the project normaly, access the system and develop their work which will then be evaluated and, if accepted, published for public access and consultation.

We've made minor changes to Moodle so that it can be used together with SPD, maintaining sessions between the two systems, information about users, roles and permissions. This way, the integration of both systems could be seen as a new tool, complementing each other in an integrated e-Learning environment.

In the following sections of this article we discuss the benefits and disadvantages of using 'traditional' digital portfolios, as well as 'reflexive digital portfolios' in education. We also refer to the involved system's background (Moodle and SPD), the user's roles on SPD and the implementations we made on sessions architecture, the allowed users roles and authentication. Finally, we discuss some details about scalability and performance of the system.

2 DIGITAL PORTFOLIOS

e-Learning is commonly used to refer to web-based and distance education, although it can also be used

to complement normal classes and physical interaction. It usually includes many types of technology to enhance and support the learning process, making it more interesting, attractive and, ultimately, efficient (vanWesel and Prop, 2008).

Taking advantage of technology and Internet development, this kind of enhancement has also evolved, making possible the creation of different kinds of activities to complement or even replace regular classes. Students can now consolidate what they have learned on classes and follow them even if they can't physically attend to it.

A portfolio is a set of artifacts filed together as a way of showing someone's work. It is normally created by joining different, but related, projects' information together so that anyone can consult it and learn about the author's work, research or projects.

A reflexive portfolio is in most ways similar to the regular and traditional one, however, here, the author should/must express his critical opinion about his own work. In this case, it's expected for him to say what went right and wrong, to reflect about the knowledge acquired and skill developed, about the project and the process of creating it, its context and development environment, his personal vision of the job, all with the goal of becoming more ware of what went right or wrong and, if the case, what can be done to improve it.

Following the progressive improvement of technology, the development of digital portfolios (or even reflexive digital portfolios) is spreading in education institutions as a valuable pedagogical tool, not only now accessible, but also attractive by using more appealing media and allowing the access of almost anyone who wants to consult them.

Therefore, ePortfolios are like regular portfolios but, instead of being stored as a physical object, they are kept available online allowing for an easier access, research and consult. Joining an ePortfolio system with an eLearning system, the projects quality is granted (by means of having it assessed by a jury) and, also, making it available to much more people interested on the project's subject.

In this article we took part of this view, but return to the original notion of a portfolio, by only considering projects created by students, evaluated by teachers and, after acceptance, published on the Internet as a new type of information to consult whenever someone wants to make another project on that subject or just consult it to learn about its subject.

Ultimately, the SPD system will be the 'showroom' (i.e. the digital portfolio) for all the institution projects.

3 BACKGROUND ON THE SYSTEMS INVOLVED

3.1 Moodle

Moodle (Moodle, n.d) is an open source system designed to allow interaction among students and between students and teachers of an institution. It's based on modules than can be altered by anyone who needs to add a new functionality or modify an existent one.

Using this system a teacher can create courses and activities inside them. Because it is also a Learning Management System (LMS) students can interact with each other along with the teacher, complementing the traditional way of course management based on books.

The standard types of activities that can be created include assignments, chats, choices, forums, glossaries, lessons, questionnaires, quizzes, wikis and workshops. A student can participate in an activity for training, but he/she can also be evaluated from the results he/she has on some of those activities.

From the moment that an activity is created by a teacher and becomes available, any student registered on that course can access it and use it according to its type.

3.2 SPD

The SPD (César Ferreira, 2007) was designed to allow students to publish their coursework, as a digital portfolio, so that it could be consulted by any member of the school community or even for public access. It was made conformant with the IMS (IMS Global Learning Consortium, 2004) norm for ePortfolios. Therefore, all included files for a particular portfolio can be aggregated and packaged at any time, so that transference between compliant systems is possible and straightforward.

The system can accept projects in every topic, with no size limit (apart from the database capacity) and new data templates can be added to suit the students' needs and wishes.

Here, users are separated by roles, each one defining what each one can do and what the users' permissions within the system are:

- **Visitor:** can only consult the projects after they have been accepted;

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- **Student:** can create, edit or reformulate a project, besides consulting the accepted ones;
- **Teacher:** if assigned to do so, can evaluate a project and still consult the ones already accepted.

Figure 1: List of current projects on SPD.

A student can create, edit or submit a project for evaluation. After it has been submitted, the course teacher – or other teacher defined by the system's administrator to belong to the jury– can begin its evaluation by rejecting, accepting, commenting or asking the student to reformulate it.

During the lifetime of a project within the system it can go through various phases:

- **Editing:** the project has not been concluded yet. At this time, only a student from the authors' group can access, edit or submit it for evaluation;
- **Waiting for Evaluation:** the student or group has submitted the project for evaluation but the teacher hasn't already started the process;
- **Evaluating:** the jury started the project's evaluation but he hasn't decided yet about its level of quality;
- **Waiting for Reformulation:** the teacher has commented a project and asked the student to make some adjustments so that the project can be accepted;
- **Rejected:** the teacher evaluated the project and decided it was not relevant enough to be on the system. Only a student from the group that created it can access it to view the comments that justify the rejection;
- **Accepted:** the project is correct and relevant and can now be accessed by any member of the community, although it can't be modified by anyone.

Only after being accepted can the students' projects be visualised by everyone. This ensures a certain quality level of the projects in the system, also providing, for consult, only good, relevant and correct projects.

3.2.1 Templates for Faster Creation

When a project is created in SPD, the author has to choose a template (César Ferreira and Álvaro R. Figueira, 2006) that will be used to format every page in the project.

The templates define which elements will figure on the project pages and where they will be placed, its size, together with other important information about the appearance of pages.

By using this kind of formatting, the users don't need to worry about the position of each item on the page, making thus the creation of a project easier and faster.

Besides that, the system projects become more uniform, allowing also a higher degree of layout and design quality.

3.2.2 Student's Role

Students are the users who most benefit from using SPD, because they can see their work valued and published where it can be seen by people interested on that subject.

Entering the system, the student can create a new project, by choosing the course it belongs to, the subject and adding more of his classmates in case of a group work.

After this step, the student, or any member of the group, can start creating the project by adding pages to the portfolio having each page a well defined structure.
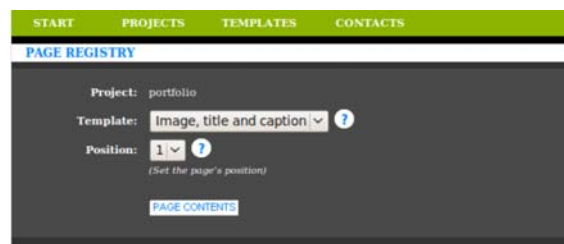

Figure 2: User choosing a template for a particular page while developing a portfolio.

When the project is finished, the student can submit it for evaluation. Then, he waits to see if the project is rejected, accepted, or if the evaluator asks for some modifications by commenting it. If this is the case, the student can edit his work making it correspond to the guidelines given by his teacher.

There are two ways for a teacher to comment a project: in general terms or in specific sections of

each page.

In the first case, the evaluator can choose a standard comment or write his a personal one.

Each page is based on a template which integrates several sections. For example, the template shown in Figure 2 presents three elements: image, title and caption. When commenting this page, the teacher is able to register his opinion about any of them.
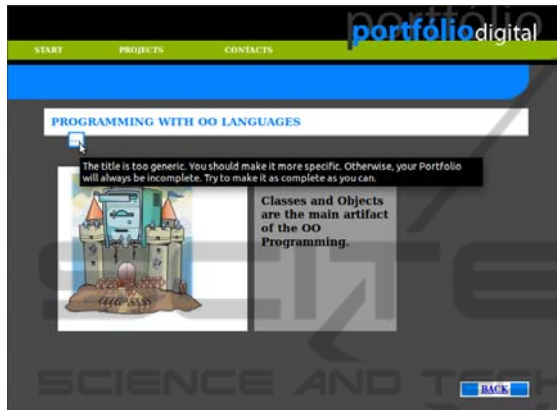

Figure 3: Student observing the comment made to his project.

After the evaluator asks for the project to be reformulated, the author can consult those comments in order to improve his work according to the guidelines given, as seen on Figure 3.

A portfolio can also be edited by any one of its authors, anytime, provided it is not waiting for evaluation nor being evaluated.

Students can also access other portfolios on the system if they have already been accepted. This way, they can improve their jobs or, if they're not assigned to one, they can also use the system to make or complement a research on any of the accepted projects subjects.

3.2.3 Jury /Evaluator's Role

SPD keeps information about who can evaluate each project and the class/course it belongs to. Initially, when the project is created, only that class' teacher is on the jury, but, later, the site administrator can easily add or remove teachers from that group.

When a teacher enters the system, he can consult the projects. If he wishes to evaluate any of them, he only has to click it and start its evaluation.

At this moment the teacher is in the role of an evaluator and can take three options:

- accept it;
- comment it and ask for its reformulation;

- reject it.

Accepting or rejecting a project is a final decision, which means that these statuses can't be changed, although the teacher can add a comment to this so that the student knows the reason of the decision.

If the teacher asks for reformulation, he expects the student to make the requested adjustments and can then restart evaluating the project, making sure that their recommendations have been followed.

4 INTEGRATION

In order to integrate SPD with the Moodle learning management system, we created a new Moodle-module so that a teacher can assign (Figure 4) students from his/her course to a project on the Moodle system, knowing it will be performed on SPD.
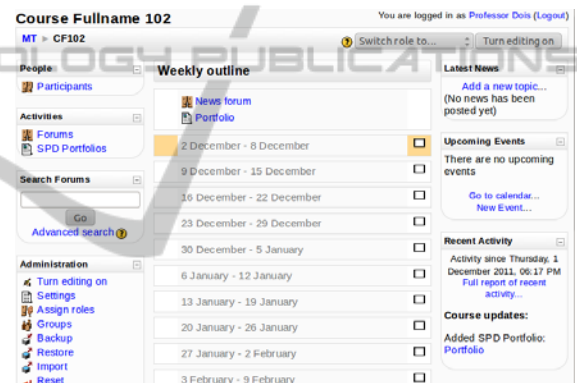

Figure 4: Activity SPD inserted on Moodle.

When a Moodle user follows the link to the SPD activity (as depicted in Figure 5), he is automatically authenticated on this system. This happens because SPD now shares Moodle's PHP session variables, by importing his $_SESSION array, and avoiding the need to login every time the user wants to switch between systems.

The situation provides a smooth and transparent transition from the LMS to SPD while keeping the two system decoupled, in order to allow independent possible evolution of each, separately.
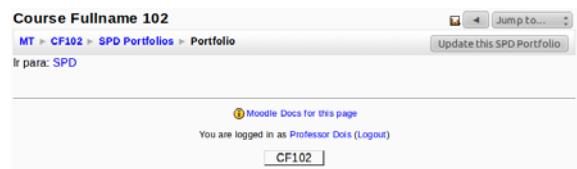

Figure 5: A Moodle link to SPD.

Despite being automatically logged in through Moodle, the user can also log in on SPD alone with the same credentials he uses on Moodle. To make this possible, we had to create a script that interacts with both Moodle's and SPD's databases, copying relevant data from the first to the second one, as can be seen on Figure 6. This operation occurs simultaneously while running Moodle's `cron.php` script, which is used to perform regular updates.
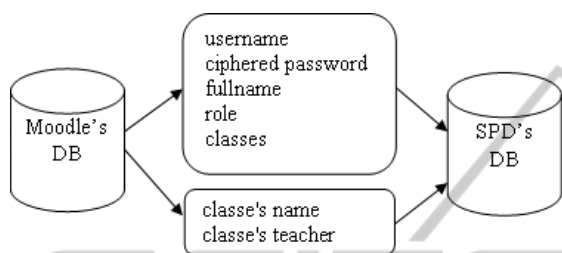

Figure 6: Data imported from Moodle to SPD.

Data imported from Moodle to SPD includes, as can be seen on Figure 6, data about users (username, ciphered password, full name, role, classes he is registered in) and courses (name and teacher).

There is almost a direct mapping from Moodle to SPD and we only had to include the public access id. The SPD's authentication process is illustrated on Figure 7.
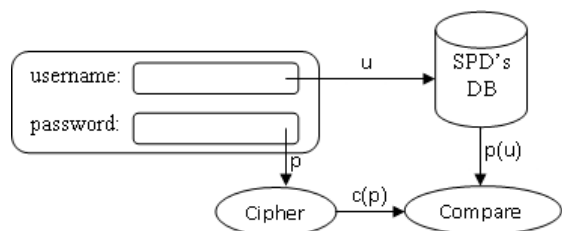

Figure 7: Authentication process on SPD.

Here, u is the username inserted on the form and p is the password. $p(u)$ is the password of the respective user, extracted from de database. $c(p)$ is the result of applying the cipher algorithm to the password inserted on the form. Although $p(u)$ is imported, ciphered, from Moodle to SPD, both $p(u)$ and $c(p)$ are computed on SPD whenever a user tries to login the system. Both these operations are performed on the server side for security purpose. Access to the system is granted if $c(p)$ matches $p(u)$, and denied otherwise.

This architecture allows a loose integration between systems and is modular to both Moodle and SPD in the sense that it can be connected and disconnected through use of separate files from the systems.

5 CONCLUSIONS

Nowadays, many schools already use Moodle or a Moodle-based system to manage their courses, teachers and students enrolled in specific classes, with the advantage of allowing a faster distribution of course material, more efficient course/class administration and providing education "anywhere and anytime".

This is not a particular issue of e-Learning or education. As stated by De Reyck: "the ever-increasing penetration of projects as a way to organise work in many organisations necessitates effective management of multiple projects. This has resulted in a greater interest in the processes of project portfolio management" (Bert De Reyck et al, 2005)

SPD can be seen as a way of complementing that system by showing students' projects to, at least, the entire school community. By joining both systems, we developed a new tool allowing students to publish their work on the same e-Learning system used by the learning institution. Students' essays, projects and portfolios can, this way, be consulted in a simpler and easier way. Being sure that all works have passed a thorough evaluation process, a high quality level is granted to all who access them.

Because the portfolios are made according to strict patterns, the templates, they become easier to make, (and consult) and provide a higher degree of design quality. The templates also allow teachers to comment on specific sections of a project page, providing additional information about which elements or contents should be reformulated by the author. While developing the integration, there were some changes made on both systems – such as creation of a new Moodle module, maintaining sessions when a user switches from Moodle to SPD and importing data between databases – so that they could work together.

We made sure that the systems could still be used separately, so that there wouldn't be constraints to their correct behaviour, despite working in a similar basis and with the same information about courses, users and their roles.

However the possibility of being used along with Moodle, SPD is autonomous, because it has got its own database, tools and management procedures which allow it to run independently from any other system and scale apart from the other systems.

Our future work is making this work available to

the users of the institution in order for the projects to be created, submitted and evaluated. We realize that although the system has proved its functionality, as it passed all unit tests, it is important and fundamental to have used and assessed by the real users (teacher and students). We hope to receive important feedback in order to tune the system to make it even easier to use and accepted by our stakeholders as an important tool in education.

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