iGoogle and gadgets as a platform for integrating institutional and external services

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Abstract. This paper presents a framework for the integration of institutional and external services in order to give support, in a personal way, to the daily activity of each faculty member. The proposed framework is based on corporative Personal Learning Environments (corporative PLE) as the services are assembled, configured and managed within the institution. The set-up of the prototype for the development of the corporative PLE uses iGoogle and gadgets over Google Apps infrastructure. If this framework works smoothly enough, on a second phase we would like to take advantage of it as a test-bed for the research, implementation and testing of social services for educational purposes, since corporative PLE seem to be particulary effective for the creation of a network of PLE, a learning nervous system where each PLE is a neuron and which will generate some type of collective intelligence.

Keywords: corporative PLE, PLE network, social services, collective intelligence, Google Apps, iGoogle, widgets.

1 Introduction

Learning environments based on technologies that combine social services that support collaborative learning, and high personalization that supports individual characteristics and learning preferences, have the potential to radically alter the landscape of e-learning [1] Within all learning environments, we think that the model based on a network made up of corporative Personal Learning Environments (corporative PLE) is the one that best achieves this vision [2].

This paper presents a framework based on iGoogle and gadgets over Google Apps infrastructure for the development of a network of corporative PLE. The objetive is, on one hand, the integration of institutional and external services in order to give support, in a personal way, to the daily activity of each faculty member, and on the other hand, to take advantage of the framework as a test-bed for the research, implementation and testing of social services for educational purposes.

This paper is structured as follows: section 2 provides an overview of the reasons for migrating from a monolithic Virtual Learning Environment (VLE) to a network of corporative PLE; section 3 describes technological framework for a network of

corporative PLE; section 4 shows examples of the services that can be implemented on the PLE; finally, section 5 summarizes the conclusions and future work.

2 From a monolithic VLE to PLE network within the institution

The possibility for teachers to upload notes to a web page and for the students to download them is a big progress. Any of the VLE provided by institutions fulfils this function. However, our needs in learning resources, planning management and user interaction are a lot more. Moreover, from a technical point of view, although they have become more feature-rich, it is still complicated to perform upgrades and customize functionality (via APIs or otherwise). Therefore, no VLE platform will ever respond to all the needs and tastes that different teachers, students and different learning contexts will request. The VLE model makes clear that the strategy that delivers the same static learning experience to all learners and makes customization difficult does not cope with personal learning.

In recent years we have seen how social software, cloud-computing, web mashups and ubiquitous computing have changed the way we develop and use applications, and create and consume information. We can improve technology-enhanced learning if we manage to fit and guide the gradual integration of those technologies into the institutional environment [3]. In this sense, some instructors are giving the learners certain intervention grade based on Web 2.0 services. However, the amount of data generated by those services reaches such volume that they are not useful if they are not enclosed with mechanisms that enable more fluid data flow and closer user interaction. In this context, the challenge of a learner lies in the ability to find and filter out information in order to feed and keep updated user and data connections that support learning. Consequently, the need for a PLE has been identified.

The corporative PLE provides a suitable environment to improve information retrieval abilities. The deepest transformation carried out by the PLE is based on an architecture of information channels that allows to distribute any specific data among services and from a service to an interface selected by the user (web page, widget or desktop application). In order to facilitate automatized data flow, the architecture of information channels lies in the adoption of RSS syndication and open Application Programming Interfaces (API).

It is unclear the grade in which big institutions like universities will allow the use of their architecture of information channels (RSS and APIs) to facilitate the access to critical information like course enrollment data. Besides, the fact that institutions store the profile of its members gives a great opportunity to preconfigure the PLE with a set of tools, services and information channels according to such profile. Due to these reasons, it is important to select the institutional environment as the place where the tools are assembled and configured. This leads us to the idea of the corporative PLE.

Furthermore, the corporative PLE also provides a suitable environment to practice social skills. If a PLE is given to each institution member, the resulting corporative PLE network will permit learners to join into groups and deploy successfully social networks where they will perform learning experiences for many educational purposes. A corporative PLE network is a grid of learning units cooperating to share

learning resources across multiple administrative and learning contexts. This model is the one that best achieves the vision of learning as a shared nervous system, like a distributed intelligence where the knowledge emerges from collaborative processes developed by all the users.

3 Technological platform for a network of PLEs

On summer 2008, a project entitled MeMeTEKA[1] was initiated in the Faculty of Medicine at the University of the Basque Country, with the primary objective of creating a prototype of a PLE network that will show the complexities involved in the implementation of social services for educational purposes. The authors participate in MeMeTEKA with the main role of providing requirements and consultancy for the technologies that will be used within the project.

The first goal of the project has been to install and configure a prototype of the corporate PLE for a test group of instructors who will use it to develop educational materials that facilitate learning in the field of medicine during the next course. The need for rapid development of the prototype loads us to the decision of running the PLE on top of Google Apps infrastructure as it provides at no cost most of the common features needed to build the PLE: iGoogle, gadgets and Google App Engine.

iGoogle is the front-end of the corporative PLE. It provides access to a wide variety of widgets within a Locally Controlled Environment represented by Google Apps. The LCE allows the institution to preconfigure a set of fixed widgets with institutional tools, services and information channels customized according to the profile of the user, but also allows users to add their own preferred widgets.

Besides, iGoogle offers some features that seem to be very suitable for PLEs: open social, canvas view, widget sharing and automatic topic-based tab creation. Open Social defines a common API for accessing a social network's users and resources. Canvas view enables the visualization of powerful full-page widgets that can be very useful on browser-based interfaces. Widget sharing refers to the ability for sharing a widget and the data within it. With automatic topic-based tab creation you can ask iGoogle about a topic (e.g.: “learn english”) and it will automatically add a tab with widgets based on the topic keywords.

Own-programmed gadgets constitute our widget platform for the integration of an increasingly number of back-ends (institutional and external services) into iGoogle. In order to do that, gadgets make use of XML, JavaScript, open APIs and REST paradigm. The open nature of these technologies allows the placement of widgets not only at iGoogle, but also at a wide range of platforms.

Google App Engine is our cloud-computing platform for the generation of server-side applications that extract and analyze the collective intelligence that emerges from the data and the interaction of many uses. These applications will implement the algorithms for building new services that detect similar elements (users or resources), recommend resources, discover groups, customize search engines, etc [4].

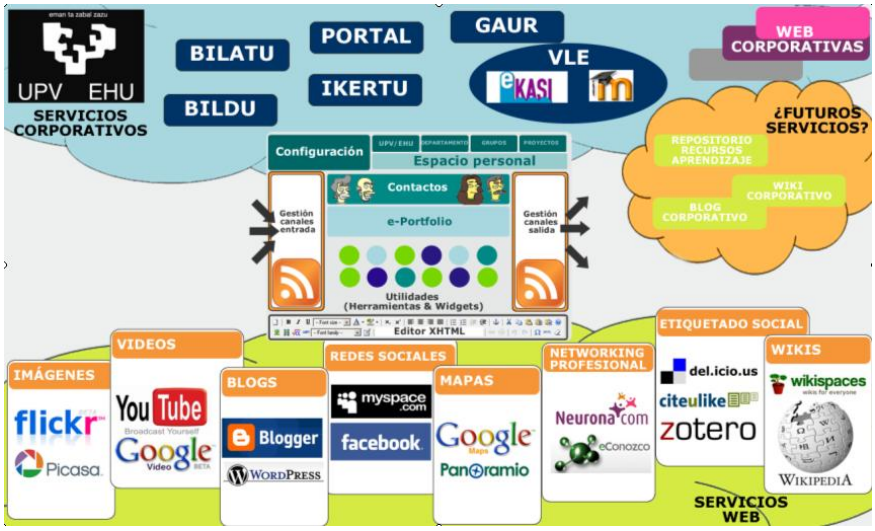
[1] http://www.memeteka.net

Authoring tool support is not provided by Google Apps infrastructure. Therefore, we plan to integrate eXe e-learning XHML editor into the framework. eXe is an IMS and SCORM compliant authoring tool configured as an standalone application based on a client-server architecture. We plan to be split the server-side from the client-side. A content manager will be added to the server-side in order to distribute learning resources among the institutional and external services integrated within the framework. The client-side will be embebed as a widget and placed at iGoogle.

4 All services in one PLE

The version of iGoogle available to the users of MeMeTEKA is preconfigured with a set of fixed gadgets which include a variety of external services like Gmail, Google Calendar, Google Docs, Google Talk, Sticky Notes, Delicious, Flickr, YouTube and blogs. Gadgets for institutional services integration are not available yet as service administrators of the university have not been notified about MeMeTEKA project. When institutional services are integrated, faculty members will be linked together in groups based on grouping information (course enrollment, academic personnel and administrative personnel structure) recorded in university services.

In the near future we plan to implement several services over the network of corporative PLE. Such services include digital identity (integration with institutional LDAP services), learning resources repositories, suggestion of new widgets, creation of social networks, social graph retrieval, point to point information flow, vertical search engines and an e-portfolio to support learn-streaming.



5 Conclusions and Future work

In this paper, a framework for a network of corporative PLE has been described that, as a result of the underlying infrastructure, enables the integration of institutional and external services without requiring specialized or expensive software.

Besides, the development of a PLE for a hands-on experience in the research, implementation and testing of social services for educational purposes is one of the mayor requirements of the MeMeTEKA project and fits perfectly in the context of a PhD dissertation, in progress, about PLE and Social Networks. This approach needs an infrastructure that allows a rapid development of a prototype in order to obtain results that allow us to advance on this topic.

Google Apps offers a flexible and innovative infrastructure that is well suited for that aim. Own-programmed widgets can be used outside Google Apps infrastructure: in widget engines for Linux, Mac and Windows; in other start pages like Netvibes and, in general, in any web page, even in current VLE that support live data transport. At the time of setting up the prototype a significant problem arose when we discovered that iGoogle on Google Apps was not the latest version (for example, there is not canvas view support). Nevertheless, it is supposed that Google will update it sooner or later.

Although the solution presented in this paper leverages the proprietary software of Google, a similar framework could be also implemented using own client-server approaches or other outsourcing application service products. What changes, according to the selected solution, is the amount of support offered, and consequently, the amount of work left to do. We choose the infrastructure of Google Apps because it masks many technical issues not directly related with our research aim, and simplifies the setting up of the prototype for the project in which it may not be possible to get from the institution the needed technical staff.

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