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IT SUPPORT FOR MANAGING THE ECDL TRAINING AND EXAMS

Abstract
Faculty of Economics Subotica has been, for two years now, certifying students in the field of information technology according to the European standards and by applying ECDL concept thereby providing its students with the opportunity to acquire knowledge during their studies which enhances productivity manifolds in businesses where computer assistance is used. On the other hand, acquiring these skills enables easier employment both in the country and abroad. This study describes the model which is used by the Faculty of Economics Subotica in order to implement training and testing of students according to the ECDL concept, as well as the Internet application developed at the faculty with purpose of promoting activities related to the ECDL at the faculty and resolve problems which appeared during the realization of the ECDL project at the faculty.

Keywords
ECDL, Internet application, Information system

ACM classification
K.3 COMPUTERS AND EDUCATION, K.3.2 Computer and Information Science Education

JEL classification
M1 – Business Administration, M15 – IT Management

Using the surveys conducted in Norway, Sweden, England and Finland we came to very indicative information, that computer users spend 38 minutes a day solving their own and other people's problems in the field of information technologies due to the lack of the appropriate PC skills. It is very simple to calculate that it amounts to 3 hours a week, i.e. 20 working days a year. According to such survey results, companies having 1000 employees who use computers daily in their line of work can expect a loss of even up to € 4.5 million annually, which makes a significant risk in a company life cycle. As a reaction to the mentioned survey results, there was a creation of a standardized training process, internationally acknowledged certificate, made up from seven relevant areas of information technology, and by mastering those users acquire basic knowledge in information technology, and in that way increase productivity in the computer using process, and therefore productivity of the company they work for. Faculty of Economics Subotica, having in mind the mentioned facts, has been implementing student education according to the ECDL standard for two years now, and all with the primary goal of providing primarily its students with the benefits offered by the ECDL certificate. With respect to the fact that a great number of students has now started the process of certification, and that consequently there are some problems burdening the process of the ECDL program implementation, such as student - office communication is more difficult, great administrative demands etc., Internet application has been developed primarily to resolve the identified problems appropriately, and with the function of efficiency and promotion to accompany all the activities connected to ECDL project implementation at the Faculty of Economics Subotica, as well. This study gives an overview of the process of ECDL project implementation at the Faculty of Economics Subotica, as well as a brief description of the Internet application developed for the support and improvement of activities connected to certification according to the ECDL standard at the Faculty of Economics Subotica.

1. IMPORTANCE OF ECDL PROJECT IN THE WORLD

ECDL (European Computer Driving License) project was initiated by CEPIS in 1997 when the ECDL foundation was established, global governing body for implementation of the ECDL project, with head office in Dublin. The final products of the ECDL project are the ECDL certificates which enable professional use of information and communication technology. The countries outside of Europe quickly recognized the benefits of the ECDL project and started to implement it. Today, 10 years later, the ECDL standard is accepted in 147 countries worldwide, where according to data from year 2006 there is 6 million people who earned the ECDL certificate, while it is estimated that in the next four years another 20 million people who are in the certification process will be certified.

1.1. ECDL CERTIFICATE AT THE FACULTY OF ECONOMICS SUBOTICA

The faculty management has, according to the current trend and results of the ECDL project in the world, noticed the significance and advantages that it brings. The main motive for making the decision to approach this kind of certification was to coordinate the computer education standards with the standards of education in the European Union and to enable its students to acquire an internationally accepted certificate while being at college, and acquire a higher level of computer literacy in the process. In October 2005 Faculty of Economics Subotica became the authorized ECDL testing center and has been providing training and testing according to ECDL standard ever since. ECDL Core certificate which students can earn at the faculty is one of the ECDL products and consists of a total of seven separate areas (modules) from the domain of information technology:
Module 1 - Concepts of Information Technology (IT)
Module 2 - Using the Computer and Managing Files
Module 3 - Text Processing
Module 4 - Spreadsheets
Module 5 - Databases
Module 6 - Presentations
Module 7 - Information and Communication
Contents of the relevant subjects have been coordinated with the plan and program according to the ECDL standard in the following way:

1. Information technologies
   - Module 1 Concepts of Information Technology (IT)
   - Module 2 Using the Computer and Managing Files
   - Module 3 - Text Processing
2. Management Information Systems
   - Module 7 - Information and communication
3. Databases
   - Module 5 - Databases

This model has enabled students to acquire theECDLStartcertificate during the coursework; they only need to pass the test for any four modules. If they want to, the students can pass the remaining three modules and earn theECDLCorecertificate which requires all seven modules to be passed. The implementation of this model has produced significant results in less than two years. There are about 1200 students in the process of certification which makes the Faculty of Economics Subotica one of the largest ECDL test centers in the Republic of Serbia. However, in the process of implementing the ECDL project in at the faculty the previous two years certain problems have been identified which significantly burden the process of implementation. As a response to identified problems an Internet application was developed under the name "ECDL Faculty of Economics Subotica".

2. GATHERING AND ANALYZING THE INFORMATION REQUIREMENTS

During the process of gathering information requests interviews with the appropriate persons, who are actively involved in the process of implementing the ECDL program at the Faculty of Economics Subotica, were performed. The most important segment of the interview that the application features were based on, are the problems of stakeholders which are at the same time inputs for analysts. The problems which were identified by the ECDL coordinator and the key

stakeholder, and which at the same time are hindering the implementation of the ECDL program at the Faculty of Economics Subotica are the following:

- The lack of uptodate information regarding the implementation of the ECDL program on the Faculty of Economics Subotica, which should be available to the faculty students, and to the potential students as well,
- Workload of the ECDL administrator, having in mind the large number of ECDL students and their data which needs to be recorded in the database after they decide to enter the process of the ECDL certification,
- The only option for the candidates was to visit the ECDL office during the working hours in order to get the testing results, testing schedules, course times etc.
- The data of the registered users being outdated (which is changeable in real life) such as telephone number, place of residence, email, ECDL courses that the student wants to attend.

When the ECDL coordinator was analyzing the identified problems two aspects were taken into consideration.

First aspect treats the technology which should be used for building the application. Features which the application should have in order to solve the identified problems points to the usage of the Internet. The second aspect treats the features which the application should have. Namely, by careful analysis of the identified problems the desirable application features were determined in order for the process of implementing the ECDL to be enhanced. Below is a tabular display (Table 1) of identified problems (organized in rows) and application features (organized in columns) where it can be clearly noticed which application features resolve the identified problems.

3. FRAMEWORK AND TECHNOLOGICAL ASSUMPTIONS

As it was already mentioned the application "ECDL Faculty of Economics Subotica" was built using internet technology. Concerning the framework, it is a fact that the LAMP framework is currently dominating the web industry, used hosting, as well as for the development of low cost, reliable and secure web applications; it is also used by the IT department of the Faculty of Economics Subotica, which greatly influenced its selection. The

Table 1: **Application features which resolve inentified problems**

	Input of notifications and results	Student registration	Listing of notifications and results	Updating students data	Logging into the system
Lack of Information	←		←		
ECDL Administrator Workload		←		←	
Arrival of candidates during working hours		←	←	←	
Data being outdated				←	
Privacy of data					←

Table 2: **Application Software Platform "ECDL the Faculty of Economics Subotica"**

Operative System	Linux FreeBSD 5.0
Web server	Apache 2.0
Server Side Scripting Language	PHP 5.0
Presentation Layer Languages	HTML and CSS
Database Management System	MySQL 5.0
Client Side Scripting Language	JavaScript

software platform which was utilized in building the application consists of the following components displayed in Table 2.

When defining the functionality for modeling the system Use Case diagram was used, and UML segment which is accepted as the standard for system modeling by the leading international IT companies. For the detailed description of the Use Case diagram the UML diagrams of activities were used, while the potential scenarios of the activities diagram were described textually.

4. IDENTIFYING THE KEY FEATURES OF THE APPLICATION

Apart from the mentioned features listed in the Table 1 the analysis of the informational requirements revealed the additional features which the application should posses. UML Use Case diagram was used to display all of the application key features displayed in Figure 1, while the Use Cases are concisely described in Table 3.

4.1. DESCRIPTION OF THE USE CASE AND PARTICIPANTS

For the detailed description of the application features, i.e. for working out all of the use cases, a very practical UML activity diagrams were used, while the potential scenarios within each activity diagram were described textually. The activities diagram is displayed below for one chosen use case: recordings of the username and password of new students.

4.2. ACTIVITY DIAGRAM AND DESCRIPTIONS OF POTENTIAL SCENARIOS

4.2.1. *THE DESCRIPTION OF POTENTIAL SCENARIOS*

The page for recording usernames and passwords appears only after logging in as

Figure 1: **Use Case diagram of all application features**

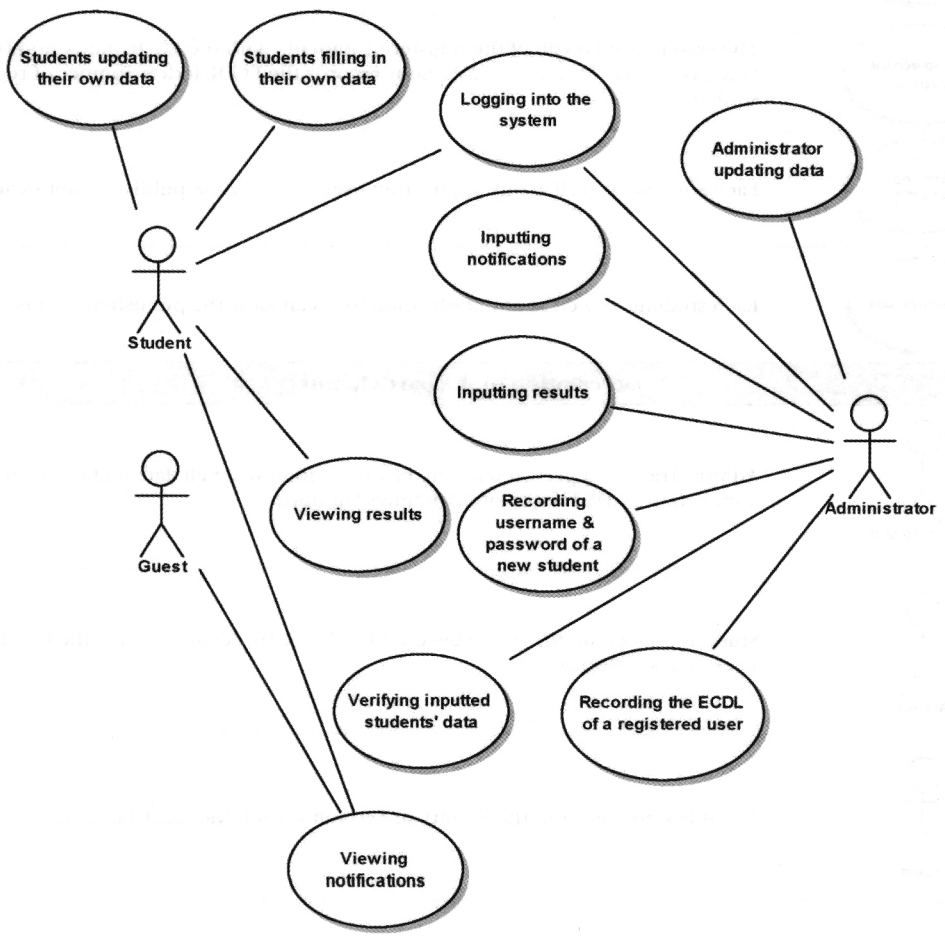


Table 3: **Use Case Description**

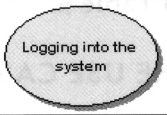
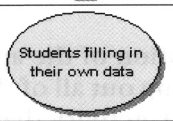
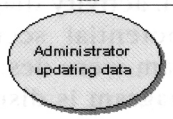
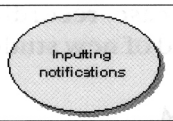
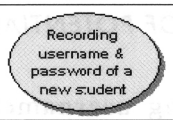
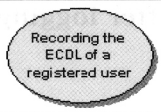
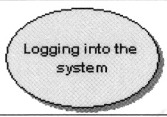
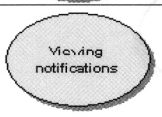
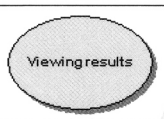
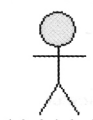
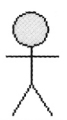
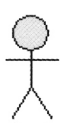
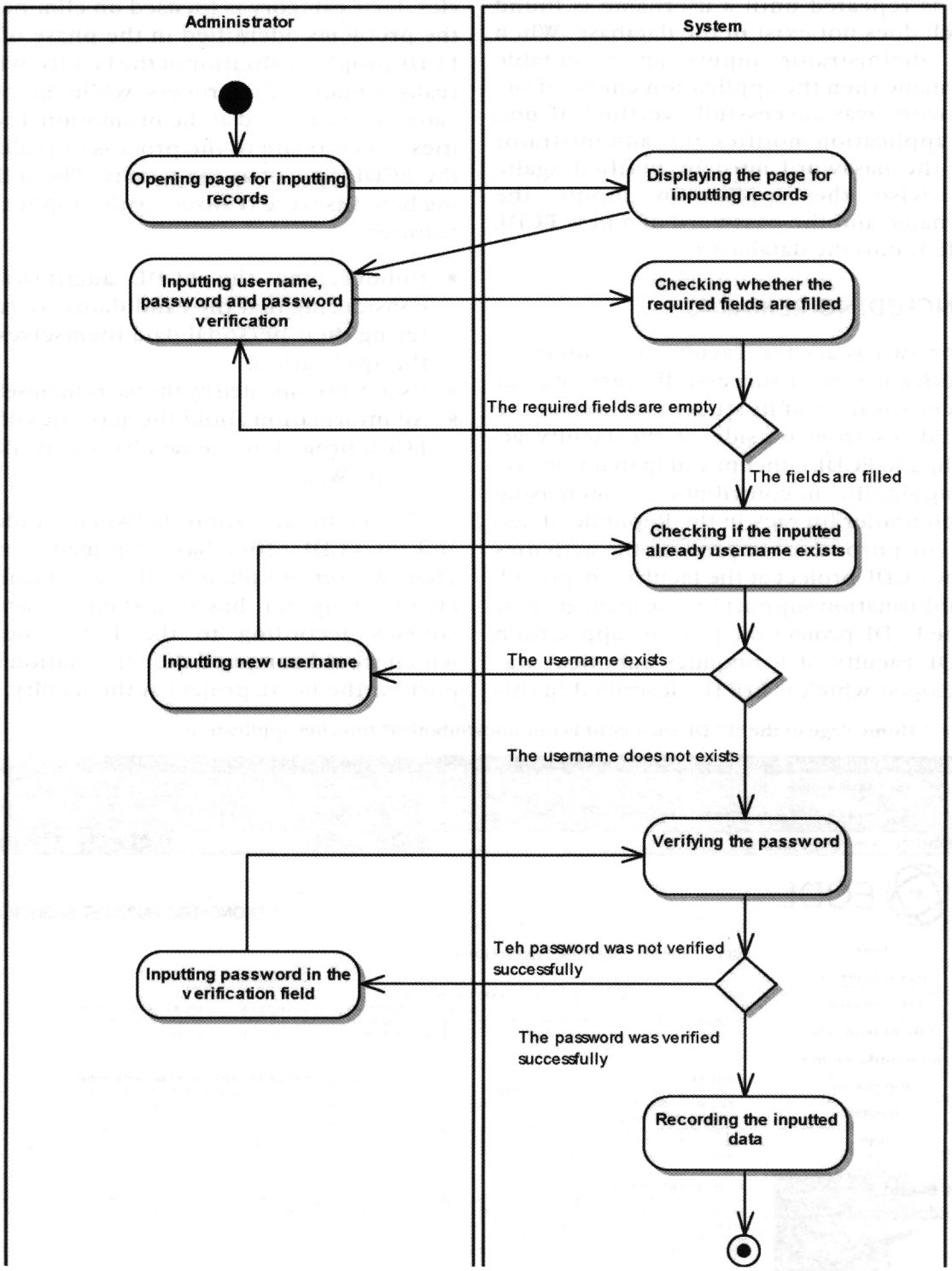
	In this part of the application the candidate or the administrator inputs the username and password. After the check, depending on the type of user, appropriate user interface is shown with the appropriate application functionality.
	After logging into the systems each user needs to fill personal data that are required by the application.
	The student data can be modified by the student, but there are limitations when modifying student data since the user can only change data which can change in the real life.
	The students' data can be modified by the administrator. The administrator can modify all of the students' data.
	System administrator inputs new notifications about the ECDL activities at the Faculty of Economics Subotica.
	System administrator inputs the results of the ECDL exams performed at the Faculty of Economics Subotica.
	System administrator records the username and the password of a new student, after the student decides to register for the ECDL certification.
	The system displays all of the registered students with the ECDL index number not being recorded. System administrator records the ECDL index number of registered student.
	Each student, as well as any application user can view the published notifications.
	Each student, as well as any application user can view the published results.
Description of the participants	
	Administrator is a person with the power to administer all data that exists in the application ECDL Faculty of Economics Subotica.
	Student is a person that has registered for the ECDL certification at the Faculty of Economics Subotica.
	Guest is a person from the Faculty of Economics Subotica surroundings.

Figure2: Activity **diagramfor usecase: recording of username and password of a new candidate**



the administrator. The administrator opens the page for recording usernames and passwords of new students. The page displays a form with the appropriate fields. The administrator inputs a username, a password and verifies the password. Client side script is checking whether the required form fields are filled. If they are not, it informs the user about which ones are empty. Otherwise it checks the inputted data. Then it is checked if the username exists in the database. If the username does not exist, the application notifies the administrator that the student cannot be registered with the inputted

username and asks for a new one. This process is repeated until a username is found which does not exist in the database. When the administrator inputs an acceptable username then the application checks if the password was successfully verified. If not, the application notifies the administrator that the password must be verified again. Otherwise the application inputs the username and the password of a new ECDL student into the database.

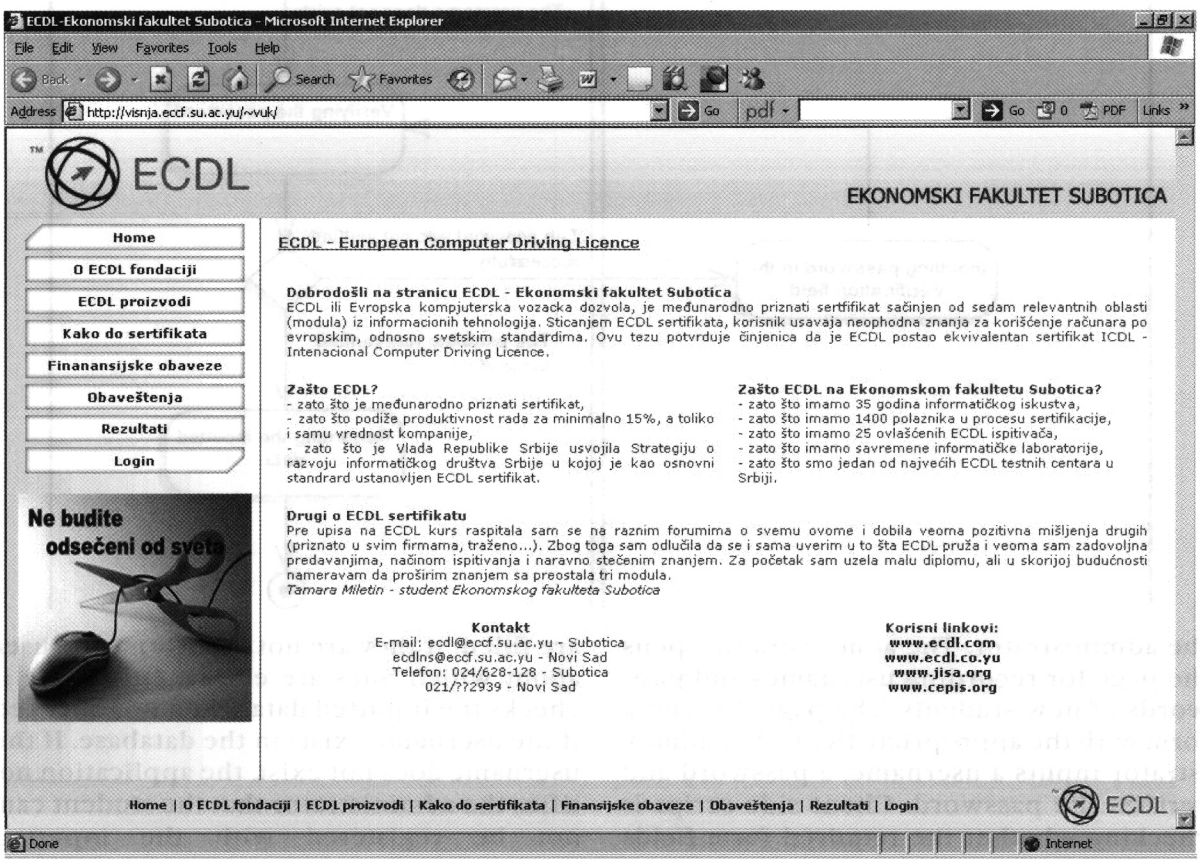
CONCLUDING REMARKS

For two years the Faculty of Economics Subotica has been successfully carrying out the certification of its students as well as the candidates from outside of the faculty according to ECDL concept and in that way providing significant contribution in increasing the computer literacy in the Republic of Serbia. For purpose of improving the activities of the ECDL project at the faculty, i.e. providing information support for the management of the ECDL project the Internet application "ECDL Faculty of Economics Subotica" was developed which is briefly described in this paper. The goals are divided into two categories. First category is focused on eliminating the problems, identified in the phase of the ECDL project realization at the faculty, which really hindered the process, while the other category is directed at the promotional activities which relate to the process of realizing the ECDL project at the faculty. The following benefits were realized by the application features:

- Unburdening the ECDL administrator considering that the candidates are registering their personal data themselves via the application,
- User data is updated by the users themselves,
- All information about the activities of the ECDL project at the faculty are available on the Web,

The communication between students and the ECDL office has been made easier. There are serious plans for the near future to create computer based distance learning courses according to the ECDL outline which would complete the information support for the ECDL project at the faculty.

Figure 3: **Home Page of the "ECDL Faculty of Economics Subotica" Internet application**



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Biography:

Saša Bošnjak is a associate professor of Computer Science at the Faculty of Economics Subotica. He holds a range of courses in information engineering. His research interests are database, softweare development, reuse methodology, ebusiness and internet teshnology. He earned a PhD degree in Information Systems Faculty of Economics Subotica in 1995.

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