

## **ALTERNATIVE PROFESSIONAL TRAINING USING IT SOLUTIONS**

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**ABSTRACT** *In the current economic context of Romania and especially in the difficult situation that mining areas are faced with, University of Petroșani aims to represent a powerful center for improvement, continuous training and reconversion of the labor force in these four counties. The project "Alternative professional training using IT solutions - a solution for reconversion of the labor force in the mining industry" could represent a solution, by developing modern and innovative methods of training based on an eLearning platform containing eight courses in a multimedia format. One of the professional training programs designed for qualify postgraduate unemployed persons is the IT consultant course. For collecting information that spot the training courses needs and competences we designed a questionnaire and distributed it to a number of employers, chosen as being the most significant within the prevailing mining mono-industrial regions. The final solution is a portal designed on a tree structure basis. The technical solution proposed for designing the <http://7.upet.ro/> portal was to use a Content Management System. We also used Info Path to design structured teaching scenario (teaching activities) and Edu Integrator to create reusable learning objects, and consequently the eContent for the IT consultant course, and the eLearning platform.*

**KEY WORDS:** *eLearning Platform; Learning Content Management System; Teaching Scenario; Learning Objects; IT Consultant Course.*

**JEL CLASSIFICATION:** *I23; J21; J62.*

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## **1. UNIVERSITY OF PETROȘANI A POWERFUL CENTER FOR IMPROVEMENT, CONTINUOUS TRAINING AND RECONVERSION OF THE LABOR FORCE IN THE ROMANIAN 2012 LABOR MARKET CONTEXT**

Under the conditions of an unprofitable, decayed industry, the economical reorganization led in the first years after 1990 to a massive industrial downfall, the investment level dropped and the labour market experienced a significant increase in unemployment and informal employment. To that end it is eloquent the fact that the percentage of employed persons in the industry from the total employed population has decreased dramatically since 1990 until 1999, the socio-economic impact being felt especially in mono-industrial areas of Romania. The impact was felt on the labour market through a significant depreciation of the employment rate of working age population (15-64 years) being considered alarming especially by comparison with the EU evolutions.

In the current economic context of Romania and especially in the difficult situation that mining areas within Hunedoara, Gorj, Vâlcea and Mehedinți counties, are faced with, University of Petroșani aims to represent a powerful center for improvement, continuous training and reconversion of the labor force in these four counties. University of Petroșani, as applicant and Mining Trade Unions Union Oltenia, the Trade Unions Federation Valea Jiului and SIVECO Romania SA, as partners, are implementing, starting with October 2010, the project "Alternative professional training using IT solutions - a solution for reconversion of the labor force in mining". The project has a 4954718 lei and a 3 years (34 months 1.10.2010 - 31.07.2013) implementation period, and is cofounded from the European Social Fund through the Sectorial Operational Program Human Resources Development 2007-2013. The University of Petroșani will elaborate 8 professional training programs for qualify 600 unemployed persons, along with the two trade unions partners, Union of Mining Trade Unions Oltenia and the Trade Unions' Federation Jiu Valley, and along with the leader of Romanian software houses, SIVECO Romania. The Project's objective is to increase the employment rate of the labor force in mining mono-industrial areas within the Jiu Valley and Oltenia, by attracting young unemployed and long term unemployed on the labor market, by developing modern and innovative methods for electronic e-learning type of training.

Besides other projects dedicated to human resource development already undertaken in the Jiu Valley, this project aims to open the door to IT&C technology and for those who have not yet penetrated. More specifically, it offers eight courses which specialized unemployed persons in IT related fields, for a period of three years. The project is based on one of the best existing electronic training collaborative portals throughout Europe. The training and educational portal will contain the 8 courses in multimedia format, accessible even after the face to face training sessions are ended, training courses will be held with traditional methods of training, but also training will be made trough the portal training. These facilities will help students more easily understand their occupation specific technologies, through access to simulation processes using multimedia tools. Subsequent participation in the course, students will

have access to the website of the course and the training collaborative electronic portal. In this way, they can deepen the knowledge gained by accessing the online digital courses.

## **2. ANALYSIS OF THE LABOUR MARKET IN THE WESTERN DEVELOPMENT AREA – JIU VALLEY COALFIELD**

### **2.1. Research Methodology**

For obtaining the required information, the proposed questionnaire outlines the evolutions of the labor market, collecting information about the major changes concerning production methods, new materials use and the implementation of projects or production teams applied by Romanian companies. We elaborated a questionnaire consisting of 24 questions and we distributed it to a number of 100 employers, chosen as being the most significant within the prevailing mining mono-industrial regions. (POSDRU/5.1/S/82, ID 59756)

### **2.2. Respondents**

For starters were identified 754 companies classified on 6 wide sections (Research Development and High Tech, Industry, Agriculture, Constructions, Trade and Tourism), 53 fields of activities and size classes (micro-enterprises, small, medium, large and very large enterprises). Data were taken from CCI Hunedoara. These 754 companies were chosen among the total of 11.637 commercial societies, cooperative societies or cooperative organizations, research institutes and autonomous administrations. Subsequent, we selected 5 fields of activity considered to have a high potential in creating new jobs: Tourism and Services – Hotels and Restaurants I, IT – Information and Communications – J, Professional Scientific and Technical Services – M, Constructions – F, Manufacturing Industry – D. Among these fields we tried to identify approximately 100 companies which have the highest turnover in these activity fields in Hunedoara County. In order to eliminate subjectivity we selected then the first 20 companies with the highest number of employees and the biggest profit. It is relevant to mention that the 5 fields selected are correlated with the fields in which we completed the 8 professional training courses. We focused on the Jiu Valley and we reduced the number of companies to 8 most representative. (POSDRU/5.1/S/82, ID 59756).

### **2.3. Results**

We tried to identify the necessary of occupations for the 8 organizations investigated, but due to the various activity fields in which they operate, just the Computer Aided Design operator occupation was identified as being needed in most organization. (20 occupations were proposed).

Enterprise	Required Courses					
	Mining	Marketing	Management	IT	EU Funds	CAD
SC D&D SAFE SRL						
SC CONSMIN SA						
COMPANIA NATIONALA A HUILEI	1					
GTS COMPANY SRL		1	1			
ICPMC - INSTITUT PROIECTARI		1		1	1	
SIP SA - PROIECTARE SERVICE		1				
CC INFO 98 SA - PROIECTARE SOFT				1	1	
GEROM INTERNATIONA SA						1

Figure 1. Required courses

Next, we tried to identify the training courses needs for these organizations, and this time the fields of marketing, IT and accessing the structural funds have prevailed. It is to be noted that the tourism field was not selected by any organization because in the Jiu Valley we could not identify too many companies with this sphere of activity.

We then identified the competencies most demanded by employers and hence we identified a shortcoming of the Romanian education system that puts no emphasis on communication and teamwork. Furthermore, lately the technical competencies have been treated with a lack of interest especially at pre-university level. (Furdui et al., 2011)

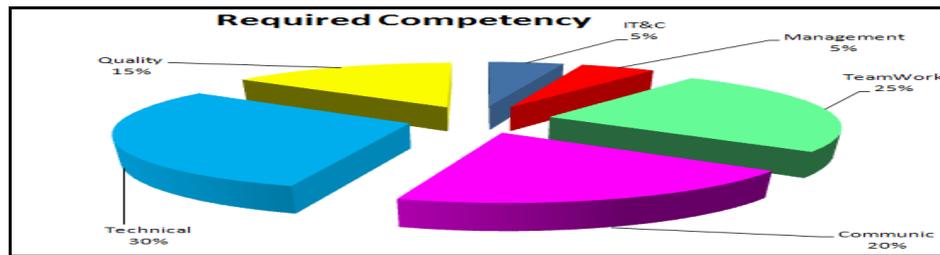


Figure 2. Required competencies

Another field investigated was that of the factors that influence regional development and in this case competitiveness and qualification hold important positions. (Furdui et al., 2011)

Enterprise	Importance for Regional Development				
	Investment	Competitiv.	Consultancy	Training	Turism
SC D&D SAFE SRL	1	1	0	0	1
SC CONSMIN SA	1	1	2	2	1
COMPANIA NATIONALA A HUILEI	2	2	2	2	2
GTS COMPANY SRL	1	1	2	2	1
ICPMC - INSTITUT PROIECTARI	1	1	2	1	2
SIP SA - PROIECTARE SERVICE	1	2	2	1	1
CC INFO 98 SA - PROIECTARE SOFT	2	3	2	2	2
GEROM INTERNATIONA SA	1	2	5	1	1
	10	13	17	11	11

5	very important
4	important
3	medium important
2	little important
1	no important

Figure 3. Importance for regional development

### **3. TOOLS FOR DESIGNING THE ELEARNING PLATFORM AND THE ECONTENT, AS A BASIS FOR A PROFESSIONAL TRAINING PROGRAM**

There is a large variety of tools used for eLearning and eContent such as the Content Management System named Drupal, and Learning Content Management System as AeL throughout InfoPath and Edu Integrator.

#### **3.1. Web Portal. CMS. Drupal.**

A content management system (CMS) is a computer system that allows publishing, editing, and modifying content as well as site maintenance from a central page. It provides a collection of procedures used to manage workflow in a collaborative environment. In a CMS, data can be defined as nearly anything: documents, movies, text, pictures, phone numbers, scientific data, and so forth. CMSs are frequently used for storing, controlling, revising, semantically enriching, and publishing documentation. Serving as a central repository, the CMS increases the version level of new updates to an already existing file

Our <http://7.upet.ro> portal was designed on a tree structure basis and contains the main sections and their subsections. These compose the main menu. Each menu item is associated with an article or a listing of items.

Drupal is a content management system. Drupal Suite is a set of tailored solutions that meet needs of different sectors to maximize the productivity of web portal. Its goal is to help users compose and present web-site content such as articles, photos, and other content types. Rather than forcing users to specify a fixed, pre-declared arrangement of content, Drupal takes care of the details of how information is arranged and presented, and lets users focus on the actual content to be displayed. Most of the content on a Drupal-based site is stored in a database. Text and images are submitted by filling in forms via a web browser. When visitors view a page, Drupal gets the relevant bits of content from the database and composes all of the components of the page in a template. This makes it easy to quickly add or change content, without requiring knowledge of HTML or other web technologies on the part of the person providing the content. Drupal is an extremely flexible system that allows you to create a wide variety of websites.

There are two hosting features that are essential to building a Drupal site. The MySQL which is a database system that stores all of the essential information about the configuration and content of the site, and the PHP software that provides the necessary functions for the Drupal software code to run on the website.

#### **3.2. AeL as a Learning Content Management System. Developing teaching scenarios in Info Path. Designing learning objects in Edu Integrator.**

The AeL is a Learning Content Management System that combines the administrative and managerial dimensions of AeL LMS with eContent creation and administration. AeL authoring tools can help users to build the content needed, according to the training objectives of the organization. SIVECO team has a strong

expertise in developing eContent according to the needs of the clients, their training objectives, training curricula, and specifications. AeL eContent is SCORM and MathML compliant, developed as RLOs (Re-usable Learning Objects) that can be assembled to create new or adapted courses. AeL is a modern eLearning solution, offering facilities for management and presentation of various types of digital content such as educational interactive multimedia content, interactive guides, exercises, simulations and tests.

The eContent will be developed with InfoPath as an application for development of scenarios and Edu Integrator as a software for converting scenarios in lessons as learning objects.

Microsoft Office InfoPath can be used in different scenarios that can scale from simple, ad hoc forms, to highly managed centralized forms solutions. Microsoft FrontPage designs Web pages, while Microsoft Internet Explorer displays them. InfoPath does both—it both designs and displays XML forms. The main advantage of using InfoPath as a tool to create forms is that it allows you to rapidly create a form and has native support for validation. When we design a form template (.xsn) file, we create a single file that contains multiple supporting files. Conversely, when users fill out a form, they are actually filling out a form (.xml) file, which is based on a form template.

Edu Integrator enables the implementation of the script done in InfoPath. Lessons are organized in independent learning units, each unit being divided in turn into several screens - frames. Each screen is built by concatenation - using instructional design principles of learning items. These learning items are: text, additional sources of information (Web address), images, maps, charts, audio, animation, simulations, interactive materials, problem solving, educational games, tests.

#### **4. RESULTS. ELEARNING PLATFORM FOR A POSTGRADUATE TRAINING PROGRAM - “IT CONSULTANT”**

##### **4.1. IT Consultant Profile**

The IT consultant is a postgraduate training program. An IT consultant works in partnership with clients, advising them how to use information technology in order to meet their business objectives or overcome problems. Consultants work to improve the structure and efficiency of an organization's IT systems. Hiring in consultants to perform specific functions over an agreed period of time is often referred to as ‘outsourcing’. IT consultants work in a range of sectors, including manufacturing, financial services, the public sector, health, and transport, to name a few. Clients include automotive firms, global investment banks and utility companies. The growth in e-services within the public sector has created an increase in consultancy projects linked to central and local government departments. (Draghici et al., 2011)

## 4.2. Designing the eLearning Portal

The technical solution proposed for designing the <http://7.upet.ro/> portal was to use a Content Management System (CMS). A CMS is a system used to organize and facilitate the creation of web content. This platform facilitates the administration and logistics visual content of a portal. Our portal the following specifications: location - <http://7.upet.ro/>, PHP - version 5.2.x, Server application- Apache 2.2.x and data base - MySql 5.x.

[http://7.upet.ro/ael/admin\\_cursuri/creare\\_curs\\_adm\\_trainer.jsp](http://7.upet.ro/ael/admin_cursuri/creare_curs_adm_trainer.jsp)

**Figure 4. Learning Management System**

The lesson moment is a file in which information are grouped thematically, which can not be shown separately. It can contain multiple sub-moment for analysis, understanding and interaction. The sub-moment of the lesson is a frame from the lesson moment.

We will present a sample for one competency required for the IT consultant – Team Work. Stages as designing the lesson plan, the scenario and the eLearning lesson were used for designing the full training program. The Romanian version of the training program is available on the project site.

## 4.3. Designing the lesson plan

Moment 4

Contains		Description	
Moment name:	Team Work		
Time:	1 min	Meets educational objectives:	Yes
Moment description:			
Frame 1 (Sub – moment)			
Steep			
Learning Item	Detailed description		
Text	Members of the team must consider the goals and team values, to determine		

	which types of information they need to assess potential risk levels and decide which of those levels can be accepted. For the accomplishment of work to implement a new IT applications, the operating organization or in a different organization, IT consultant will be able to identify team members extended, which can be: head hierarchical consultants from other computer companies, colleagues of the department or other departments, marketing specialists (Draghici et al., 2011)
Moment 4	
Frame 1	
Graphical requirement	

Figure 5. Moments and Frames of a Lesson – Lesson Plan

#### 4.4. Designing the scenario

Info Path allows structured teaching scenario (teaching activities) from the perspective of integrating several facilities offered by IT&C such as text, hypertext, web pages, images, audiovisual materials, animations, simulations in a lesson. Teaching scenarios are developed step by step, considering the different moments of a lesson. For each point of the lesson we can specify exactly interactive component that we want to use. This mode allows us to have a clear vision of the script, being able to revert to a specific sequence to optimize it. (Halstead et al., 2004)

<pre> Moments&gt;   &lt;MomentName&gt; Team Work &lt;/MomentName&gt; = &lt;Frames&gt; = &lt;ContentText&gt; = &lt;ContentTextItems&gt;   &lt;ContentTextDescription&gt;Members of the team must consider the goals and team values, to   determine which types of information they need to assess potential risk levels and decide which   of those levels can be accepted. For the accomplishment of work to implement a new IT   applications, the operating organization or in a different organization, IT consultant will be able   to identify team members extended, which can be: head hierarchical consultants from other   computer companies, colleagues of the department or other departments, marketing   specialists&lt;/ContentTextDescription&gt;   &lt;tg_ContentText&gt;2&lt;/tg_ContentText&gt;   &lt;/ContentTextItems&gt; = &lt;ContentTextItems&gt; </pre>
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Figure 6. Teaching scenario in Info Path (XML)

#### 4.5. Designing the eLearning lesson

Edu Integrator allows users who do not have programming knowledge to create their own reusable learning objects. The two stages of IT development are brought together in a single user environment, based on a default scenario, is able to create learning objects by linking items that has set in the script. (<http://ticavansat.pmu.ro/>)

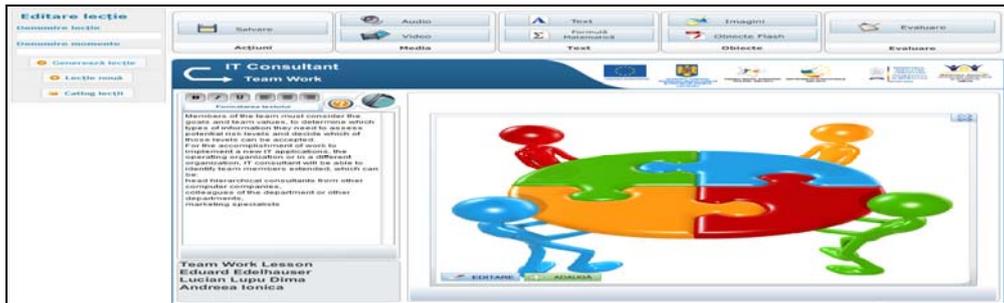


Figure 7. AeL Editor (moment.php) in EduIntegrator



<http://localhost/indexMoment.html>

Figure 8. AeL Index Moment in EduIntegrator

The workspace is divided into three areas: the first area is to in the left of the screen and contains scientific information; the second area occupies most of the screen and can contain pictures, animations, simulations, exercises and so on; the third area is on the left foot of the screen and provides guidelines for users.

#### 4. CONCLUDING REMARKS

The Project's objective is increasing the employment rate of the labor force in mono-industrial areas in mining from the Jiu Valley and Oltenia, by attracting young unemployed and long term unemployed, on the labor market, by developing modern and innovative methods for electronic e-learning type of training. The strategic multiregional Project - selected within the Sectorial Operational Program Human Resources Development 2007-2013, cofounded from the European Social Fund, will be developed in the West and South - West regions, in the counties Hunedoara, Gorj, Vâlcea and Mehedinți, where the reconversion of the mining labor force is necessary.

One of the professional training programs designed for qualify postgraduate unemployed persons is the IT consultant course. The constant pressure of deadlines and client expectations is extremely stressful for computer consultants. With the demand for skilled IT professionals increasing around the world, and the increase in the number and type of consulting companies, the employment options available for computer consultants are increasing. IT consultants are used to provide strategic guidance to organizations with regard to IT technology, IT infrastructures and the enablement of major business processes through enhancements to IT. They can also be used to provide guidance during selection and procurement as well providing highly expert technical assistance, and may be responsible for user training and feedback. The eLearning web portal was designed using a CMS named Drupal Suite and the eContent was developed with InfoPath as an application for development of scenarios and Edu Integrator as a software for converting scenarios in lessons as learning objects.

## 5. ACKNOWLEDGEMENT

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