Using the Web to support an education, learning and training service centre

Joaquim Borges Gouveia, Luis Gouveia, Francisco Restivo

bgouveia@egi.ua.pt, lmbg@mail.telepac.pt, fjr@fe.up.pt

GIOTE, IDIT Technology and Operations Innovation Group
Rua Teixeira Lopes, 96 – 4400-320 Vila Nova de Gaia
Phone: +351223719739 Fax: +351223719738
Portugal

KEYWORDS

distance learning, computer mediated technologies, web based learning systems, content management, service delivery, service innovations

ABSTRACT

EFT*Web* is a World Wide Web based learning system developed to support both presence and distance learning. The EFT*Web* model offers the means for content management of educational material, taking into account user needs, security and economic issues. It also provide integration and user/content independence taking advantage of its flexible architecture.

This paper briefly presents the model and discusses EFT*Web* content management approach to education, learning and training activities. The discussion is centred in the impact of using the EFT*Web* model as the hub to run a service centre for education, learning and training support.

1.   INTRODUCTION

The qualification of the human resources, as a competitive factor for any institution, is fundamental to maximise results. The need of the people's constant preparation is also a factor of competitiveness that demands treatment, from the institutions. This treatment translates more and more in the taken care of education, learning and training actions.

Strategy thinking is not an everyone task, but the institutions will have more and more need of people to discuss, conceive, define, manage, implement and control the release of new strategies, planning new actions and introducing new products to market, reacting with anticipation to its competitors. Also, people need to have a global, regional and local perspective.

1.1   NEW FORMS OF COMMUNICATING

The digital economy obeys to very different paradigms from the traditional ones. The later ones are based in a form of analysing the chain of operations and the chain of value. This analysis is in a perspective of the search for the offer giving total priority to the customer and forcing the manager to maintain a constant attention on market evolution and in particular to customers. The operations chain composition and redefinition is also a very important factor of success of the new business in the digital economy era.

This characteristic of the digital business in the Society of Information allows, with great easiness starting from the information picked up in the most varied sources and for the most several forms, to store, to negotiate, to conceive, to produce, to reconfigure, to manage, to implement and to control the development of new products, including the opening of enormous opportunities in the field of the education, training and learning.

Rethinking education, training and learning is crucial. It can be seen as a group of services, in a perspective of the search for the offer, and conceiving it as a product that allows its easy transformation in a service and making it more useful to the students and professionals. It is important to state that, more and more, students are seen as customers, information and knowledge buyers.

1.2   EDUCATION, TRAINING AND LEARNING IN THE WEB

Education, learning and training constitutes one of the areas of great potential for innovation. This enormous potential can promote modifications both in the processes and form that these activities are performed. It is currently accepted that education, training and learning will meet, in a close future, among economic activities of larger importance (Britain, 1999).

This potential for the change is due, largely, to the opportunities created by the existence of computer networks and services, namely the Web and the growing available computation power and mobile communications, as they are the cases of laptop computers, cellular telephones and, more recently, personal digital assistants (Britain, 1999).

Although they exist countless pedagogic projects using information and communication technologies, few among them introduce the technology together with process redesign of existent practices (largely secular) of education, training and learning, mainly in what it concerns to the presential teaching.

The *EFTWeb* system proposes an innovation of the education, training and learning process, through the use of the Web by presenting a framework that bases teacher and students interaction on the materials and tasks to be accomplish where the content is so important as the means for classifying it.

The structuring for the student is based on a simple unit - theme - content scheme. A unit possesses themes and for them corresponds the presential sessions. Each theme has a group of contents that aids information and knowledge transmission. A content is an independent object of a given format, among the many multimedia available supported by the Internet.

The organisation scheme for user access, unit - theme - content, is given by the notion of a guide. A well defined sequence of the referred elements is associated to structure contents and give to the user a path to explore information.

The user with appropriate rights can create new guides that can include, in all or partly, already existent guides. This user can also introduce enhancements in the way content is classified.

2.   EFT*WEB* MODEL

A brief description of the EFT*Web* model (Gouveia, 1999) introduce the model base concepts, technology support, entities and mechanisms.

2.1   Model approach

The EFT*Web* user can be an individual or a group of individuals like a class. The idea for support maximum flexibility in accessing content is to give total permission to use available resources and facilities by assign a particular profile to each user that defines what it can use. To support it the model implements a system of credits allowing each user the access to a given resource based on a cost of each unit used on the system. Each user receives a given amount of credits that can use with some degree of freedom.

Another important aspect of the model is that each system user is considered a client. The model allows the necessary flexibility to consider both types of user as potential consumers and producers. This way, the system provides support to organise student's works and integrate them in the content offering by appropriate control of author rights, versioning and certification.

2.2   Technology support

The EFT*Web* model is implemented with available widespread technology. To support content distribution, the World Wide Web becomes the natural solution. It has a lot of information available that needs to be mediated for being trusted. Also, its information can be searchable and exists in a digital format. Web access is possible with a personal computer and its cost is acceptable.

To support content, database technology is used. This technology eases the storage and retrieval of contents and supports multiple and concurrent accesses, supporting multimedia storage and logs activity. It also provides proven means for search and dynamic maintenance of contents and model data structures.

To support semantic structures, where relations between contents are of importance, thesaurus technology is used. This will provide the necessary flexibility to access content by using a set of ordered concepts that allows to store, with each content, independent semantic and high order relationships.
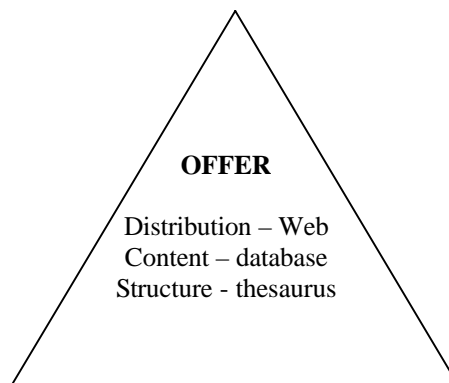
```
          OFFER

    Distribution – Web
    Content – database
    Structure - thesaurus
```

Figure 1. The offer in the EFT*Web* model

The combined use of Web, databases and thesaurus technologies are designed as the support for the system offer - distribution plus content plus structure - and constitutes the system core added value. Figure 1 represents the model offer.

One of the more relevant features of this model is the use of thesaurus technology to structure content semantics. The thesaurus is used to describe a particular model of knowledge about a given area in terms of keywords and relations between these keywords. The system allows the creation of several different structures in the thesaurus, for different overlapping classification systems to use at the same time.

From the user perspective, the Web browser integrates system functionality by offering a common and easy to use hypermedia interface. This option allows for the technology integration without increasing user client complexity to configure and use. Its use also allows integration with Internet and Intranet existent facilities.

2.3   Model entities

A model for support "real world" education, learning, and training must have as a requirement some core support of security and billing issues. The entities represent the interface with external issues like the client, the security, and billing (figure 2). These three entities show a clear business orientation for the EFT*Web* model.

- client: includes teachers and students. The model allows a client to be a consumer and also a producer;

- security: deals with the need of protecting client identification and client system use. Also included user operations allowed and what can the user really do, modify, comment and add as content and context information;

- billing: allow the necessary arrangements to use the system in a commercial way, where different types of promotions, paying programs, and fees can be applied.
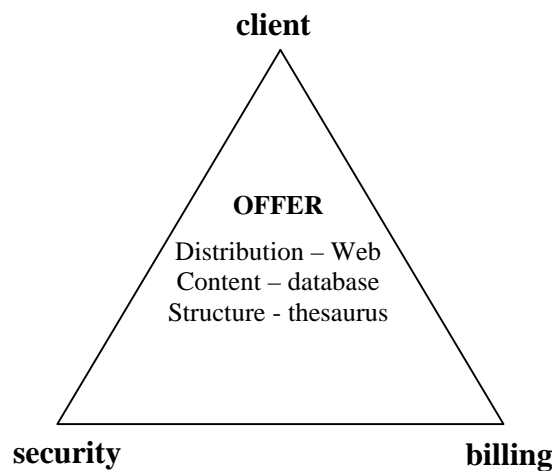
client

OFFER

Distribution – Web
Content – database
Structure - thesaurus

security   **billing**

Figure 2. The entities in the EFT*Web* model

2.4   Model mechanisms

The model mechanisms are used to interface the offer with the entities presented. The mechanisms receive the information from corresponding entities and provide the processes and storage needs to deal with entities requirements in a flexible and independent way.

For each entity, the model offers a correspondent mechanism that acts like a system translator between each entity requirements and the functioning for system offer integration. The model mechanisms (figure 3) are defined as:

- scripts: having the distribution, content and structure as an organised and available offer, to each client can correspond a particular path that shows a set of selected offer;

- profiles: corresponds to how each client can interact with the offer, by allowing different levels of functionality to take place, like using, reading, executing, commenting, adding, certifying, evaluating;

- credits: allow the provisions to the client use and interaction with the offer for a cost based approach. Each content or each kind of interaction can cost or give credits. The credits also allow system usage regulation by controlling accesses. The credits mechanism interact with the billing by allowing a internal unifying cost usage and commercial independent pricing.
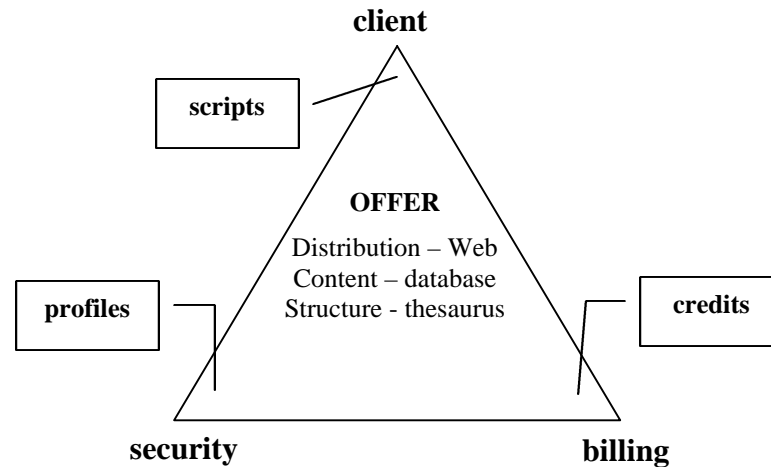

Figure 3. The mechanisms in the EFT*Web* model

3.   CONTENT MANAGEMENT MECHANISMS

With the offer, entities and mechanisms concepts the EFT*Web* model define the relation between the client, its support and content. The system core deals with the Web use, database and thesaurus technologies.

Three types of users should be considered. The *normal* user can be a teacher or a student. The administrative users are responsible for the normal definition of the system offer and operation. There are two types of *administrative* users: the ones that deal with the base offer definitions and the *thesaurus administrative* users that are responsible for maintaining multiple thesaurus.

The model also proposes two types of services: administrative services that allow administrative users and thesaurus administrative users to enter the information necessary to the system operation, like user information, content and structure information. The administrative services are:

- certifying and authoring: certifying contents and authoring scripts;

- version control: promoting and maintain related content collections;

- catalogue creation: complementing the thesaurus with additional information by introducing lists of available thesaurus keywords with correspondent weighting factors.

The current implemented services for the normal user are described in (Borges Gouveia, 2000). They are:

- mail: each client must have access an email address to send/receive messages;

- dialog: allow client chat in real time. The service is organised in rooms that groups users by topic;

- personal area: works as a system portal, proposing a link collection;

- personal folder: the place where the client place his documents with the option to share them;

- search engine: available in two modes - textual search and thesaurus (by directory);

- guides: this facility defines the content sequence - "knowledge road" - to be used. It groups other guides, units, and content.

4. IMPACT ON EDUCATION, LEARNING AND TRAINING

EFT*Web* proposes a model to support the need to store, represent and maintain both contents and contents semantics in order to allow contents relationships in an independent and not previous known ways. This characteristic allows context support along with contents as well as semantic and context support provided by thesaurus technology.

The EFT*Web* system impact education, learning and training by proposing a framework for:

- provide teacher / students communication using actual Internet facilities, integrated in a same, consistent Web interface – usability issues;

- allow the separation between content production, content certification, assessment and lecturing as independent activities in the learning process;

- support for continuity in the use of produced contents (both by teachers and students);

- allow an easy interface to administrative support for content reuse;

- increase students involvement in content management by supporting rating and comments / annotations about each particular content in the system;

- support students system usage based on a credits scheme that allows selling and buying contents turning each user a potential producer and consumer;

- support content classification based on a thesaurus system allowing greater abstraction and flexibility for searching contents;

- provide the integration of high level services as automatic assessment and 3D interactive visual interfaces.

5.   CONCLUSIONS

To consider EFT*Web* as a valid and mature ICT product for educational use three main goals must be accomplished (Gouveia, 2000):

- flexiblility: concerning the production process. The production includes contents, thesaurus and guides;

- diversification: by means of reusing existent content in new guides (contexts) and upgrading them with new contents or improving existent contents;

- differentiation at the product level, by offering content and guides for satisfying each client needs.

EFT*Web* can be of help in the emerging of new approaches to the education business not only by supporting but also for packaging contents and facilitate its management.

A working EFT*Web* prototype can be tested in the following *url*: *http://194.79.88.252/Contacto*. The password to access the system can be provided when requested.

REFERENCES

Gouveia, L. and Borges Gouveia, J. and Restivo, F. (2000). "EFT*Web*: an application to support skills trading within education, learning and training environments." *First World Conference on Production and Operations Management POM Sevilla 2000.* 26 - 30 August. Sevilla, Spain.

Borges Gouveia, J. and Gouveia, L. and Restivo, F. (2000). "Proposing a knowledge network to assist education, training and learning." *ITS'2000 XIII Biennial Conference*. 2-5 July. Buenos Aires, Argentina.

Britain, S. and Liber, O. (1999). "A Framework for Pedagogical Evaluation of Virtual Learning Environments". Report 41. *JTAP. JISC Technology Applications*. October.

Gouveia, L. and Borges Gouveia, J. and Restivo, F. (1999). "EFT*Web*: a working model proposal to support Education, Learning and Training." *Conferência Especializada Sistemas e Tecnologias de Informação*. Universidade Católica Portuguesa, Lisboa. 4 e 5 de Outubro de 1999.

One page summary of:

Using the Web to support an education, learning and training service centre

Joaquim Borges Gouveia, Luis Gouveia, Francisco Restivo
bgouveia@egi.ua.pt, lmbg@mail.telepac.pt, fjr@fe.up.pt
GIOTE, IDIT Technology and Operations Innovation Group

Keywords: distance learning, computer mediated technologies, web based learning systems, content management, service delivery, service innovations

ABSTRACT

EFT*Web* is a World Wide Web based learning system developed to support both presence and distance learning. The EFT*Web* model offers the means for content management of educational material, taking into account user needs, security and economic issues. It also provide integration and user/content independence taking advantage of its flexible architecture. This paper briefly presents the model and discusses EFT*Web* content management approach to education, learning and training activities. The discussion is centred in the impact of using the EFT*Web* model as the hub to run a service centre for education, learning and training support.

INTRODUCTION

Rethinking education, training and learning is crucial. It can be seen as a group of services, in a perspective of the search for the offer, and conceiving it as a product that allows its easy transformation in a service and making it more useful to the students and professionals. It is important to state that, more and more, students are seen as customers, information and knowledge buyers.

Education, learning and training constitutes one of the areas of great potential for innovation. This potential for the change is due, largely, to the opportunities created by the existence of computer networks and services, namely the Web and the growing available computation power and mobile communications. Although they exist countless pedagogic projects using information and communication technologies, few among them introduce the technology together with process redesign of existent practices (largely secular) of education, training and learning, mainly in what it concerns to the presental teaching.

The *EFTWeb* system proposes an innovation of the education, training and learning process, through the use of the Web by presenting a framework that bases teacher and students interaction on the materials and tasks to be accomplish where the content is so important as the means for classifying it. The structuring for the student is based on a simple unit - theme - content scheme. A unit possesses themes and for them corresponds the presental sessions. Each theme has a group of contents that aids information and knowledge transmission. A content is an independent object of a given format, among the many multimedia available supported by the Internet.

CONCLUSIONS

EFT*Web* proposes a model to support the need to store, represent and maintain both contents and contents semantics in order to allow contents relationships in an independent and not previous known ways. This characteristic allows context support along with contents as well as semantic and context support provided by thesaurus technology. EFT*Web* can be of help in the emerging of new approaches to the education business not only by supporting but also for packaging contents and facilitate its management.

Reference: Gouveia, L. and Borges Gouveia, J. and Restivo, F. (2000). "EFT*Web*: an application to support skills trading within education, learning and training environments." *First World Conference on Production and Operations Management POM Sevilla 2000.* 26 - 30 August. Sevilla, Spain.