

# Managing PhD promotions and register of doctors in CRIS UNS

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*Abstract*—Paper presents the module for managing and organizing PhD promotions at the University of Novi Sad. The module is integrated into CRIS UNS (Current Research Information System University of Novi Sad) that is based on international standards of representing research data. The module is implemented as web application and supports the process that begins with selecting candidates (from CRIS UNS system) for several forthcoming promotions, following by managing the lists of selected candidates, printing necessary information, and finishing with entering the promotion date, updating the list of all candidates promoted at the University for input into the official register.

## I. INTRODUCTION

Promotion of the PhDs is a ceremonial act in which the Rector of the University promotes the candidates into doctors. For each promotion the officials at the Rectorate prepare a list of candidates that have defended dissertation in the certain time period before the scheduled promotion. The process of selecting candidates for promotion as well as updating the official register of the promoted doctors are automated and implemented within the web application of CRIS UNS.

CRIS (*Current Research Information System*) based on CERIF data model (Common European Research Information Format) is meant for processing all relevant entities of research activity and is considered very important for the development of science [1]. CERIF (Common European Research Information Format) is the standard that proposes the data model that allows the interoperability among research management systems [2]. The CRIS systems support entities that contain data about researchers, projects, scientific conferences, institutions, published results, etc. In the last couple of years, the most scientific institutions already have or are in the process of implementation of the CRIS system.

The system CRIS UNS [3,4] was developed for the needs of the University of Novi Sad according to the recommendations of non-profit organization euroCRIS (<http://www.eurocris.org/>). The implementation of the system started 2009 and it is publically available at <http://www.cris.uns.ac.rs/>. Two main requirements for the specification and implementation of the system were the compliance with the international standards in the field of representing scientific-research data on one side and fulfilling the local requirements specific to the University and Republic of Serbia within which the University was established. Moreover, the CRIS UNS is

implemented as web application using Web 2.0 technologies for creation of user-friendly interface.

Among other types of scientific results, CRIS UNS supports the repository of dissertations defended at the University of Novi Sad that is integrated with the ETD-MS-compatible repositories as described in the papers [5,6,7]. Migration of data from the former dissertation repository DIGLIB UNS was described in the paper [8]. The ontology for presenting data about thesis and dissertation in the Semantic Web technology is given in [9]. Public service for searching repository of dissertations defended at the University of Novi Sad is available at:

<http://www.cris.uns.ac.rs/searchDissertations.jsf>.

The promotion of the dissertation and candidate is the very last step of the dissertation lifecycle that starts with the submission of the dissertation by the student. More details about this process are given in the next section. In the third section we give the use case diagram that describes the functional requirements of the module for organizing promotions. The data model that is behind the module and input parameter to official register is presented in fourth section. The implementation and screen forms are described in fifth section. The main purpose of implementation the module for managing dissertations and promotion is the implementation of the official registry of doctors that is described in sixth section. At the end, we provide some conclusions and summary of the work presented in the paper.

## II. PROCESS OF COLLECTING DATA FOR PROMOTION

The procedure of submitting and defense of the dissertation consists of the well-defined steps and involves several entities, and these are Student service of the Faculty, the Faculty Council, the University Senate and the commission for evaluation and defense of the dissertation. For some steps in this process the data about the candidate and the dissertation are entered in CRIS UNS and in that way become available in the module for promotion.

After student finishes his/her dissertation, he needs to hand in the printed and electronic version of the dissertation to the Student service of the Faculty on which the dissertation is going to be defended. Student service then sends the request to the Faculty Council to establish the commission for evaluation and defense of the dissertation and the dissertation is handed to the commission members. After some time period, the

commission writes the evaluation report and submits it to the Student service at the Faculty.

By receiving the report, Student service enters some data about dissertation to the digital library within CRIS UNS including dissertation metadata such as author's name, the language of the dissertation, title of the dissertation and scientific field. The institution on which the dissertation is going to be defended is also stored in the CRIS UNS database and is obtained from the user account as the user form the Student service at the Faculty have to be logged in for entering these data. In addition to entering metadata, the Student service uploads the electronic version of the dissertation and the commission report for a public review. The documents are publically available in CRIS UNS web application for 30-day period.

After 30 days Student service sends the commission report to the Faculty Council together with the remarks and comments received during the public review. The Faculty Council then makes the decision about accepting or rejecting the report, or to require the review of the report. The Faculty Council sends the decision to the Student service. If the decision is accepting or rejecting (with the explanation) the commission report, then the Student service sends the report to the University Senate. If Senate gives the agreement on commission positive report about the quality of the dissertation, the student

can defend dissertation, and the public defense is scheduled by the Student service.

If student successfully defend the dissertation, the Student service at the Faculty enters in CRIS UNS all necessary information for digital library and all data for promotion and the register.

In the described procedure, all metadata necessary for the organizing promotion become available in CRIS UNS and are further processed by the module that is the subject of this paper.

### III. FUNCTIONAL REQUIREMENTS OF THE PROMOTION MODULE

Figure 1 shows the use case diagram that describes the functional requirements of the module for scheduling promotions.

The Rectorate official in charge of organizing promotions selects the candidates for promotion using the metadata entered by the Student services at the Faculties on which the dissertations were defended.

The system needs to support creating several lists for several forthcoming promotions. The lists are created by selecting candidates from the list of all candidates that have been sent to promotion by the Faculties. The lists are created over time, so the user can save the list and finishes it later.

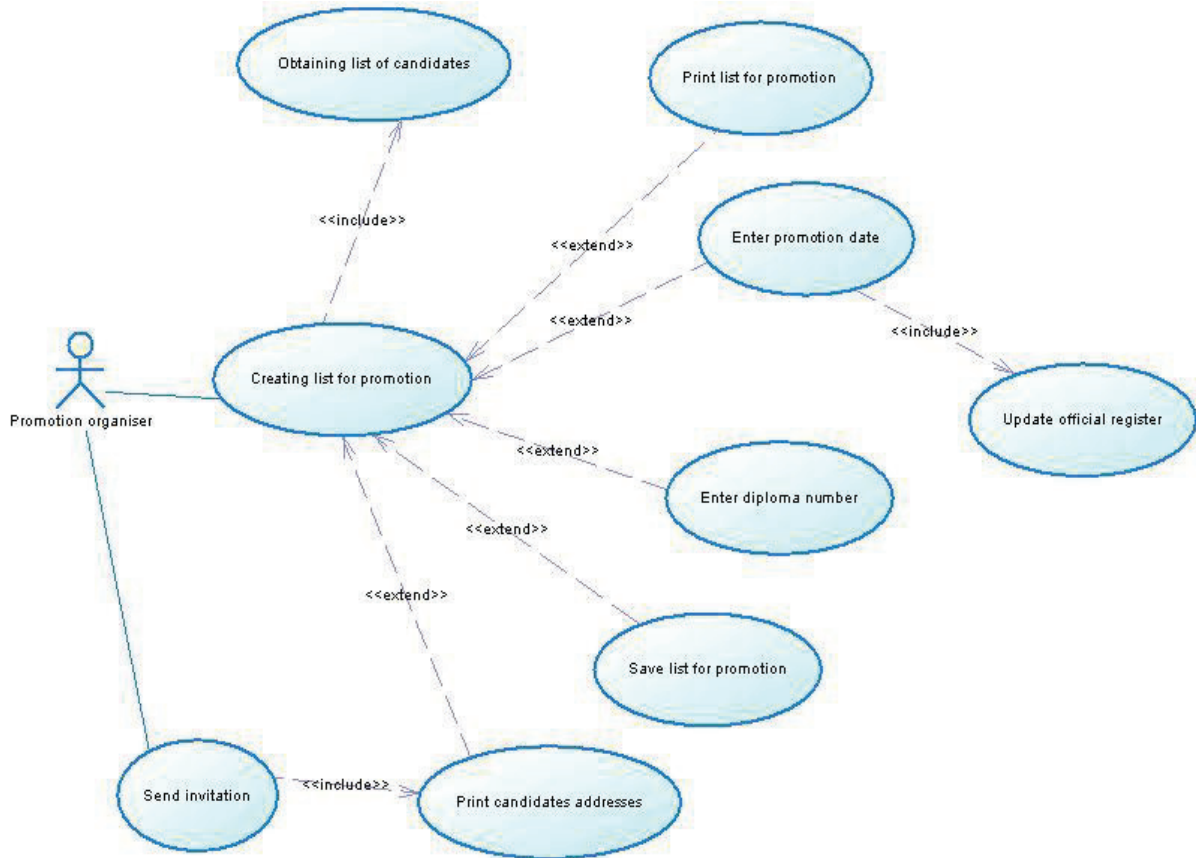


Figure 1. Use case diagram of the module for organizing promotion

The created lists for promotion are also used for gathering data for sending invitations and official records, so system needs to support printing the list for promotion and printing addresses.

For some candidates, and these are students that have defended PhD thesis by old program without finishing PhD studies by Bologna declaration program, diploma numbers are entered in this module. For other candidates, diploma numbers together with the supplement numbers are entered in CRIS by the Faculties.

After the promotion ceremony, the process is finished by entering the promotion date for the candidates that were promoted and updating the register of doctors.

#### IV. METADATA ABOUT DEFENDED DISSERTATION – REGISTER ENTRY

For the implementation of the register as well as the module for organizing promotion at the University of Novi Sad the CRIS UNS data model [3] was extended by one more entity called RegisterEntry. This entity represents metadata about dissertation and author himself.

The data about author are his/her first and last name, mother's and father's name or guardian's name, date and place of birth.

The special properties are reserved for candidate's previous education such as the name and place of the previously graduated institution and name of author's previous academic degree (before PhD). The author's academic degree differs in case he has finished the old program (magister) or new program by Bologna declaration (master).

In addition to information about author, the RegisterEntry entity contains data about dissertation including title of the dissertation, name and place of the institution on which the dissertation was defended, advisor(s) and commission member, date on which dissertation was defended and academic degree obtained after dissertation defense. The special property is reserved for the CRIS UNS control number of the dissertation, identifier of the dissertation as a scientific result within CRIS. In case of a new program, i.e. PhD studies, the candidate gets the mark on public defense which is also stored in the RegisterEntry entity.

As was mention in previous section, the input of the diploma number also depends on the program. If candidate has finished PhD studies by the new program, the Student service on the Faculty enters the diploma number together with the supplement number. In case of old program, the official in the Rectorate in charge of promotion enters the diploma number. These pieces of information are stored in different properties of RegisterEntry.

Properties that are especially important for the promotion module are contact details of the candidate that are used for sending invitations, and these are street and number, place, postal code, city, country, email and phone number.

The system supports managing several forthcoming promotions and one property is reserved for the name of the future promotion. The property is defined as arbitrary string and user usually enter the date or the month of the future promotion.

After the promotion, the promotion date is stored in the related property.

Some properties are especially important for updating and generating register, and these are:

REGISTERENTRYID – ordinal number of the dissertation in the register,

ACADEMICYEAR – academic year in which the dissertation was defended,

ACADEMICYEARNUMBER - ordinal number of the dissertation within the academic year.

#### V. IMPLEMENTATION AND SCREEN FORMS

CRIS UNS system is implemented as web application using Web 2.0 technology. Other technologies used for the implementation are Java for the business logic and implementation of data model, Apache Tomcat as web server and MySQL as database management system.

After logging in at the web application the officials at the Rectorate in charge of scheduling PhD promotions open the web page for selecting candidates for promotion, shown in figure 2.

The functionality is organized in two tabs. The first tab (Candidates) provides the list of all candidates for promotion that defended dissertation and are not yet promoted. All candidates are presented in a table, with basic data and one extra text field in every row. That text field is reserved for entering the name of the future promotion. The second tab (Prepare for promotion) that is shown on figure 2 contains all candidates selected in the first tab and grouped by the promotion name. The user chooses the promotion name from the drop down menu and gets all candidates that are linked to that promotion. All data on figure 2 are given in Serbian (Cyrillic) like they are stored in the database and which is in accordance with the rules proposed by the law.

For the candidates that defended dissertation by old program it is enabled to enter the diploma number, and for those who finished the PhD studies the diploma and supplement numbers are entered by the Faculties and their text fields are disabled in the promotion module.

There are three actions that can be performed on the created list, the list can be printed, saved or added to the register. The action Print list opens the popup window in which user can choose different formats of printing the chosen list, such as the list of addresses for all candidates for sending invitation and list of candidates in special format used for publishing the official announcement for the promotion. By calling action Save list user stores all current lists for promotion in database and can finish editing them later. After user that is registered to be in charge for promotion logs in at the CRIS UNS he/she gets all previously prepared lists for promotion. Action

Add to register is called after the promotion. User enters the exact date of promotion after which the ids for the register entries i.e. the ordinal numbers for all dissertations promoted are generated and they are stored

in the database. As the final step, the register can be generated, as described in the next section.

Prepare PhD promotion - UNS

Candidates: Prepare for promotion

Choose promotion: jan

Full name	Faculty	Name of degree	Defended on	Diploma number	Supplement number	For promotion	Remove
Брић Ивана	Економски факултет у Суботици	Доктор економских наука	28.09.2014.	457/2014		jan	✖
Марић Слободан	Економски факултет у Суботици	Доктор наука-економске науке	02.03.2014.	248/2014		jan	✖
Мировић Вера	Економски факултет у Суботици	Доктор економских наука	04.07.2014.			jan	✖
Пркуновић Бабичковић Блаженка	Економски факултет у Суботици	Доктор економских наука	15.01.2014.			jan	✖
Пркувић Бенида	Факултет спорта и физичког васпитања	Доктор наука из области физичког васпитања и спорта	09.06.2014.	247/2014		jan	✖
Шакум Велимир	Факултет спорта и физичког васпитања	Доктор наука из области физичког васпитања и спорта	19.06.2014.			jan	✖
Јанковић Николаша	Факултет техничких наука	Доктор наука - електротехника и рачунарство	14.11.2013.	D12-DS-7/E1	PD-012-DS-7E1-P000048	jan	✖
Билић Снежана	Факултет техничких наука	Доктор техничких наука из области механике флуида	16.10.2013.			jan	✖
Драговицац Јасна	Факултет техничких наука	Доктор техничких наука из области електротехнике и рачунарства	19.12.2012.			jan	✖
Кладић Мирослав	Факултет техничких наука	Доктор техничких наука из области машинство-енергетика	30.06.2014.			jan	✖
Совић-Низић Сандра	Факултет техничких наука	Доктор техничких наука из области електротехнике и рачунарства	09.07.2014.			jan	✖
Станишић Дарко	Факултет техничких наука	Доктор техничких наука из области електротехнике и рачунарства	18.05.2014.			jan	✖
Стојановић Брелић Љиљана	Факултет техничких наука	Доктор техничких наука из области заштите животне средине	23.01.2014.			jan	✖
Богдановић Весна	Филозофски факултет	Doktor lingvističkih nauka	29.06.2014.			jan	✖
Веселиновић Соња	Филозофски факултет	Doktor filozofskih nauka	11.07.2014.			jan	✖

1 2 >>>>

Print list Save list Add to register

Figure 2. Screen form for organizing PhD promotion in CRIS UNS

## VI. REGISTER OF DOCTORS

Every University in Serbia is obliged to keep the official register of all doctors that defended dissertation at that University. In case of University of Novi Sad, that register was kept manually, by handwriting all data proposed by the low.

By introducing CRIS UNS, and keeping records about dissertations and promotions in the information system, the register is created as a report in PDF format (Figure 3) by sending request to web application.

The official register is generated in CRIS UNS by calling Java Servlet on specific URL. Servlet supports several cases of creating register in real time, one of which is generating the complete register by including all dissertations stored in CRIS UNS that has promotion date and ordinal number. The second case is generating register for the specific period by assigning start and end date. And the last is generating register by including dissertation from the specific institution. This case is used in purpose of validation and checking the quality of the entered data.

The official register is implemented as a report using the open source report engine - Jasper Report Library (<https://community.jaspersoft.com/project/jasperreports-library>). The input in the report engine is the list of RegisterEntry entities that are described in section 4.

As shown in Figure 3, the report is given in a form of a table, and every dissertation is presented with all data from the RegisterEntry entity. The register entries are

grouped by the academic year, and are sorted by the ordinal number of the dissertation. The labels and data in register shown on figure 3 are given in Serbian (Cyrillic) as this is the official document and the language, labels and the format are proposed by the low.

## VII. CONCLUSION

The main advantage of having the application described in this paper is having the complete lifecycle of the dissertation managed in the web application. The application is accessed by different users that have the specific role in the process.

Moreover, in this case we integrated the process of organizing promotions and updating the register with the digital library of dissertations and information system for storing and managing data about scientific research (CRIS).

The very last step in processing the dissertation is promoting the candidate into doctors which is done in the ceremonial promotion organized by the Rectorate. In this paper we described how we used data collected in CRIS UNS in module for managing the organization of that promotion.

The main purpose of developing module for organizing promotions in CRIS is having the environment for automatic generation of official register. The layout of the register, as well as the set of data included in the register are proposed by the low and now is implemented as a report and integrated into web application.

Укуп. бр. ред. бр. у школ. год.	Име и презиме	Датум, место, општина рођења и држава	Преиме и име оба родитеља (или старатеља)	Назив завршене високошколске установе и седиште	Стручни или академски и сарађени назив после завршених дипломских или специјалних академских студија	Назив организационе јединице Универзитета на којој је одбрана дисертација	Назив докторске дисертације или докторски уметнички пројекат	Комисија за одбрану и ментор за израду докторске дисертације	Оцена дисертације и датум одбране дисертације	Научни назив који је кандидат стекао	Број и датум издавања дипломе и додатна дипломе	Датум промоције
<b>Школска 2011/2012</b>												
3208 1	Весна Драгилевић	25.04.1970 Земун	Душан	Пољопривредни факултет, Београд	Магистарске студије-мир 14.12.1999	Пољопривредни факултет, Нови Сад	ДИСЕРТАЦИЈА: Утицај убрзане старења и стимулативних концентрата 2,4-D на семе кукуруза (Zea mays L.)	др Живо Стојковић, ред. проф. Пољопривредни факултет, Нови Сад, председник др Миле Узаревић, ван. проф. Београдски факултет, Београд др Еленио Константиновић, ред. проф. Пољопривредни факултет, Нови Сад др Душанка Илић, ред. проф. Пољопривредни факултет, Нови Сад др Мирјана Милошевић, ред. проф. Пољопривредни факултет, Нови Сад, ментор и члан	ОДБРАЊЕНО: 20.12.2007	доктор пољопривредних наука	БРОЈ ДИПЛОМЕ: 207/2011 ДАТУМ: 13.05.2011	05.10.2011
3209 2	Татјана Петровић	13.03.1968 Бар	Станко	Пољопривредни факултет, Београд	Магистарске студије-мир 31.07.2000	Пољопривредни факултет, Нови Сад	ДИСЕРТАЦИЈА: Оптимизација времене промене средстава за растителну биљку и редукција муке Маслине Вастороса (Olea Europaea L.)	др Сандра Лазар, ред. проф. Пољопривредни факултет, Нови Сад, председник др Снежана Хрњачић, доцент, Пољопривредни факултет, Београд др Душанка Илић, ред. проф. Пољопривредни факултет, Нови Сад, ментор и члан	ОДБРАЊЕНО: 16.12.2010	доктор пољопривредних наука	БРОЈ ДИПЛОМЕ: 71/2011 ДАТУМ: 13.01.2011	05.10.2011
3210 3	Одржеј Пољачан	18.08.1971 Нови Сад	Одржеј	Пољопривредни факултет, Нови Сад	Магистарске студије-мир 01.09.2004	Пољопривредни факултет, Нови Сад	ДИСЕРТАЦИЈА: Анализа параметара машиничке формације млинегредница при промоводу колекторског токова	др Милош Ђурковић, ред. проф. Пољопривредни факултет, Нови Сад, председник др Зоран Милеускић, доцент, Пољопривредни факултет, Земун др Анђелина Барјак, ред. проф. Пољопривредни факултет, Нови Сад, ментор и члан	ОДБРАЊЕНО: 07.05.2010	доктор пољопривредних наука	БРОЈ ДИПЛОМЕ: 235/2011 ДАТУМ: 06.06.2011	05.10.2011
3211 4	Тодор Марковић	17.03.1978 Нови Сад	Ђорђе	Пољопривредни факултет, Нови Сад	Магистарске студије-мир 28.02.2005	Пољопривредни факултет, Нови Сад	ДИСЕРТАЦИЈА: Временски деривати као динамички инструмент у ризичару усева и плодова	др Маријана Тиша, ред. проф. Пољопривредни факултет, Нови Сад, председник др Петар Тогић, ред. проф. Пољопривредни факултет, Земун др Милена Јовановић, ред. проф. Пољопривредни факултет, Нови Сад, ментор и члан	ОДБРАЊЕНО: 05.11.2010	доктор пољопривредних наука	БРОЈ ДИПЛОМЕ: 300/2010 ДАТУМ: 23.11.2010	05.10.2011
3212 5	Јовица Васић	19.07.1969 Берн	Радица	Пољопривредни факултет, Нови Сад	Магистарске студије-мир 30.03.2001	Пољопривредни факултет, Нови Сад	ДИСЕРТАЦИЈА: Солончаки развојне карактеристике и савремена класификација	др Билјана Нешић, ван. проф. Пољопривредни факултет, Нови Сад, председник др Петар Секулић, науч. сав. Институт за ратарство и повртарство, Нови Сад др Милана Белић, ван. проф. Пољопривредни факултет, Нови Сад, ментор и члан	ОДБРАЊЕНО: 21.01.2010	доктор пољопривредних наука	БРОЈ ДИПЛОМЕ: 208/2011 ДАТУМ: 13.05.2011	05.10.2011
	Мирјана Савић	25.08.1955 МЕСТО:	Станко	Медицински факултет, Нови Сад	Магистарске студије-мир 30.01.1995	Медицински факултет, Нови Сад	ДИСЕРТАЦИЈА: Утицај ланчаног постојења на развој	др Петар Спанковић, ред. проф. Медицински факултет, Нови Сад, председник	ОДБРАЊЕНО: 26.11.2010	доктор медицинских наука	БРОЈ ДИПЛОМЕ: 307/2010 ДАТУМ:	05.10.2011

Figure 3. Official register of the doctors at the University of Novi Sad

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