Project Description

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Project Lead	Project	Institution
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Project start and end: *1.7.2011 -- 31.12.2012*

Title of project: PLE - *Personal Learning Environment*

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1. Introduction

In the last decade, Learning Management Systems (LMS) also called Virtual Learning Environments (VLE) have dominated the academic landscape of both North American and European universities, and favored a renewing of teaching in Higher Education. As a consequence, in Switzerland, all institutions of higher education have implemented at least one LMS. Yet in recent years, driven by numerous mutations (eg, lifelong learning) and reforms (eg, Bologna), European universities further moved away from a teacher centric approach by adding a new paradigm where the learner becomes the main actor in the process of building his skills and his knowledge.

This trend has given birth to a range of new eLearning tools focusing primarily on the learner. All of these tools, both formal and informal, can be aggregated in what is commonly called a Personal Learning Environment (PLE). Among them, the ePortfolio plays a key role as it groups together productions from both teachers and learners centric applications.

The concept of PLE has emerged relatively recently and remains largely open. If it is not possible to provide a clear definition, due to the many different interpretations of the term, it is possible however to identify the main features that characterize a PLE.

In today's world, most people need to keep on updating both their skills and knowledge to meet the challenges of everyday life. This has spurred new learning needs which exceed by far the formal courses, provided commonly by institutions, which allow to target a general public. Instead, the needed trainings must also include more informal training in order to better address individual needs.

In turn, this could stimulate a new form of teaching, more centered around the learner, which encourages the learner to keep on developing his skills throughout his life. Such an environment allows learners to go beyond what is commonly offered by LMSs, which are generally limited to distributing, monitoring and managing learning contents.

2. Project description, goals and benefit:

Goals:

The first goal of this project is to provide the students with a set of learning tools, both formal and informal. Among them, the PLE will be a key component, responsible for linking together institutional tools (eg, Moodle, Chamilo, Mediaserver, etc.) and non-institutional tools (eg, Youtube, twitter, Googledocs, etc.), as shown in Fig. 1.
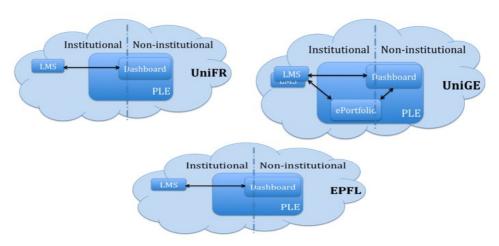

Figure 1: PLE Swiss landscape

The second goal is to teach how to use these technologies, that is, (1) to inform and train students and teachers about the values and educational usages of the tools proposed in the PLE and (2) to assess the tool usages so as to improve the understanding of those usages and of the users' ICT needs.

The third goal of this project is to federate and recommend resources (tools and content) among institutions via a recommendation engine (RE). The RE :

- is designed to suggest resources according to a given context;

- is fed with both institutional and external information (resources, actions, rating, etc.), the   more the RE is fed with information, the more it returns pertinent information;

- enables access to resources located outside a given institution that would otherwise remain unnoticed. This ensure that developments made for the PLE can be reused on a large scale in the Swiss academic community;

- upon request, computes a list of recommendations based on its internal information representation. This list of linked resources is then returned to the user.

Benefits:

- stimulate a new learner-centric form of education;

- create learning networks where pertinent information and knowledge are shared;

- boost active and collaborative learning, critical thinking and the building of knowledge creation;

- encourage students to use web technologies beyond social networks and apply them to improve their learning;

- offer of trainings for developing Soft Skills about learning with ICTs;

- open up new perspectives in knowledge construction for teaching staff (going from course-centric Learning Management Systems (LMS) to PLEs)

Potential users: about 30'000[1]

- Mainly students (including PhD), teachers and teaching assistants in Swiss higher education institutions (already using LMS)
- Staff working in CCSPs.

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[1]EPFL . The PLE will be proposed to all EPFL students (6'000 students)

UniFR. The PLE will be proposed to all students of the University (10'000).

UniGE. The PLE will be proposed to all UniGE students (14'000)

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3. Principles of the project

3.1 Feedback of the pre-studies (PLE and ePortfolio)

Two preliminary studies allowed us to establish several reasonable assumptions from which we can build and develop a number of prospects for the design and deployment of a PLE. The concept map below summarizes the needs that were identified in both pre-studies.
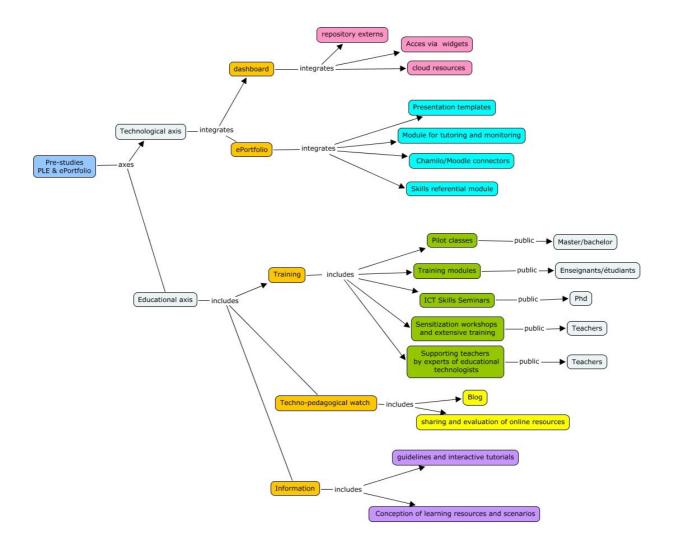

Figure 2: Conceptual map containing the needs expressed by participants in both pre-school and PLE ePortfolio.

These pre-studies strongly suggest to consider students as the first target for a campaign on awareness, information and training on PLE, so as to enable them to develop transversal competencies in online resources. This campaign will combine technological and educational aspects of ICT usages through a "didactic Dashboard" (see below).

3.2 Project's objectives

3.2.1 Educational Objective

<u>Techno-pedagogical watch</u>
A techno-pedagogical watch activity is expected to help selecting ongoing tools and resources with regards to their usefulness for learning and teaching activities. This screening can then be integrated and offered to PLE users who can use them if they want to. The watch will be organized around a community of experts made of members coming from all partners' institutions. Different information sources will also be available to this community: blogs, elearning tools collections and evaluations, reviews of the scientific literature, etc.

<u>Training</u>
The aspect of training is particularly important when considering the objective of the PLE and ePortfolio is to target independent users or self-directed learners. Such an autonomy develops only with the help of scaffolding activities. It requires first an initial training on technology and second an introduction to its educational uses and formats. Such trainings can take different forms (workshop, seminar, training modules, etc.) which will be offered to different audiences (BA and MA students, PhD students, teachers, etc.).

<u>Information</u>
Information remains a key pillar to support future PLE and ePortfolio users to grasp the benefits of techno-pedagogical tools. This effectively requires a set of documents, with diversified contents and forms to meet various users (teachers, BA, MA and PhD students). This includes:
- Practical worksheets (ie. pdf) and interactive tutorials (ie. video captures) introducing basic tools.
- Good practice guides to help users make better use of tools (including the ePortfolio).
- Educational scenarios allowing trainers to easily integrate the tools of PLE and ePortfolio in their courses and learning activities.

<u>Formative Evaluation Process</u>
The project development is supported by a continuous formative evaluation process of the tools and of their usages in order to improve the understanding of the students' ICT needs. This includes:
- surveys and analysis of users' needs;
- tests of prototypes (PLE and ePortfolio) about their usability aspects (direct observation of users and feedback discussions);
- evaluation of training sessions and of information resources on their impact on the development of ICT usage skills (questionnaires and discussion sessions with teachers ans students).

3.2.2 Technological objective

A dashboard as a solution for integrating different applications and content
Based on the PLE pre-study (unige.6), we inferred an interest in the development of a *dashboard*, which can be compared to a single entry point for all available tools and services. Such a dashboard seems to respond to students' practices, as it enables them to quickly check available resources, which are either pre-integrated (but may be disabled by the user) or integrated by the students themselves. By their collaborative nature, resources will not be limited to those provided by a single institution, but will be shared between institutions or gathered directly from the Web. Another objective of this development is the creation of user profiles (templates) dedicated to the Dashboard. These models will be pre-filled from a predefined set of resources, and will then be associated with user profiles - bachelor, master, doctoral student, teacher, etc. Each user can thus be offered a default environment, with the possibility to customize it by removing or adding resources.

Tool selection - Graaasp
During the preparing phase of the project (unige.8), we tested and compared several solutions to implement a PLE. This led us to select Graaasp as a potential tool to implement a dashboard.

Figure 3 shows the Graaasp user interface which acts as a dashboard to display both related and recommended resources according to a given context or activity. Related resources are defined by the activity's owner and can be of types: activities, users, assets or tools (using widgets). External resources can also be linked to the current activity. The recommendation engine (RE) suggests resources of interest to the current activity based on its internal calculation which considers: resources relationships, user actions, ratings and tags. Additional views can be designed via the help of skin widgets. Graaasp is described in more details in section 4.

Figure 3. Graaasp main user interface

Resources sharing and federation

The institutional information will be federated and recommended with the help of the contextual recommendation engine (RE) developed at EPFL (Fig. 3). The RE gathers available institutional information (green lines). After computation, a recommendation is provided to the users via the dashboard widgets (green 'W' boxes) or through other means. Then, the recommended information will be made exchanged between institutions (blue arrows). The whole process and infrastructure will thus work as a cross-institution federating hub.
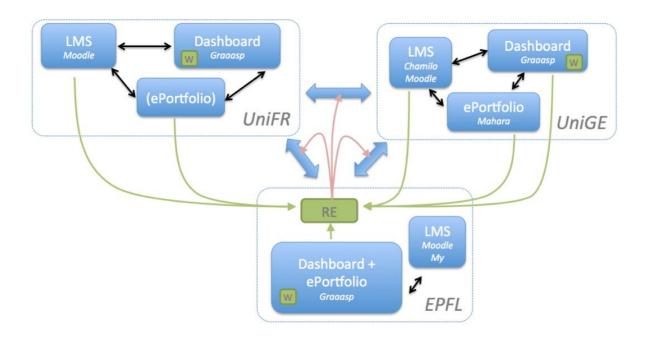

Figure 4. Federating hub: the recommendation engine (RE) gathers information from different institutions and recommends it to other parties via a dashboard.

Integration of the ePortfolio

The objective is to integrate Mahara with didactic activities fed by teachers and students. Based on the results obtained from the ePortfolio pre-study, we know that these activities mainly consist to:
- Provide an easy management of student productions (i.e., collect, select, reflect, present).
- Allow a better monitoring of the student activities by the teachers.
- Integrate reference lists of competences and learning outcomes to help students manage their progression in learning.
- Ensure the interoperability and the sustainability of the contents.

Some of the aspects cited above are already included in the Mahara platform (e.g., most of the student production management). For the aspects that are not currently available, our goal is to integrate them in Mahara.

4. Solutions proposed

Based on the two axes introduced in the previous section (educational and technological objectives), we now describe in more details the project deliverables.

The contents will be delivered primarily in French, except for the part on ePortfolio in English. There could be an oncoming small AAA competitive bid project with German and Italian speaking partners, who could contribute to translate the proposed products into more languages.

4.1 Educational Solutions

4.1.1 Blog

A publishing space will be designed and implemented to promote techno-educational collaborations. Its main purpose is to collect, process and redistribute information to a community of people interested in the use of new educational technologies for social learning and institutional teaching in general. It will support the techno-pedagogical watch activity.

The blog will be represented by an online sharing and publication space managed by a community of scholars and practitioners of e-Learning. It will also allow readers to post comments and votes. In this way, the dissemination of information should be structured and organized by the selection of keywords, ranking levels and links, as well as via RSS feeds and mailing lists.

4.1.2 Development of training modules

The PLE pre-study included a survey (questionnaire performed by UNIGE in 2010), which allowed to grasp a good understanding of the elearning needs for both students and teachers. The results of this analysis permitted to construct the global structure of this proposal.

ICT skills are well known: research of information, collaboration and communication, choice-manipulation-understanding of ICT tools, creation and management of numeric resources-documents, critical thinking, etc. A detailed analysis of students' needs will allow to develop training modules adapted to various publics and learning situations. In the design of these training modules, we will take into account the preexisting ICT students' skills, those they would like to develop, the web tools they are using to learn, the types of "workflow" activities they do (taking notes, searching for information, working on learning platforms, etc.). We will also ask them the amount of time, pace and training type they would prefer. During this phase, we will also use the results emerging from the techno-pedagogical watch (using experts, blogs, scientific literature) about new educational technologies. BA, MA, and PhD students of the project partners will be considered as they form populations with differing learning objectives.

Training modules will then be developed in IMS compatible format. They will be deployed through the UNIGE Learning Object Repository (LOR), which can be harvested by SwitchCollection. These resources will thus be available for all members of the Swiss academic community having an AAI connection.

Teaching coordination of these training modules will be performed by the UNIGE's CCSP in collaboration with the UNIFR's NTE and UNIGE's Institute of Science Services (ISS) department.

4.1.3 Development of guidelines and interactive tutorials

Guidelines and interactive tutorials aim at explaining briefly (one page maximum) the usage of the PLE basic tools, including the ePortfolio.

In addition to specific technical documentation, deploying ePortfolios at an institutional level implies multiple decisions and involves various types of actors. In order to ensure coherency within and across institutions, it is necessary that decisions makers be adequately informed on pedagogical, deployment and long-term issues. Since its early days, the Eduhub SIG ePortfolio has registered a growing demand

for guidelines to help master the shift in paradigm induced by the use of ePortfolios, namely the learner-centered and lifelong aspects. Therefore, the Eduhub SIG ePortfolio will produce guidelines for institutional decision makers, teaching staff and students, including subjects like:

- *student level:* self-reflection, personal development plan, showcase, etc.
- *course level:* learning scenarios, assessing portfolios, tutoring, etc.
- *cursus level:* defining learning outcomes, working with reference lists or grids of competences (as defined in the project "TUNING Educational Structures in Europe" - http://www.tuning.unideusto.org/ and exemplified in the European Portfolio for Languages - http://www.coe.int/t/dg/portfolio/ GPS4Learning - http://www.gps4learning.com), mentoring, etc. The guideline will include a grid of competences for self-regulated learning and the organisation of an e-portfolio for students and coaches.
- *institutional level:* leadership, support, guidance and training, reference material, issues related to the technical infrastructure, etc.
- inter-institutional level: interoperability issues [information on the state of adoption of the IMS eP (ePortfolio) standard http://www.imsglobal.org/ep.html, long-term needs and decisions, etc.

Guidelines will be provided in formats suitable for dissemination in a variety of contexts: paper, web, social networks, etc. In addition, some guidelines will be completed with some specific developments on Mahara such as:

- Tutoring and monitoring: module to enable teachers to easily track the different versions of students' eportfolio and monitor their progress.
- Reference lists of competences and learning outcomes (see section 4-1-6 for more details).

4.1.4 Soft Skills Seminars for PhD students to develop transversal competences

The purpose of these seminars is to enable PhD students to practice and develop mastery of certain categories of Web 2.0 tools and PLE, useful for their learning and research activities. The goal is to combine theoretical and practical workshops to help them first to effectively exploit all these resources essential to their academic activities and, second to develop an intelligent strategy so to become independent while these technologies continuously evolve.

The audience of PhD students is well suited for these seminars. On one hand, PhD-students form a population consuming external resources available on the Web. On the other hand, many doctoral students are involved in teaching (seminars and tutorials). Once trained, they can be a vector of active dissemination (such as "viral") for the use of PLE and ePortfolio by recommending or introducing it into their teaching practices with students.

These seminars will provide a basis for the formative evaluation process of the project aiming at improving seminars adapted for various audiences. Through the formative evaluation, these PhD seminars will help the project to estimate:

- the adequacy of our pedagogical scenarios for more informal types of trainings
- the impact of such trainings on ICT transversal skills development

This action will be implemented in collaboration with teachers Institute of Science Services (ISS) at the University of Geneva and Centre NTE in Fribourg. CUSO is interested that we organize two seminars per semester for PhD students, as part of a hybrid learning scenario.

4.1.5 Application and testing of PLE with BA students

BA students represent a large population at University, with a lot of scaffolding needs to develop ICT skills along all their cursus. With these students, we envision to introduce the use of Dashboard through formal educational activities, which will allow us to estimate:

- the adequacy of our pedagogical scenarios;
- the impact of such trainings on ICT transversal skills development (use of institutional and non-institutional resources as well as between formal and informal training).

This action will be implemented in a BA course of EPFL (Automatic Control labs), a BA course of UNIFR, and a BA students course of the UNIGE ISS.

In the process, we will also help some teachers (considered as pilot classes for the project) introduce activities teaching based on the Dashboard in their courses so as to disseminate the use of PLE in the academic community of teachers.

4.1.6 Skills referential and learning outcomes

This feature (not currently available in Mahara) would significantly help students to manage their progressions in learning and therefore promote self-reflexion and *Personal Development Planning* (PDP). Concretely, this feature will be implemented as a Mahara module and will allow teachers and students to perform at least the following tasks:

- Create and manage a referential skills, add new skills, add sub skills, disable existing skills, etc.
- Extract skill usage (i.e., how many users have a certain skill).
- Reference skills from the repository and add them to their views.
- Comment on somebody else skills.
- Track their progress depending on a specific skill.

This module will also take into account all the reflexions that were made in the European Language Portfolio, GPS4Learning. In addition, the development will be realized in close collaboration with the SIG-ePortfolio members specialized in this field.

4.2 Technical Solutions: implementation of the federating hub for Contextual Recommendation with Aggregated Data

The technical solutions for implementing the dashboard will rely (at least in a first stage) on the Graaasp social media platform. Graaasp is developed by EPFL in the framework of the ROLE European project on responsive open learning environment. The Graaasp infrastructure is hosted and managed at EPFL by the React group (at least for the duration of the ROLE project). Graaasp API is open source and will continued to be developed through other projects. To cope with the institutional constraints and to deploy a scalable solution, it is envisioned to implement a server of the Graaasp social media platform in each institution or alternatively to host a Graaasp server at Switch.

The current version of Graaasp cannot interface the UNIGE and UNIFR institutional tools and resources. Thus Graaasp needs to be adapted and extended in order to supports external tools such as Chamilo, Mahara, Moodle. Similarly, the recommendation engine (RE) needs to be enhanced accordingly to support the new types of institutional actions/entities. In addition, its internal algorithm must be customize and tuned to take these new types into consideration.

4.2.1 Graaasp: Common solution adopted for the Dashboard

Graaasp's main purpose is to support self-directed learners and knowledge workers in their daily online learning and knowledge management practices. It relies on resources gathered from the Web and online communities. Graaasp enables the aggregation, the sharing and the interaction with a rich set a resources in private of public contexts defined by the learners themselves. Assets, activities, Web apps and people can be associated for a given purpose. Graaasp supports typical Web 2.0 features such as the rating, the tagging, and the commenting of resources and people.

4.2.1.1 Graaasp Design:

Graaasp enforces the notion of context (called a space) by providing in a single Web page a pad integrating simultaneously all the people, the assets, the apps and the sub-activities necessary for a given purpose (a course, a learning activity, a collaborative project, …). Most interactions in the graphical user interface are based on drag and drop actions to ease adoption and exploitation. As such, the Graaasp pad can be considered as a shared dashboard that can be fully personalized by the users without any external intervention. Privacy settings and access rights can also be fully controlled by the learners. Relevant awareness cues always make explicit with who which resources is shared.

4.2.1.2 Resource Aggregation:

The main challenge is the Web 2.0 realm is to find relevant and trusty resources from the Web. Graaasp integrates features to ease such task. First, Graaasp integrates a bookmarklet (called Graaasp it!) which enables learners to gather resources from more than 100 social media platforms in the Graaasp space of their choice just with one click. Second, Graaasp integrated an advanced relation-based recommender system to offer users with alternative resources and people in context. The recommender system takes into account the context (space) in which the user is located, as well as all the ratings, tags, annotations and relations provided by the social and trusty network of the user. Third, the Graaasp drag and drop feature enables an easy distribution of the existing, grabbed or recommended resources in the relevant spaces.

The scope of the Graaasp bookmarklet will be expanded in the framework of this project to enable the selection of resources in LMS and other sharing tools provided at the SWITCH level.

The other core objective of this proposal is to federate in the SWITCH framework the repositories of the institutional Graaasp servers in order to take advantage of the distributed resources available, as well as their local evaluation for recommendation.

4.2.1.3 Interaction Graph Model:

The recommendation service is built on top on the *3A interaction model*, and exploits interactions and relationships in an online platform such as a PLE to infer interest, and deliver personalized and contextualized recommendations.

Figure 5: The 3A interaction model

The 3A interaction model is particularly intended for designing and describing online environments for knowledge management, personal and collaborative learning. It consists of three main constructs referred hereafter as entities: Actors represent entities capable of initiating an event in a collaborative environment, such as regular users, agents or widgets performing actions on behalf of the user. Actors collaborate in Activities Spaces to reach specific objectives. Assets represent artifacts produced, edited, shared and annotated by actors in order to mediate collaboration and meet objectives of group activities. They can consist for example of simple text files, RSS feeds, content of wikis, videos or audio files.

The model accounts for Web 2.0 features: entities can be shared, assessed, linked and tagged. An illustration of the 3A model is presented in Fig. 5. CRUD is an acronym refering to the four main actions of creating, reading, updating and deleting. SALT (Share, Assess, Link, and Tag) is an acronym to account for Web 2.0 features that encourage opinion expression and active participation. In the realm of Web 2.0, assessment or feedback can either be quantitative (rating or voting) or qualitative (commenting, bookmarking).

4.2.1.3 Shibboleth integration into Graaasp:

The current version of Graaasp has its own login mechanism. Adding a Single Sign On mechanism would greatly simplify the user experience. This is especially true if users access resources on/from more than one environments and in addition in more than one institutions. Since it has already been deployed on some partner institutions, Shibboleth is the obvious candidate. This would not refrain other SSO and credential mechanisms to be added to Graaasp.

4.2.2 Recommendation Engine

The main technological objective of the recommendation engine (RE) is to provide contextual recommendation for the aggregation of relevant educational resources, applications, experts and activities. The RE exploits inter-relations between 3A entities that confer interest. Relevance is measured relatively to the target user's context and their reputation, and more importantly within the target user's network.

4.2.3 Graaasp/RE <--> Institutional Tools @ UNIFR (Moodle)

Moodle is the official LMS of UNIFR (and is also in use at UNIGE and EPFL). A migration to Moodle 2 is currently being planned. New APIs provided by Moodle 2 should facilitate communication between Moodle and Graaasp. Development will thus be performed using Moodle 2.

Integration of Moodle and Graaasp-RE consists of two main parts : the feeding of the recommendation engine with Moodle data, and displaying specific Moodle information inside Graaasp.

A. Feeding of recommendation engine with Moodle data

Actions performed by users in Moodle can be used by the recommendation engine to enhance its suggestions : e.g. if a student reads a document in Moodle, this document might be proposed to a student's colleague who is also using Moodle. In the context of this project, this includes the following aspects :

- A list of actions performed in Moodle that can be used by the RE will be determined (e.g. opening a document, taking a test, etc.).
- Moodle log files will be harvested to filter these actions. The results will be stored in a format suited to the recommendation engine.
- An interface will be implemented to allow the transfer of the information collected in Moodle to the recommendation engine

B. Moodle widget for Graaasp

Graaasp displays external information via widgets. Once logged in into Graaasp, students will see their specific information through the Moodle widget, such as list of their courses, recent activities, deadlines, etc. Depending on the progress of this implementation, the widget will also allow students to select information they want to display.

On the implementation side, the widget will use Moodle web services. The Moodle widget will display the user data fetched by the Moodle XML-RPC services.

4.2.4   RE <--> institutional tools @ UNIGE (Chamilo, Mahara, Moodle)

Current Infrastructure

The UNIGE elearning infrastructure is primarily made of two LMSs - Moodle and Dokeos - an ePortfolio - Mahara - and a streaming platform - Mediaserver. Dokeos is the most widly used LMS accounting for about 90% of all users. UNIGE intends to migrate Moodle to version 2.0 during summer 2011, and Dokeos to Chamilo (new version of Dokeos) in the near future. Developments will thus target Moodle 2.0 and Chamilo.

Future Infrastructure

The objective is to deploy the dashboard (Graasp, RE) at UNIGE and enable the current architecture to communicate with it while keeping the infrastructure as much independent as possible. For this to happen, the existing infrastructure must be adapted to support communication and integration, as shown in Fig. 6.
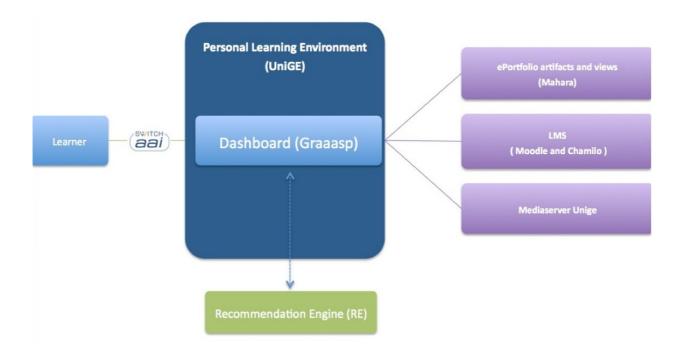

Figure 6: UNIGE PLE infrastructure

A. Feeding user actions to RE

The recommendation engine (RE) works by tracking users' actions - Create, Read, Update, Delete, Assess, etc. With most of those actions happening outside the dashboard it is very important to adapt existing applications to communicate with the RE. Specifically,

- Chamilo and Moodle must be adapted to translate "Chamilo's events" into Graaaps format and feed them to the RE;
- Mahara must be interfaced with the RE.

B. Integrating exiting resources into the Dashboard

One of the main purpose of the Dashboard is to aggregate content. Interfaces already exist for well known repository - *aka* YouTube, Dailymotion, etc. Existing applications must be adapted to allow linking and embedding of existing content.

This is done by developing ad-hoc widgets for each one of the applications and by supporting discovery and linking protocols - for example oEmbed and Open Graph Protocol - at the applications' level. Specifically,

- modify Chamilo to allow integration of its content into the Dashboard;
- modify Mediaserver to allow integration of its content into the Dashbaord;
- extent Mahara to allow integration of its content into the Dashboard;
- deploy the work done by UNIFR to allow integration of Moodle's content into the Dashboard.

C. Integrating of RE results into Chamilo

With users spending a significant amount of their time in LMSs it is quite useful to deliver recommendations coming from the RE directly into the LMSs without having to log into the Dashboard. The goal here is to develop a RE widget for Chamilo that will display recommendations based on users' selection.

D. Integrating Mahara within the learning infrastructure

It is necessary for the learner to be able to easily collect the productions of LMS (Chamilo, Moodle) and those from Graasp. Therefore, Mahara must offer functionalities responsible to communicates artifacts between him and Chamilo/Moodle/Graaasp as shown in Fig. 7.
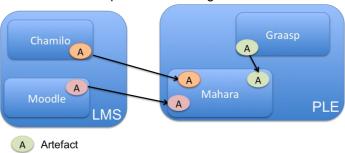

Figure 7: Communication of artifacts between Mahara, LMS (Chamilo and Moodle) and Graasp.

In the other direction, students must be able to submit their Mahara Views to any LMS courses for assessment, as illustrated in Fig. 8.
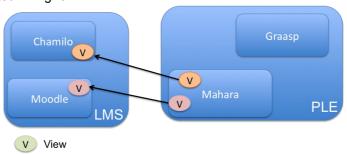

Figure 8: Submission of Mahara views to Chamilo and/or Moodle.

4.2.5 Sustainability and Integration

One of the goal pursued by this project is to reduce the dependency between different parts of the infrastructure. The reason for that is to maximize reuse and ensure stability if one of the part becomes obsolete in the future.

This goal is achieved by leveraging existing protocols and developing widgets that can be embedded in a large class of applications. As an example a set of technologies, already well supported by several key players such as Youtube, iGoogle, Dailymotion or Facebook, have already been identified: oEmbed, Open Graph Protocol, Open Social and IFrames. Those technologies should ensure some stability over time.

Another facet of sustainability concerns the ePortfolio in the context of Life Long Learning (LLL), where it is essential to ensure accessibility of students' porfolio during and beyond their curriculum. Particularly, it is crucial that students (and lecturers) who change institutions can take with them their artefacts (production, progression data, peer comments and teachers commentaries, learning outcomes, etc.). In some cases, it might even be necessary to store users' property outside their workplace/institution. We thus have to find a practical solution, such as for instance a centralized eportfolio storage system, which could ensure the importation/exportation of any portfolios, as shown in Fig. 9. However, to find the solution best suited to institutional needs, we will perform a feasibility study, performed by the UNIGE and piloted by the SIG-ePortfolio, which will take into account
- the identification of common needs across all the involved institutions;
- various LLL scenarios, which involve the use of ePortfolios and the way the students' artifacts have to be moved from one ePortfolio to another
- the design of a conceptual model, if possible along IMS standards (or LEAP2A) to facilitate later integration with other institutions.
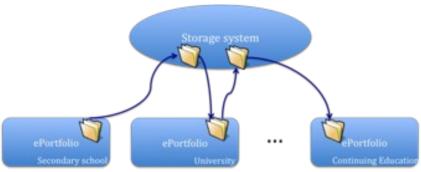

Figure 9: Example of a storage system for users' eportfolio.

5. Innovative nature of the project

PLE paradigm shift
The PLE paradigm shift as proposed in this project, lets users (students) organize their learning environment as they wish. It shifts from a directed top-down LMS institutional organization to a user-centered organized structure. Users may already be using some tools that could be part of their PLE but they do not use them as such, especially since there is no mechanisms to recommend tools and/or resources for a given user context.

Bridging Institutional knowledge through recommendation
Institutions have developed Portfolio and LMS through the years. Knowledge captured by these environments are available only through these platforms. While these platforms may propose searching tools, they only search within limited environment bonds. This project aims at sharing among institutions the available knowledge/resources provided by users, along with a list of recommended material. This way of doing is akin to knowledge mining and sharing practices, and constitutes a quite innovative approach.

Quality process of the project to refine resource usability and training modality
A real challenge remains on looking for the adequate balance of formal and informal modality in the learning of ICT soft skills. Therefore, the application of a formative evaluation process is a good project methodology. Regulation loops will operate on the development of tools and scenarios, while using key questions. Are the tools functions easy to use? How to design tutorials and trainings on the basis of learning scenarios, which integrate the users' work habits? How to motivate for LLL? From what starting point and how far can a student learn with and about ICTs? What are the "proofs" of autonomy for ICT soft skills?

6. Cooperative nature of the project

The two UNIGE pre-studies have generated strong interest from the Swiss academic community on the PLE project. Beyond the partners of this project (EPF-L, UNIFR NTE, UNIL Riset, UNIZH, IFeL), the adjunction of new partners will require a subdivision of the project into phases which follow SWITCH "competitive bid" timelines:

Phase 1, July 2011 - December 2011
This phase will focus on early development in cooperation with interested partners, and the preparation of WPs for integrating projects "competitive bid" for the September session 2011.

Phase 2, January 2012 - December 2012
Will follow the preliminary user testing phase. Eventually, integration of new partners, particularly the e-portfolio. This phase will continue throughout the year 2012 (for details, see table below).

7. Sustainability of the proposed solution

The project is part of the strategical development of eLearning at the University of Geneva.

The React group will provide both hardware and maintenance support for Graaasp and the RE at EPFL for at least the next 3 years, and will continue to develop and support this platform through other projects (EU-Role, CTI, etc.). In any cases, Graaasp will be one potential platform, but by no means the definitive one. It will provide the incentive on a longer term to develop an Open Source application, in which sustainability would be performed by a larger community.

The sustainability of the project is addressed at both the pedagogical and the technological levels. From a pedagogical point of view, this project will be maintained and extended as the users and producers community will enrich its content (e.g., soft skills seminar, modules, blog). For the ePortfolio module, see section 4-2-5 for sustainability aspects. On the technical side, this project extend existing infrastructures and as such each institution already provide the resources needed to administer these infrastructures. The effort to adapt, federate and disseminate the institutions' resources is handled in this project. In addition, the proposed architecture permits the integration of new partners without major modifications.

The blog main objective is to help develop a community of people willing to share their experiences. Once in place the community will be responsible to add and manage contents. The technical administration of the blog will be handled by UNIGE NTICE unit.

8. Work packages

WP 0 : Project Management / Lead : UNIGE

- Management of project planning
- Coordination between project partners
- Organization and chairing of project meetings
- Checking milestones and deliverables
- Planning and organizing measures for the dissemination of deliverables

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WP 1 : Development of training modules / Lead : UNIFR (H. Platteaux)

Partner : UniGE (A. Ronchi, O.Benkacem)

- Analysis of ICT needs and learning-working habits of BA and PhD students (using techno-pedagogical watch and surveys)
- Identification of learning objectives
- Conception of learning resources and scenarios for self-learning
- Development of guidelines and interactive tutorials
- Development of training modules (including usability tests)
- Structured collection of all learning resources and scenarios (self-learning, PhD seminars, BA pilot courses)

Outcome: - Learning objectives
               - IMS/SCORM training modules
               - Structured collection of learning resources and scenarios

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WP 2 : Softs Skills Seminars with PhD students / Lead : UNIGE (L. Moccozet, O. Benkacem)

Partners : UNIFR (H. Platteaux), EPFL (D. Gillet), CUSO

- Survey about ICT needs and learning-working habits of PhD students
- Conception of learning resources and scenarios for PhD seminars
- Designing, managing and delivering online learning activities in Moodle
- Organization, information and animation of PhD seminars
- Evaluation of impact on ICT skills development

Outcome: - Workshop materials (presentation, online handouts)
               - Two workshops by semester

WP 3 : Application and testing of PLE with BA students / Lead : UNIGE

Partners : UNIFR (H. Platteaux), EPFL (C. Salzmann)

- Survey about ICT needs and learning-working habits of BA students
- Conception of learning resources and scenarios for BA pilot courses
- Organization, Information and animation of BA pilot courses
- Evaluation of impact on ICT skills development

Outcome: - Selection of a basic set of widgets to support learning (laboratory activities in engineering education, collaborative working)
- Assessment of the PLE platform for collaborative learning at the BA level

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WP 4 : RE's requirements specification / Lead : EPFL (C. Salzmann)

Partners : UniFR (G. Collaud, J. Monnard), UniGE (O. Benkacem, P. Roth)

- Requirements' specification for the RE
- Provide specifications to other services/environments
- Review and assess institutional needs (UNIFR, UNIGE)
- Based on requirements' analysis, select the RE architecture

Outcome: - RE requirements
- RE architecture
- RE deployment scenario

WP 5 : Dashboard - (Graaasp) : Lead: EPFL (C. Salzmann)

Partners : UNIFR (G. Collaud, J. Monnard), UNIGE (O. Benkacem, P. Roth)

- Add Shibboleth SSO to RE/Graaasp (UNIGE)
- Development/Integration of new tools (UNIGE)
- Other development and adaptation of a prototype RE
- Customizing of RE based on institutional needs
- Restricted usability and functionality tests with a limited number of users

Outcome: - Complete solution integrated in the existing institutional infrastructure.

WP 6 : Integration Graaasp/RE with institutional tool @ UNIFR / Lead: UNIFR

Partners : UNIGE (O. Benkacem, P. Roth), EPFL (C. Salzmann)

- Define Moodle's data visibility
- Specify information to be displayed in Moodle widget for Graaasp
- Implement widget
- Specify Moodle user actions to be used by RE
- Implement interface RE - data from Moodle

Outcome: - Moodle widget for Graaasp
- Interface between RE and data from users' actions in Moodle

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WP 7 : Integration Graaasp/RE with institutional tool @ UNIGE / Lead : UNIGE

Partner : EPFL (C. Salzmann)

- Feed Chamilo's widgets to Graaasp
- Link Chamilo's resources (files, object, resources, etc) with Graaasp
- Feed Chamilo's user events to Graaasp
- Add a Graaasp block to Chamilo
- Integrates Graaasp/RE with Chamilo through Chamilo's search system.
- Mahara integration with Graaasp/RE
- Mediaserver integration with Graaasp
- Usability tests

Outcome: - Chamilo package for interconnection with Graaasp/RE
- Graaasp block for Chamilo
- Mahara package for interconnection with Graaasp/RE
- Mediaserver package for embedding with Graaasp

WP 8 : Integration of Mahara / Lead : UNIGE (P. Roth)

Partners : UNIL (N. Spang Bovey)

- Integrate Mahara with Chamilo and Moodle
- Add tutoring and monitoring module
- Add integration of reference lists of competences and learning outcomes

Outcome: - Interface module with Chamilo/Moodle for Mahara
- Tutoring and monitoring module for Mahara step 1 - Feedback
- Tutoring and monitoring module for Mahara step 2 - Revision Control and Versionning
- Skills referential and learning outcomes module for Mahara

WP 9: ePortfolio Guidelines and tutorials / Lead : SIG-ePortfolio

Partners : UNIL (N. Spang Bovey), UNIZH (E. Berg), FFHS (A. Hediger), UNIFR (H.Platteaux), UNIGE (P. Roth)

- Production of tool-related guides and tutorials
- One week on-site collaborative work (seven members of the Eduhub SIG ePortfolio) to elaborate common guidelines for the deployment of ePortfolio in Higher Education settings.
- Completion, fine tuning and layout of the guidelines documents in English
- Production of dissemination materials

<u>Outcome:</u> - A set of tool-related guides and tutorials
- A set of guidelines for institutional stakeholders

WP 10: Interoperability and the sustainability of ePortfolio contents / Lead : SIG-ePortfolio

Partners : UNIGE (P. Roth), UNIL (N. Spang Bovey)

- Identify common needs
- Design of a conceptual model
- Define various LLL scenarios using the ePortfolio
- Development of a prototype

<u>Outcome:</u> - Report detailing all the solutions
- Learner-portfolio demonstrator

WP 11 : Deployment, Scalability and performance assessment / Lead : UNIGE

Partners : UNIFR (H. Platteaux), EPFL (C. Salzmann)

- Usability tests
- Test results taken into account
- Deployment, scalability and performance
- Compilation of final version
- Compilation of the manual and documentation
- Evaluation of RE and Graaasp hosting at Switch

<u>Outcome:</u> - Deployment of the software PLE and manual compiled.

WP 12 : Dissemination and integration of partners / Lead : UNIGE (P. Roth)

Partners : UNIFR (H. Platteaux), EPFL (C. Salzmann)

- Information and dissemination
- Organization and coordination of Meetings
- Integration of the new partners
- Website promotion
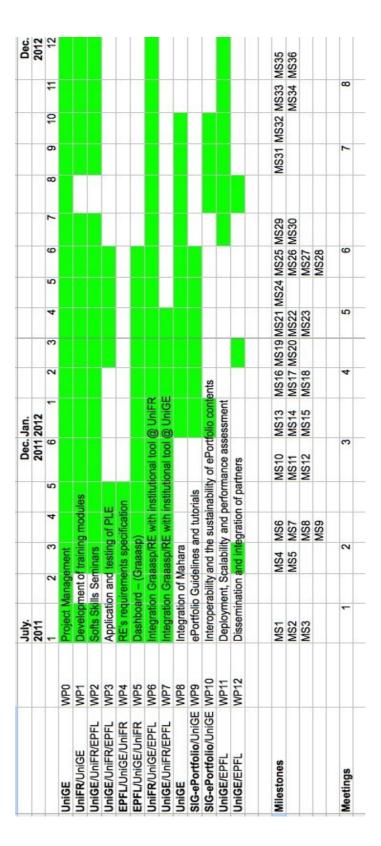- Review of the project, best practices, publications and presentations - eduhub days, etc.

<u>Outcome</u> : - Website, publications, presentations at Swiss events

9.Project plan / deliverables / milestones:

Milestone	WP	Title	Planned	Deliverables/Comments
1		Kickoff meeting	5.7.11	
2	WP12	Website promotion	29.7.11	
3	WP1	Starting Development of training modules	2.7.11	A state of the situation on the development shall be communicated at each quarterly report
4	WP5	First prototype Dashboard	19.09.11	Adaptation of Graaasp, first version with Shibboleth SSO ready for detailed testing\n\nDevelopment/Integration of new tools
5		Quarterly report No. 1	30.09.11	
6	WP4	RE Requirement	19.10.11	Specifications for RE interface
7	WP3	Application and testing of the first prototype (Fall 2011)	25.10.11	First iteration with users (in pilot classes) to improve and adapt Dashboard
8	WP2	Report 1	28.10.11	Design of seminars for PhD students
9	WP2	Starting Softs Skills Seminars	30.10.11	Two seminars to be held
10	WP7	Graaasp block for Chamilo	1.12.11	
11		Quarterly report No. 2	31.12.11	
12	WP1	Report 1	31.12.11	Analysis of ICT needs and work habits of students (from literature and blogs)
13	WP6	Moodle widget for Graaasp	31.01.12	
14	WP9/ WP10	Guidelines elaboration + Report + Prototype ePortfolio for data exchange requirements (team work)	31.01.12	Final deadline to be yet decided
15		Annual Report	31.01.12	
16	WP5	First version of Graaasp/RE is ready	6.2.12	Initial usability test
17	WP3	Start of Application and testing -Report 1	13.02.12	Design of pilot courses for BA students
18	WP7	Chamilo package for interconnection with Graaasp/RE	17.2.12	
19	WP8	Tutoring and monitoring module for Mahara	16.3.12	step 1 - Feedback

20		Quarterly report No. 3	31.03.12	
21	WP7	Graaasp/RE- Mediaserver	2.04.12	Mediaserver package for embedding with Graaasp
22	WP7	Mahara package for interconnection with Graaasp/RE	27.4.12	
23	WP2	Softs Skills Seminars - Report 2	about 30.04.12	Results from evaluation of seminars for PhD students (after 4 seminars)
24	WP5	Testing at large RE	1.5.12	Integrated version
25	WP6	Interface between RE and data from users actions in Moodle	29.6.12	
26	WP3	Application and testing - Report 2	29.06.12	Results from evaluation of pilot courses for BA students
27	WP9	Guidelines publication	29.06.12	Set of guidelines available for dissemination
28		Quarterly report No. 4	30.06.12	
29	WP8	Tutoring and monitoring module for Mahara + integration of reference lists of competences and learning outcomes	13.7.12	Step 2 - Revision Control and Versionning
30	WP1	Report 2	30.07.12	Analysis of ICT needs and work habits of students (from literature, blogs and surveys done in courses) and Learning objectives definition
31		Quarterly report No. 5	30.09.12	
32	WP8	Integration Mahara/Chamilo	13.10.12	
33	WP10	Prototype ePortfolio for exchange of data between institutions	1.11.12	Release of software, tests and review
34	WP1	Report 3	30.11.12	Development of trainings for ICT skills development and PLE usage - Final report
35	WP11	Final deployment	17.12.12	
36		Final report	31.12.12	

Timetable Chart

Partner(s)	WP	Activity
UniGE	WP0	Project Management
UniFR/UniGE	WP1	Development of training modules
UniGE/UniFR/EPFL	WP2	Softs Skills Seminars
UniGE/UniFR/EPFL	WP3	Application and testing of PLE
EPFL/UniGE/UniFR	WP4	RE's requirements specification
EPFL/UniGE/UniFR	WP5	Dashboard – (Graaasp)
UniFR/UniGE/EPFL	WP6	Integration Graaasp/RE with institutional tool @ UniFR
UniGE/UniFR/EPFL	WP7	Integration Graaasp/RE with institutional tool @ UniGE
UniGE	WP8	Integration of Mahara
SIG-ePortfolio/UniGE	WP9	ePortfolio Guidelines and tutorials
SIG-ePortfolio/UniGE	WP10	Interoperability and the sustainability of ePortfolio contents
UniGE/EPFL	WP11	Deployment, Scalability and performance assessment
UniGE/EPFL	WP12	Dissemination and integration of partners

Timeline (months): July 2011 = 1–5; Dec./Jan. 2011/2012 = 6; then 1–11; Dec. 2012 = 12.

Milestones (by month column)

Month	Milestones
July 2011 (1)	MS1, MS2, MS3
(3)	MS4, MS5
(4)	MS6, MS7, MS8, MS9
Dec. 2011 (6)	MS10, MS11, MS12
Jan. 2012 (1)	MS13, MS14, MS15
(2)	MS16, MS17, MS18
(4)	MS19, MS20, MS21, MS22, MS23
(5)	MS24, MS25, MS26, MS27, MS28
(7)	MS29, MS30
(9)	MS31
(10)	MS32, MS33, MS34
(12)	MS35, MS36

Meetings (by month column)

Month	Meeting
1	1
3	2
6	3
(2012) 2	4
(2012) 4	5
(2012) 6	6
(2012) 9	7
(2012) 11	8

Risks, possible problems:

This project has been split into work packages that are shared among partners. Most of these work packages requires some partners' collaboration. If one or more of the main partners do not get financed, the planned work packages and deliverables will have to be re-evaluated accordingly.

More precisely, if the EPFL part does not get financed this would imply:

- No recommendation engine (WP4)
- No federated hub, no resources sharing (WP5)
- No dashboard (graaasp) and adaptation to institutional environments (WP6, WP7) (at least under this form)
- No EPFL evaluation in engineering education (WP3)

If the UNIFR does not get financed, this would imply:

- A deficit in pedagogical e-learning expertise (WP1)
- No Moodle integration (WP6)
- No conception and test of ICT learning scenarios (WP2, WP3)

Concerning the doctoral students participation to the Softs-Skills Seminars (WP2), which represents an important pedagogical part of the project, we received so far an principle agreement with the CUSO, the organism responsible for the *programme doctoral romand*. It thus improves the chance of a participation of this user group.

If the institutions listed with the Eduhub SIG ePortfolio do not get financed, this would imply:

- No guidelines for institutional stakeholders on the deployment of an ePortfolio approach at various levels (WP9)
- No awareness raising of issues related to ePortfolio processes and tool at a national and institutional level
- No search for ePortfolio coherency across Swiss Higher Educations

Boundaries to other projects and activities:

The e-portfolio part has links with the SIG e-portfolio on one hand and with the "LLL-transfer" on the other hand. These links are not formal but will contribute to value this project through other communities.

Prerequisites for success of the project:

The two PLE and ePortfolio pre-studies carried out these last months by UNIGE strongly contribute to this project success since the need analysis and the partners search has already been conducted. Moreover these pre-studies provide intital measurements regarding the underlying technological complexity which enables a finer evaluation of the requirements to achieve our goals.

Confidentiality of project submission (for competitive bid):

SWITCH can communicate project content

Remarks:

Signature project leader

Signature project responsible of the university