EUROPEAN UNIVERSITY
REPUBLIC OF MACEDONIA

FUNCTIONAL REQUIREMENTS

Student Enrolment
iKnow Tempus Project

20 December 2010

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Ref: Enrolment Procedure.doc

1 OVERVIEW

1.1 Executive Summary

This document details the functional requirements for the student enrolment process at European University (EURM), and is prepared as part of the iKnow Tempus project.

Section 2 describes the current student enrolment procedure at EURM. The first step in this process, namely – student expresses interest in studying at EURM, is supported by means of a web form. However, the rest of the process is entirely manual, is not supported by a software solution, is paper based, data collected about prospective students is not entered in a centralised database, and is not imported into the main student database after a student is enrolled.

Section 3 details the functional requirement for the future solution planned to be delivered by the iKnow Tempus project. We aim to fully support the student enrolment process by a software solution, and modern communication media. It is envisaged and required that the process is paperless, and that all parties are kept informed on the status of the enrolment process at all times.

1.2 Document Purpose

The purpose of this document is to define the functional requirements for the Student Enrolment process as per the WP1.1 of the iKnow Tempus project.

2   CURRENT SYSTEM

2.1   Description of the current system

Following diagram describes the current procedure for student enrolment at EURM. Enrolment Committee (EC) is a body consisting of representatives from all faculties at EURM which is responsible for the creation of a ranking list of all applicants who apply for enrolment at EURM. Students Administrative Office (SAO) is responsible for all the communication with prospective students.
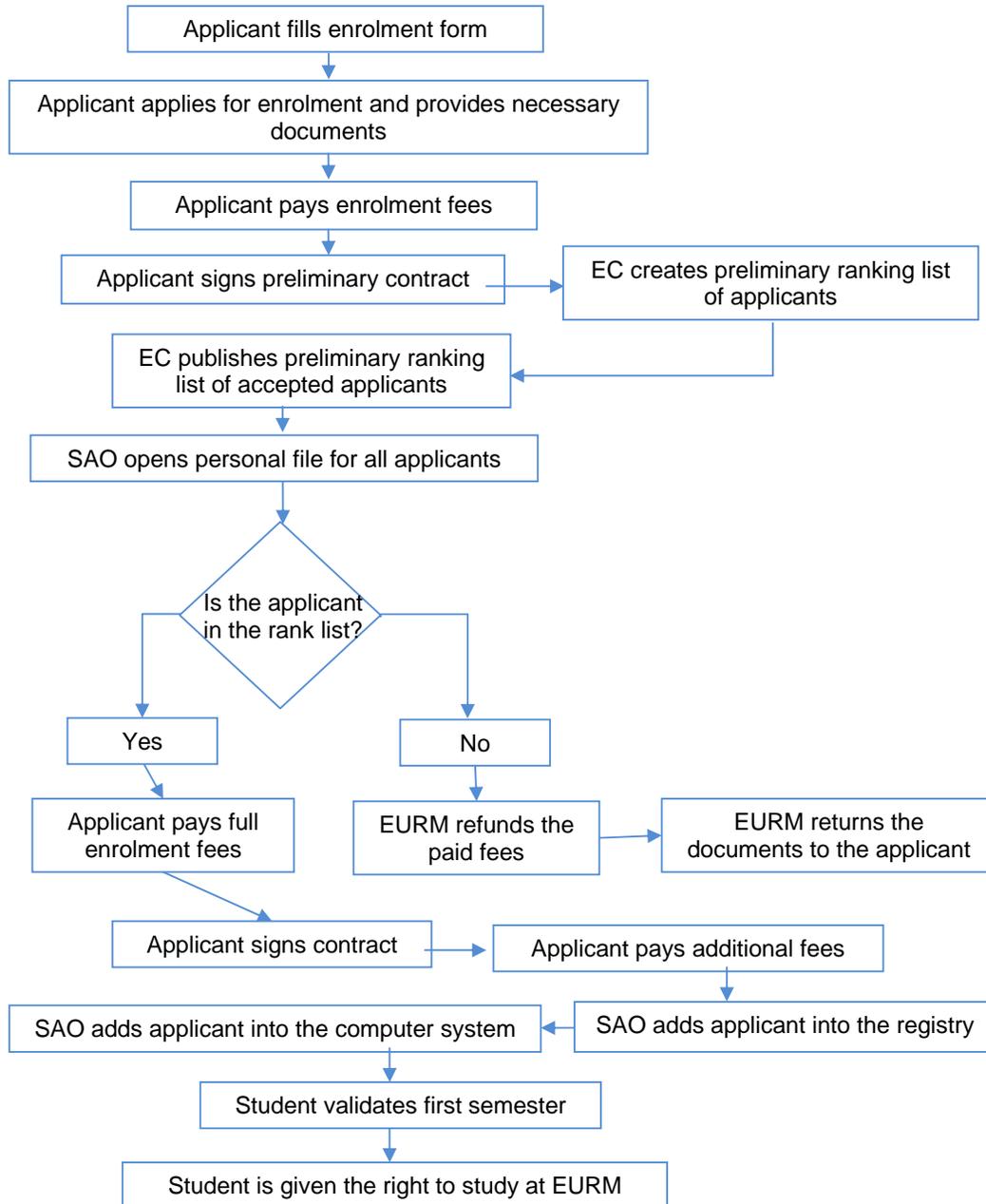
```
┌─────────────────────────────────────┐
│     Applicant fills enrolment form   │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐
│ Applicant applies for enrolment and  │
│   provides necessary documents       │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐
│     Applicant pays enrolment fees    │
└─────────────────────────────────────┘
                  │
                  ▼
┌──────────────────────────────┐      ┌──────────────────────────────┐
│ Applicant signs preliminary  │─────▶│ EC creates preliminary       │
│ contract                     │      │ ranking list of applicants   │
└──────────────────────────────┘      └──────────────────────────────┘
                  │                                   │
                  ▼                                   │
┌──────────────────────────────┐                     │
│ EC publishes preliminary     │◀────────────────────┘
│ ranking list of accepted     │
│ applicants                   │
└──────────────────────────────┘
                  │
                  ▼
┌──────────────────────────────────────┐
│ SAO opens personal file for all      │
│ applicants                           │
└──────────────────────────────────────┘
                  │
                  ▼
              ◇ Is the applicant in the rank list? ◇
              │                       │
            Yes                      No
              │                       │
              ▼                       ▼
┌────────────────────┐    ┌────────────────┐    ┌──────────────────────┐
│ Applicant pays     │    │ EURM refunds   │───▶│ EURM returns the     │
│ full enrolment fees│    │ the paid fees  │    │ documents to applicant│
└────────────────────┘    └────────────────┘    └──────────────────────┘
              │
              ▼
┌────────────────────────┐    ┌──────────────────────────┐
│ Applicant signs contract│──▶│ Applicant pays additional│
│                        │    │ fees                     │
└────────────────────────┘    └──────────────────────────┘
                                          │
                                          ▼
┌──────────────────────────────────┐    ┌──────────────────────────────┐
│ SAO adds applicant into the      │◀───│ SAO adds applicant into the  │
│ computer system                  │    │ registry                     │
└──────────────────────────────────┘    └──────────────────────────────┘
              │
              ▼
┌──────────────────────────────────┐
│ Student validates first semester │
└──────────────────────────────────┘
              │
              ▼
┌──────────────────────────────────────┐
│ Student is given the right to study  │
│ at EURM                              │
└──────────────────────────────────────┘
```

Figure 1. Procedure for Student Enrolment at European University

The procedure for Student Enrolment at EURM begins when an applicant fills a paper-based student application form. The applicant enters the following information: *Surname, Name, Middle Name*,

Address of living, *ID Number, Date* and *Place of birth*, *Nationality, Gender,* home/mobile/work phone numbers, and *previous education* (secondary education, university degree, MSc): *name of the secondary school* and *Secondary Education Average Score*. In the form the applicant also enters data on his knowledge of *foreign languages*. The applicant also chooses a faculty. He also enters data about one of his parents (name, profession, and employer). The applicant also provides data on the method of financing and payment of tuition fees: self, parent, bank loan, or other type of financing.

In the next of the enrolment procedure, the applicant is required to provide the supporting document for his application: *Birth Certificate, Certificate of Citizenship, 4 Certificates from Secondary School, Secondary Education Diploma,* and *4 Photos*. For the Faculty for Detectives and Criminology, additionally the applicant needs to provide a *Medical Certificates*.

Staff from SAO checks the documents, and informs the applicant to *sign preliminary contract*, and *pay a part of the tuition fee*. After the enrolment period is finished, EC creates and publishes the *preliminary ranking list* of accepted applicants. The applicants are sorted by the average score from secondary school.

Next, approved applicants are offered to *sign contract* for studying at EURM, and also pay the remaining part of the tuition fee. Otherwise, the fees are fully refunded to the applicant within 3 days. Before the contract is signed, the SAO team creates personal file for the applicant, where all the documents are kept in. Within 15 days the applicant is required to pay the other fees: student uniform, student ID card, ISIC card, student insurance etc.

Once all the payments are made by the applicant, the SAO team inserts the student into the Registry. At the end, the applicant registers for the first semester of the first study year and thus is enrolled as a student at EURM.

2.1.1 Expression of interest web form

Prospective students can express their interest in studying at EURM by filling the following web form available at http://www.eurm.edu.mk/apliciraj.html:

Figure 2. "Expression of interest" web form for Macedonian applicants.

Data entered in the enrolment form is sent via email to the representatives from all faculties. It is the responsibility of the representatives to contact the applicants via email or phone. If the prospective student choose to apply for enrolment at EURM, then he/she can do so by filling the paper-based enrolment form as described in Section §2.1.

Another web form available at the EURM web site (http://www.eurm.edu.mk/international-students/apply-to-enroll.html?L=2) is used by foreign students to express interest in studying at EURM. Following is the screenshot from the web form for foreign students:

Apply to Enroll

Personal Information

Name:	
Surname:	
Citizenship:	
Phone:	
E-mail:	
Mother tongue:	
Are you fluent in English?	☐
Other languages you speak?	
Your Comment:	

Information about Your Prior Education

Prior education	<-- Choose Prior Education --> ▼
School / Faculty:	
Country:	
Graduation Date:	

Faculty to apply at

Faculty:	<-- Choose Faculty --> ▼
Postgraduate:	☐
Campus:	<-- Choose Campus --> ▼

Submit

Figure 3. "Expression of interest" web form for foreign applicants.

2.2 Limitations of the Current System

Current enrolment procedure and the supporting software solutions have the following serious drawbacks:

- Data from the expression of interest web form is emailed to representatives from all faculties, but is not kept in a database and is therefore lost for further processing.

- Prospective students are required to enter the same data from the expression of interest web form in the paper – based student application form too. This breaks the highly desirable "single point of entry" design principle.

- Notifications are not automatically sent to applicants regarding the status of their application, due payments, missing documents etc. Students are notified by the SAO staff, and it can happen that notifications are either not sent or mail does not arrive on time.

- Applicants do not have online access to their application.

- Enrolment Committee, University Management, Chancellor, Dean etc. do not have electronic access to the database of prospective applicants.

3 BUSINESS REQUIREMENTS FOR THE STUDENT ENROLMENT MODULE

Future software solution is required to implement the student enrolment procedure presented in Figure 1.

3.1 Actors

Following table describes the actors that take part in the student enrolment procedure.

Name	Description and Access Rights
Staff from Administration Office	Contacts with the applicants, access to the Registry and Database, sends e-mail notifications to the applicants, review the documents for enrolment and validate the contracts
Manager	Chancellor, Deans, Vice-Chancellor, General Manager are members of this role. This role has full access to all business functionality
System Administrator	Members of this role have full access to the business and administrative functionality.
Enrolment Committee	Access to the data entered via the Student Application Form. Creates the Ranking List of accepted applicants. Access to the reports on accepted applicants.
Student	Access to his personal file

Table 1. Actors.

3.2 UML diagrams

In this sections we give several diagram which aim to depict the functional requirements for the software solution.

Following Use Case diagram depicts the use cases which need to be supported by the software solution.
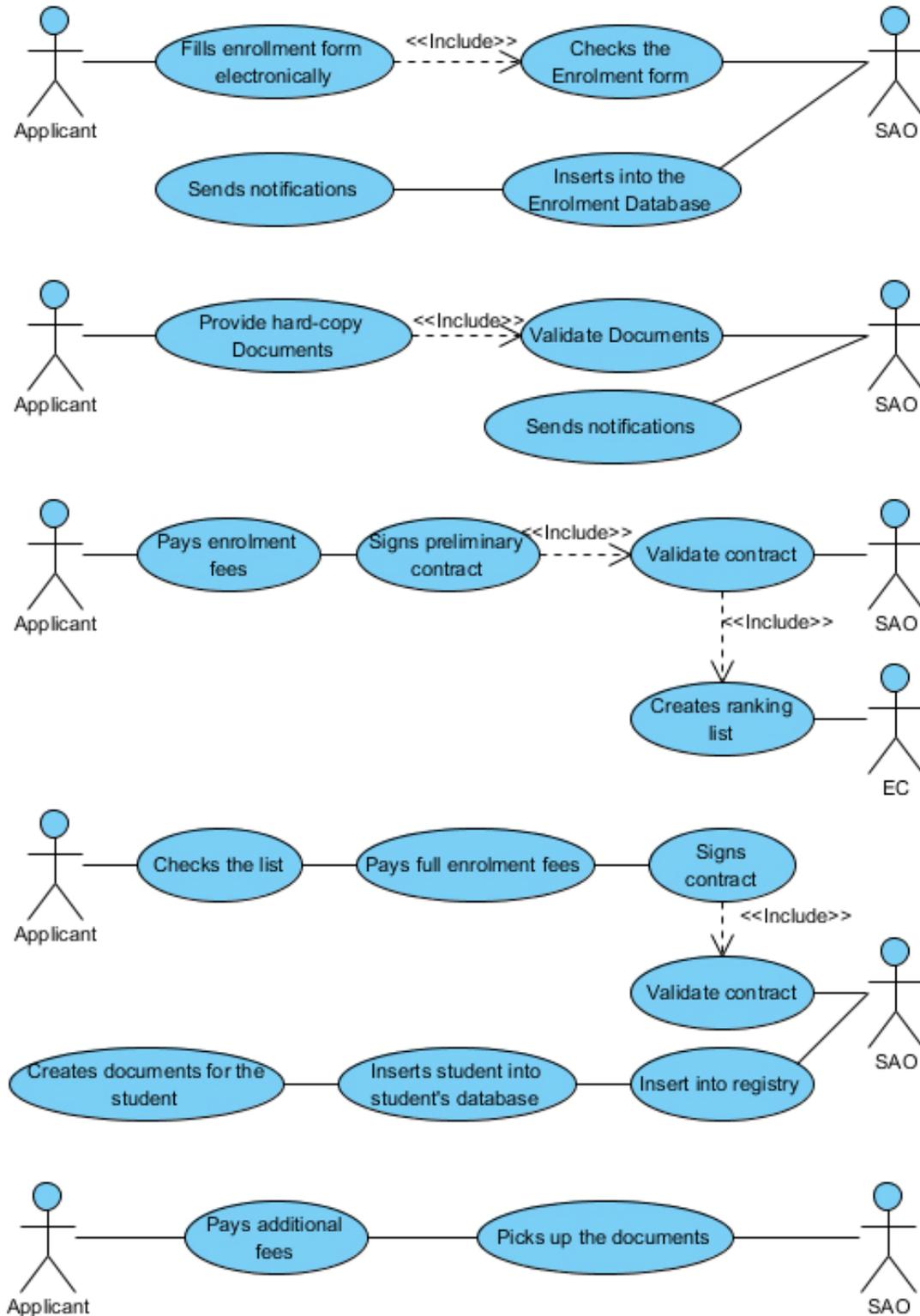
Figure 4. Use case diagram.

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.
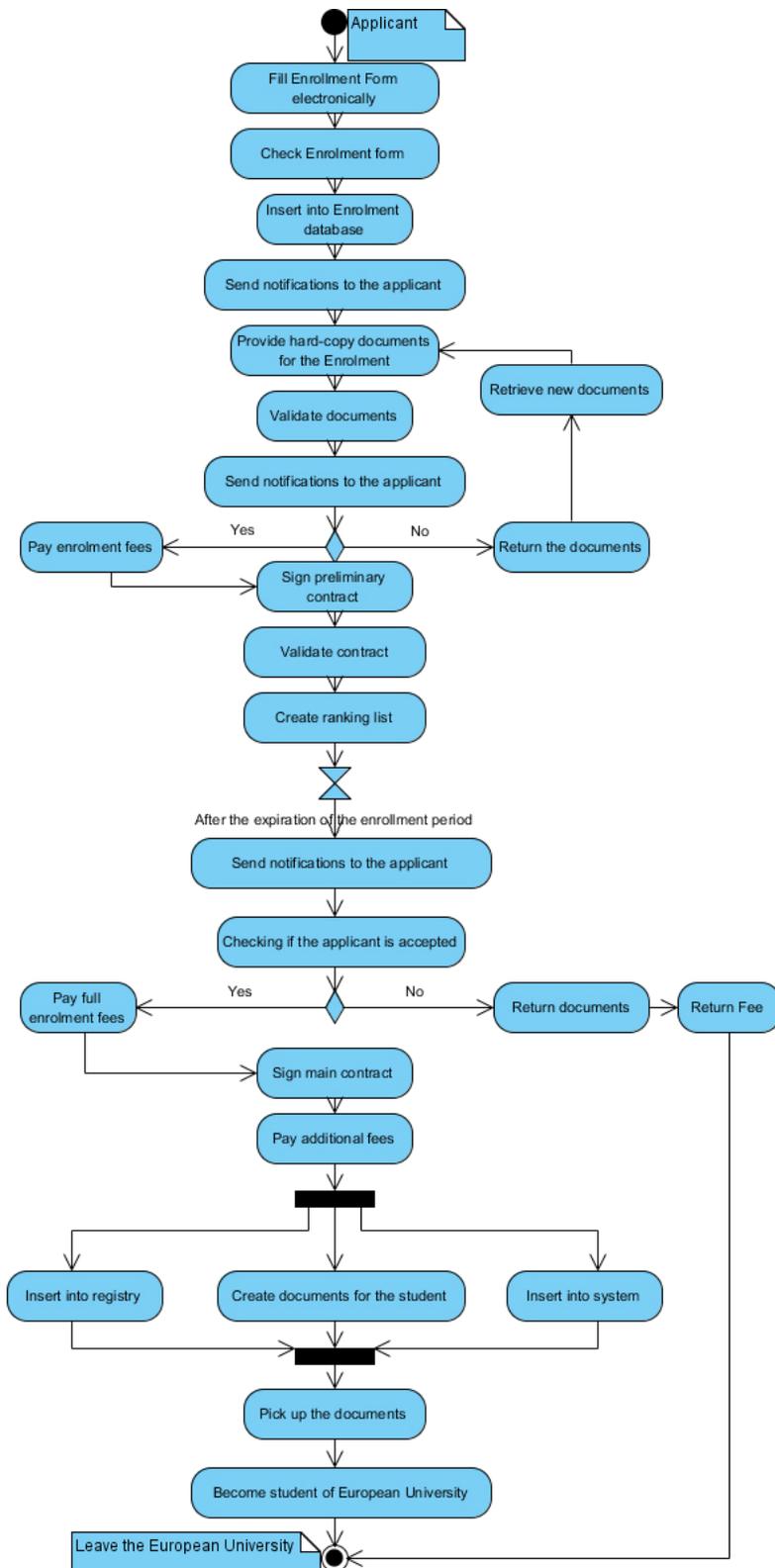
Figure 5. Activity diagram.

Following UML state diagram shows the various states that an enrolment application may be in and the transitions between those states.

Fills enrollment form/fills_enrolment_form()

Filled form

Check the enrolment form/checks_enrolment_form()

Checked Enrolment form

Inserting into enrolment database/insert_into_enrolment_db()

Inserted into database

Sending Notification to the student/send_notification()

Sent mail notification

Providing hard-copy documents/provide_documents()

Provided documents

Validating documents/checks_documents()

Supplying new documents/supply_documents()

Paying enrolment fees/pays_fees()

if [validate_documents]/checks_documents(false)

Supplied new documents

Paid Fees

Signing preliminary contact/sign_contract()

Signed preliminary contract

Validating contract/validate_contract()

Validated contract

Creating ranging list/creates_ranking_list()

Created ranking list

Sending notifications/send_notifications()

Sent notification

Checking the ranging list/checks_ranging_list()

Checked ranking list

Paying full enrolment fees/pays_fees()

Returning documents/returns_documents(true)

Paid Fees

Returned documents

Signing main contact/signs_contract()

Signed contract

Paying additional stuffs/pays_fees()

Paid additional fees

Inserting into registry/insert_into_registry()

Inserted into registry

Inserting the student into the system/inserting_into_system()

Inserted into system

Creating documents/creates_documents()

Created Student's documents

Picking up the documents/picks_up_documents()

Picked documents up

Enrolling Student/is_student_enrolled(true)

Figure 6. State Machine Diagram for the Enrolment Application entity.

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

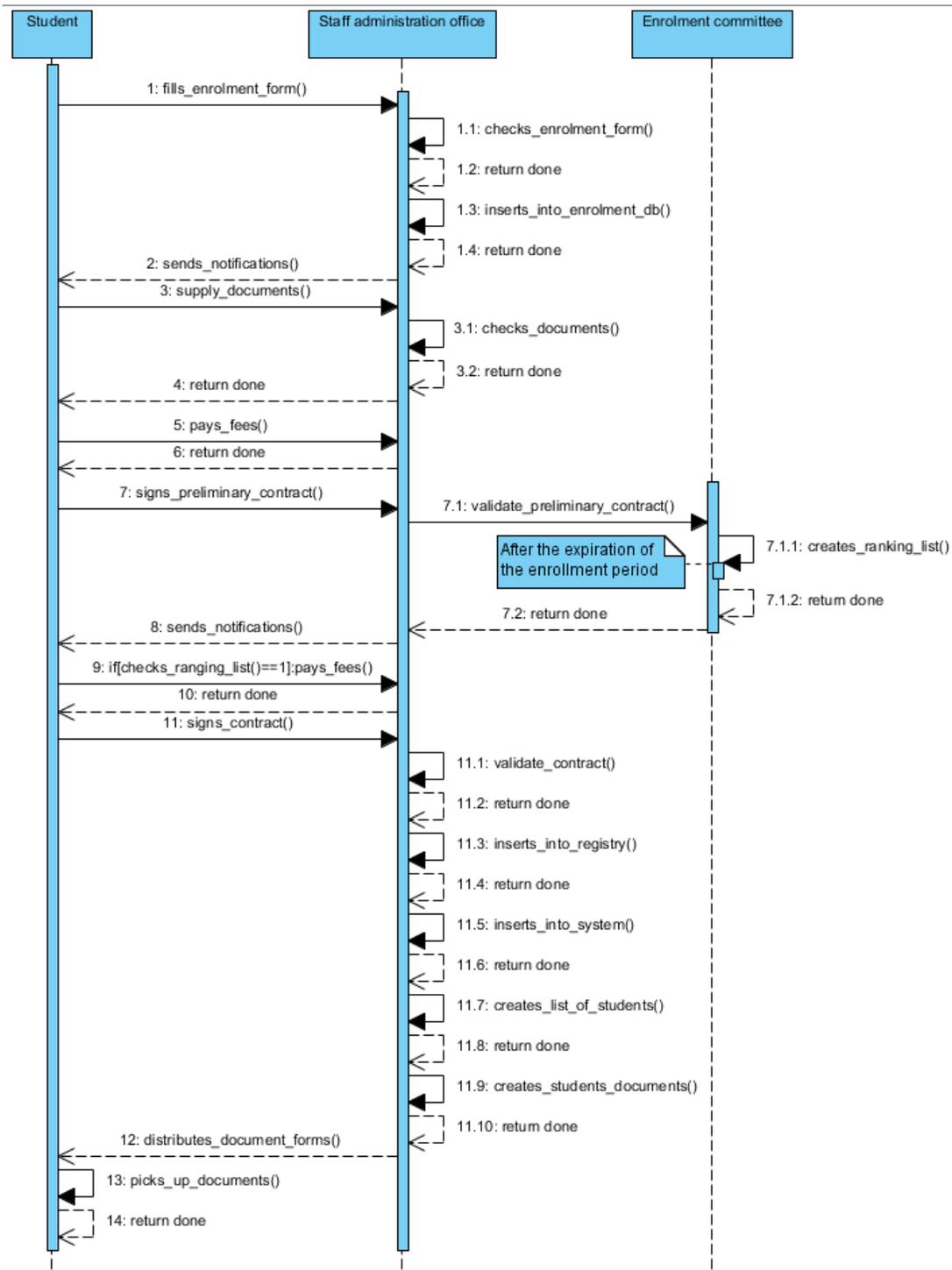*Figure 7. Sequence Diagram.*

Collaboration diagram shows the same steps from the enrolment procedure as the Sequence diagram, but puts an emphasis on the actors responsible for the execution of steps rather than on the order of steps.

Figure 8. Collaboration Diagram.

Following class diagram is a very eraly attempt to envisage the future classes in the software solution and the relationships between them.

Figure 9. Class diagram.

3.3   Data model

This section describes the data entities, and the business rules related to them.

3.3.1   Applicant

Applicant is the key data entity in the required solution.

3.3.1.1   Functionality

- **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.

3.3.1.2   Fields

Name	Type	Description
ID	Int, identity	
Name	String [80]	
Surname	String [80]	
Address	String [200]	
Date of birth	Date	
Place of birth	String [80]	
Mother tongue	String [30]	
{Foreign language}	String [30]	
Gender	Int $\in$ {Male, Female}	
{Phone}	String [30]	
{Email}	String [50]	
{Course}	String [50]	Subjects that applicant will sit as part of the high school final year exam, and requires tutoring classes from EURM. Defined in a Master list.
High School	String [50]	Previous education. Defined in a Master list.
Faculty	String [50]	Faculty that the applicant is interested in. Defined in a Master list. Currently, following faculties exist at EURM: Faculty of Economy, Faculty of Informatics, Faculty of Law, Faculty of Political Sciences, Faculty of Art and Design, Faculty of Dentistry, Faculty of Detectives and Criminology
Parent's name	String [80], Optional	
Parent's profession	String [80], Optional	
Parent's employer	String [80], Optional	
{Provided Document}	Structure of type Provided Document	Documents provided by applicant in support of his application
{Signed Contract}	Structure of type Signed Contract	Contracts signed by applicant

{Paid Fee}	Structure of type Paid Fee	Fees paid by the applicant
Tuition payment type	Int ∈ {Self, Parents, Bank loan, Other}	How will the applicant financially support his education?
Status	Int ∈ {Applied, Accepted, Rejected}	What is the status of the application?

3.3.1.3   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 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.

3.3.2   Paid Fee

3.3.2.1   Functionality

- **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.

3.3.2.2   Fields

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

3.3.2.3   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.

3.3.3   Provided Document

3.3.3.1   Functionality

- **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.

3.3.3.2   Fields

Name	Type	Description
Type	String [80]	Chosen from the master list of document types

Date provided	Date	
Electronic Copy	Object	Scanned (or otherwise electronic) copy of the provided document

3.3.3.3   Business rules and access rights

- System administrator can maintain the master list of document types.

- SAO staff can maintain the list of documents type.

3.3.4   Signed Contract

3.3.4.1   Functionality

- **List**: Provide a list of all contract 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.

3.3.4.2   Fields

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

3.3.4.3   Business rules and access rights

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

- SAO staff can maintain the list of contract types.

3.3.5   Ranking list

3.3.5.1   Functionality

- Maintenance: Ranking points can be awarded to each applicant.

- Publishing: Ranking list can be published at EURM web site

- Notification: Notifications (via email, SMS) can be sent to applicant containing the status of their application and position in the ranking list.

3.3.5.2   Fields

Name	Type	Description
Enrolment period	Date	End date of enrolment period
Publish date	Date	Date when the ranking list is published
{Student}	Int, FK	FK to the table of applicants (See section §3.3.1)
{Rank}	Int	Position of the applicant in the ranking list
{Status}	Int $\in$ {Applied, Accepted}	Is the applicant accepted or rejected?
{Points}	Number	Number of points scored by an applicant

3.3.5.3   Business rules and access rights

- Enrolment Committee creates a ranking list of accepted students.

- At the end of the enrolment period, the ranking list is published at the EURM web site, and all applicants are automatically notified via email and SMS.

- Ranking list is publicly available at the EURM web site.

3.4 Master data

Master data consists of the following lists:

- List of subjects that applicants sit as part of the high school final year exam

- List of faculties at EURM

- List of contract types

- List of document types

- List of fess payable by applicants

- List of High schools

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

The list is maintainable by the System Administrator.

3.5 General Functional Requirements

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 as defined in §3.1.

- 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.

- Provides reports to university management and Ministry of Education.

- Implements the "single point of data entry" principle.

- Manual data entry is minimised. For example, data from the student application form is checked and approved by SAO. Once the applicant is enrolled, the data is migrated to the list of enrolled student. The same data is used to create student's e-document.

4   LIST OF ACRONYMS

EURM	European University – Republic of Macedonia
EC	Enrolment Committee
SAO	Student Administration Office