ISSUES ABOUT MASHUP APPROACH IN E-LEARNING

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Abstract: Learning environment has an important role in learning and this explains the concerns of researchers to find a way in which this medium can be customized. New technologies and the Web as distributed system, allow the combining data and services that give a high degree of information accessibility in applications. Thus, the mashups, as a result of the current technology trend, are becoming more and more oriented to the end user and offer increased facilities. The purpose of this paper is to present the advantages offered by creating and using mashups in e-learning and their importance in opening the way for innovation regarding the designing of didactic content through the direct involvement of people (teachers) who don't have advanced computer knowledge.

Keywords: mashups, learning environments, creativity, active participation, open source.

I. INTRODUCTION

Currently, the access to information on the Web has become a necessity and a habit in their retrieval, especially since the digital format is available and is integrated in different services, being helpful in any field. A major contribution have had and still have technologies that are in constant change. Among the results of current technologies development the mashups are found and these are created in order to meet user requirements by offering more and more complex facilities.

In e-learning the desire to make a personalized learning environment that facilitates learning explains the need of mashups approach.

II. LEARNING ENVIRONMENTS AND MASHUPS

At basis of learning process is the learning environment and construction and its maintenance must become a concern of instructional design specialists, especially since the learning is focused on end user needs and its success depends on learning environment. On the other hand, new technologies are focused on providing more advanced features that users’ needs can be met.

The evolution and the stage reached by current technology explain the desire and need to find the best online tools to promote learning and to meet different needs. An example of this are electronic platforms that offer online training components, so-called Virtual Learning Environments (VLEs), the dominant learning environments in institutions of higher education.

Known to be learning management systems (LMS) and content management systems (CMS) with the main function to simplify the management of the course for students have however a major disadvantage related to the fact that learning is centered on content [8]. In this case the learning materials are presented in a uniform manner for all students, regardless of their learning styles or preferences [5].

The trend in education is to provide a learning environment that will fundamentally change the nature of learning and teaching, where the learning on the web is controlled by the student, what led to the concept of Personal Learning Environment (PLE - Personal Learning Environment,
The student can choose the applications and services that is his PLE, may add new applications or integrate data from different resources to produce a new service and this type of solution is found as mashup PLE [9].

With a high speed development given by the collaboration of online communities and the possibility to rapidly connect to applications or products already designed, the mashups allow to fast access to information on the Web.

2.1 Aspects of mashup

Mashups as a set of components, from multiple sources to serve a purpose, have the following main features:

- the components and services from which the mashups are built there are in other Web applications, and by adding code and reuse these can be integrated into a whole;
- mashups use feeds and XML for connecting internal and external components;
- mashups can be used by people who don’t have advanced computer knowledge (because mashups are based on self-development);
- the creativity and innovation are encouraged by mashups, offering through cooperation the possibility to develop software adapted to user needs.

There are currently two models of mashups, namely those developed by users and those developed by commercial companies. According to ProgrammableWeb.com (http://www.programmableweb.com) many independent developers use their blogs, profiles or Web pages to create new mashups, widgets or gadgets. The business model tries to bring the mashups utility in the Web or intranet with features that are missing to the tools, respectively security or SOA (Service-Oriented Architecture) local support. This type of mashup often ignores the improvements made by users, and this should not be ignored when they want advanced applications.

2.2 The advantages of using mashups

There are a number of arguments which recommend the use of mashups mainly due to [2], [3], [11]:

- their applicability, given by the tools available for mashups, which are useful in different fields;
- ease of use, because the tools have an intuitive design and web interface easy to use for beginners;
- simplicity in integration and reuse, because of the possibility by effective combination between Web components, and reusable SOA (Service-Oriented Architecture);
- interoperability, given by the possibility of combining various instruments, which results in increasing the use of mashup's potential;
- active participation of users, that facilitate applications’ improvement much faster than traditional methods;
- mashups require only a Web browser and a URL, no installation or updates, plug-ins or administrator rights.

Despite these advantages in using mashups are some basic issues related to [2]: the data recovery, which can be complicated when there are multiple Web pages or the software need for integrated data visualization from multiple sources.

2.3 Requirements for achieving Mashups

Generally, the creation of a mashup doesn’t require special knowledge, but for integrate the APIs (Application Programming Interface) are necessary the high level programming languages.

There are certain criteria that must be taken into account to create of a mashup, namely: the creativity, user experience, the mashup's utility and its contents.

Mashups effective tools are those instruments that provide:

- ease of use in to any web browser and language, for use by people without programming knowledge;
- encapsulation patterns in software development, including automated testing, version control or security, problems that should not be a barrier to the development process mashups by end users non-programmers;
- support for the open standards because applications created with tools mashup should be Web applications based on open formats.

From a technological perspective, mashups are designed in order to be implemented on the server-side or client-side. To implement mashups there are a series the freely available tools such as Yahoo Pipes, Microsoft Popfly, Google Mashups Editor. A client-side mashup can be created with free tools such as iGoogle or Oosah [1]. Usually, a server-side mashup combines the content from Web server and transfers it to the client through HTTP protocol and client-side mashup integrates the software and data components within browser. For linking different services the mashups use different channels, such as APIs, Widgets and Web service interfaces or RSS Feeds.

Alongside other areas in which they are useful, there is educational domain, where mashups have a great potential to connect the content, the collaboration and communication, which are considered key objectives of the virtual learning processes [1].

III. MASHUPS IN E-LEARNING

Using mashups for educational purposes becomes more efficient by bringing social networking at the teaching hours level and the use various Web 2.0 technologies [4]. Compared to traditional Learning Management Systems (LMS) characterized by rigidity in terms of exchange and collaboration on the Web, the mashups can help create an open learning environment that enables the personal learning by using various Web resources provided by mashups.

An alternative is the integration into Learning Content Management System (LCMS) of free services for interaction (eg Wikipedia, Google Maps) or communication platforms (blogs, microblogs) in order to enrich the traditional content or as examples of learning [4], [6].

Another option is to let the students to create their own mashup pages. Thus, to achieve different learning scenarios are required different technical solutions [1].

Currently, there are three different possibilities for combining content [1]:
- RSS Feeds, that can be implemented in a course;
- APIs that can be used to integrate web applications (eg Wikipedia) in an LMS allowing direct search through the interface LMS;
- Widgets and Web services built in code form as html tags (Web service) or links to a source JavaScript (Widget).

By using these possibilities (Widgets, APIs and RSS technology) the online courses are improved by social platforms or other applications such as Flickr, YouTube [1].

A Learning Management System (LMS), with built-in Web services can be part of a mashup. Thus, LMS is able to follow the formal aspects of learning, while providing an informal environment for collaboration [12].

Mashups implementation can be focused on teacher or student. If implementation is teacher-centered, he keeps control over the process of learning by developing his own applications and make them available to students. Implementing student-centered allows them to use the instrument for create their own mashups, developing their creativity while they discover new information [10].

The use of mashups for learning changes the teacher’s role and learning management system (LMS). Thus, the teacher is not only the content creator but becomes a facilitator of content using the LMS as learning environment. The teacher remains responsible for structuring the content and learning support activities.

Several advantages are provided by the use of mashups in e-learning, including:
- creation of interactive activities for learners and maintain their interest in developing creativity;
- increasing participation and interaction with the social networking spaces;
- sharing didactical methods;
- development of customized collaborative learning systems;
- possible addition of functions using Web services.

On the other hand, there are a number of mashups - based projects on web, the projects in progress, which aim to the access at information and training. Among these can be found the mashups
with audio books, which are an option for people with visual disabilities (e.g. Project Gutenberg: http://www.gutenberg.org, Librivox: http://librivox.org/). The mashups can be integrated on an open source platform with learning objects for the blind or people who are visually impaired.

Beyond the potential offered in various domains and the continued development of mashups, remain to be solved some problems with they currently face, namely: the lack of security at data uploading, limited functioning of features (due to version "beta" of some tools) or the server’s instability (in the bugs’ case) [1].

IV. CONCLUSIONS

Mashups are characterized by increased connectivity, speed development, support from online communities, helping to rapidly improve of information found on the Internet.

The effective use of mashups by teachers allows the creation of interesting lessons which has the effect of increasing students' interest for learning. Important is how instruments can be combined to achieve educational goals.

The tendency to provide a personalized learning, based on Web 2.0 technologies, in which is stimulated creativity, communication, collaboration and active participation gives e-learning mashups the possibility to become powerful learning tools.

References