

# A Positive Thinking Training Application

Spyros Argyropoulos†  
spyros@intelligence.tuc.gr

Euripides G.M. Petrakis†  
euripides@intelligence.tuc.gr

Panos Milios‡  
pmdian@otenet.gr

†School of Electronic and Computer Engineering, Technical University of Crete (TUC), Chania, Greece

‡ DIAN Publishing – Consulting – Education, Athens, Greece

## ABSTRACT

The development of innovative (Information and Communication Technology) ICT-based content, services, pedagogies and practices has become an integral part of today's educational procedure. ICT-based applications in education must be well designed and, to become acceptable by their end-user, they must also be comprehensible and easy to use. The PoTrain system is such an application aiming at encouraging the collection and dissemination of positive (good) news by students across the EU using the Web.

## Categories and Subject Descriptors

H.3.5 [Information Storage and Retrieval]: Online Information Services – *Web-based services*; K.3.1 [Computers and Education]: Computer Uses in Education – *Collaborative learning*.

## General Terms

Design, Experimentation, Human Factors.

## Keywords

Education, e-learning, e-training, positive thinking, Web.

## 1. INTRODUCTION

E-TRAINING refers to using Information Technology to education and learning [1]. The advent of the Web has generated additional interest in applications capable of delivering learning content over the Internet to its end-users. E-training (or e-learning) applications on the Web are emerging as the most cost-effective learning process by reducing the time, money and teaching resources to accomplish a learning objective. Learning is becoming significantly richer as students have access to a variety of information types (e.g., video, graphics along with text in a hypertext format) and can manipulate and communicate such content along with their ideas to their teachers, classmates and friends around the world.

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PoTrain is a Web-based application developed on behalf of project 'PoTrain: Positive Thinking Training'<sup>1</sup>. PoTrain aims at encouraging the collection and dissemination of positive (good) news by students across the EU using the Web. The media, especially TV are transmitting mostly negative news, so establishing negative psychology and pessimistic mode to young people. Collecting positive news from different Web sources will counterbalance the flow of negatives news. PoTrain provides non-formal training and aims at assisting in developing useful skills and positive way of thinking. PoTrain incorporates state-of-the-art technologies for system development on the Web and has undergone through a thorough and exhaustive evaluation procedure by students in schools across Europe (like Bulgaria, Slovakia, Romania and Greece) and also independent users. The results of this evaluation demonstrated that the system has become widely and very well accepted by its end-users. PoTrain is accessible on the Web<sup>2</sup>.

The rest of this paper is organized as follows: The PoTrain project is discussed in Section 2, focusing on the system architecture and its supported types of users as well as on system design and implementation. Follows Section 3 with conclusions and issues for future research.

## 2. THE POTRAIN PROJECT

The *Positive Thinking Training (PoTrain)* project aims at encouraging collection and dissemination of positive information about the events that occur every day through-out the world. The PoTrain initiative also aims at contributing towards encouraging young people to envision a better future for themselves and the world they live in. The project took place between the November 2010 and February 2012. The leader of the project was ISMB ('The Bucharest School Inspectorate', Romania), a public authority who assured the quality of education and trained educators. The Intelligence Systems Laboratory of TUC (was the Information and Technology expert of the project responsible for the overall system design and development) collaborated with DIAN<sup>3</sup> a highly innovative SME from Greece specializing on products and services for e-Training, and schools for secondary and technical education from Bulgaria, Slovakia, Romania and Greece.

The technical objective of the project was to integrate non-formal training methods, services and pedagogical approaches, based on ICT practical applications, in order to train the target user groups, which for this project are, secondary school students and teachers. The goal is to assist the users of this application combine knowledge and skills that they have acquired from their formal

<sup>1</sup> 'PoTrain: Positive Thinking Training' (EU Life-Long Learning, Comenius, Project No. 509925).

<sup>2</sup> <http://www.intelligence.tuc.gr/potrain/>

<sup>3</sup> <http://www.dian.gr>

school education with the non-formal training the project would offer to them.

In the course of the project, students built up a positive way of thinking and they also gained experience and satisfaction when they saw the results of their efforts to be realized in the form of a "positive news site". The teachers also had an important role in this project, by assisting and guiding students in developing transversal competencies through subjects of common interest and by teaching students on ways for searching and collecting positive news using computers and the Web. All collected news articles, are stored in a database, can be translated in different languages (either automatically using Google Translate or, interactively by manually importing translations of existing news articles into the system database). Finally, all news articles are categorized interactively according to subject and presented into thematic categories in the positive news Web site.

The outcome of this project was the implementation of an ICT application, PoTrain, which will be described in following sections.

## 2.1 PoTrain System

The purpose of PoTrain is to present *the most popular positive news articles* according to the positive votes they have received by the students of the four participated schools, mentioned in previous section. Participated schools played the most critical role in PoTrain. The students were the ones who gathered all these positive news articles and they voted for them in order to contribute for the most popular ones. They also provided valuable feedback for improving both, system functionality and the overall look and feel of its User Interface. The system, despite its innovative character and the highest possible level of software technology it integrates, had to be user friendly and present its contents in a comprehensive and pedagogical way (even for elementary school students).

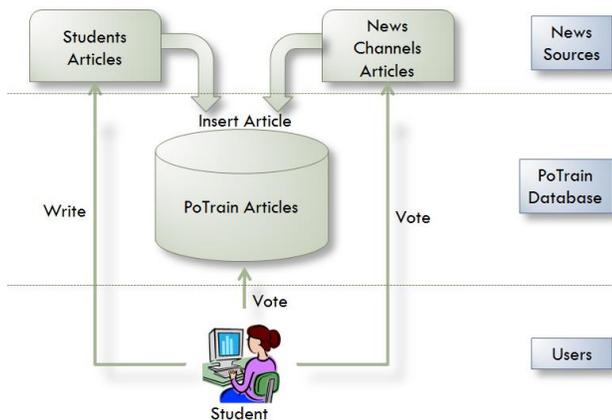


Figure 1. PoTrain System Architecture

Figure 1 illustrates PoTrain system architecture. The system consists of three basic modules:

1. **The Users Module:** The basic type of users are the school students who can be registered in the system and then are able to write their own articles, incorporate articles they have found in specific news sites in the Internet, or vote for existing articles in the system. Three different types of users are supported, as will be described later.

2. **The PoTrain Database Module:** All voted news articles are stored in a database. Each article is associated with
  - the *votes* it has received from the students,
  - a specific *news category* (e.g. nature, technology, education, sports, etc.) depending on its content, and
  - a number of *comments* that students have made on it.
3. **The News Sources Module:** All these news articles that are gathered by the school students are either
  - (a) Articles written from the students themselves (*students articles*), or
  - (b) Articles from specific news sites in the Internet (*news channels articles*). These news sites are pre-selected sites that are connected with PoTrain and are called news channels. These news channels contain information (articles) that is considered appropriate for secondary school students. It is obligatory for these news channels to provide their header news as a Web feed<sup>4</sup> in a specific format (Atom, RSS2.0) in order to be connected to the system. Characteristic news channels already connected to the system are the following: *Discovery News, National Geographic, Unisef News, Archaeology Magazine*, etc. Users have the ability to view all the latest news articles (*header news*) of the connected news channels. The provided header news are primarily external news articles meaning that they are not yet inserted into the PoTrain database until a student gives a positive vote for them.

As already explained, voted news articles (news channels articles, student's articles) are grouped together and are organized in news categories. These news articles can then be viewed either

- (a) as a whole (all together) e.g. "view most positive news articles of all categories" or,
- (b) by category e.g. "view most positive news articles of category Sports".

Special filters are also provided in order to

- (a) View selected news channels articles and students articles separately, e.g. "view positive student news articles of category Sports" or "view positive news channels articles of category Technology" and,
- (b) View selected news articles in a specific order (i.e. most popular, least popular, most recent, oldest first), e.g. "view most (or least) popular positive news articles of all categories" or "view most recent positive news articles of category Nature".

For providing lingual content support, the *Google Translator API* is incorporated in PoTrain.

Finally, a smart on line *Help* supports users with useful information on actions that can be taken at any time.

## 2.2 Types of Users

Three user types are identified in PoTrain, as shown in Figure 2:

1. **Visitors (V):** No username and password is required. They are entitled to view all information stored in the PoTrain sys-

<sup>4</sup> [http://en.wikipedia.org/wiki/Web\\_feed](http://en.wikipedia.org/wiki/Web_feed)

tem (positive news articles and their comments), starting from the system homepage.

2. **Registered Users (U):** They need username and password to login. They are school students and they belong in a specific school of a specific country. Registered users are entitled to perform any of the following actions:
  - (a) Vote for news articles. These news articles can either be external news articles by the corresponding news channels, or already voted positive news articles of PoTrain.
  - (b) Write news articles (student articles). Students can create their own news article with a completely new content or with a reference to an existing interesting article they have already found on the Internet. When a new student article is created, it automatically takes one positive vote by the creator.
  - (c) Write comments on existing positive news articles of PoTrain.
3. **Administrators (A):** They need username and password to login. They have access to all system functions but, in addition they are entitled to create or erase user accounts and maintain control of the system use by the other user types (visitors and registered users). In addition, they have access to the system data and are authorized to add or update news articles, news channels, news categories, schools, countries, languages and users.



Figure 2. Types of Users

## 2.3 System Design

To meet both operational requirements and the specific requirements arising from different types of users of the system, such as those recorded in the previous section, we need proper planning of both the database supporting the application and the organization of information at dynamic Web pages:

### 1. Database Design

The design of the database supporting the Web application of PoTrain was based on the following criteria:

- (a) To capture system information according to its functional requirements.
- (b) To meet the support of different types of users who have different rights to access and configure information on the system.

- (c) To preserve system information consistency and integrity.
- (d) To support different character sets of different languages.

### 2. User Interface Design

Information in PoTrain is organized in a database. Presentation of this information is realized via dynamic Web-pages. The organization of the elements of each Web page meets the following criteria:

- (a) Homogeneous presentation with the logo of PoTrain, specific colors, specific fonts, etc. This way the user understands that any such Web page belongs to PoTrain.
- (b) Easy, uniform and in-formative presentation of options for the user at each Web page so he/she can easily locate the information he/she seeks through the system.
- (c) Informing the user's location at any time within PoTrain so that the user can navigate in it with ease and com-fort.

All pages of the system, depending on type of the user, are following a specific structure which is shown in the following Figures.

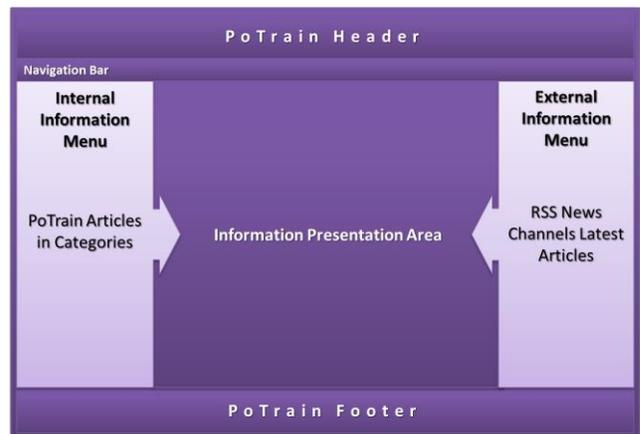


Figure 3. Web Page Structure for Visitors

Figure 3 depicts the structure of a typical Web page used for the user type 'Visitors'. It consists of the following elements:

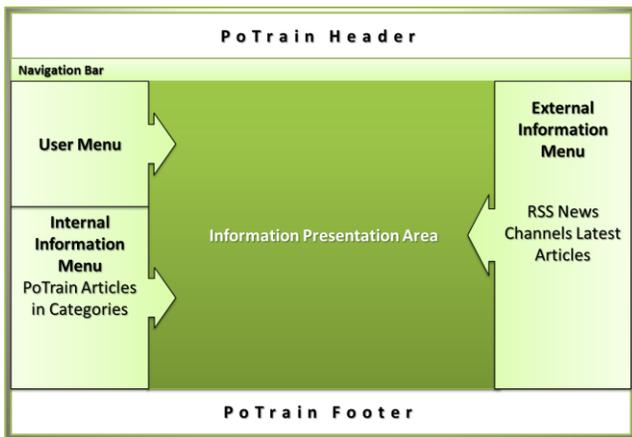
- 1) **Header and Footer:** They are common to all pages and include the PoTrain logo and links to relevant websites, such as the Technical University of Crete, or links for special actions, such as the translation of the current web page in a different language.
- 2) **Navigation Bar:** (You are here) Informs in any time about the user location within the site and the path that the user followed starting from the home page. Links to intermediate locations within the path are also provided.
- 3) **Menu on Internal Information:** It is the menu through which the user can choose to visit a part of the internal information of the system (i.e. the positive news articles). More specifically, through this menu the user has the ability to visit the existing positive news articles of a certain category of interest.
- 4) **Menu on External Information:** It is the menu through which the user can visit in-formation of external sources (i.e. news channels) that are relevant to the system. More specifically, through this menu the user has the ability to visit the latest news provided by a certain news channel.

5) **Information Presentation Area:** It is the area where the information selected through the two menus above finally appears.



**Figure 4. PoTrain Web Page for Visitors**

Figure 4 depicts a typical Web page of the system that follows the structure of Figure 3.



**Figure 5. Web Page Structure for Registered Users**

Figure 5 depicts the structure of a typical Web page used for the user type 'Registered Users'. It consists of all elements described in Figure 3. It also contains one more element:

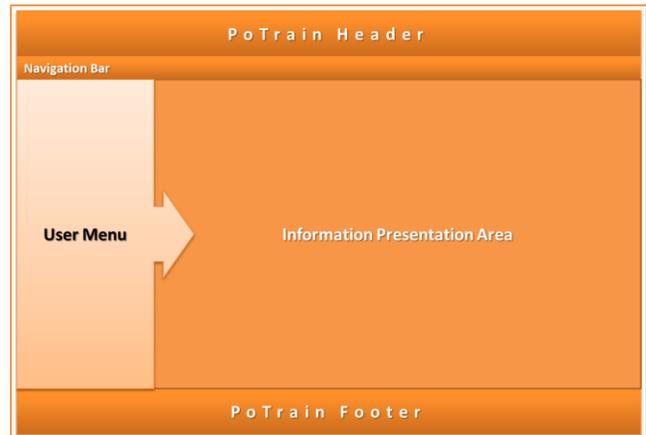
- **User Menu:** It is the menu through which a set of actions that concern the registered user can be chosen e.g. change account information, write a new article, etc.



**Figure 6. PoTrain Web Page for Registered Users**

Figure 6 depicts a typical Web page of the system that follows the structure of Figure 5.

For the presentation of the above elements, PoTrain uses specific colors, fonts, icons as well as distinct and concrete structure of the presented text so that the user can easily distinguish the selected information, and also be informed about the potential options provided from the current location within the site.



**Figure 7. Web Page Structure for Administrators**

Finally, Figure 7 depicts the structure of a typical Web page used for the user type 'Administrator'. In this case the structure is simpler and pays attention in the administrator's functionality which is the management of the PoTrain system information. This is accomplished through the use of two basic (already described) elements: *User Menu* and *Information Presentation Area*.

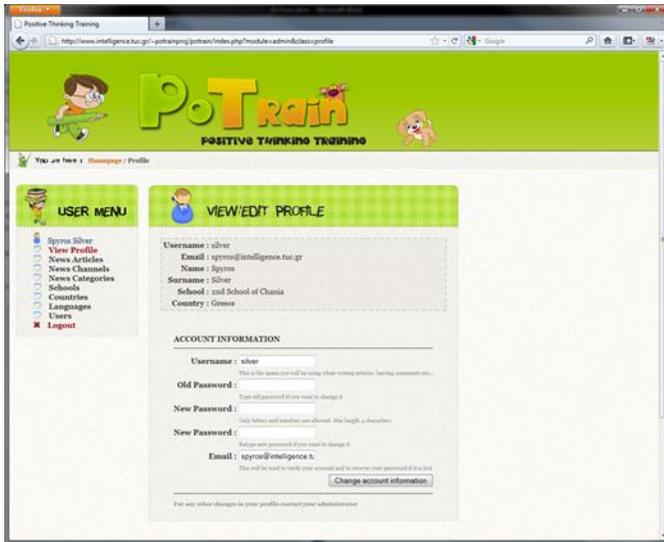


Figure 8. PoTrain Web Page for Administrators

Figure 8 depicts a typical Web page of the system that follows the structure of Figure 7. Through the 'User Menu' the administrator can make changes in his/her own profile or proceed with the management of the PoTrain users, news channels, categories, news articles and their comments, schools, countries and languages.

## 2.4 System Implementation

For the development of PoTrain the following technologies were used:

- *PHP scripting language*<sup>5</sup>, for the implementation of the system logic and data preparation.
- *HTML* for the Web presentation of the system,
- *Javascript language*<sup>6</sup> for the active components on the Web pages, such as the on-line help,
- *CSS technology*<sup>7</sup> for the Web pages layout, and
- *MySQL Relational Database Management System*<sup>8</sup> for the organization of information of PoTrain.

The principles of the Model-View-Controller (MVC) design pattern ([2], [3]) were followed for the implementation in PHP<sup>9</sup> of PoTrain. Model-View-Controller (MVC) is a software architecture pattern that separates the representation of information from the user's interaction with it. The model consists of application data and business rules, and the controller mediates input, converting it to commands for the model or view.

Finally, a news aggregator in PHP was incorporated in the system in order to collect news from the corresponding RSS news channels. News aggregator is a reader application that collects automatically web feed from different locations in a single location for easy viewing. A web feed is a document (often XML-based) whose discrete content items include web links to the source of

the content. News websites and blogs are common sources for web feeds.

## 3. CONCLUSIONS

PoTrain is a Web-based application for training students to search and collaborate with other students or their teachers in order to distinguish and highlight positive news articles. Enhancing PoTrain functionality towards a) active involvement of the 'teacher role' (as a special user type) assisting students in developing useful skills and positive way of thinking, b) search automatically on the Internet for spotting, suggesting and filtering positive news articles, and c) automatic categorization of existing news articles in one or more categories provided by the system, are important directions for future work.

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<sup>5</sup> <http://www.php.net>

<sup>6</sup> <http://en.wikipedia.org/wiki/JavaScript>

<sup>7</sup> <http://www.w3.org/Style/CSS/>

<sup>8</sup> <http://www.mysql.com/>

<sup>9</sup> <http://oreilly.com/pub/a/php/archive/mvc-intro.html>