

# SW REQUIREMENTS AND SYSTEM DESIGN

## Enrolment Module

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### LIST OF ACRONYMS

EMIS	Education Management Information System
EC	Enrolment Committee
SAO	Student Administration Office
MoES	Ministry of Education and Science

### CONTENT

<b>1</b>	<b>ENROLMENT AND MIGRATION MODULE .....</b>	<b>4</b>
1.1	LIST OF FUNCTIONS .....	4
1.2	INTRODUCTION.....	4
1.3	REFERENCE DOCUMENTS .....	5
1.4	OBJECTIVE .....	6
1.5	GENERAL OVERVIEW .....	6
1.6	SCOPE.....	6
1.7	BENEFITS.....	7
1.8	GOALS.....	7
<b>2</b>	<b>USER AND FUNCTIONAL REQUIREMENTS .....</b>	<b>8</b>
2.1	USERS.....	8
2.2	FUNCTIONALITIES .....	10
2.3	GENERAL BUSINESS RULES .....	12
2.4	DATA ARCHIVING .....	12
<b>3</b>	<b>MODELING .....</b>	<b>13</b>
3.1	USE CASE DIAGRAMS.....	13
3.1.1	<i>Global system</i> .....	13
3.1.2	<i>Enrolment system</i> .....	13
3.1.3	<i>Application proces</i> .....	14
3.1.4	<i>Finalization of application proces</i> .....	14
3.1.5	<i>System administrator</i> .....	15
3.2	ACTIVITY DIAGRAMS.....	16
3.2.1	<i>Register</i> .....	16
3.2.2	<i>Complete activity diagram</i> .....	17
3.3	SEQUENCE DIAGRAMS .....	19
<b>4</b>	<b>DATA MODEL.....</b>	<b>20</b>
4.1	APPLICANT .....	22
4.1.1	<i>Functionality</i> .....	22
4.1.2	<i>Fields</i> .....	22
4.1.3	<i>Business rules and access rights</i> .....	27
4.2	APPLICANTS TO SECOND CYCLE OF STUDIES .....	28
4.2.1	<i>Functionality</i> .....	28
4.2.2	<i>Fields</i> .....	28
4.2.3	<i>Business Rules</i> .....	30

4.3	PAID FEE .....	31
4.3.1	<i>Functionality</i> .....	31
4.3.2	<i>Fields</i> .....	31
4.3.3	<i>Business rules and access rights</i> .....	31
4.4	PROVIDED DOCUMENT .....	31
4.4.1	<i>Functionality</i> .....	31
4.4.2	<i>Fields</i> .....	31
4.4.3	<i>Business rules and access rights</i> .....	31
4.5	SIGNED CONTRACT .....	32
4.5.1	<i>Functionality</i> .....	32
4.5.2	<i>Fields</i> .....	32
4.5.3	<i>Business rules and access rights</i> .....	32
4.6	STUDY PROGRAMMES .....	33
4.6.1	<i>Functionality</i> .....	33
4.6.2	<i>Fields</i> .....	33
4.6.3	<i>Business rules</i> .....	34
4.7	STUDY PROGRAMMES GROUP / FACULTY .....	35
4.7.1	<i>Functionality</i> .....	35
4.7.2	<i>Fields</i> .....	35
4.7.3	<i>Business rules</i> .....	36
4.8	STUDENT ENROLMENT TERM .....	37
4.8.1	<i>Functionality</i> .....	37
4.9	RANKING THE CANDIDATES .....	38
4.9.1	<i>Functionality</i> .....	38
4.9.2	<i>Fields</i> .....	39
4.9.3	<i>List of applicants</i> .....	39
4.9.4	<i>Preliminary and final ranking list</i> .....	40
4.9.5	<i>Reviewing the candidates' applications</i> .....	42
4.9.6	<i>Filling in a complaint</i> .....	42
4.9.7	<i>Complaints revision and answering</i> .....	42
4.9.8	<i>Business rules and access rights</i> .....	42
4.10	MASTER DATA.....	43
4.10.1	<i>Overview of master data tables</i> .....	43
4.10.2	<i>Master data tables</i> .....	44
<b>5</b>	<b>USER INTERFACE.....</b>	<b>50</b>
5.1	GENERAL REQUIREMENTS .....	50
5.1.1	<i>Validation</i> .....	50
5.1.2	<i>Control focus</i> .....	50
5.1.3	<i>Grid</i> .....	50
5.1.4	<i>Preview of details page</i> .....	51
5.1.5	<i>Error page</i> .....	51
5.1.6	<i>File attachments</i> .....	51
5.1.7	<i>Consistency</i> .....	51
5.1.8	<i>Data formatting</i> .....	51
5.1.9	<i>Help system and tips assistance for filling forms</i> .....	51
5.2	AUTHENTICATION AND IDENTIFICATION.....	52
5.2.1	<i>Overall functional requirements</i> .....	52
5.2.2	<i>Registration</i> .....	52

5.2.3	<i>Profile configuration</i>	53
5.2.4	<i>Applicants menu</i>	53
5.3	APPLICATION FORM FILLING	54
5.3.1	<i>Identification and validation</i>	54
5.3.2	<i>General requirements</i>	54
5.3.3	<i>Filling details in the application form by the candidate</i>	54
5.3.4	<i>Transferring the high-school data for the candidate form the MoES</i>	55
5.3.5	<i>Application form for paper applications</i>	56
5.4	APPLICANT SERVICES	57
5.4.1	<i>Application form filling (see section 4.1)</i>	57
5.4.2	<i>Complaint form filling</i>	57
5.5	ADMINISTRATION FUNCTIONS	59
5.5.1	<i>Master data manipulation (see section 4.10)</i>	59
5.5.2	<i>Enrolment terms administration (see section 4.8)</i>	59
5.6	ADMISSION OFFICER – APPLICATIONS REVIEW	61
5.6.1	<i>Application form for paper applications</i>	61
5.6.2	<i>Review of the complaints</i>	61
5.7	RANKING AND REPORTING	63
5.7.1	<i>Ranking the candidates (see section 4.9)</i>	63
5.7.2	<i>Reporting – general overview</i>	63
5.7.3	<i>Advanced search and graphs</i>	64
5.7.4	<i>Summary reports by study group</i>	64
5.7.5	<i>Summary report for faculty</i>	64
5.7.6	<i>Summary reports by type and quotas</i>	66
<b>6</b>	<b>INTERFACE WITH OTHER SYSTEMS</b>	<b>72</b>
6.1	INTERFACE FOR WEB SERVICE WITH MOES	72
6.1.1	<i>Functionalities of the web service</i>	72
6.1.2	<i>Triggering EMIS by prospective students</i>	72
6.1.3	<i>Web service</i>	72
6.1.4	<i>Activity and sequence diagrams</i>	73
6.1.5	<i>Security</i>	73
6.2	“ENROLLED CANDIDATES” WEB SERVICE	75
6.2.1	<i>Functionalities of the web service</i>	75
6.2.2	<i>Web service</i>	75
6.2.3	<i>Triggering</i>	76
6.2.4	<i>Security</i>	76
6.3	REPORTING WEB SERVICE TO MOES	77
6.3.1	<i>Functionalities of the web service</i>	77
6.3.2	<i>Web service</i>	77
6.3.3	<i>Triggering</i>	78
6.3.4	<i>Security</i>	78
6.4	WEB SERVICE TO IMPORT STUDY PROGRAMS AND MASTER DATA	79
6.4.1	<i>Functionalities of the web service</i>	79
6.4.2	<i>Triggering</i>	79
6.4.3	<i>Security</i>	79

# 1 Enrolment and migration module

## 1.1 List of functions

### (ENR) Module for enrolment

- Management of enrolment of students (for every level of studies)
- Management of candidates, ranking and completing the enrolment of new students
- Exchange of information with the Ministry of education

### (MGR) Migration of existing data

- Preparing web services, forms and specification of formats for migration of data from existing systems
- Correction and fine tuning of migrated data

## 1.2 Introduction

Students are the main purpose of the existence and operation of every university. Students are being enrolled at the university in a process called admission. Student admissions are a vital part of any university's running because students are what keep university alive.

The main purpose of every admission process is to:


- Acknowledge that the prospective candidates do comply with the internal/external policy/rules/laws for specific study program enrolment
- Select the candidates who, (in its judgment,) will make the best students and become valuable professionals.
- Plan the resources needed for the education process according to the interests of the future students
- Record statistical data collected from the prospective students in order to use it in future management / educational / other decisions.

Student admissions are usually organized in the certain periods of the year and last for a certain predetermined period of time in which a certain process of submitting applications, candidate selection and final enrolment takes place. In this process, the candidates (prospective students) usually express their intention to continue their education in a certain area of study by submitting an application at a certain university accompanied by other documents and certificates that are to certify that they satisfy certain prerequisites, and to support their application in the process of candidate selection. The applications are then reviewed by administrative officers to ensure that all of the required information has been provided, from the form itself to the supplementary documentation, such as degree certificates. If any of the required information is missing, an administrative or an admission officer contacts the potential student and arranges for the delivery of the outstanding data. The completed applications are then forwarded to the admission officers that according to the university/faculty/department rules for candidate selection prepare the preliminary lists of the admitted and rejected candidates. The candidates are then given an opportunity to formally complain about the admission officers' decision. After the revision of complaints, the admission officers prepare the final lists of the admitted students. The process continues for the admitted candidates by registering them at the university/faculty/department, filling additional enrolment forms, regulating financial issues, issuing the student an ID card, etc.

A poor admissions system can mean errors in the admission process that can result in wrong choice of the candidates, fewer candidates being admitted, lot of support personnel occupied by admission process during the admission periods and overly slow response time that dissatisfies the candidates and the university management.

### 1.3 Reference Documents

This section lists other documents which contain additional information about the enrolment process.

Ref.	Title	Document Id.
[1]	<a href="#">Закон за високото образование</a> , „Службен весник на Република Македонија”, број 35, 14 март 2008 Измена и дополнување 19.08.2008 Одлука на Уставен суд 03.12.2008 Измена и дополнување 24.02.2009 Измена и дополнување 03.07.2009 Измена и дополнување 05.08.2009 Измена и дополнување 31.08.2010 Закон за високо образование, „Службен весник на Република Македонија”, број 17 од 11.02.2011	<a href="http://www.pravo.org.mk/documentDetail.php?id=799">http://www.pravo.org.mk/documentDetail.php?id=799</a>
[2]	<a href="#">КОНКУРС за запишување студенти на прв циклус студии на студиските програми на Универзитетот „Св. Кирил и Методиј“ во учебната 2010/11 година</a>	
[3]	УПАТСТВО за реализација на Конкурсот за запишување студенти на прв циклус студии во учебната 2010/11 година. Note: This document is not available on the Internet. It explains in details the ranking criteria.	 Microsoft Office Word Document
[4]	<a href="#">КОНКУРС за запишување студенти на втор циклус студии на студиските програми на Универзитетот „Св. Кирил и Методиј“ во учебната 2010/2011 година</a>	
[5]	<a href="#">ДОПОЛНИТЕЛЕН КОНКУРС за запишување студенти на додипломски студии на студиските програми на Универзитетот „Св. Кирил и Методиј“ во учебната 2010/11 година</a>	
[6]	<a href="#">Листа на екстерни и интерни предмети од државната матура потребни за пријавување за запишување на студиските програми на Универзитетот „Св. Кирил и Методиј“ во Скопје</a>	
[7]	<a href="#">К О Н К У Р С за запишување студенти на прв циклус студии во рамките на реализацијата на „Проектот 45“ во учебната 2010/11 година</a>	
[8]	Best practice: Croatian National AAI service for education: <a href="http://www.aaiedu.hr/">http://www.aaiedu.hr/</a>	
[9]	GEANT Identity federations: <a href="https://rnd.feide.no/identity_federations/">https://rnd.feide.no/identity_federations/</a>	
[10]	<a href="#">Europass CV web site</a>	
[11]	<a href="#">European Credit Transfer and Accumulation System (ECTS) Site</a>	
[12]	<a href="#">Правилник за студирање по КС на ПМФ</a>	
[13]	<a href="#">Diploma Supplement</a>	
[14]	Microsoft, “Design and Implementation Guidelines for Web Clients”, <a href="http://www.microsoft.com/downloads/en/details.aspx?FamilyId=B0B680E-6CC9-49B8-A872-8B6DD8D9B8E6&amp;displaylang=en">http://www.microsoft.com/downloads/en/details.aspx?FamilyId=B0B680E-6CC9-49B8-A872-8B6DD8D9B8E6&amp;displaylang=en</a>	

## 1.4 Objective

The objective of this project is to design a web-based system that will support the university enrolment process (on-line university admission system). The intent of the system is to:

- Exchange information about results
- Provide grading system and selection methodology
- Realize electronic registration and application
- Realize complete pro-active customized feedback
- Generate reports to university management and Ministry of Education

The main objective of this project is to design a system that will automate the tasks carried out by different persons in the organization and performing the student admission process. Specific design and implementation details will be specified in future documents.

## 1.5 General Overview

The system is intended to be used by the prospective students (candidates for university enrolment), the admission officers and the support personnel both at the university and departments/faculties level, and other government institutions like the State Statistical Office and the Ministry of Education.

## 1.6 Scope

The aim of the proposed system is to automate the system, pre-check the inclusion of all required materials and automatically rank each student's application based on a number of criteria. The data used by the system are to be stored in a database. A web-based application is to be provided for the candidates that will enable them to register for enrolment, provide their details including all the details from the certificates that have effect in the ranking process. This will enable the process to be simplified and considerably quickened, making the jobs of the people involved, especially the university staff and admission officers easier and faster. The system can support the current process but is meant to centralize it and make possible for the decisions to be made earlier and easier. The system should enable the future extension to almost fully paperless admission process including transferring the basic data of the candidates and their certificates in fully digital form (digitally signed) from other certificate providers (high schools).

## 1.7 Benefits

The aim of the proposed system is to address the limitations of the current system. The requirements for the system have been gathered from the defects recorded in the past and also based on the feedback from users. Following are the objectives of the proposed system:

- *Reach to geographically scattered students.* One of the important objectives of the admission system is to be able to communicate with all the students irrespective of their geographical location.
- *Reduce time spent on enrolment.* Reduce the time taken to process the applications of candidates, admit a candidate, conduct the online examination, verify student marks, and send confirmation letters to admitted candidates.
- *Centralized data handling.* Transfer the data smoothly to all the departments involved and handle the data in a centralized way.
- *Paperless admission with reduced manpower.* Reduce the manpower needed to perform admission and administration tasks by reducing the paper works needed.
- *Cost cutting.* Reduce the cost involved in the admission process.
- *Operational efficiency.* Improve the operational efficiency by improving the quality of the process.

## 1.8 Goals

The main goal of the system is to automate the admission process at universities with improved performance and realize the vision of paperless admission. Some of the goals of the system are listed below:

- Manage large number of candidates with much data.
- Create candidate accounts and maintain candidate's data in an effective way
- View all the details of the candidates.
- Create extensive reports.
- Enable the candidates to take proactive role in the process by entering their data in the system
- Highest level of transparency: Provide the candidates with updates of the current status of the enrolment process
- Effective data management;
- Lowest possibility of human factor failure;
- Applying from distance.

## 2 User and functional requirements

### 2.1 Users

The software should enable creation of users and user groups through its user interface. For every new user created, the administrator of the software should be able to specify the forms and modules within forms that the created user can access and work with, with various levels of user permissions. All activities are tracked and stored.

Enrolment procedure can be carried out by the central university admission officers for all study programmes offered by the university, or distributed to faculties/departments where faculty/department admission officers are responsible for most of the steps during the admission process, depending on the organization of the university.

The following users and groups are to be initially created:

- Administrator
- Enrolment Committee
- Admission officer
- Supporting personnel
- Ministry of Education
- State Statistical Office
- Applicant / prospective student
- Technical Administrator
- University Administration Office members
- Resource administrators

The next table defines users and identifies their main functionalities:

ID	User groups	Roles
AD	Administrator	<ul style="list-style-type: none"> <li>• Manages all Faculty/study program data specifics of the enrolment process</li> <li>• Create and manage user accounts for other user groups</li> <li>• Manages all setup data</li> </ul>
EC	Enrolment Committee	<ul style="list-style-type: none"> <li>• Conducts the admission process</li> <li>• Monitor and supervise the admission process carried out by Faculty / Study programme admission officers</li> <li>• Views and analyse comments</li> <li>• Analyses statuses and response times</li> <li>• Analyses quality of service provided</li> <li>• Views reports about FAQ</li> <li>• Issues reports to the University management</li> <li>• Issues reports to media / MoES</li> </ul>
AO	Admission officer	<ul style="list-style-type: none"> <li>• Receives and reviews complaints</li> <li>• Sends answers</li> <li>• Prepares preliminary and admission lists</li> <li>• Edits FAQ</li> </ul>
SP	Supporting personnel	<ul style="list-style-type: none"> <li>• Receives the forms and other documents/certificates from the applicants (in paper form)</li> <li>• Checks if all requested documents are provided and the forms are properly filled and signed</li> <li>• Keeps records of all received documents</li> <li>• Enters data from the paper only applications (received by mail, special cases, translated documents, etc.) in the system. Data needs approval from EC.</li> </ul>
ME	Ministry of Education	<ul style="list-style-type: none"> <li>• View various statistical reports for applied / admitted candidates</li> </ul>



ID	User groups	Roles
SO	State Statistical Office	<ul style="list-style-type: none"> <li>View various statistical reports for applied / admitted candidates</li> </ul>
AP	Applicant / prospective student	<ul style="list-style-type: none"> <li>Registers to the system</li> <li>Inputs personal details, fills application</li> <li>Fills details from his/her certificates (academic scores)</li> <li>Submits / prints application</li> <li>Views FQA</li> <li>Fills complain request</li> <li>View results</li> </ul>
TA	Technical Administrator	<ul style="list-style-type: none"> <li>Manages the software parameters</li> </ul>
UA	University Administration Office members	<ul style="list-style-type: none"> <li>Views and analyse reports and data</li> <li>Analyses statuses and response times</li> <li>Analyses quality of service provided</li> <li>Views reports about FAQ</li> <li>Issues reports to the University management</li> <li>Issues reports to media / Ministry of Education</li> <li>Conducts the enrolment process</li> <li>Monitor and supervise the process carried out by Faculty / Study programme</li> <li>Manage the student and staff accounts using standard LDAP schemas</li> <li>Enable and revoke privileges</li> <li>Work in the office for communications with students</li> <li>Provide administrative services for students</li> <li>Manage students data</li> <li>Coordinate work with faculty members and provide services</li> </ul>
RA	Resource administrators	<ul style="list-style-type: none"> <li>Define access to their resources using standard LDAP schemas</li> </ul>
UC	University computing centre	<ul style="list-style-type: none"> <li>Maintain and monitor the infrastructure</li> <li>Provide hosting for the AAI services for institution with smaller members</li> <li>Maintain the users/resource database (LDAP and associated services)</li> <li>Maintain the identities of the users (identity providers)</li> </ul>

## 2.2 Functionalities

Basic functionalities of the e-Enrolment system are specified as follows:

ID	Functionality	Description	Objective
[1]	Creating / managing accounts	The administrator should have opportunity to create and manage accounts for the other user groups (except applicants)	To create and manage the accounts for the other persons from the university involved in the enrolment process
[2]	Manage master data	The administrator should have opportunity to manage the master data used in the form filling process (list of municipalities, list of schools, ...)	To manage the data that can appear in the application forms in an organized way
[3]	Manage study programmes, prerequisites and admission quotas	The administrator should have opportunity to manage the study programmes, prerequisites and admission quotas for every study programme	The admission quotas, accredited study programmes, dispersed study groups, prerequisites can change frequently
[4]	Manage points calculation, ranking and precedence rules	The administrator should have opportunity to manage: the way the points awarded to applicants are being calculated; the ranking rules; and precedence rules	Point calculation, additional assessment exams, interviews should be recorded. In case of multiple choice for study program selection (where allowed) certain precedence rules should be applied
[5]	Initiating enrolment process	Enables the administrator to initiate the process that starts with candidates registration and finishes with enrolment/rejection	Most of the other activities can be performed only while the enrolment is active
[6]	Applicant registration	Applicants register on the system by entering their e-mail. After the account activation the user can use the system	Applicants can register on the system before and during the application submission period
[7]	Filling application form	Applicants can enter all data requested by the application form in a web based interface and save them. Data includes all high school marks and graduation exam marks.	The applicant can recheck and correct the entered data before the final application submission.
[8]	Submitting the application	Applicants should print out a reference form with generated unique ID that is supposed to be submitted with the originals of the requested document and certificates to the admission office	The admission officer can view and check the consistency of the data entered by the applicant to the original documents. The data entered is later used in the ranking process.
[9]	Viewing preliminary results	Applicants can view the list of all candidates that applied for the same study programme	
[10]	Fill a complain form / request a revision	A candidate should be able to raise a complain about an error in his/her data as published	To allow the candidate to request correction of mistakes or revision of his academic/exam results by the admission commission
[11]	Edit application form	Editing one applicants form in order to correct mistakes	Enables the officer to correct a mistake in the candidate application
[12]	Entering additional information in the application form	The system should enable entering of additional data in the application like results of additional exam	To enter data from additional exams
[13]	Ranking the candidates	The system should be able to automatically rank all the candidates for every study programme	To produce list of accepted and rejected candidates
[14]	Close the submission process	The system should be able to produce the list of applied candidates	Publication of results

ID	Functionality	Description	Objective
	and produce the list of candidates that have applied		
[15]	Production of the preliminary list of accepted and rejected candidates	The system should be able to produce the preliminary list of accepted and rejected candidates	Publication of results
[16]	Production of the final list of accepted candidates	The system should be able to produce the final list of accepted and rejected candidates	Publication of results
[17]	Produce various statistical reports for applied / admitted candidates	The system should produce various statistical reports for all candidates that have applied, for the accepted and rejected ones	Statistics reports
[18]	Online Counselling	The systems should provide media for online communication between prospective students and admission officers regarding any open questions about the admission process or provided documents. E-mail communication, or integration with popular social networks e.g. Facebook, Twitter is a possible implementation.	
[19]	Audit log	The system should keep audit log with time stamp and user ID for all changes to the student application record once the application has been submitted	

## 2.3 General Business Rules

This delivery aims to design a system that satisfies the following requirements

- Uses one centralised database to keep data on applicants and the enrolment procedure.
- Allows online access to all actors.
- Uses role-based authorisation.
- Implements customisable notification functionality on change in the status of their application, missing document, pending events, due payments etc.
- Supports multiple notification mechanisms: SMS, email, social networking sites.
- Provides grading system and selection methodology. Allows Enrolment Committee to define ranking parameters.
- Implements web based enrolment application.
- Implements the “single point of data entry” principle.
- Administrator should be able to configure the system.

## 2.4 Data archiving

Data from past enrolment terms is required to be made available to application users for reporting purposes. After the end of the last enrolment term and prior to the beginning of the following enrolment term, administrator is allowed and required to lock the data from the last enrolment term. Further changes to data from past enrolment terms are not allowed after the locking action. Data from past enrolment terms are available for read-only access, and mainly for reporting purposes. During the locking action following reports are automatically generated and stored in MS Excel format in a dedicated folder:

- Reports explained in chapter 5.7.2 **Error! Reference source not found.**
- Ranking lists

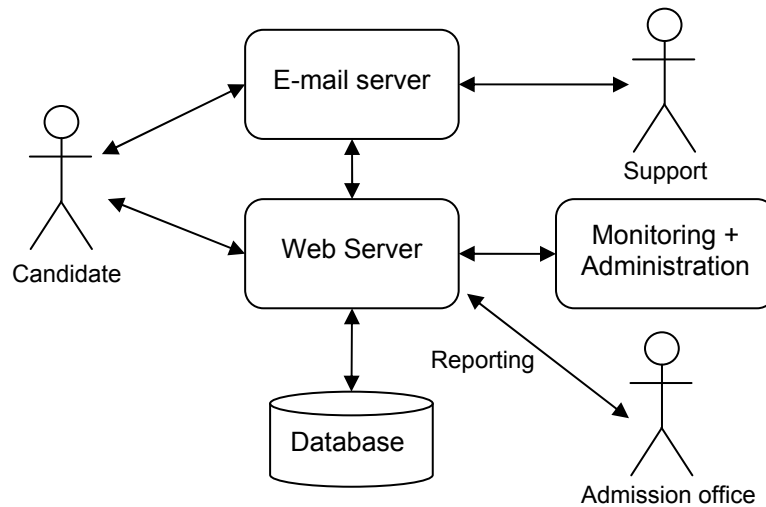
### 3 Modeling

In this section we specify several behaviour and interaction diagrams for functional requirements.

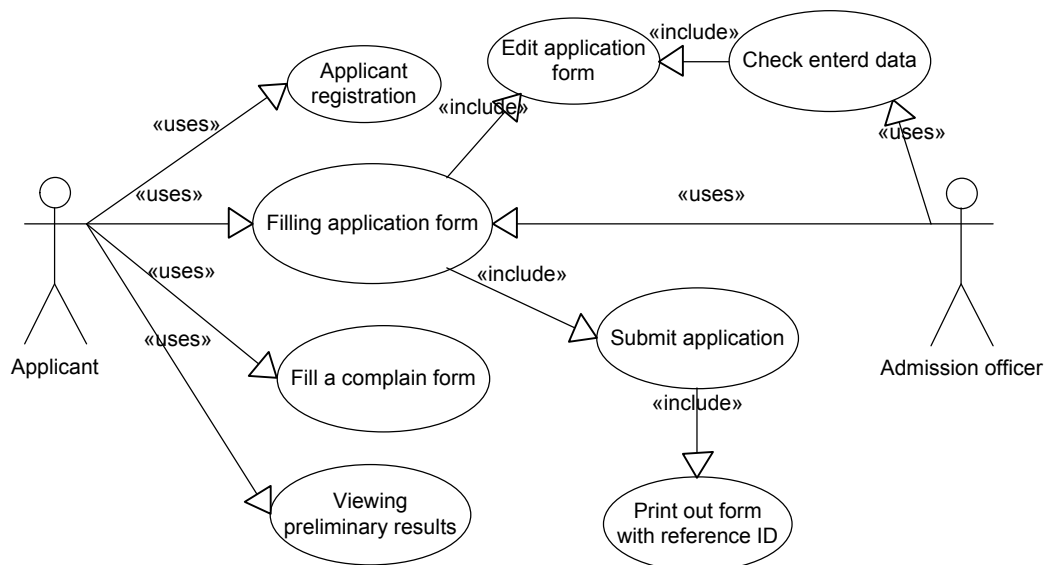
#### 3.1 Use case diagrams

Following Use Case diagram represents the use cases which need to be supported by the software solution.

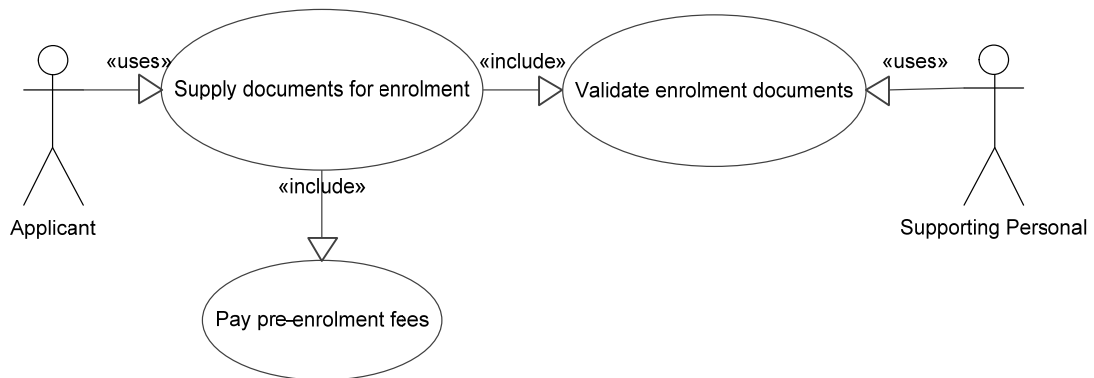
##### 3.1.1 Global system



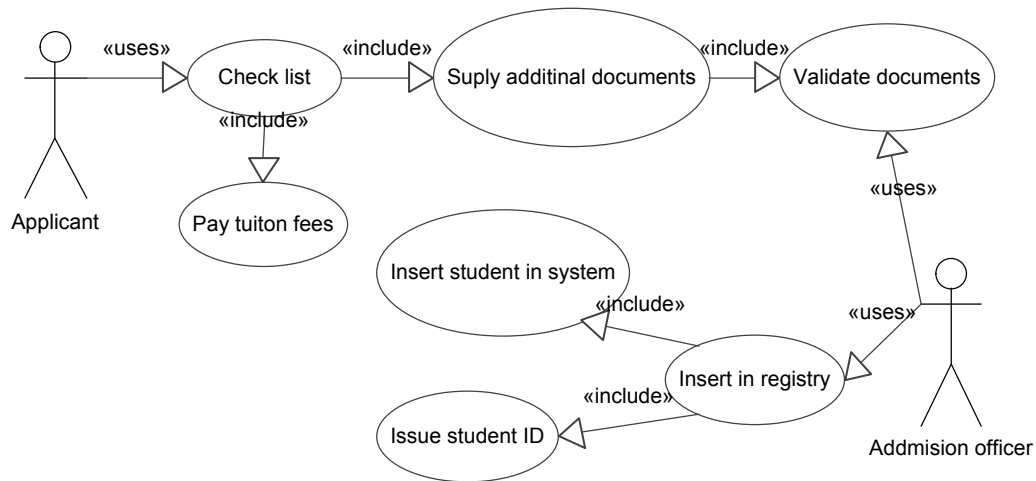
##### 3.1.2 Enrolment system



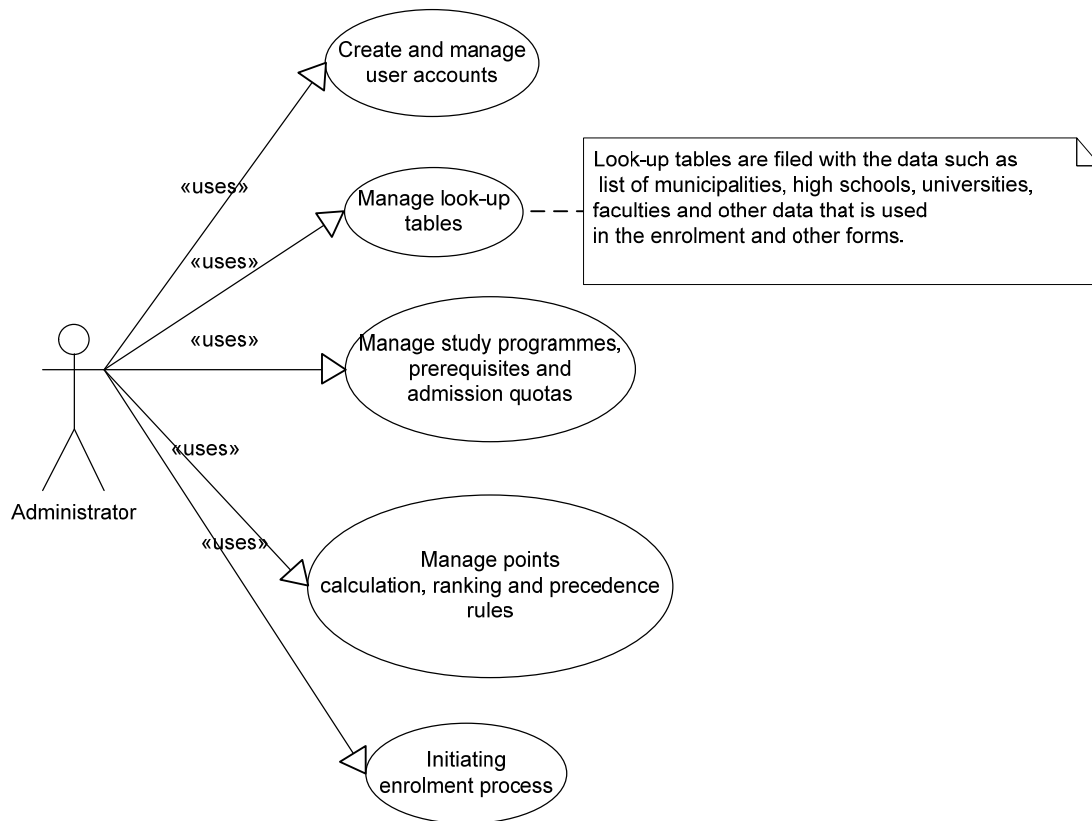
### 3.1.3 Application proces



### 3.1.4 Finalization of application proces



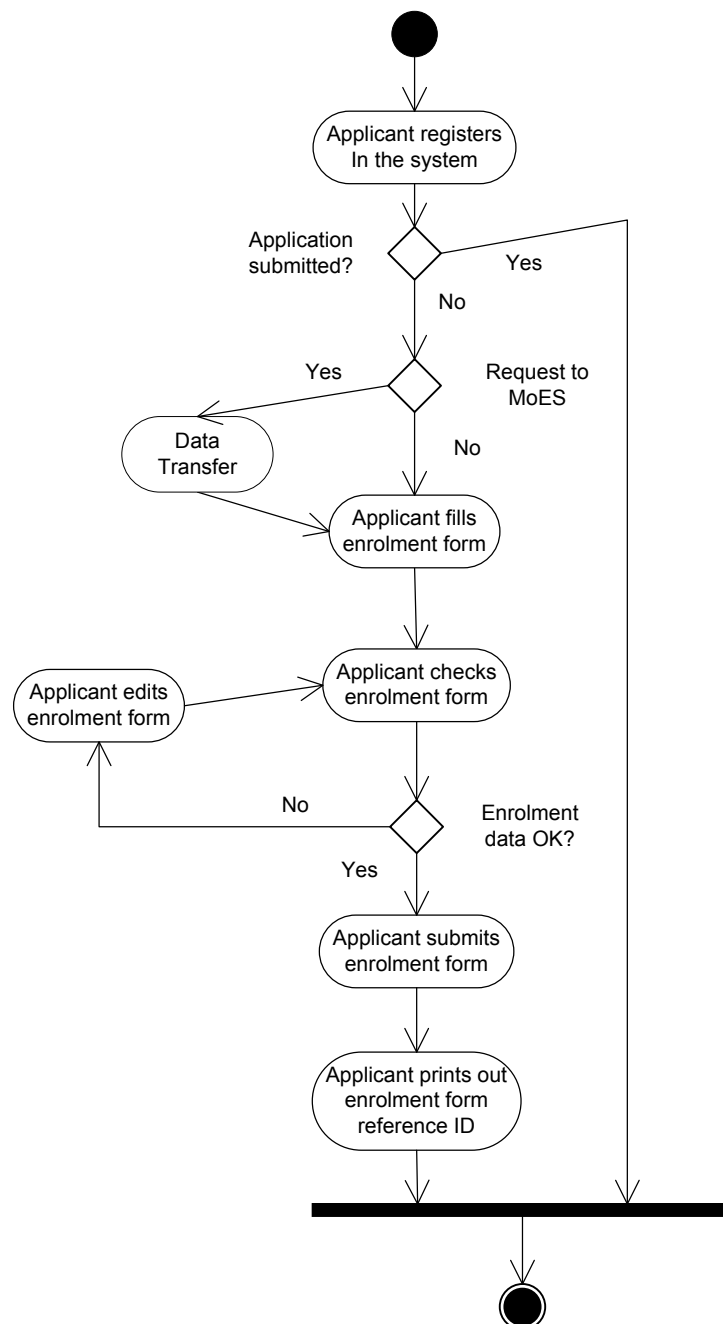
### 3.1.5 System administrator



## 3.2 Activity diagrams

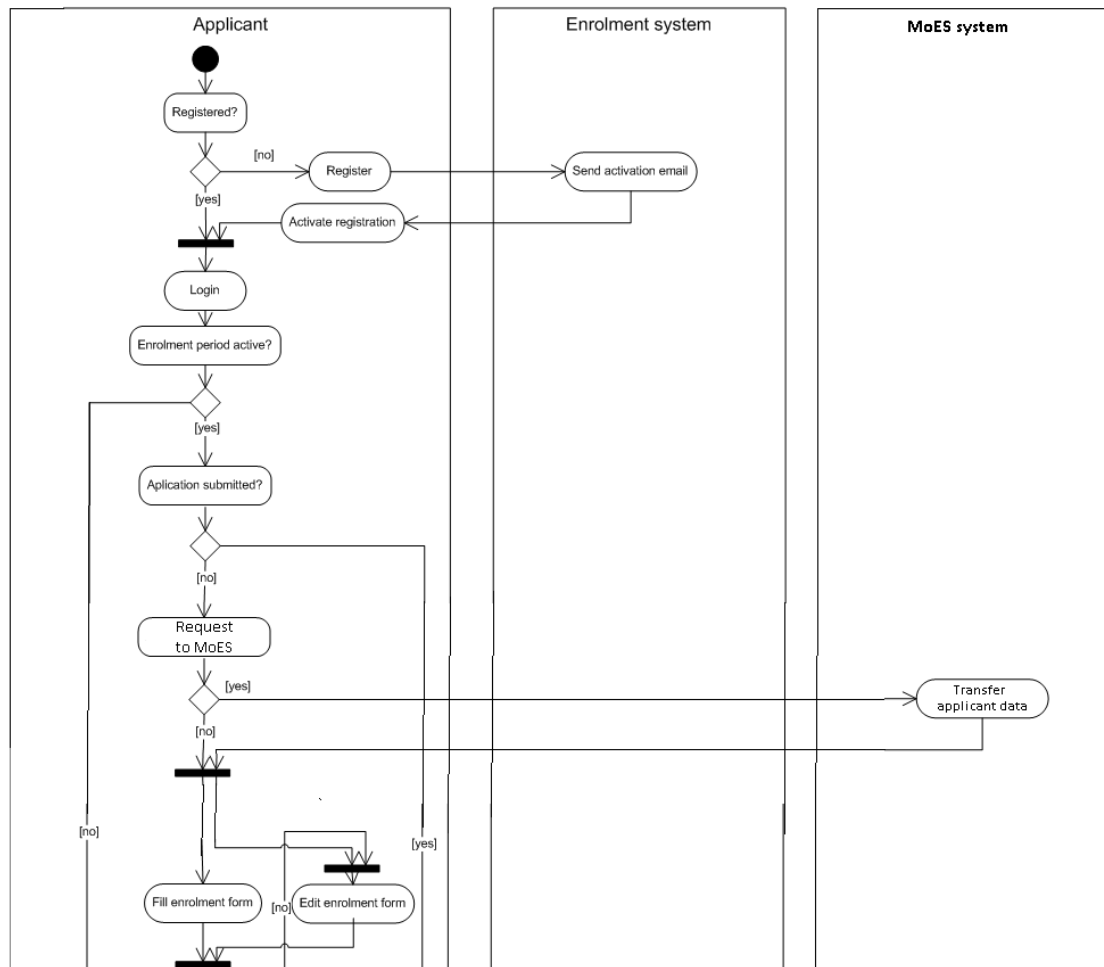
Following activity diagrams represents the business logic flow, and shows the activities and the events that cause the enrolment application to be in a particular state.

### 3.2.1 Register

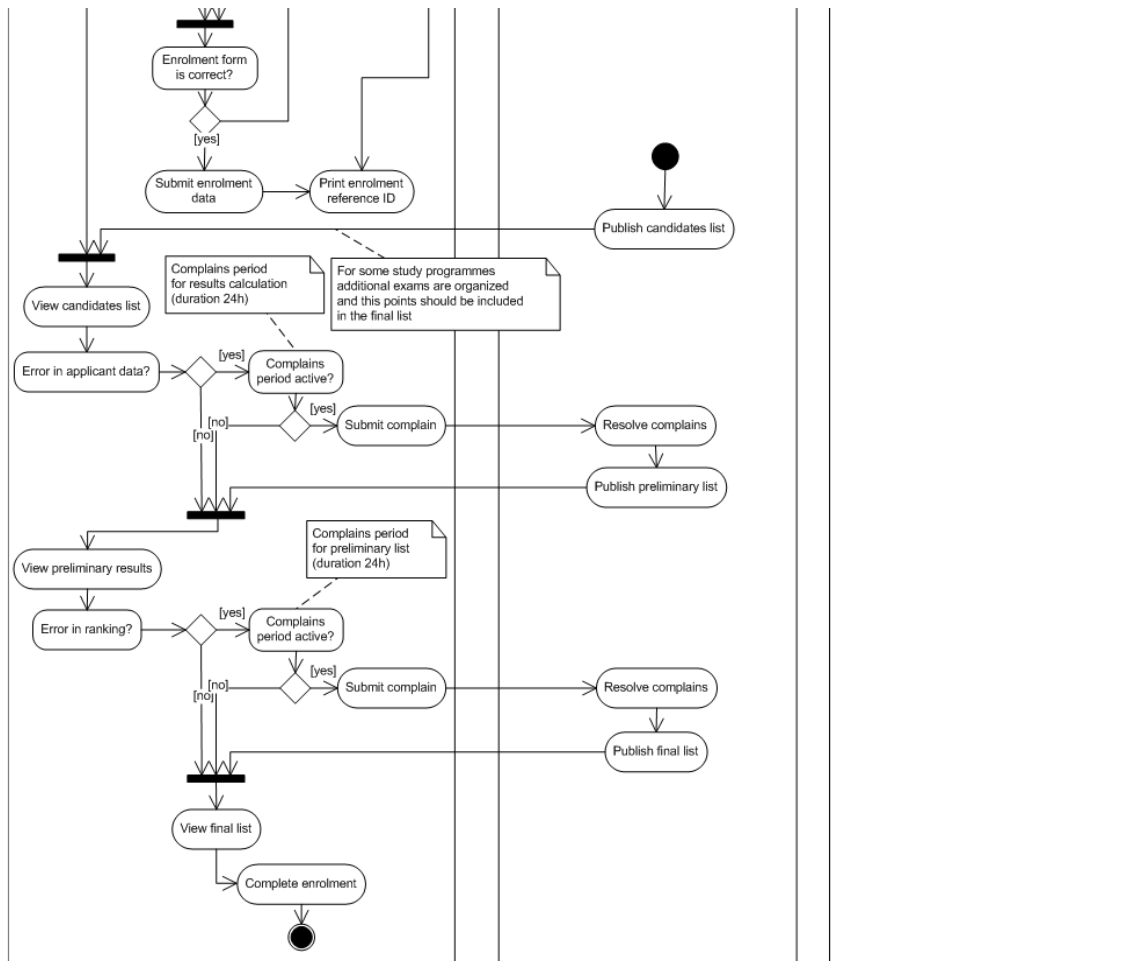




### 3.2.2 Complete activity diagram

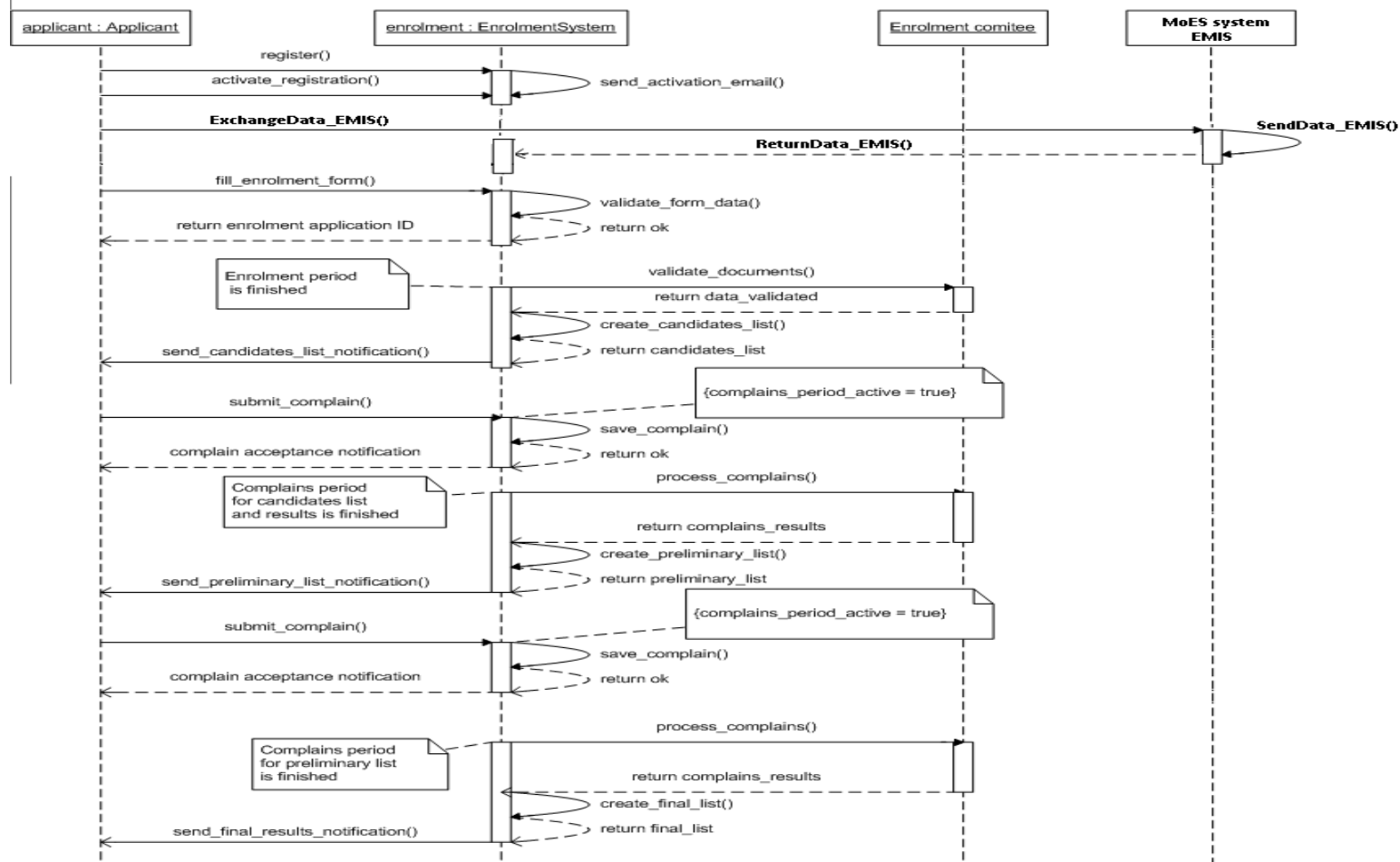


Second part of this diagram continues on next page.



### 3.3 Sequence diagrams

Following UML sequence diagram shows the order of steps during the enrolment procedure, and the actors responsible for their execution.



## 4 Data model

Following section explains the data model for the future Enrolment module. The data model is given as the most appropriate mechanism for description of the functional requirements rather than as the final definition of the data model. Developers of the enrolment module can define a different data model as long as the functional requirements are satisfied.

Some functional requirements in this section are defined textually without specification of data model e.g. chapter 4.9 and chapter 4.10.

### 4.1 E-R diagram

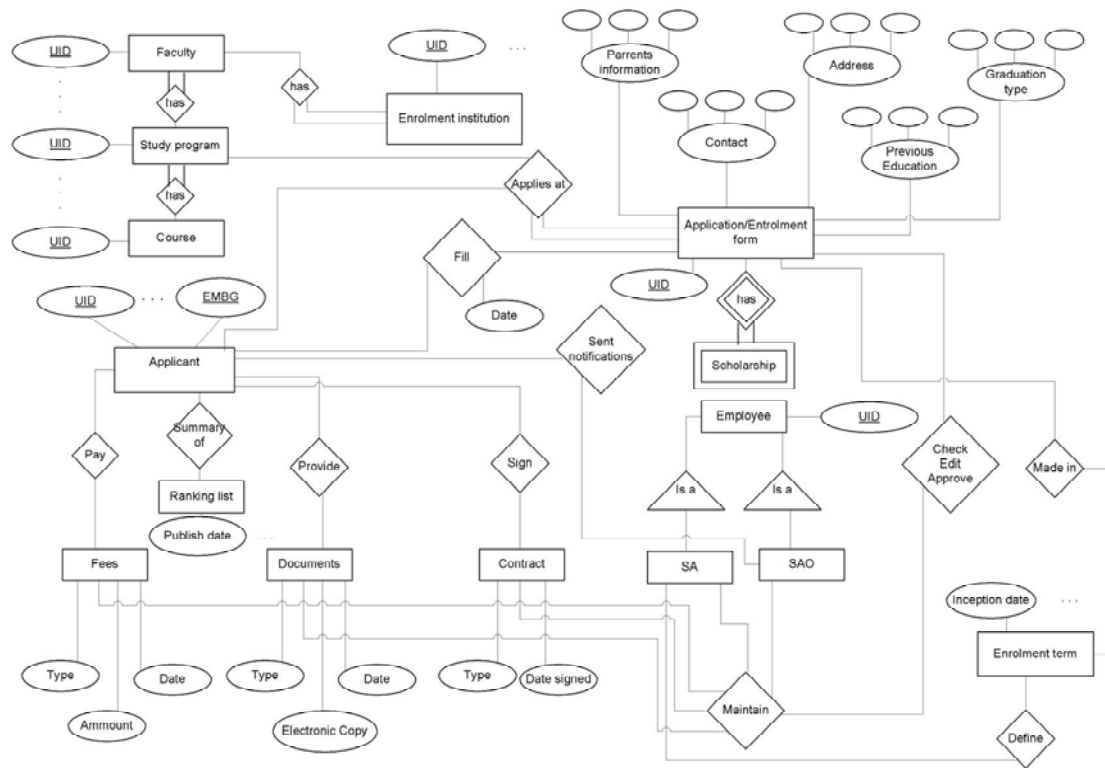
This section define the entity-relationship diagram for the envisaged data model.

Detailed list of attributes for all data entities are given in the remainder of this section. Please note that Contact, Address, Previous education and parent's information are shown as complex attributes rather than entities in the E-R diagram.







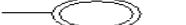

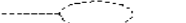
In order for the diagram to be less busy with details, participant constraints are given in the following table rather than in the E-R diagram:

Entity A	Name of the relationship	Entity B	Participant constraints
Applicant	fill	Application/Enrolment form	1..1
Applicant	pay	Fees	1..M
Applicant	provide	Documents	1..M
Applicant	sign	Contract	1..M
SAO	sent notifications	Applicant	M..M
SA/SAO	maintain	Fees/Documents/Contracts	M..M
SAO	check/edit/approve	Application/Enrolemnt form	M..M
Enrolment institution	has	Faculty	1..M
Faculty	has	Study program	1..M
Study program	has	Course	1..M
Applicant	Applies at	Study program,Enrolment f.	M..1
Application/Enrolment form	has	Scholarship	1..0,1
SA	Define	Student enrolment term	M..M
Application/Enrolment form	Made in	Enrolment Term	1..1
Ranking list	Is a summary of	Applicants	1..M

The E-R diagram is given in the following figure:



We use the following notation in the E-R diagram.

Symbol	Meaning
	ENTITY TYPE
	WEAK ENTITY TYPE
	RELATIONSHIP TYPE
	IDENTIFYING RELATIONSHIP TYPE
	ATTRIBUTE
	KEY ATTRIBUTE
	MULTIVALUED ATTRIBUTE
	COMPOSITE ATTRIBUTE
	DERIVED ATTRIBUTE

## 4.2 Applicant

Applicant is the key data entity in the required solution.

This section describes the details which are contained in the application form for enrolment in the first cycle of studies.

### 4.2.1 Functionality

The following functionalities are essential for this data entity:

- **List:** Provide a list of all applicants. Provide, sorting, paging and filtering functionality.
- **Search:** Search for candidates by multiple criteria.
- **Add:** SAO staff can enter applicant's data.
- **Modify:** SAO staff can modify applicant's data.
- **Auditing:** All changes to applicant's data are logged.

### 4.2.2 Fields

This data entry consists of the following essential data fields:

Study details in enrolment form			
Field	Description	Type	Possible Values
<b>Candidate Personal Data</b>			
Candidate Number	Unique identifier of the candidate	Identity, Automatically assigned by the system	
Surname	Surname	Text	
Maiden surname	Maiden surname	Text, optional	
Parent's name	Parent's name	Text	
Name	Name	Text	
EMBG	Unique number of the citizen	Text (13 digit)	Includes checksum digit, candidate's date/place of birth & sex can be extracted
Date of birth	Date of birth	Date	
Place of birth	Place of birth	Text	
Municipality of birth	Municipality of birth	Text	Master list
Country of birth	Country of birth	Text	
Sex	Sex	Selection	Male / Female
Citizenship	Citizenship	Text	
Ethnicity	Ethnicity	Text	Master list
Mother tongue		Selection	Master List



Study details in enrolment form			
Field	Description	Type	Possible Values
<b>Address</b>			
Town	Place of living	Text	
Address	Address of living	Text	
Municipality	Municipality	Text	Master list
Country	Country	Text	
<b>Contact/Phones</b>			
Home	Home phone number	Text, optional	
Cellular	Cellular Phone number	Text	
{e-Mail}	Private e-mails	Text	
{Information channels}	Selecting information channels to be used to inform the candidate	Selection, optional	SMS, e-mail, ...

Study details in enrolment form			
Field	Description	Type	Possible Values
<b>Previous education</b>			
Type	Profile of the high school	Selection	Master list
Name	Name of previous school	Selection	Master list
Town	Place of previous education	Text	Master list
Year of graduation	Year the candidate has graduated high-school	Number	-
{Studying language}	Studying language in the high school	Selection	Master list
High school average	Average grade of the previous education	real number	Shown – automatically calculated
{Subject Marks In Year}		There will be four structures of type SubjectMark – one for each school year	List of marks for all subjects in years 1-4 in high school
Graduation type	Type of graduation	Selection	State graduation; School graduation; Without graduation and International graduation

Study details in enrolment form			
Field	Description	Type	Possible Values
<b>Following fields are filled if the applicant has State graduation</b>			
External exam #1 subject		Selection	Macedonian; Albanian; Turkish
External exam #1 mark		Number 2-5	
Percentile rank #1		Real number	
External exam #2 subject		Selection	Master list
External exam #2 mark		Number 2-5	
Percentile rank #2		Real number	
Internal exam #1 subject		Text	
Internal exam #1 mark		Number 2-5	
Internal exam #2 subject		Text	
Internal exam #2 mark		Number 2-5	
Project task name		Text, optional	
Project task mark		Number 2-5	

Study details in enrolment form			
Field	Description	Type	Possible Values
<b>Following fields are filled if the applicant has School graduation</b>			
Subject #1 name		Text	
Subject #1 mark		Number 2-5	
Subject #2 name		Text	
Subject #2 mark		Number 2-5	
Project task name		Text	
Project task mark		Number 2-5	
<b>Following fields are filled if the applicant is without graduation</b>			
First important subject		Number 2-5	
Second important subject		Number 2-5	



Study details in enrolment form			
Field	Description	Type	Possible Values
<b>Following fields are filled if the applicant has International graduation</b>			
{SubjectAndMark}		Structure SubjectMark	
Project task name		Text, optional	
Project task		Number	
Special exam	Score on the additional special exam (if required)	Number	Some SP have additional qualification exam – entered by AO after exam
Education data source	How the education data were obtained. Filled automatically by the system.	Selection	On the web by the candidate ; by web service from MoES; by EO from paper application / documents provided
{Foreign language studied}	Foreign languages studied in the previous education	Selection	Master list
{Foreign language spoken}		Selection	Master list
Special circumstances	Special case type	Selection	Master list

Study details in enrolment form			
Field	Description	Type	Possible Values
<b>Personal data for the parent / guardian</b>			
Name and Surname	Name and Surname	Text, optional	
Profession	Profession	Text, optional	
Employment	Employment	Text, optional	
<b>Scholarship</b>			
{Tuition payer}	Person paying the tuition	Selection	Parent/Guardian; personally, Other person; completely free of charge; partial discount, Bank Loan
Scholarship	Whether the student is receiving a scholarship	Selection	Yes/No
Scholarship provider	Provider of the scholarship	Text	

Study details in enrolment form			
Field	Description	Type	Possible Values
<b>Enrolment Institution</b>			
Faculty	Name of the Faculty	Selection	Master list
{Study programme(s)}	Name of the programme	Selection	Master list
Preference	Numerical preference of selected programme s	Number	
QuotaType	Boolean	Selection	State / Private quota (co-financing)
Type of studies	Full time / part time	Selection	Master list set up by admin
Location	Location of the studies	Selection	Master list
Language of studies	Study language	Selection	Macedonian, Albanian, English
Start year	Year of enrolment. set up by admin	Number	
Enrolment term	Term of enrolment in the current year. set up by admin	Number {1,2,3}	
Note by applicant	Anything else the candidate thinks the admission officers should know	Text, optional	
Note by admission officer	Admission officer note on candidate's extra documents provided	Text, optional	
List of additional documents provided	List of additional documents	Text, optional	
{Course}	Subjects that applicant will sit as part of the high school final year exam, and requires tutoring classes from the University.	Selection, optional	Master list
{Provided Document}	Documents provided by applicant in support of his application	Structure of type Provided Document. Optional	
{Signed Contract}	Contracts signed by applicant	Structure of type Signed Contract. Optional	
{Paid Fee}	Fees paid by the applicant	Structure of type Paid Fee. Optional	
Status		Int ∈ {Applied, Accepted, Rejected}	What is the status of the application?

Following table defines the structure SubjectMarksInSchoolYear.

Field Name	Type	Description
Marks	Text	List of all marks e.g. "55545543255"
School year	Number	{1, 2, 3, 4}

Following table defines the structure SubjectMark.

Field Name	Type	Description
Subject	Text	Name of subject
Mark	Number	{2, 3, 4, 5}

#### 4.2.3 Business rules and access rights

This data entry should satisfy at least the following specific business rules and access rights:

- A student can fill an application form available on the web and enter all the required data. A student can also attach scanned copies of required documents.
- SAO staff can check, edit if corrections are necessary and approve the data entered by applicants. SAO staff can define customisable notification or reminder to be sent to an applicant. If all the required data is correctly provided, then SAO staff accepts the application.
- Upon acceptance, corresponding notification is sent to applicant. Applicant is informed on the next step: applicant needs to provide the necessary documents in order to support and complete his application.

### 4.3 Applicants to second cycle of studies

#### 4.3.1 Functionality

The following functionalities are essential for this data entity:

An applicant for the second cycle of studies can be a new one or a student from the same university. For existing students, enrolment process starts from the ranking stage, because his existing data is used. Index name from the previous cycle is also kept.

Student admissions to second cycle of study are organized in the same way as it is in the first cycle.

Details for data on application form for enrolment of new students in the system in the second cycle of studies.

#### 4.3.2 Fields

This data entry consists of the following essential data fields:

Study details for second cycle of studies			
Field	Description	Type	Possible Values
<b>Candidate Personal Data</b>			
Candidate Number	Unique identifier of the candidate	Identity, Automatically assigned by the system	
Surname	Surname	text	
Maiden surname	Maiden surname	Text, optional	
Parent's name	Parent's name	text	
Name	Name	text	
EMBG	Unique number of the citizen	Text (13 digit)	Includes checksum digit, candidate's date/place of birth & sex can be extracted
Date of birth	Date of birth	Date	
Place of birth	Place of birth	text	
Municipality of birth	Municipality of birth	text	Master list
State of birth	Country of birth	text	
Sex	Sex	Selection	Male / Female
Citizenship	Citizenship	text	
Ethnicity	Ethnicity	text	Master list

Study details for second cycle of studies			
Field	Description	Type	Possible Values
<b>Address</b>			
Town	Place of living	text	
Address	Address of living	text	
Municipality	Municipality	Text	Master list
Country	Country	Text	



Study details for second cycle of studies			
Field	Description	Type	Possible Values
<b>Contact/Phones</b>			
Home	Home phone number	Text, optional	
Cellular	Cellular Phone number	Text	
{e-Mail}	e-mail	Text	
{Information channels}	Selecting information channels to be used to inform the candidate	Selection, optional	SMS, e-mail, ...

Study details for second cycle of studies			
Field	Description	Type	Possible Values
<b>Previous education</b>			
Name of finished Faculty		Text	
Type of first cycle of study	Type of first cycle of study	Selection	Traditional system / ECTS
Diploma Name	Name of diploma for first cycle of study	Selection	Master list
Study programme for diploma	Name of the programme	Selection	Master list
Town	Place of institution	Text	Master list
Year of graduation	Year the candidate has graduated first cycle of study	Number	-
Studying language	Studying language in first cycle of study	Selection	Master list
Credits	ECTS Credits	Number	
Studying average	Average grade of the cycle of study	real number	Shown – automatically calculated
{Foreign languages studied}	Foreign languages studied in the previous education	Selection	Master list
Publication	Publication list	Text	
References	References list	Text	

Study details for second cycle of studies			
Field	Description	Type	Possible Values
<b>Personal data for the parent / guardian</b>			
Name and Surname	Name and Surname	Text, optional	
Profession	Profession	Text, optional	
Employment	Employment	Text, optional	



Study details for second cycle of studies			
Field	Description	Type	Possible Values
<b>Scholarship</b>			
{Tuition payer}	Person paying the tuition	Selection	Parent/Guardian; personally, Other person; completely free of charge; partial discount
Scholarship	Whether the student is receiving a scholarship	Selection	Yes/No
Scholarship provider	Provider of the scholarship	Text	

Study details for second cycle of studies			
Field	Description	Type	Possible Values
<b>Enrolment Institution</b>			
Faculty	Name of the Faculty	Selection	Master list
{Study programme}	Name of the programme	Selection	Master list
Presidence of selected programme(s)	Numerical presidence	Number	
Location	Location of the studies	Selection	Master list
Status	Student status	Selection	Full time / Part time
Language of studies	Study language	Selection	Macedonian, Albanian, English
Start year	Year of enrolment	Number	
Enrolment term	Term of enrolment in the current year	Number	1,2,3

Study details for second cycle of studies			
Field	Description	Type	Possible Values
<b>Comment</b>			
Note by applicant	Anything else the candidate thinks the admission officers should know	Text, optional	
Note by admission officer	Admission officer note on candidate's extra documents provided	Text, optional	
List of additional documents provided	List of additional documents	Text, optional	
{Provided Document}	Documents provided by applicant in support of his application	Structure of type Provided Document. Optional	
{Signed Contract}	Contracts signed by applicant	Structure of type Signed Contract. Optional	
{Paid Fee}	Fees paid by the applicant	Structure of type Paid Fee. Optional	
Status		Int ∈ {Applied, Accepted, Rejected}	What is the status of the application?

### 4.3.3 Business Rules

This data entry should satisfy at least the following specific business rules:

- The candidates are ranked by the number of points scored.
- The rates are defined independently by Enrolment Committee on each carrier of study programme, which leads to manual score definition based on candidate documentation.

## 4.4 Paid Fee

### 4.4.1 Functionality

The following functionalities are essential for this data entity:

- **List:** Provide a list of all fees paid by an applicant.
- **Search** for candidates by paid and unpaid fees.
- **Maintain** the list of fess paid signed by an applicant.
- **Auditing:** All changes to paid fees are logged.

### 4.4.2 Fields

This data entry consists of the following essential data fields:

Field Name	Type	Description
Type	String [80]	Chosen from the master list of fee types
Date of payment	Date	
Amount	Currency	

### 4.4.3 Business rules and access rights

This data entry should satisfy at least the following specific business rules and access rights:

- System administrator can maintain the master list of fee types.
- SAO staff can maintain the list of fees paid by an applicant.

## 4.5 Provided Document

### 4.5.1 Functionality

The following functionalities are essential for this data entity:

- **List:** Provide a list of all documents provided by an applicant in support of his enrolment application.
- **Search** for candidates by provided and missing documents.
- **Maintain** the list of documents provided by an applicant.
- **Auditing:** All changes to provided documents are logged.
- **Electronic form:** Scanned copies of provided documents are kept in the system.

### 4.5.2 Fields

This data entry consists of the following essential data fields:

Field Name	Type	Description
Type	String [80]	Chosen from the master list of document types
Date provided	Date	
Electronic Copy	Object, optional	Scanned (or otherwise electronic) copy of the provided document

### 4.5.3 Business rules and access rights

This data entry should satisfy at least the following specific business rules and access rights:

- System administrator can maintain the master list of document types.
- SAO staff can maintain the list of documents type.

## 4.6 Signed Contract

### 4.6.1 Functionality

The following functionalities are essential for this data entity:

- **List:** Provide a list of all contracts signed by an applicant.
- **Search** for candidates by signed and unsigned contracts.
- **Maintain** the list of contracts signed by an applicant.
- **Auditing:** All changes to signed contracts are logged.

### 4.6.2 Fields

This data entry consists of the following essential data fields:

Field Name	Type	Description
Type	String [80]	Chosen from the master list of contract types
Date signed	Date	

### 4.6.3 Business rules and access rights

This data entry should satisfy at least the following specific business rules and access rights:

- System administrator can maintain the master list of contract types.
- SAO staff can maintain the list of contract types.



## 4.7 Study programmes

Study programme is the officially acknowledged and accredited comprehensive set of compulsory and elective course units that define the principal field of study.

### 4.7.1 Functionality

The following functionalities are essential for this data entity:

- **List:** Provide a list of all study programmes.
- **Search filter, and sort** the study programmes by all fields.
- **Maintain** the study programmes.
- **Auditing:** All changes to signed contracts are logged.

### 4.7.2 Fields

This data entry consists of the following essential data fields:

Field	Description	Type	Possible Values
SP_ID	Unique ID of the study programme	Identity, Automatically assigned by the system	
Study programme name	Name of the study programme	Selection	List of all accredited study programmes
Cycle of studies	Which cycle of studies is the SP	Selection	1, 2, 3, other
Duration	Duration of the study programme in years	Number	
Type	Type of the study programme	Selection	Academic; professional; ...
Full time / part time studies	Way the study programme is offered	Selection	Redovni; vonredni
Title gained after completion / graduation	What title the candidate gains after the successful completion of the SP	Text, optional	
Faculty	Faculty where the SP is accredited	Selection	List of all Faculties + university for interdisciplinary studies
Place	The place (town) where lectures are organized	Selection, optional	If dispersed studies of the same SP are organized on several places - selection of places; otherwise hidden
Language of study	Languages on which the study programme is offered	Selection	List of values which are different for each SP.
Additional exam	Is there additional special exam for the candidates organized by the Admission Office (AO)	Yes/No	Some SP have additional qualification exam (eg. Art)

Field	Description	Type	Possible Values
<b>Enrolment numbers</b>			
State quota	Maximum number of students allowed to be enrolled in state quota	Number	
Private quota	Maximum number of students allowed to be enrolled in private quota	Number	
Activation minimum	Minimum number of students needed to be enrolled in order to activate the SP	Number	
Tuition fee per semester for state quota		Number	
Tuition fee per semester for private quota		Number	
Minimum points required to rank for state quota	Minimum number of points needed to be ranked in the state quota	Number	
Minimum points required to rank for private quota	Minimum number of points needed to be ranked in the private quota	Number	

Field	Description	Type	Possible Values
<b>National quotas</b>			
{Quota for ethnicity}	Is there an ethnic quota for the corresponding ethnicity for this study programme	Pair [Ethnicity name, Yes/No]	

#### 4.7.3 Business rules

This data entry should satisfy at least the following specific business rules:

- Study programmes can exist on different places (dispersed studies) at the same university
- Study programmes can be offered on different languages
- Different rules can apply for such cases even for the same study programme.
- Study programmes can be offered to full-time and/or part-time students.

## 4.8 Study programmes group / faculty

### 4.8.1 Functionality

The following functionalities are essential for this data entity:

University units (Faculties / Institutes) often organize several study programmes of the same corresponding area, sharing the same enrollment prerequisites. In such cases they usually allow the candidates to apply for several study programmes at the same institution in the same enrollment term, in which case each candidate must specify precedence over his/her choices. In such cases, a group of study programmes eligible for multiple selections by the candidates must be defined. Since the prerequisites for the study programmes in the group must be shared, they are defined once for the whole group. In a case of a single (separate) study programme, a group consisted of the single study programme should be created.

In order to stimulate education of ethnic minorities, rules for positive discrimination for candidates of ethnic minorities are also applied. Additional so called "national quotas" are applied for the candidates of ethnic minorities that qualify for enrolment.

### 4.8.2 Fields

This data entry consists of the following essential data fields:

Field	Description	Mandatory	Possible Values
Faculty	Faculty where the SPs are accredited	Selection, optional	List of all Faculties + university for interdisciplinary studies
Cycle of studies	Which cycle of studies is the GoSP	Selection	1, 2, 3, other
Place	The place (town) where lectures are organized	Selection	If dispersed studies of the same SP are organized on several places - selection of places; otherwise hidden



Field	Description	Mandatory	Possible Values
<b>Prerequisites</b>			
{Type of high-school finished}	What type of HS the candidate must have completed in order to apply	Selection	MasterList
{Graduation type(s) eligibility}	What type of graduation the candidate must have taken in order to apply	Selection	State graduation; School graduation; Without graduation and International graduation
{Eligible external exam #2 subject}	What subject the candidate must have taken for external graduation exam	Selection	List of eligible subjects
Eligible internal exam #1 subject	What subject the candidate must have taken for internal graduation exam	Text	
Eligible internal exam #2 subject	What subject the candidate must have taken for internal graduation exam	Text	
First important subject	Important subject for point calculation for candidates without graduation	Selection	List of eligible subjects
Second important subject	Important subject for point calculation for candidates without graduation	Selection	List of eligible subjects
<b>National quotas</b>			
{Additional quota for ethnicity}	Additional quota for the applicants of the corresponding ethnicity	Structure [Ethnicity Name, Number]	

### 4.8.3 Business rules

This data entry should satisfy at least the following specific business rules:

- all SPs in GoSP must be of same cycle of studies
- all SPs in GoSP must be organized in the same place (town)
- all SPs in GoSP must share same prerequisites
- SPs in GoSP are usually on the same Faculty
- Ethnic quotas are usually specified per faculty, not per SP (total number of candidates of corresponding ethnicity for all SPs on that faculty are specified regardless of their distribution among SPs), but in the same time for some SPs some ethnic quotas can be 0 (no additional ethnic quotas for some study programmes).

## 4.9 Student enrolment term

### 4.9.1 Functionality

The following functionalities are essential for this data entity:

Student enrolments are usually organized in the certain periods of the year and last for a certain predetermined period of time. Different rules can apply for different enrolment terms resulting in different prerequisites for the candidates.

Each enrolment term is defined by several dates when certain activities of the enrolment process are taking place. The dates (including precise timing: hours+minutes) that define an enrolment term are:

- **Inception date** – after this date candidates can open accounts on the system and enter information in the enrolment form (but can not submit it)
- **Submission start** – candidates can start submitting their applications. Registration and application form filling is still active. However, after submitting the application, candidate's application is locked and he/she can not edit the application any more.
- **Submission end** – candidates can no longer register for account, fill in and submit the form. After this moment the admission officers can start reviewing applicant's data.
- **Special exam** – date and time for the specialized exam for the candidates if defined by the study programme
- **Candidate list publication** – the deadline to publish list of candidates that have completed the application process (with full documentation). Candidates are notified through info channel selected by each candidate about this event.
- **Start of complaint period for applicant data** - the date/time the candidates can start filling in and submitting a complaint about the data for their application entered in the system (misspelled name, wrong calculation of points, study programme precedence)
- **End of complaint period for applicant data** - the deadline for candidates to fill in and submit a complaint about the data for their application. After this moment no more complaints can be submitted and the enrolment officers can review the complaints, produce a report and send responses to the applicants accompanied by corrections in the database (where approved by the enrolment commission).
- **Preliminary ranking list publication** – the deadline to publish preliminary ranking list of candidates. Candidates are notified through info channel selected by each candidate about this event.
- **Start of complaint period for ranking** - the date/time the candidates can start filling in and submitting a complaint about the ranking process according to the published preliminary ranking list.
- **End of complain period for ranking** - the deadline for candidates to submit a complaint about the ranking process. After this moment the enrolment commission can review the complains, produce a report and issue responses to candidates accompanied by possible corrections in the database (where approver by the enrolment commission)
- **Final ranking list publication** - the deadline to publish the final ranking list of candidates. Candidates are notified through info channel selected by each candidate about this event accompanied by information for the further steps they are expected to carry on the enrolment
- **Enrolment start** - the date/time when the enrolment of the accepted candidates starts. The accepted candidates are expected to submit additional documents, pay tuition fees, etc. Rejected candidates can take their documents back or agree to apply in the next enrolment term (if available) on the same institution (possibly on different study programme)

- **Enrolment end** - the date/time when the enrolment of the accepted candidates ends. All accepted candidates that have successfully completed the enrolment are transferred to the “core module” defined in WP 1.2 and WP 2.1

Different rules can apply for different groups of study programmes and in different enrolment terms. The administrator should be able to configure the enrolment system with the actual rules for the institution (group of study programmes) for the enrollment period. This includes enrolment term dates, prerequisites to apply, tuition fee, number of candidates allowed to enroll in each quota (state, private, ethnic).

## 4.10 Ranking the candidates

### 4.10.1 Functionality

The following functionalities are essential for this data entity:

- Maintenance: Ranking points can be awarded to each applicant.
- Publishing: Ranking list can be published at University / Faculty web site
- Notification: Notifications (via email, SMS) can be sent to applicant containing the status of their application and position in the ranking list.

The success rate of each candidate is given in points. The candidates are ranked by the number of points scored. The points are calculated from the candidate's high school marks adding the points scored on the qualification exam, if such exam is defined for the study programme (only for art, architecture, ...). The points from the candidates high school marks are calculated in a slightly different way depending on the candidates type of graduation (explained in [3])

Public universities are regulated by admission quotas for each type of studies on each study programme offered. Admission quotas are given as maximum number of students allowed to be enrolled on certain study programme in the so called “state financed quota” (students that pay lower fees) and additional quota for students that can be enrolled at the study programme if the state financed quota has been filled – these students pay higher fees. The process is carried out as follows: all candidates apply for the study programme and are ranked by their high-school and graduation marks; the first N students (where N is the state quota) on the ranking list are admitted while the next M students on the ranking list (where M is the private quota) are offered to be enrolled in the private quota (paying higher fee).

Depending on the enrolment term, candidates with different type of graduation may apply. The way the points are calculated is different depending on the type of graduation of the candidate (explained in [3]). Calculation of the points awarded to candidates is performed up to a certain precision (rounded to the 3<sup>rd</sup> decimal digit by default, should be configurable).

The candidates of the ethnicities that have scored enough points to be enrolled are enrolled in the additional quota for the corresponding ethnicity. If the number of the candidates of the corresponding ethnicity eligible for enrolment is bigger than the quota for that ethnicity (N) than the best N candidate are enrolled in the additional quota, while the rest are ranked with the others and the same ranking rules as for the rest of the candidates apply.

In case of study programmes group where candidates has appointed precedence to their choices the candidates are first ranked according to their first choice. If the candidate has not scored enough points to be ranked for enrolment on his/her initial choice of study programme and the enrolment quota for the study programme that is his/her second choice is not filled up, the candidate is moved to the ranking list for his/her second choice SP, but after the candidates that are already ranked for enrolment on that study programme according their first choice. This means that no candidate that is moved to his/her second, third, etc. choice he/she can push out of the list a candidate that has been already ranked for enrolment on his initial choice SP (has scored the minimum points required for enrolment) regardless of the fact that this candidate may have less points. If the quota for the second choice is filled up, the ranking system should try to rank the candidate to his/her third choice and so on. This procedure is continued until the candidate is not placed on a list that is not filled up yet, or all choices of the candidate are exhausted (in which case he/she is not ranked).

The candidates that have chosen different study programmes as their initial choice but did not have enough points to be ranked on the initial choice are ranked among themselves to some of their other choices in sequential order of their selected precedence without interfering with the candidates that had the corresponding SP as their first choice. After the ranking of all the candidates is finished every ranking list can be consisted of either:

- All candidates that have the corresponding study programme as their first choice; or
- All the candidates that have applied for the corresponding study programme plus the best N candidates (up to the enrolment quota for the study programme) among all the candidates that did not make to be enrolled to their first, second, etc. choice but have the corresponding study programme as their second, third, etc. choice.

The enrolment rules do allow especially gifted candidates to be enrolled at the university even if they have not finished formal education. Enrolment rules also allow some candidates in some special cases to be directly enrolled. However, even these candidates must appear on the admission lists that will clearly note the type of special case (circumstances) under which this was done. To enter such candidates in the system, a special form accessible only to admission officers should be created that will allow bypassing the prerequisites and ranking rules. This form should contain a mandatory field explaining the circumstances and noting the article / internal decision which was passed by the institution (commission) / approved by the management.

At state universities, candidates from certain schools (private) are eligible for application only in private quota. Also, at state universities foreign applicants and some other special type of applicants (ex. already graduated from similar faculty) can be enrolled out of the quota (up to a certain percentage) with co-financing. Some other special type of applicants (“деца на припадници на безбедносни сили“) are enrolled out of the quota (state financed).

During the enrolment period (between Enrolment start and Enrolment end) the data for the enrolled candidates is transferred by the web service *EnrolledCandidates\_WS* (details in chapter 6.2) in the eStudent Services (core) module. As soon the data for an enrolled candidate is transferred it is marked so in the enrolment module and his/her account is disabled. The data for the rejected and the candidates that did not complete the enrolment process are to be kept in the enrolment system for the consecutive enrolment terms. Such candidates can keep their active accounts in the system and after the inception date of the next enrolment term can log on and resubmit their application (without opening new account and re-entering their data) possibly on other study programme. After the completion of the enrolment cycle (usually once per year) the data from the candidates can be archived and deleted from the system.

#### 4.10.2 Fields

Following table gives a subset of the fields in the data model. The rest of the data model is defined textually in this section.

Field Name	Type	Description
Enrolment term	Date	End date of enrolment term
Publish date	Date	Date when the ranking list is published
{Student}	Int, FK	FK to the table of applicants (See section 4.2)
{Rank}	Int	Position of the applicant in the ranking list
{Status}	Int ∈ {Applied, Accepted}	Is the applicant accepted or rejected?
{Points}	Number	Number of points scored by an applicant

#### 4.10.3 List of applicants

The list of applied candidates is the first list that is produced and published in the enrolment process. A separate list for every study programme group is created. It lists all the candidates that have applied on the particular study programme / group of study programmes. For each candidate the application number (ID), name, parent name, surname, points from high school, points from graduation, points from special exam (if needed for the study programme), total

points, study programmes precedence, full-time/part-time studies (if available on the SP) and state/private quota enrolment (if available on the SP).

Example:

		Универзитет <input type="text"/>						
		Факултет <input type="text"/>						
<b>Список на пријавени кандидати за запишување во прва година на Факултетот <input type="text"/> за учебната 2009/2010 (прв уписан рок)</b>								
бр.	презиме	име	студиска програма	избрано кофинан.	редослед на ст. пр.	успех	матура/ стручни пр.	вкупно
1214	Стојчева	Ленче	7	не	85691324	60,000	39,737	<b>99,737</b>
1215	Мицкоски	Илија	7	да		60,000	29,230	<b>89,230</b>
1216	Кицев	Кристијан	7	не	8	60,000	39,232	<b>99,232</b>
1217	Јаневска	Маја	5	не	78912346	60,000	39,488	<b>99,488</b>
1218	Стојановски	Александар	8	да	7	56,700	36,472	<b>93,172</b>
1219	Науновска	Катерина	7	не	8564	60,000	29,913	<b>89,913</b>
1220	Камова	Ивана	7	не	8	59,714	22,412	<b>82,127</b>
1221	Локоски	Александар	5	да	8763129	47,400	22,017	<b>69,417</b>

After the publication of this list the candidates have certain time to fill in a complaint and requesting correction/revision of their data.

The admission officers (commission) review the complaints and make the approved corrections. After this a document “answer to the complaints” is produced and published. This document lists all ref. numbers (IDs) of the candidates that have filled in a complaint followed by a table of the accepted complains and the correction that was made to the results.

#### 4.10.4 Preliminary and final ranking list

A separate list is produced for the ranked and not ranked candidates, separate for every study programme, state and private quota, full-time and part time students. The list includes the application number (ID), name, parent name, surname, total number of points and is sorted by the total number of points in descending order.


Example:

		Универзитет <input type="text"/>			
		Факултет за електротехника и информациски технологии			
<b>Прелиминарна ранг-листа за прием на студенти на студиските програми на Факултетот <input type="text"/> за учебната 2009/2010</b>					
			<input type="text"/> Студиска програма	Државна квота	
рбр.	Пријава	Презиме	Татко	Име	Бодови
1	1281	Ташовска	Георги	Марија	96,418
2	1296	Алексовска	Зоран	Магдалена	88,234
3	1147	Николовски	Трајче	Васил	84,638
4	1029	Јовановски	Славе	Филип	84,298
5	1282	Јанев	Ристе	Лазар	83,844
6	169	Старковска	Насте	Ивана	82,948
7	1032	Спасиќ	Бране	Никола	81,638
8	1182	Тануровски	Перикли	Никола	78,067
9	1047	Клинчаров	Митре	Александар	77,834



The candidates that are ranked for enrolment on different study programmes, in the state and private quota, under different (special) circumstances and in the ethnic quotas are listed on separate lists.

Example:


 Универзитет   
 Факултет 



Прелиминарна ранг-листа за прием на студенти на студиските програми на Факултетот  за учебната 2010/2011  
**прв уписан рок (Националности)**

Студиска програма Државна квота

рбр.	Пријава	Презиме	Татко	Име	Националност	Бодови
1	1114	Крстеска	Тони	Паракева Влав		96,949
2	1121	Таири	Скендер	Еркан Турчин		95,960
3	490	Станојевиќ	Душан	Радослав Србин		94,102
4	1326	Ахмедоска	Нагип	Елмедина Турчин		90,453
5	1279	Реџеп	Хајдар	Ербил Турчин		80,459

The candidates that are not ranked for enrolment are listed on separate list(s).

Example:


 Универзитет   
 Факултет

Список на НЕРАНГИРАНИ кандидати за запишување во прва година на  
 Факултетот  за учебната 2009/2010 (прв уписан рок)

бр.	презиме	име	студиска програма	избрано кофинан.	редослед на ст. пр.	матура/ успех	стручни пр.	вкупно
230	Бојковски	Александар	7	не	8	60,000	32,241	<b>92,241</b>
132	Божиноски	Марко	7	не	8	59,733	31,789	<b>91,522</b>
1007	Максимовски	Душко	7	не		60,000	31,257	<b>91,257</b>
301	Маркоски	Филип	7	не		60,000	30,031	<b>90,031</b>
243	Николова	Емилија	7	не		60,000	28,303	<b>88,303</b>
122	Ташонов	Мирослав	7	не		52,500	33,480	<b>85,980</b>
1125	Атанасов	Киро	7	не		50,100	34,173	<b>84,273</b>
1071	Кулаку	Муамеднафи	7	не		57,067	26,518	<b>83,585</b>
162	Тодоровски	Дејан	7	да	95	56,100	26,529	<b>82,629</b>
1220	Камова	Ивана	7	не	8	59,714	22,412	<b>82,127</b>
191	Јосковска	Емилија	7	да	958	50,700	30,884	<b>81,584</b>

After the publication of this list the candidates have certain time to fill in a complaint and requesting correction/revision of their data.

The admission officers (commission) review the complaints and make the approved corrections. After this a document "answer to the complaints" is produced and published. This document lists all ref. numbers (IDs) of the candidates that have filled in a complaint followed by a table of the accepted complains and the correction that was made to the results.

Finally the final ranking list (list of accepted candidates) is published. The final ranking list has the same form as the preliminary ranking list.

#### 4.10.5 Reviewing the candidates' applications

The system should provide a way for the admission officers to check if the candidate has submitted all required documents, to review the data entered by the candidates, compare it with the paper documents provided, make any necessary corrections (if needed) and mark the application reviewed. After all applications are reviewed the list of applied candidates can be generated and published.

The admission officers should be able to easily review the complaints submitted by applicants, generate a report to be published and send individual notes to the applicants that complained. The admission officers should be able to make corrections to all applicants' data in the database. Each change in the data for the candidate after the candidate's application has been submitted / list of candidates has been published must be accompanied by an audit log entry with details about the change.

The system should enable the admission officers to fill an application form for the candidates that supplied their documents by mail accompanied by filled and signed paper enrolment form.

#### 4.10.6 Filling in a complaint

The system should distinguish among at least two complaint cycles: the first after the publication of the list of the applied candidates and a second one after the publication of the preliminary ranking list. Candidates can fill in a complaint form requesting a correction of different data in each cycle.

In the first cycle the candidates can request a change in the spelling of the name, the high school and graduation marks, ethnicity, type of school and the precedence of selected study programs.

In the second cycle the candidates can request a revision of the results of the special exam (if existing on the particular study programme).

#### 4.10.7 Complaints revision and answering

The system should provide a form that the admission officers can use to list all the candidates that have filled in a complaint, review the complaint, accept it, reject it, make a revision and possibly enter additional explanation that can be sent to the candidate. Every change should be logged in the audit log including the record ID, the change made, date/time of change, and ID of the admission officer that performed the revision. After closing all complaints (either accepted or rejected) the system should enable a report of the complaint revision from the admission commission to be generated automatically.

#### 4.10.8 Business rules and access rights

This data entry should satisfy at least the following specific business rules and access rights:

- Only the applications that were reviewed and validated by SAO staff are to be included in the ranking process.
- Enrolment Committee creates a ranking list of accepted students.
- At the end of the enrolment term, the ranking list is published at the University/Faculty web site, and all applicants are automatically notified through info channel selected.
- Ranking list is publicly available at the University/Faculty web site.

## 4.11 Master data

### 4.11.1 Overview of master data tables

Master data consists of the following lists (See List of Acronyms):

- List of subjects that applicants sit as part of the high school final year exam
- List of faculties
- List of study programmes
- List of contract types
- List of document types
- List of fess payable by applicants
- List of municipalities in Macedonia
- List of ethnicities
- List of high-school types (occupational profile)
- List of high schools in Macedonia
- List of towns in Macedonia (with at list one active high school)
- List of high-school graduation types
- List of subjects for external exam
- List of languages (high school study language, mother tongue, studied, spoken)
- Special circumstances types
- Tuition payer type

This data changes very rarely. Still, there is a need for the data to be maintainable.

The list is maintainable by the System Administrator, as depicted in the corresponding use case diagram in section 3.1.5.

#### 4.11.2 Master data tables

The following master data tables will be used:

Ethnicity:	
1.	Македонец
2.	Албанец
3.	Турчин
4.	Ром
5.	Србин
6.	Бошњак
7.	Влав
8.	Друго

Type of high-school / occupational profile	
01	гимназиско образование
02	електротехничка струка
03	машинска струка
04	сообраќајна струка
05	хемиско-технолошка струка
06	графичка струка
07	геолошко-рударска и металуршка струка
08	градежно-геодетска струка
09	економско-правна и трговска струка
10	здравствена струка
11	земјоделско-ветеринарна струка
12	текстилно-кожарска струка
13	угостителско-туристичка струка
14	уметничко образование
15	лични услуги
16	шумарско-дрвопреработувачка струка

<b>List od municipalities in Macedonia</b>	
01	Аеродром
02	Арачиново
03	Берово
04	Битола
05	Богданци
06	Боговиње
07	Босилово
08	Брвеница
09	Бутел
10	Валандово
11	Василево
12	Вевчани
13	Велес
14	Виница
15	Вранештица
16	Врапчиште
17	Гази Баба
18	Гевгелија
19	Ѓорче Петров
20	Гостивар
21	Град Скопје
22	Градско
23	Дебар
24	Дебарца
25	Делчево
26	Демир Капија
27	Демир Хисар
28	Дојран
29	Долнени
30	Другово
31	Желино
32	Зајас
33	Зелениково
34	Зрновци
35	Илинден
36	Јегуновце
37	Кавадарци
38	Карбинци
39	Карпош
40	Кисела Вода
41	Кичево
42	Конче
43	Кочани
44	Кратово
45	Крива Паланка
46	Кривогаштани
47	Крушево
48	Куманово
49	Липково
50	Лозово

51	Маврово и Ростуша
52	Македонска Каменица
56	Македонски Брод
54	Могила
55	Неготино
56	Новаци
57	Ново Село
58	Осломеј
59	Охрид
60	Петровец
61	Пехчево
62	Пласница
63	Прилеп
64	Пробиштип
65	Радовиш
66	Ранковце
67	Ресен
68	Росоман
69	Сарај
70	Свети Николе
71	Сопиште
72	Старо Нагоричане
73	Струга
74	Струмица
75	Студеничани
76	Теарце
77	Тетово
78	Центар
79	Центар Жупа
80	Чаир
81	Чашка
82	Чешиново
83	Чучер-Сандево
84	Штип
85	Шуто Оризаре

<b>List of high schools in Macedonia</b>	
<b>БЕРОВО</b>	
01	ОСУ „Ацо Русковски“
<b>БИТОЛА</b>	
02	СОУ „Јосип Броз Тито“
03	СОТУ „Ѓорѓи Наумов“
04	СОУ „Таки Даскало“
05	СОЕУ „Јане Сандански“
06	ДСЗУ „Кузман Шапкарев“
07	ОСМУ „Д-р Јован Калаузи“
08	Државно музичко училиште - Битола
<b>БОГДАНЦИ</b>	
93	СОУ „Богданци“
<b>БРОД МАКЕДОНСКИ</b>	
09	СОУ „Св. Наум Охридски“
<b>ВАЛАНДОВО</b>	
10	ОСУ „Гоце Делчев“
<b>ВЕЛЕС</b>	
11	УСО „Кочо Рацин“
12	УСО „Јовче Тесличков“
13	ССОУ „Коле Неделковски“
14	УСО „Димитрија Чуповски“
<b>ВИНИЦА</b>	
15	СОУ „Ванчо Прке“
<b>ГОСТИВАР</b>	
16	СОУ „Гостивар“ („Панче Попоски“)
17	ОСТУ „Гостивар“ („Злате Малакоски“)
18	СЕОУ „Гостивар“ („Чеде Филипоски“)
<b>ГЕВГЕЛИЈА</b>	
19	СОУ „Јосиф Јосифовски“
<b>ДЕБАР</b>	
20	ЦСНО „Здравко Чочковски“
<b>ДЕЛЧЕВО</b>	
21	СОУ „Методија М. Брицо“
<b>ДЕМИР ХИСАР</b>	
22	СОУ „Крсте П. Мисирков“
<b>КАВАДАРЦИ</b>	
23	ОСУ „Добри Даскалов“
24	СОУ „Киро Спанцов - Брко“
25	СОЗШУ „Ѓорче Петров“
<b>КИЧЕВО</b>	
26	ОСУ „Мирко Милески“
<b>КОЧАНИ</b>	
27	ОСУ „Љупчо Сантов“
28	СОУ „Гошо Викентиев“
<b>КРАТОВО</b>	
29	СОУ „Митко Пенџуплиски“
<b>КРИВА ПАЛАНКА</b>	

30	СОУ „Горче Петров“
<b>КРУШЕВО</b>	
31	ОСУ „Наум Наумовски - Борче“
<b>КУМАНОВО</b>	
32	СОУГ „Гоце Делчев“
33	ССОУ „Киро Бурназ“
34	СОУ „Перо Наков“
35	ОСТУ „Наце Буѓони“
<b>НЕГОТИНО</b>	
36	СОУ „Св. Кирил и Методиј“
<b>ОХРИД</b>	
37	ОСУ „Св. Климент Охридски“
38	ОЕМУЦ „Св. Наум Охридски“
39	ОУТУ „Ванчо Питошески“
<b>ПРИЛЕП</b>	
40	СОУГ „Мирче Ацев“
41	СОУ „Горче Петров“
42	СОУ „Орде Чопела“
43	СОЕПТУ „Кузман Јосифовски-Питу“
44	СОУ „Ристе Ристески-Ричко“
<b>ПРОБИШТИП</b>	
45	СОУ „Наум Наумовски-Борче“
<b>РАДОВИШ</b>	
46	СОУ „Коста Сусинов“
<b>РЕСЕН</b>	
47	СОУ „Цар Самуил“
<b>СВЕТИ НИКОЛЕ</b>	
48	СОУ „Кочо Рацин“
<b>СКОПЈЕ</b>	
49	СУГСГ „Раде Јовчевски-Корчагин“
50	СУГС „Никола Карев“
51	СОУ „Зеф Љуш Марку“
52	СУГСГ „Јосип Броз Тито“
53	СУГСГ „Орце Николов“
54	СУГС „Кочо Рацин“
55	СУГС „Панче Арсовски“
56	СУГС „Браќа Миладиновци“
57	СУГС „Георги Димитров“
58	СМУГС „Д-р Панче Караѓозов“
59	СЕПУГС „Васил Антевски - Дрен“
60	СЕПУГС „Арсени Јовков“
61	СУГС „Цветан Димов“
62	СУГС „Лазар Танев“
63	СУГС „Марија Кири Скловска“
64	СГГУ „Здравко Цветковски“
65	СУГС „8-ми Септември“
66	СУГС „Владо Тасевски“
67	СУГС „Димитар Влахов“
68	АСУЦ „Боро Петрушевски“



69	СЕТУГС „Михајло Пупин“
70	ДМБУЦ „Илија Николовски-Луј“
71	ДСУПУ „Лазар Личеноски“
72	ДУФК „Методи Митевски Брицо“
73	ЦОР „Партенија Зографски“
74	ДУРДМОВ „Димитар Влахов“
75	ДСУРО „Св. Наум Охридски“
<b>СТРУГА</b>	
76	СОУ „Нико Нестор“
92	СОУ „Д-р Ибрахим Темо“
<b>СТРУМИЦА</b>	
77	СОУ „Јане Сандански“
78	СОУ „Димитар Влахов“
79	СОУ „Никола Карев“
<b>ТЕТОВО</b>	
80	СОУГ „Кирил Пејчиновиќ“
81	СОМУ „Никола Штејн“
82	СОЕУ „8 Септември“
83	ССОУ „Моша Пијаде“
84	СТОУ „Гоце Стојчески“
85	СМУ „Тодор Скалоски-Тетоец“
<b>ШТИП</b>	
86	СОУ „Славчо Стојменски“
87	СОУ „Коле Нехтенин“
88	СОУ „Димитар Мирасчиев“
89	СОУ „Јане Сандански“
90	ДСМУ „Сергеј Михајлов“
91	ЦССНО „Искра“
<b>ПРИВАТНИ УЧИЛИШТА</b>	
95	ПСУ „Јахја Кемал“
96	ПСУ „Петта приватна гимназија“
97	ПУСО „САБА“
<b>99</b>	<b>ДРУГИ приватни и странски училишта</b>

<b>Special circumstances</b>	
0	Normal application (no special circumstances)
1	деца без родители
2	лица со прв степен на инвалидност
3	воени инвалиди
4	лица од дом за напуштени деца
5	припадници на безбедносни сили
6	деца на починати учесници во мировни операции

## 5 User interface

### 5.1 General requirements

Application is expected to follow the good design practices for web user interface such as [14]. Following is a suggested list of guidelines:

#### 5.1.1 Validation

There are several options for handling validation errors:

- Raise an exception. This might not be a useful action in the presentation layer. However, application might rise (or log) an exception if one of the validator controls detects some sort of attack.
- Display individual error messages, indicating the reason for the validation error and allowing the user to re-enter data accordingly.
- Use the ValidationSummary control to display a summary of all validation errors in a single location.
- Whatever action application performs when validation fails, application must make sure that the user is clearly notified about what is wrong and is given an opportunity to correct the data entry.

When the user clicks to “Save” data, any field that is bound to validation logic, for which the validation logic fails (for example: no data has been provided for a “Required” field) will show a red “Validation” message at the right side of that control. Once data are entered and the focus is changed to other controls that red “Validation” message will disappear. Here are the common validation types and messages that will be used in the application:

- Required: “Required”
- Email address format: “Valid email address required”
- Date format: “Not a valid date”
- Number: “Not a number”
- Fractional value: “Enter a valid number or value”

The following messages should be included “\*” for required fields, and also a description message text “\* indicates required fields” at the top right of the UI panel.

When the user exceeds the recommended length of text, a message box will be shown automatically and no characters can be entered.

A validation for the EMBG filed should be provided (for details on checksum calculation and EMBG structure see: [http://en.wikipedia.org/wiki/Unique\\_Master\\_Citizen\\_Number](http://en.wikipedia.org/wiki/Unique_Master_Citizen_Number)). After entering the EMBG the candidates date and place of birth and sex can be automatically extracted and the corresponding fields in the form should be populated. The system should perform this without post-back to the server.

#### 5.1.2 Control focus

The following rules apply for control focus:

- When a form is loaded, the focus will be on the first control.
- There will be a default submit button in each web form.

#### 5.1.3 Grid

The lists will be generated on a grid. The following rules should apply:

- Include “Delete Confirmation Box”
- Include Paging.
- Include Sorting. When the application retrieves a large amount of data, data paging techniques should be used to avoid scalability problems. Application should not retrieve more data than required at any one time. For example, if a screen displays 1,000 rows of data in a grid with 20 rows per page, then the application should implement data retrieval logic that retrieves 20 rows at a time.

- Enable filtering for all displayed columns.
- For action buttons use text/ image.

#### 5.1.4 Control to access a list of predefined values

The fields that have a limited set of predetermined values should be presented as:

- A drop down list if the number of values is greater than 5.
- A set of radio buttons if the number of values is less than 4.

#### 5.1.5 Preview of details page

The details info of a record of tabular data can be viewed and updated in any of the following ways:

- **Grid:** Data can be updated on the grid. Include save, cancel, and delete button
- **Preview details panel:** Details content will be placed on the same page and can be updated.
- **Pop-up page:** Content for the selected record will be shown in a pop-up page.
- **Multiple pages:** Include “Show” button to go to another page showing details for the selected record

#### 5.1.6 Error page

If an error occurs at the web server while processing user requests, an error page will be shown with user friendly and informative text.

#### 5.1.7 File attachments

Maximum file size should be mentioned in the file upload page.

#### 5.1.8 Consistency

Consistency of UI should be achieved in all web pages. It is suggested to use CSS at the very minimum, and also other mechanisms specific to the technology used e.g. Themes, Master pages, Skins, Navigation controls in ASP.NET.

#### 5.1.9 Data formatting

Formatting of all data types (number, currency, date, time etc.) must follow the regional settings in Macedonia.

#### 5.1.10 Help system and tips assistance for filling forms

On every screen a clearly visible link to the help subsystem that explains the procedure and what is expected by the user. Next to every field the applicant is expected to fill, an image (with question mark for example) that displays as a floating window (or in a dedicated part of the screen) explanation of the field and what is expected by the applicant.

Tips (text messages to appear when mouse is positioned on data items) should be provided for data field identifications in forms and grids.

## 5.2 Authentication and identification

The following functionalities are specified in this system:

- Registration of new users
- Logging into the system
- Retrieving forgotten password
- Changing a password
- Reporting a problem without logging into the system

### 5.2.1 Overall functional requirements

This section describes the requirements for the following five functionalities:

- Register on the system – The new user registers on the system by filling a form providing valid e-mail address, choosing a password (entered twice for verification) and entering a security code (captcha). Links to the “Terms of Use” and “Privacy Policy” documents should be present on this screen. The system checks if the e-mail address is already registered on the system and if it is not sends an email to the new user’s address with activation code. The user account is activated after the user enters the activation code (send as a hyperlink) in the e-mail message.
- The start page of the system is the login screen. A registered user can log in on the system by entering his e-mail and password. A link to the registration form and the password recovery form should also be present on the initial screen.
- For retrieving forgotten password the user should be presented with a form to enter his e-mail address. By submitting the e-mail the system will reset the password for the corresponding user to a random password and send it to the user’s e-mail.
- The user should be able to change its present password when logged on to the system by editing his profile
- The system should provide a way for a user to report a problem with the system without logging to the system by sending an e-mail or filling and submitting an on-line form describing the problem (verified by captcha to avoid robots).

### 5.2.2 Registration

#### Description and priority

Applicants will carry out their own registration, providing the system with a way to associate a user to their application. This will enable the system to display personalized information when the user logs in and certain information. Giving each student a unique ID will also allow the system to associate the user with the data entered in the system associated to his application file.

On the initial visit to the admission web site the prospective students will be offered to open an account (create a profile) on the admission system. After identifying with their e-mail address and choosing a password (and verifying by captcha) an account activation e-mail message will be sent to the candidate.

#### Stimulus/Response Sequences

The following information is to be obtained in order to register an account:

- Name
- Surname
- Personal e-mail address

#### Functional Requirements

**Activation** – First time users should first activate their account by logging in with their personal e-mail address and input a password.

**Password generation** – The system should provide automatic password generation for registered account.

**Registration** – The system should give access to applicants to their application form, application status and ranking results panel.

**Forgotten password** - The system should provide a mechanism for resetting / retrieving a forgotten password.

### 5.2.3 Profile configuration

#### Description and priority

The candidate should be able to configure:

- the user profile on the system regarding the interface language,
- the channel(s) used for notification (e-mail, SMS ...)
- the notifications to be sent by the system on different events (submission has started, list of candidates has been published ...).

### 5.2.4 Applicants menu

#### Description and priority

After activating the account the candidate can

- proceed to logging in at the system,
- filling / editing the application form,
- submitting the application,
- browse the ranking results,
- filling a complaint and perform the other activities of the admission process explained below.

## 5.3 Application form filling

### 5.3.1 Identification and validation

A unique candidate number ID is generated for every applicant in the moment his account was created. This number cannot be changed. This number should be present in all transactions.

The system should enable the user to fill in the required data in the application form.

If the candidate is applying for a group of study programmes he/she must select at least one study programme. If multiple study programmes are selected than a precedence for the selected options must be specified by the applicant. The precedence can be defined by selecting the offered options from one list and moving them to second list ordered by precedence (or by entering the single character label assigned to the option in a decreasing precedence order as a text string).

The entered values of all fields that can be validated should be validated on the client side.

### 5.3.2 General requirements

The system is required to enable entering of all data requested for implementing the ranking and enrolment process as well as data requested by the SSO. Different data can be required by different universities / study programmes. Although most of the data is mandatory, some data can be mandatory in some cases and optional in other, or even not required for others. The system should provide a way for the administrator to configure which fields of the form are mandatory, optional or not required (hidden) and provide default values for them.

The system should provide several ways for completing the application form:

- Filling all the details in the application form by the candidate
- Transferring the high-school data for the candidate form the MoES using a web service and filling automatically some of the fields
- Filling all the details in the application form by the admission officer / support personnel for applications submitted in paper-only form

The system should allow the partially or fully filled application form to be saved on the system so that the applicant can log off the system, than log on again, and edit the form multiple times before submitting it. After the submission of the form, the entered data should be locked and the applicant cannot modify the data in the form any more, but only view the data that were submitted to the system and print the reference form with generated unique ID. The applicant should be warned before the final submission of the form that after the submission he will not be able to change the entered data in the form any more. Any server-side validation of the form should be done immediately after submitting the form, and the user should be informed about the success of the submission process. The system should provide an option for all the completed applications that were not submitted by the applicant to be automatically submitted at the end of the application submission period.

### 5.3.3 Filling details in the application form by the candidate

#### Description and priority

The enrollment procedure implies that the prospective candidates should fill details and provide mandatory documents to be available to SAO through the system. The application form should consist of several areas of information logically structured as described below.

Specific faculties will have additional fields and data to be filled by the applicant. This should be resolved in a way where the administrator will have the privilege to configure which fields of the form are mandatory, optional or not required (hidden) and provide default values for them.

### Stimulus/Response Sequences

The system is supposed to enable entering all data that are required for application. This includes:

- Application Section
- Recommended section

The applicant section includes:

- Candidate personal Information
- Application information
- Previous education
- Required documents (Birth certificate, Certificate of Citizenship, 4 Certificates from Secondary School, Secondary Education Diploma, Photo)
- Application Fee

The recommended section includes:

- Previous classes
- Work History
- Interests

The applicants information entered in the application form should be accessible by the SAO to check the validity of the data entered.

### Functional Requirements

**Create/Edit/Delete an application form** – Prospective students/applicants should be able to create/edit/ delete and existing application form through the system. The system should guide the student through the application steps (wizard like) described above, and enable saving option for the information entered. The applicant should be able to edit information entered at a previous login session, and also should be available with an Application withdrawal option. This option should delete the created (and if submitted) application form by that user ID.

A submitted application should enable to the applicant to edit the recommended section only, and also should show indication of the applicant's application status (rejected, pending, accepted)

The SAO should have access only to submitted applications to check the validity of the entered data.

**Application Fee** – The application fee payment should be enabled by available bank interface with proper security measures applied. The application fee could also be paid directly through a proper bank account.

**Submit application** – The applicant should be enabled to submit the application form once filled. The system should check if all the mandatory information is made available before issuing a confirmation receipt and whether the enrolment period is still active. After this the SAO checks the applications data and notifies the applicant if the application is approved or whether certain information should be edited and finished.

#### 5.3.4 Transferring the high-school data for the candidate form the MoES

##### Description and priority

The previous education section could be automatically filled with applicant details if a specific web service is available for the information from MoES. The applicant should be able to review this entered information and file a complaint if an error appears. A confirmation from the applicant is indispensable in order to proceed to the next step in the application procedure.

##### Functional Requirements

**File complaint** – The applicant should be able to file a complaint if any of the information obtained through the MoES system is incorrect. The system should automatically file the complaint to the MoES system in order for the problem to be resolved.

### 5.3.5 Application form for paper applications

This section is about filling all the details in the application form by the admission officer / support personnel for applications submitted in paper-only form

#### Description and priority

The staff from the Administration office should be able to review the submitted applications forms. The staff should be able to send a notification email to the specific applicant if any of the information in his/her application form is to be edited.

All the approved applicants are informed by the SAO to sign preliminary contract, and *pay a part of the tuition fee*. The staff from the Administration office should manually enter the paper-based applicants in order to obtain proper candidate ranking.

#### Functional Requirements

**Fill application form for paper-only applicants** – The SAO should be able to fill application details provided by paper-only candidates.

**Notifications** – The SAO should be able to send notification emails to specific applicant or to the group as whole for several purposes: Application edits, Contract signing and Fees payment.



## 5.4 Applicant services

### 5.4.1 Application form filling (see section 4.2)

#### Description and priority

This section describes the details which are contained in the application form for applicant enrolment in the first and second cycle of studies.

#### Stimulus/Response Sequences

The applicant should provide information and details when filling the application form. This information should be logically structured and saved in proper data model. The following information is included:

- Candidate personal information
- Previous Education
- Optional fields
- Parent/guardian information
- Tuition fees/Scholarship
- Enrolment institution

Optional fields include:

- Applicant has State graduation
- Applicant has School graduation
- Applicant has no graduation
- Applicant has international graduation

#### Functional Requirements

- **Applicant fill application form** – An applicant can fill an *application form* available on the web and enter all the required data. A student can also attach scanned copies of required documents.
- **Applicant data validation** - SAO staff can check and approve the data entered by applicants. SAO staff can define customisable notification or reminder to be sent to an applicant. If all the required data is correctly provided, then SAO staff accepts the application.
- **Applicant notification** - Upon acceptance, corresponding notification is sent to applicant. Applicant is informed on the next step: applicant needs to provide the necessary documents in order to support and complete his application.

### 5.4.2 Complaint form filling

#### Description and priority

The system should distinguish among at least two complaint cycles: the first after the publication of the list of the applied candidates and a second one after the publication of the preliminary ranking list. Candidates can fill in a complaint form requesting a correction of different data in each cycle.

In the first cycle the candidates can request a change in the spelling of the name, the high school and graduation marks, ethnicity, type of school and the precedence of selected study programs.

In the second cycle the candidates can request a revision of the results of the special exam (if existing on the particular study program).

#### Stimulus/Response Sequences

- **Start of complaint period for applicant data** - the date/time the candidates can start filling in and submitting a complaint about the data for their application entered in

the system (misspelled name, wrong calculation of points, study programme precedence)

- **End of complaint period for applicant data** - the deadline for candidates to fill in and submit a complaint about the data for their application. After this moment the enrolment officers can review the complaints, produce a report and send responses to the applicants accompanied by corrections in the database (where approved by the enrolment commission).
- **Preliminary ranking list publication** – the deadline to publish preliminary ranking list of candidates. Candidates are notified through info channel selected by each candidate about this event.
- **Start of complaint period for ranking** - the date/time the candidates can start filling in and submitting a complaint about the ranking process according to the published preliminary ranking list.
- **End of complain period for ranking** - the deadline for candidates to submit a complaint about the ranking process. After this moment the enrolment commission can review the complains, produce a report and issue responses to candidates accompanied by possible corrections in the database (where approved by the enrolment commission)
- **Final ranking list publication** - the deadline to publish the final ranking list of candidates. Candidates are notified through info channel selected by each candidate about this event accompanied by information for the further steps they are expected to carry on the enrolment

#### Functional Requirements

**Check for complaint files** – Complaints should only be enabled in the proper complaint period defined by the institution. Complaints should be directed to SAO for review.

**Notifications** – individual notes to the applicants that complained.

## 5.5 Administration functions

### 5.5.1 Master data manipulation (see section 4.11)

#### Description and priority

Master data manipulation includes the functions to list, add, and modify the following entities:

- subjects that applicants sit as part of the high school final year exam
- faculties
- study programmes (see chapter 4.7)
- study programmes group (see chapter 4.8)
- contract types (see chapter 4.6)
- document types (see chapter 4.5)
- fees payable by applicants (see chapter 4.4)
- High schools

### 5.5.2 Enrolment terms administration (see section 4.9)

#### Description and priority

Student enrolments are usually organized in the certain periods of the year and last for a certain predetermined period of time. Different rules can apply for different enrolment terms resulting in different prerequisites for the candidates.

The enrolment terms should be checked before successive steps are enabled to the applicant.

#### Stimulus/Response Sequences

The following dates and terms should be checked by the system:

- **Inception date** – after this date candidates can open accounts on the system and enter information in the enrolment form (but cannot submit it)
- **Submission start** – candidates can start submitting their applications. Registration and application form filling is still active. However, after submitting the application, candidate's application is locked and he/she cannot edit the application any more.
- **Submission end** - candidates can no longer register for account, fill in and submit the form
- **Special exam** – a specialized exam for the candidates if defined by the study programme
- **Candidate list publication** – the deadline to publish list of candidates that have completed the application process (with full documentation). Candidates are notified through info channel selected by each candidate about this event.
- **Start of complaint period for applicant data** - the date/time the candidates can start filling in and submitting a complaint about the data for their application entered in the system (misspelled name, wrong calculation of points, study programme precedence)
- **End of complaint period for applicant data** - the deadline for candidates to fill in and submit a complaint about the data for their application. After this moment the enrolment officers can review the complaints, produce a report and send responses to the applicants accompanied by corrections in the database (where approved by the enrolment commission).
- **Preliminary ranking list publication** – the deadline to publish preliminary ranking list of candidates. Candidates are notified through info channel selected by each candidate about this event.
- **Start of complaint period for ranking** - the date/time the candidates can start filling in and submitting a complaint about the ranking process according to the published preliminary ranking list.

- **End of complain period for ranking** - the deadline for candidates to submit a complaint about the ranking process. After this moment the enrolment commission can review the complains, produce a report and issue responses to candidates accompanied by possible corrections in the database (where approved by the enrolment commission)
- **Final ranking list publication** - the deadline to publish the final ranking list of candidates. Candidates are notified through info channel selected by each candidate about this event accompanied by information for the further steps they are expected to carry on the enrolment
- **Enrolment start** - the date/time when the enrolment of the accepted candidates starts. The accepted candidates are expected to submit additional documents, pay tuition fees, etc. Rejected candidates can take their documents back or agree to apply in the next enrolment term (if available) on the same institution (possibly on different study programme)
- **Enrolment end** - the date/time when the enrolment of the accepted candidates ends. All accepted candidates that have successfully completed the enrolment are transferred to the "core module" defined in WP 1.2 and WP 2.1

Different rules can apply for different groups of study curriculum and in different enrolment terms. The administrator should be able to configure the enrolment system with the actual rules for the institution (group of study curriculum) for the enrollment period. This includes enrolment term dates, prerequisites to apply, tuition fee, number of candidates allowed to enroll in each quota (state, private, ethnic).

#### Functional Requirements

**Check inception date** – The inception date should be checked each time the applicant tries to submit the application form.

**Check submission date** – The system should not allow application form submissions before and after the submission deadline

**Check specialized exam** – the system should check whether the chosen Faculty by the application enlists a specialized exam and notify the applicant/ register the applicant for the exam.

**Check for complaint files** – Complaints should only be enabled in the proper complaint period defined by the institution. Complaints should be directed to SAO for review.

**Check for candidate ranking deadlines** – The system should notify the EC when ranking list deadline approaches.

**Check enrollment period** – An applicant should be enabled to apply solely in the enrollment period available for the given educational institution.

## 5.6 Admission officer – applications review

The system should provide an interface for the admission officers that will enable them to easily check if the candidate has submitted all required documents, if the data entered in the system by the applicant corresponds to the data in the paper documents. The admission officers should be able to easily review the complaints submitted by applicants, generate a report to be published and send individual notes to the applicants that complained. The admission officers should be able to make corrections to all applicants' data in the database. Each change in the data for the candidate after the candidate's application has been submitted / list of candidates has been published must be accompanied by an audit log entry with details about the change.

The system should enable the admission officers to fill an application form for the candidates that supplied their documents by mail accompanied by filled and signed paper enrolment form.

### 5.6.1 Application form for paper applications

This section is about filling all the details in the application form by the admission officer / support personnel for applications submitted in paper-only form

#### Description and priority

The staff from the Administration office should be able to review the submitted applications forms. The staff should be able to send a notification email to the specific applicant if any of the information in his/her application form is to be edited.

All the approved applicants are informed by the SAO to *sign preliminary contract*, and *pay a part of the tuition fee*. The staff from the Administration office should manually enter the paper-based applicants in order to obtain proper candidate ranking.

#### Functional Requirements

**Fill application form for paper-only applicants** – The SAO should be able to fill application details provided by paper-only candidates.

**Notifications** – The SAO should be able to send notification emails to specific applicant or to the group as whole for several purposes: Application edits, Contract signing and Fees payment.

### 5.6.2 Review of the complaints

This section is about review of the complaints submitted by applicants, generate a report to be published and send individual notes to the applicants that complained

The system should provide a form that the admission officers can use to list all the candidates that have filled in a complaint, review the complaint, accept it, reject it, make a revision and possibly enter additional explanation that can be sent to the candidate. After closing all complaints (either accepted or rejected) the system should enable a report of the complaint revision from the admission commission to be generated automatically.

#### Stimulus/Response Sequences

- **Start of complaint period for applicant data** - the date/time the candidates can start filling in and submitting a complaint about the data for their application entered in the system (misspelled name, wrong calculation of points, study programme precedence)
- **End of complaint period for applicant data** - the deadline for candidates to fill in and submit a complaint about the data for their application. After this moment the SAO can review the complaints, produce a report and send responses to the applicants accompanied by corrections in the database (where approved by the enrolment commission).



**Functional Requirements**

Review the complaint, accept it, reject it, make a revision and possibly enter additional explanation that can be sent to the candidate.

**Notifications** – individual notes to the applicants that complained.

## 5.7 Ranking and reporting

### 5.7.1 Ranking the candidates (see section 4.10)

#### Description and priority

Each application form should be confirmed by the SAO in order to be counted in the ranking procedure. The candidate ranking should be provided once the enrollment term has ended. The EC should form a preliminary list of accepted candidates based on the ranking parameters agreed beforehand.

After the enrolment term is finished, EC creates and publishes the *preliminary ranking list* of accepted applicants. This ranking list should be made available to the applicants through the system once logged in. An email confirmation should precede notifying the applicants that a preliminary ranking list has been made available.

The final ranking list should be completed once the applicants have been able to submit their tuition and additional mandatory fees in order to enrol at the given University

All the applicants with submitted applications and SAO should be enabled access to the ranking list interface. No changes should be allowed to either of them.

#### Functional requirements

**Review applications** – EC should have proper access to applications to approved applicants in order to form the ranking list. EC should have read-only rights in this context.

**Create ranking list** – EC should be able to generate a ranking list based on predefined parameters. This ranking list will automatically be created by the system once the ranking parameters are stated.

**Publish ranking list** – EC should be able to publish a preliminary and final ranking list available to the applicants.

**Complaint form** – Applicants should be able to file a complaint from this interface concerning the ranking list provided.

**Notification e-mail** – Notification email should be send to all applicants who have submitted an application form when a ranking list becomes available.

### 5.7.2 Reporting – general overview

#### Description and priority

This section defines the reports that are required to be generated by the application. In addition, the system should allow generation of reports which show all the records for a given data entity in tabular format.

The reporting subsystem should allow producing lists and reports. The lists should be configurable in a form of an advanced search allowing multiple criteria connected with logical expressions, also allowing additional sorting and grouping criteria to be defined. The system should enable for the user to choose which columns (attributes) to be shown on the list and in what order. Each report should be producible in paged (for printing) and continuous list (for web) form. The number of rows per page should be configurable. When producing table reports it is expected the header row to appear on each page of a multipage report.

For every report the user should be able to define certain text (title) that will appear on the beginning and on the end of the report, as well as the text that will appear in the header and the footer of each page. The user should be able to place certain predefined fields (like date, time, page number, enrolment period) in the report. The font to be used, the size, column width, and colors (including background color) should be configurable independently for the different parts (title, table, footer, ...) of the report.

The system should also enable once configured report to be saved for future reuse.

Every generated list/report should be exportable in: csv, xls, xml, pdf, html and txt format.

Every list produced by the advanced search should allow on-screen manipulation of the result like filtering by column value, changing the column for sorting and the sort order before exporting.

At the end of every enrolment term, the system allows report generation displaying various statistics on the enrolled candidates.

The system should allow a content of an e-mail message to be specified and an circular e-mail to be send to all the applicants of a produced list (by advanced search/filtering options) on each applicant's registered e-mail address (or an SMS to be sent to their registered phone).

### 5.7.3 Advanced search and graphs

#### Description and priority

Advanced search should be realized according to setting logical AND function of several search criteria. Each criteria is logical OR combination of setting values to a given data field. For example, advanced search can be find all applications of prospective students that are living in municipalities Неготино OR Кавадарци and have finished type of high school гимназиско образование OR електротехничка струка.

Supported graphs to all search results are pie, bar and XY line graphs. All parameters for the graph header and selection of graph type can be entered by a form. Each graph should be exported in (MS Office recognizable) object form or picture format like jpg or png.

The system should allow a content of an e-mail message to be specified and an circular e-mail to be send to all the applicants of a produced list (by advanced search/filtering options) on each applicant's registered e-mail address.

Similar functionality should be enabled also for mobile technologies using text messages (SMS) to be sent to their registered phone).

### 5.7.4 Summary reports by study group

#### Description and priority

Reports need to display the following data in tabular format: For each study programme show the number of enrolled candidates (by ethnicity and total) that:

- have applied
- were tested (if testing was required)
- have passed the test
- are accepted for enrolment in state quota
- are accepted for enrolment in private quota (full-time + part-time + total)
- are accepted for enrolment in ethnicity quota
- are accepted for enrolment under special circumstances (for every type)
- are accepted for enrolment (total – sum of previous)

### 5.7.5 Summary report for faculty

The report also displays total number of enrolled candidates for faculty, group of faculties (natural sciences, engineering, humanities, arts, ...), and the number of available places for the next enrolment term (separately for the state quota, private quota and ethnic quotas, full-time and part-time). A sample report is presented on the next figure:



**ПРЕГЛЕД**  
Реализација на Конкурсот за запишување студенти државјани на РМ во прва година според национална

		ПРИЈАВЕНИ КАНДИДАТИ																
ФАКУЛТЕТ	Националност	пријавени			проверка на знаење и умеења			дополнително тестирање			положиле			во државна квота		со кофинансирање		
		р	в	вк	р	в	вк	р	в	вк	р	в	вк	р	в	вк		
Факултет за електротехника и информатички технологии	Македони	475	0	475	0	0	0	0	0	0	0	0	0	0	317	111	0	111
	Албани	8	0	8	0	0	0	0	0	0	0	0	0	0	4	4	0	4
	Турци	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Срби	13	0	13	0	0	0	0	0	0	0	0	0	0	2	4	0	4
	Власи	9	0	9	0	0	0	0	0	0	0	0	0	0	2	5	0	5
	Роми	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Бошњаци	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Други	9	0	9	0	0	0	0	0	0	0	0	0	0	4	3	0	3
	<b>ВКУПНО</b>		<b>518</b>	<b>0</b>	<b>518</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>329</b>	<b>127</b>	<b>0</b>	<b>127</b>
	□ телекомуникации	Македони	73	0	73	0	0	0	0	0	0	0	0	0	0	73	0	0
Албани		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Турци		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Срби		2	0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0
Власи		1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Роми		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Бошњаци		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Други		4	0	4	0	0	0	0	0	0	0	0	0	0	4	0	0	0
<b>ВКУПНО</b>			<b>80</b>	<b>0</b>	<b>80</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>80</b>	<b>0</b>	<b>0</b>	<b>0</b>
□ компјутерско системско инженерство и автоматика		Македони	83	0	83	0	0	0	0	0	0	0	0	0	0	76	7	0
	Албани	4	0	4	0	0	0	0	0	0	0	0	0	0	4	0	0	0
	Турци	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Срби	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Власи	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Роми	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Бошњаци	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Други	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	<b>ВКУПНО</b>		<b>90</b>	<b>0</b>	<b>90</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>80</b>	<b>7</b>	<b>0</b>	<b>7</b>

та припадност во учебната 2010/2011 - ПРВ УПИСЕН РОК

ЗАПИШАНИ КАНДИДАТИ										СЛОБОДНИ МЕСТА					
вон квота по националност	Деца без родители	лица со прв степен на инвалидност	воени инвалиди	лицата кои се напуштени	припадници на безбедносни сили	Деца на починати учесници во мир-овни операции	ВКУПНО запишани			државна квота	кофинансирање	ВКУПНО			
							р	в	вк			р	в	вк	
0	0	0	0	0	2	0	430	0	430						
0	0	0	0	0	0	0	8	0	8						
0	0	0	0	0	0	0	0	0	0						
2	0	0	0	0	0	0	8	0	8	0	0	0	0	0	0
1	0	0	0	0	0	0	8	0	8						
0	0	0	0	0	0	0	0	0	0						
1	0	0	0	0	0	0	1	0	1						
0	0	0	0	0	0	0	7	0	7						
<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>462</b>	<b>0</b>	<b>462</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
0	0	0	0	0	0	0	73	0	73						
0	0	0	0	0	0	0	0	0	0						
0	0	0	0	0	0	0	0	0	0						
0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0
0	0	0	0	0	0	0	1	0	1						
0	0	0	0	0	0	0	0	0	0						
0	0	0	0	0	0	0	0	0	0						
0	0	0	0	0	0	0	4	0	4						
<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>80</b>	<b>0</b>	<b>80</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
0	0	0	0	0	0	0	83	0	83						
0	0	0	0	0	0	0	4	0	4						
0	0	0	0	0	0	0	0	0	0						
0	0	0	0	0	0	0	0	0	0						
0	0	0	0	0	0	0	0	0	0						
0	0	0	0	0	0	0	0	0	0						
0	0	0	0	0	0	0	0	0	0						
<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>87</b>	<b>0</b>	<b>87</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

The following MS Excel document gives further details about the above report



C:\Documents and Settings\Dejan\My Dc

### 5.7.6 Summary reports by type and quotas

These reports show the number of “applied candidates”, “ranked candidates”, “not ranked candidates”, and “not enrolled ranked candidates”, where candidates are grouped according to the following criteria: full-time, part-time, ethnicity, special circumstances (every type) and the municipalities the candidates are coming from. Following are sample reports.

7

Табела 1

## ПРЕГЛЕД

на првнат запишаните студенти - државјани на РМ во академската 2010/2011 година

### ФАКУЛТЕТ - СТУДИСКА ПРОГРАМА ФЕИТ

информатика и компјутерско инженерство

Состојба 01.X.2010 год.

Запишани студенти				
категорија	начин на студии	пол		
		машки	женски	вкупно
државна квота	редовни	50	70	120
со кофинансирање на студиите	редовни	55	20	75
	вонредни *			0
	<b>вкупно</b>	<b>55</b>	<b>20</b>	<b>75</b>
надвор од квота по основа на националност	државна квота	3	2	5
	кофинансирање			0
	<b>вкупно</b>	<b>3</b>	<b>2</b>	<b>5</b>
надвор од квотата со завршен дел од средно образование во странство и со меѓународна матура	редовни (државна квота)			0
	редовни (со кофинансирање)			0
	<b>вкупно</b>	<b>0</b>	<b>0</b>	<b>0</b>
надвор од квота - припадници на безбедносните сили на РМ	редовни	1	1	2
деца без родители	редовни			0
лица со 1-степен на инвалидитет	редовни			0
воени инвалиди	редовни			0
лица растени во домови за напуштени лица	редовни			0
деца на починати учесници во мировни операции	редовни			0
<b>Вкупно запишани</b>	редовни	<b>109</b>	<b>93</b>	<b>202</b>
	вонредни	<b>0</b>	<b>0</b>	<b>0</b>
	<b>Вкупно</b>	<b>109</b>	<b>93</b>	<b>202</b>

\* Во оваа колона треба да се прикаже бројот на запишаните вонредни студии, според објавените квоти во Конкурсот Скопје, \_\_\_\_\_ 2010 год.

Одговорен \_\_\_\_\_

**ЗАБЕЛЕШКА:** Оваа табела треба да се прикаже по СТУДИСКИ ПРОГРАМИ

Табела 2

СТУДИСКИ ПРОГРАМИ БЕЗ ПРОВЕРКА НА ЗНАЕЊА И УМЕЕЊА

**ПРЕГЛЕД**

 на кандидатите - државјани на РМ за запишување,  
според успехот од средното образование

 ФАКУЛТЕТ  
ФЕИТ

Состојба 01.X.2010 год.

број на кандидати	начин на студии	успех од средното образование				
		одлични	мв.добри	добри	доволни	Вкупно
пријавени	редовни	389	98	39	4	530
	вонредни					0
	вкупно	389	98	39	4	530
рангирани	редовни	389	98	39	4	530
	вонредни					0
	вкупно	389	98	39	4	530
нерангирани	редовни	0	0	0	0	0
	вонредни	0	0	0	0	0
	вкупно	0	0	0	0	0
рангирани незапишани	редовни	7	1	5	0	13
	вонредни	0	0	0	0	0
	вкупно	7	1	5	0	13
Вкупно запишани	редовни	382	97	34	4	517
	вонредни				0	0
	вкупно	382	97	34	4	517

 517  
0  
517

Скопје, \_\_\_\_\_ 2010 год.

 Одговорен работник  
\_\_\_\_\_

**ФАКУЛТЕТ  
ФЕИТ**

Состојба 01.X.2010 год.

број на кандидати	начин на студии	Национална припадност								
		Македонци	Албанци	Турци	Власи	Роми	Срби	Бошњаци	Други	Вкупно
пријавени	редовни	480	13	4	9	0	15	1	8	<b>530</b>
	вонредни								0	<b>0</b>
	<b>вкупно</b>	<b>480</b>	<b>13</b>	<b>4</b>	<b>9</b>	<b>0</b>	<b>15</b>	<b>1</b>	<b>8</b>	<b>530</b>
рангирани	редовни	480	13	4	9	0	15	1	8	<b>530</b>
	вонредни								0	<b>0</b>
	<b>вкупно</b>	<b>480</b>	<b>13</b>	<b>4</b>	<b>9</b>	<b>0</b>	<b>15</b>	<b>1</b>	<b>8</b>	<b>530</b>
нерангирани	редовни	0	0	0	0	0	0	0	0	<b>0</b>
	вонредни	0	0	0	0	0	0	0	0	<b>0</b>
	<b>вкупно</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
рангирани незапишани	редовни	10	1	1	0	0	1	0	0	<b>13</b>
	вонредни	0	0	0	0	0	0	0	0	<b>0</b>
	<b>вкупно</b>	<b>10</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>13</b>
<b>вкупно запишани</b>	редовни	470	12	3	9	0	14	1	8	<b>517</b>
	вонредни								0	<b>0</b>
	<b>вкупно</b>	<b>470</b>	<b>12</b>	<b>3</b>	<b>9</b>	<b>0</b>	<b>14</b>	<b>1</b>	<b>8</b>	<b>517</b>

Скопје, \_\_\_\_\_ 2010 год.

 Одговорен работник  
\_\_\_\_\_

Табела 3

**СТУДИСКИ ПРОГРАМИ СО ПРОВЕРКА НА ЗНАЕЊА И УМЕЕЊА**

# ПРЕГЛЕД

на кандидатите - државјани на РМ за запишување,  
според успехот од проверката на компетенции  
и според нивната национална припадност

**ФАКУЛТЕТ**
**XYZ**

Состојба 01.X.2010 год.

број на кандидати	начин на студии	Национална припадност								
		Македонци	Албанци	Турци	Власи	Роми	Срби	Бошњаци	Други	Вкупно
пријавени	редовни	0							0	0
	вонредни	0							0	0
	вкупно	0	0	0	0	0	0	0	0	0
полагале	редовни	0							0	0
	вонредни	0							0	0
	вкупно	0	0	0	0	0	0	0	0	0
положиле и биле рангирани	редовни	0							0	0
	вонредни	0							0	0
	вкупно	0	0	0	0	0	0	0	0	0
неположиле и рангирани	редовни	0	0	0	0	0	0	0	0	0
	вонредни	0	0	0	0	0	0	0	0	0
	вкупно	0	0	0	0	0	0	0	0	0
незапишани	редовни	0	0	0	0	0	0	0	0	0
	вонредни	0	0	0	0	0	0	0	0	0
	вкупно	0	0	0	0	0	0	0	0	0
вкупно запишани	редовни								0	0
	вонредни								0	0
	вкупно	0	0	0	0	0	0	0	0	0

Скопје, \_\_\_\_\_ 2010 год.

 Одговорен работник  
\_\_\_\_\_

## ПРЕГЛЕД

Табела 5

на кандидатите - државјани на РМ за запишување во прва година  
според нивната општинска припадност

ФАКУЛТЕТ  
XYZ

Состојба 01.X.2010 год.

Општина	број на кандидати										Вкупно
	пријавени	Запишани кандидати									
		во рамките на Државна квота	со кофинансирање РЕДОВНИ	со кофинансирање ВОНРЕДНИ	надвор од квотата по основа на национал	Со меѓународна матура	безбедносни сили на РМ	деца без родители	лица со 1-степен на инвалидитет	воени инвалиди	
Арачиново											0
Аеродром	52	33	15								48
Бутел	11	7	4								11
Гази Баба	23	13	10								23
Горче Петров	25	17	6				1				24
Карпош	58	37	20				1				58
Кисела Вода	27	19	8								27
Сарај	2				2						2
Центар	44	27	16		1						44
Чаир	10	3	3		3						9
Шуто Оризари	1	1									1
<b>Вкупно Скопје</b>	<b>253</b>	<b>157</b>	<b>82</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>247</b>
Берово	4	1	3								4
Битола	21	12	9								21
Богданци	4	3	1								4
Боговиње											0
Босилово	1		1								1
Брвеница	2	2									2
Центар Жупа											0
Дебар	1				1						1
Дебарца	1		1								1
Делчево	9	6	3								9
Демир Хисар	2	1	1								2
Демир Капија	1		1								1
Дојран	1		1								1
Долнени											0
Другово	1										0
Гевгелија	2		2								2
Гостивар	9	9									9
Градско	1	1									1
Желино											0
Илинден	3	1	1								2
Јегуновце	3	3									3
Карбинци											0
Кавадарци	15	14	1								15
Кичево	9	6	2		1						9

Кочани	17	17											17
Конче													0
Кратово	7	6	1										7
Крива Паланка	5	4	1										5
Кривогаштани													0
Крушево	3	1	1	1									3
Куманово	20	19	1										20
Липково													0
Лозово													0
Македонска Каменица	6	4	2										6
Македонски Брод	2	1	1										2
Маврово и Ростуша													0
Могила													0
Неготино	8	6	1										7
Новаци													0
Ново Село	3		3										3
Охрид	30	21	9										30
Осломеј													0
Пехчево	2	1	1										2
Петровец	1	1											1
Пласница													0
Прилеп	20	16	3	1									20
Пробиштип	3	2	1										3
Радовиш	7	1	5										6
Ранковце	1	1											1
Ресен	7	6	1										7
Росман	1		1										1
Сопиште													0
Старо Нагоричане													0
Струга	4	2	1										3
Струмица	11	5	6										11
Студеничани	1			1									1
Свети Николе	5	5											5
Тearце													0
Тетово	4	2		2									4
Валандово													0
Василево													0
Велес	8	6	1										7
Вевчани	1		1										1
Виница	7	4	2										6
Вранештица													0
Врапчиште	1	1											1
Зајас													0
Зелениково													0
Зрноци													0
Чашка													0
Чешиново-Облешево													0
Чучер Сандево													0
Штип													0
<b>Вкупно запишани</b>	<b>528</b>	<b>348</b>	<b>152</b>	<b>0</b>	<b>13</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>515</b>

Скопје, \_\_\_\_\_ 2010 год.      Одговорен работник  
\_\_\_\_\_



Elektrotehnika.xls

Following MS Excel document gives further details about the above reports

## 6 Interface with other systems

### 6.1 Interface for web service with MoES

#### 6.1.1 Functionalities of the web service

The web service should allow the specific end user of the Enrolment Module to access MoES EMIS system, and requesting the prospective student's data to be entered in the enrolment process of the University.

In the following text, the interaction with the EMIS system is elaborated as part of the complete admission procedure.

EMIS system stores all data for each high school student in *state high schools* in RM. At the end of the school year, a record in EMIS is created for every graduated high-school student including data on type of graduation, date of graduation, name of high school etc. There is a time window between the graduation date and the start of admission period at universities in RM during which the data can be entered into EMIS. At a state level, MoES defines three admission periods at state Universities. Then, during the admission period a prospective student can access the web service and transfer the data into the enrolment system of the University where he or she applies for enrolment.

Only candidates that finished high school in one of the state high schools can have records at EMIS. Other candidates must manually enter the data input in the enrolment application.

Regarding this, the registration of prospective candidates will be possible only through electronic way, by filling in the appropriate electronic application. Candidates who do not exist in the internal system of MoES (candidates who do not take the graduation exam, foreign applicant, citizens of the RM with partially or fully completed secondary education abroad), also submit an electronic application, which differs from the electronic application that fill candidates described above, but they have to submit written documents, necessary for verification of data entered in the application.

#### 6.1.2 Triggering EMIS by prospective students

Candidate accesses the enrolment system at the University. Using the enrolment system, he/she authenticates himself/herself to EMIS, and allows the enrolment system to download his/her data from EMIS's web service.

This requires that there should be a level of integration between university's enrolment system and EMIS in terms of authentication.

In a specifically designed web form, end user fills two main groups of data:

- personal information not present in EMIS,
- information about the study program(s) he/she applies for.

Information about the finished high school is downloaded from EMIS.

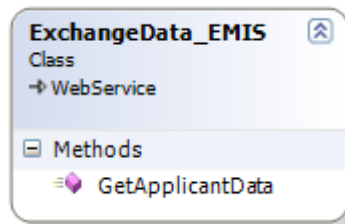
In a specific form field, candidate enters his authentication details, which triggers the necessary web service for transferring his data from EMIS into the enrolment system.

#### 6.1.3 Web service

Web service named *ExchangeData\_EMIS* is consumed by the internal enrolment system of each University to get data for prospective students. Using the methods from this web service, the enrolment system of each University can obtain data for prospective students from EMIS system at MoES. Enrolment system has to implement a client for this web service.

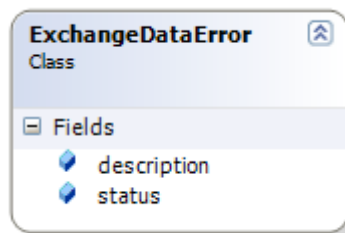
Following class diagram gives the list of web methods in the *ExchangeData\_EMIS* web service.





The only web method *GetApplicantData* returns an array of values from the type *ExchangeDataError*, which explains the reasons for exception while transferring data from EMIS system.

*ExchangeDataError* is a class containing two fields as shown in the following diagram:



Web service *ExchangeData\_EMIS* implements the following method:

Method Signature	Description
<p><i>ExchangeData_EMIS</i>.ExchangeDataError[]  <i>GetApplicantData</i>(string applicantID, ref string surname, ref string maidenSurname, ref string fatherName, ref string name, ref string embg, ref DateTime birthDate, ref string birthPlace, ref string birthMunicipality, ref string birthState, ref string sex, ref string citizenship, ref string nationality, ref string livingPlace, ref string livingAddress, ref string livingMunicipality, ref string livingState, ref string sPhoneNumber, ref string mPhoneNumber, ref string email, ref string nameSurname, ref string profession, ref string employment, ref string schoolName, ref string schoolProfile, ref string schoolMunicipality, ref string schoolAverage, ref string fSchoolYear, ref string studyingLanguage, ref <i>ExchangeData_EMIS</i>.GraduationType graduationType, ref string scholarship, ref string scholarshipProvider, ref int externalExam1, ref double percentileRank1, ref int externalExam2, ref double percentileRank2, ref int internalExam1, ref int internalExam2, ref int projectTaskStG, ref int firstSubject, ref int secondSubject, ref int projectTaskSG, ref int importantSubject1, ref int importantSubject2, ref int importantSubject3, ref int importantSubject4, ref int importantSubject5, ref int importantSubject6, ref int projectTaskIG)</p>	<p>The method returns the personal data, address information, contact information, information related to the previous education, data for the parent/guardian, other data and data for state/school/international graduation type (depending of the type of graduation taken by the candidate) for the prospective student with applicantID. Otherwise the method's return value of type <i>ExchangeDataError</i>[] gives a list of reasons why the method can't transfer the requested data.</p>

#### 6.1.4 Activity and sequence diagrams

Activity and sequence diagrams from chapter 3.2 and chapter 3.3 present the exchange of applicant data between the MoES and systems for admission and ranking of universities.

#### 6.1.5 Security

Data transfer between University and EMIS needs to be secured (e.g. SSL or VPN) to protect the privacy of candidate's data.

With regards to the authentication mechanism, there are two options:



- University is authenticated, and all transfers of candidate's data are logged. If a fraud is detected e.g. university requested data for a non-applying high school graduate, then one can later on prove that the data was requested.
- Student is authenticated, and requests that his or her data is entered into the enrolment system of a University.

## 6.2 “Enrolled candidates” web service

### 6.2.1 Functionalities of the web service

Manual data entry needs to be minimised. For example, data from the student application form is checked and approved by SAO. Once the applicant is successfully ranked and paid the necessary fees, his/her data is migrated to the database of enrolled students. The same data is used to create student's e-document. This data migration from the enrolment module to the Core Functionality Module (CFM) is provided by means of a web service. This web service will allow the CFM to import the data on enrolled candidates from the enrollment module.

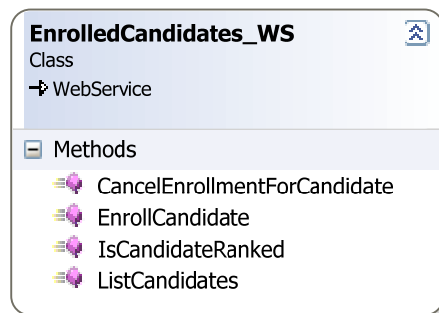
Enrollment module will make **all data** on successfully ranked candidates available to CFM via web service. It is the responsibility of CFM to decide which data fields are imported into its database.

Web service receives the lists of enrolled students of each enrollment period from the “Reports” module with predefined parameters of student's data. As mentioned in report module, all reports for enrolled students can be exported if necessary in excel, xml and other formats and saved on local/remote disk for further processing or import.

### 6.2.2 Web service

Web service named *EnrolledCandidates\_WS* is part of the enrolment module. It is consumed by the internal CFM, as part of iKnow, to get data on successfully ranked candidates. After a candidate pays the appropriate enrolment fees, SAO staff enters his EMBG into the CMF. CMF in turn accesses the enrolment module's web service and imports the candidate's data. CMF can access the data only for enrolled candidates. It is the responsibility of the web service to keep track of exported candidates, and to mark them as enrolled.

Following class diagram gives the list of web methods in the *EnrolledCandidates\_WS* web service.



In order to avoid double export of candidate data, it is the responsibility of the method *EnrollCandidate* to mark the candidate as exported.

Method Signature	Description
<pre>public bool IsCandidateRanked(string EMBG, string firstName, string lastName, string enrolmentID)</pre>	Checks if a candidate specified by input parameters EMBG or firstName or lastName or enrolmentID is ranked.
<pre>public EnrolledCandidate[] ListCandidates(string EMBG, string firstName, string lastName, string enrolmentID, ref string error)</pre>	Returns a list of ranked candidates specified by input parameters EMBG EMBG or firstName or lastName or enrolmentID.
<pre>public EnrolledCandidate EnrollCandidate(string EMBG, ref string error)</pre>	Returns data on ranked candidate specified by input parameters EMBG. Informs Enrolment module that the student is enrolled. Enrolment module marks the candidate's record as enrolled. If error occurs, then Enrolment module returns error description in parameter error.
<pre>public string CancelEnrollmentForCandidate(string EMBG, string firstName, string lastName, string enrolmentID)</pre>	Informs Enrolment module that the candidate specified by input parameters EMBG or firstName or lastName or enrolmentID cancels his enrolment. Enrolment module marks the candidate's record as not enrolled. If error occurs, then Enrolment module returns error description in parameter error.

Data structure *EnrolledCandidate* contains all the data defined in the data model sections chapter 4.2 and chapter 4.10.

### 6.2.3 Triggering

After the confirmation for paid fees for each student, SAO enters EMBG (Personal ID number) into dedicated field / form (part of CFM), which automatically triggers the web service *EnrolledCandidate* for data transfer for the specific (enrolled) student into the CFM system. From this point forward, student starts his regular study process according to the CFM rules and regulatives.

### 6.2.4 Security

Regarding the fact that this web service is used internally in the system, by SAO members, the security issue is directly related with the authentication mechanism for each separate user, together with his/her authorization.

## 6.3 Reporting web service to MoES

### 6.3.1 Functionalities of the web service

Data from the reports described in chapter 5.7.4, chapter 5.7.5, and chapter 5.7.6 need to be made available to MoES via a web service. In order to protect the privacy of the data, connection from MoES and the web service will be secured by cryptographic means.

If necessary (web service or MoES system unavailable), all summary reports for enrolled students are exportable in excel, xml and other formats and can be saved on local/remote disk for further processing or import.

### 6.3.2 Web service

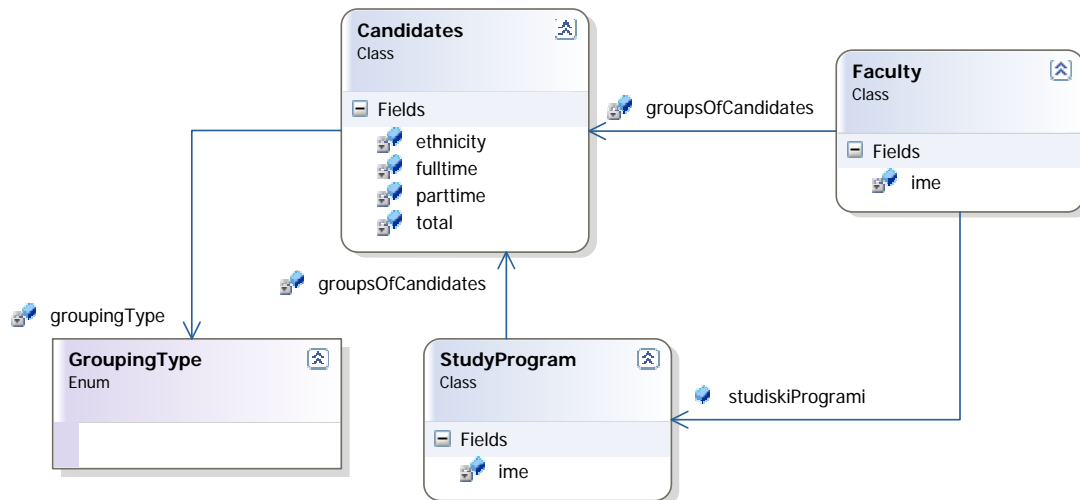
The web service should transfer a specific data for enrolled students, depending on the specific study group (study program). For each study group (study program), the following numbers on candidates need to be transferred:

- number of applications
- number of tested applicants(if testing was required)
- number of candidates that have passed the test
- number of candidates accepted for enrolment in state quota
- number of candidates accepted for enrolment in private quota (full-time + part-time + total)
- number of candidates accepted for enrolment in ethnicity quota
- number of candidates accepted for enrolment under special circumstances (for every type)
- number of candidates accepted for enrolment (total – sum of previous)

The web service should transfer a specific data for enrolled students, depending on the faculty, group of faculties (natural sciences, engineering, humanities, arts, ...), and the number of available places, if any, for the next enrollment term (separately for the state quota, private quota and ethnic quotas, full-time and part-time). The sample reports are presented in chapter 5.7.5.

The web service should transfer a specific data for “applied candidates”, “ranked candidates”, “not ranked candidates”, and “not enrolled ranked candidates”, where candidates are grouped according to the following criteria: full-time, part-time, ethnicity, special circumstances (every type) and the municipalities the candidates are coming from. The sample reports are presented in chapter 5.7.5.

For example, for the first report in chapter 5.7.2, following class diagram gives a possible data model for the data returned by a web method:



Enumeration *GroupingType* has following values:

- prijaveni,
- proverkaNaZnaenjaUmeenja,
- dopolnitelnoTestiranje,
- polozile,
- voDrzavnaKvota,
- soKofinansiranje,
- vonKvotaPoNacionalnost,
- decaBezRoditeli,
- licaSoPrvStepenNaInvalidnost,
- voeniInvalidi,
- licaOdDomZaNapusteniDeca,
- pripadniciNaBezbednosniSili,
- decaNaPocinatiUcesniciVoMirovniOperaciji,
- vkupnoZapisani,
- drzavnakvota,
- kofinansiranje,
- vkupno.

### 6.3.3 Triggering

If requested from MoES (for example, via e-mail), member of the university staff access the enrolment module, triggers the web service (from a dedicated form) and the web service perform its operation (transfer the necessary data into the MoES system).

### 6.3.4 Security

Data transfer between University and EMIS needs to be secured (e.g. SSL or VPN) to protect the privacy of candidate's data.

With regards to the authentication mechanism, there is only one option:

- University is authenticated, and all requested information for the enrolled students are transferred in MoES system EMIS.

## 6.4 Web service to import study programs and master data

### 6.4.1 Functionalities of the web service

This web service should transfer the data specific for each study program, from CFM into the enrollment module, for each enrollment term separately. For each study program transferred in the enrollment module, SAO members shall define separate quotas:

- State quota
- Private quota
- Activation minimum
- Tuition fee per semester for state quota
- Tuition fee per semester for private quota
- Minimum points required to rank for state quota
- Minimum points required to rank for private quota
- Ethnic quota

Data that need to be transferred is following (for each study program):

- Study program name
- Cycle of studies
- Type
- Full time / Part time studies
- Faculty
- Place (dispersed studies)
- Additional exam

### 6.4.2 Triggering

Before every enrolment term, member of SAO triggers the web service manually for transferring the necessary data for enrolment, mentioned above into the enrolment module. This shall be done in a dedicated form, which is part of the enrolment module..

### 6.4.3 Security

Regarding the fact that this web service is used internally in the system, by SAO members, the security issue is directly related with the authentication mechanism for each separate user, together with his/her authorization.