TON DUC THANG UNIVERSITY FACULITY OF INFORMATION TECHNOLOGY



Enterprise Systems Development Concepts

Design and Analyze a student management system for an English Language Center



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Abstract

Today, information technology is playing an important role in society. It helps people work with high levels of accuracy, manage and organize their work effectively, with information being updated quickly. Therefore, the application of technology to the departments of companies, enterprises and schools is inevitable.

So that, the ABC English Center is step by step emphasis on the management (with student management is the most important). This is because this work requires large amounts of information to be processed with high accuracy. Meanwhile, the number of students is increasing and continuously changing so the management becomes very difficult to inevitably mistakes. So that, the student management program will brings many benefits to the center:

- Save money, time, avoid mistakes for managers.
- Storage is safe and diverse.
- Easy to manage in entering or retrieving information.

With this project, we would like to apply the knowledge learned in the university along with studying language research, system analysis, social knowledge to build the system of managing students for the English language center to achieved the highest efficiency.

Special Thanks

I would like to express my deepest appreciation to Mr Duong Huu Phuc, whose contribution in stimulating suggestions and encouragement, helped we to coordinate my project especially in writing this report.

The project was completed at Ton Duc Thang University

We pledge that this is our own project and is guided by Mr. Duong Huu Phuc. The research contents, results in this topic are honest and not published in any way before. The data in the tables used for the analysis, comment, and evaluation are collected by the authors themselves from various sources indicated in the reference section. In addition, the project uses some comments, reviews as well as data from other authors, other organizations have cited and annotated the

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source.

Contents

1	Cha	apter 1	. Preliminary Survey	6
	1.1	Taking	g Request	6
		1.1.1	Describing the system by natural language	6
		1.1.2	Actors and Use-case	7
	1.2	System	m Overview	8
		1.2.1	Basic tasks	8
		1.2.2	Some processes	9
2	Cha	apter 2	2. System Analysis	12
	2.1	Functi	ion Requirement	12
	2.2	Non-fu	unctional requirements	12
	2.3	Functi	ion's Description	13
	2.4	Diagra	am	14
3	Cha	apter 3	3. System Design	14
	3.1	Model	l design	14
		3.1.1	Use-case Diagram and Specification	14
		3.1.2	ERD Diagram	28
		3.1.3	Relation Diagram	31
		3.1.4	Class Diagram	32
		3.1.5	Sequence Diagram	33
	3.2	Interfa	ace	38
		3.2.1	Guest	39
		3.2.2	Admin	41
		3.2.3	Student	49
4	Ref	erence	Material	51

1 Chapter 1. Preliminary Survey

1.1 Taking Request

ABC is an English Center with high-quality and suitable for all levels with competitive tuition with many attractive incentives. Currently the center offers courses including English for Children, English for Teenagers, English for Communication, TOEIC Preparation. Due to the large number of trainees and their frequent changes, the center needs a student management system to ensure smooth operation of the center.

For the purpose of providing an application that supports the management for the center, ESmart software came to solve that problem.

1.1.1 Describing the system by natural language

The system consists of three actors: guests, administrators (staffs) and students. Guests come to search the infos about the courses and test. If they agree, the center will be made for admission records and the information will be saved on the system. Students will include ID, name, DOB, gender, email, address, phone number, date of admission. Students can take many courses as long as they match the level of The course includes information such as the ID, name, the class. duration, and type of tuition. If There're enough students, the center will open classes. The class will carry information including course ID, student ID, teacher ID, days. Each student will have the study results according to their course registration. In addition, students and guests can send a request for the information on the course as well as possible new course registration when the old course has ended. When receive the study results from the teacher, admin will save the results of the students in each class. Admin and teachers infos are also stored in the system like student.

1.1.2 Actors and Use-case

Actors

After surveying several English language centers, we learned that support techniques for identifying actors are based on the answers to the following questions:

No	Question	Answer
1	Who will use the main function of the system?	
2	Who is the administers and maintainers?	
3	Who needs the support of the system to perform daily tasks?	
4	What equipment does the management system use?	
5	Should the system interact with other systems?	
6	Who or what is involved in the results of the system?	

Use-case

No	Question	Answer
1	How can the guest enroll class?	
2	How can the guest see the course's information	
3	What is the staff's main task?	
4	How will the learning outcomes of each student be managed?	
5	which learning method and evaluate can the students use?	
6	How to see the scores, schedule and homework?	
7	How many ways of payment can the students use?	
8	Who needs to be notified for system changes?	
9	Does the information need to be read, write, modify or update?	
10	Do external changes need to be reported to parents or students?	

1.2 System Overview

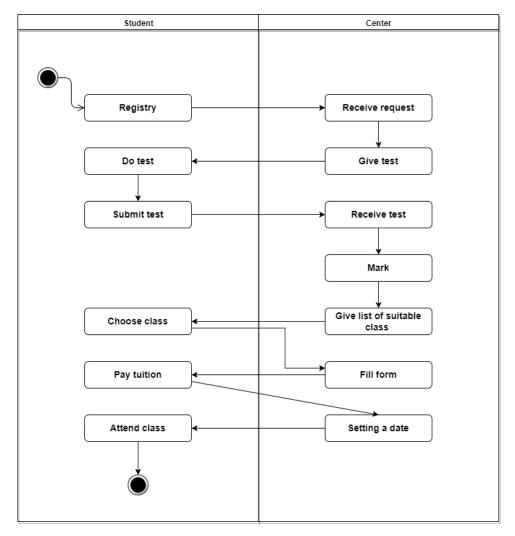
1.2.1 Basic tasks

The student management problem poses the following basic tasks:

- Manage your student registration, study registration.
- Manage classes, courses.
- Manage list of students, can filter the list to meet specific requirements.
- The system should allow to create monthly summary reports such as the number of students per recruitment, the list of students,...
- Record events that have occurred, such as adding new students, correcting student information, collecting outstanding tuition fees, ...
- Statistics of the number of trainees, teachers, tuition fees collected in the month,...

1.2.2 Some processes

Application process

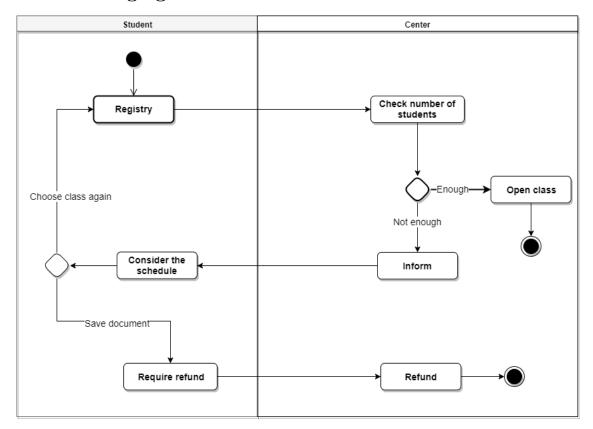


- The Center will open classes to meet the needs of the students
- When applying for the first time, students will be given a test and counseling program then classifying them according to the level of the learner
- Each course can be divided into class according to the learner's schedule.
- After completing the test, the staff records the student information, receive the money and gives a receipt of the tuition fee and sets the date of enrollment. At the same time, students will be provided with account information to log into the system to see the schedule as well

as test scores. If the student is too young, the parent will manage the account.

- Former students of the center after passing the final exam will be registered for higher level (if not pass will be retested).
- Students are flexible in terms of time: can change study time but make sure have enough 2 sessions in a week.
- For each class will be from 15 to 22 students, the duration of the English classes for children is 2 hours, the remaining classes are 3 hours.

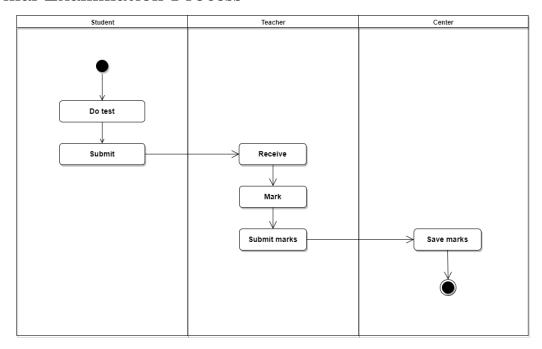
Class Arranging Process



- The staff will be based on the hours students register to add to their class.
- Each student will have their own schedule for each level.
- A class is up to 22 students, if more, will be split into two classes.
- If there aren't enough student in a class (less than 10), the staff will contact the student to change schedule:

- + The class has to be the same level as you.
- + If there are no classes at the same level, the staff will be based on the entrance test score of the student to decide whether he or she will go up or down a level (if the student agrees).
- + Refund the tuition if there are no other choices.

Final Examination Process



- Final exams will not be held centrally, but the teacher will plan the schedule according to the schedule outlined for each student and will automatically take the exam after finishing a level.
- The test is available for each level, the teacher will only need to pick up or rewrite the test according to the prepared structure.
- The teacher will take the student's test and will schedule a parent's appointment to report the results and counseling on the student's new level.
- The teacher will then summarize the scores in each student's personal book and will send it to the staff to save the results.
- When students pass the test after completing a level, they will be awarded a certificate, if the highest level of a course will be awarded and honored on the central gold.

2 Chapter 2. System Analysis

2.1 Function Requirement

- Management of student information: personal information, classarranging test time, class-arranging test results, levels achieved in the course, final level test results.
- Manage guest's request:
- Manage class information, open classes and related information.
- Update student information
- Note some other information such as paying additional tuition fees for former student, retake time for student who do not pass the exam, and change course schedules.
- The department will enter the results of class-arranging tests on the system, the system will automatically classify students at the same level or same class hour to support class Arrangement.
- Making statistics by month: list of students need to add tuition fee, number of student of each course, number of student retake the test, number of absent students, or refund.
- Record events that have occurred, such as adding new students, correcting student information, collecting outstanding tuition fees,...

2.2 Non-functional requirements

- The system has security and authorization:
- + Users of the program: register and assign the right type of user as admin or user to be able to easily monitor and control the program.
- + Use account and password to enter the program.
- It is necessary to divide the access to data for each user group in order to avoid the adjustment of data not belonging to the users, leading to the bias of the monthly statistics.

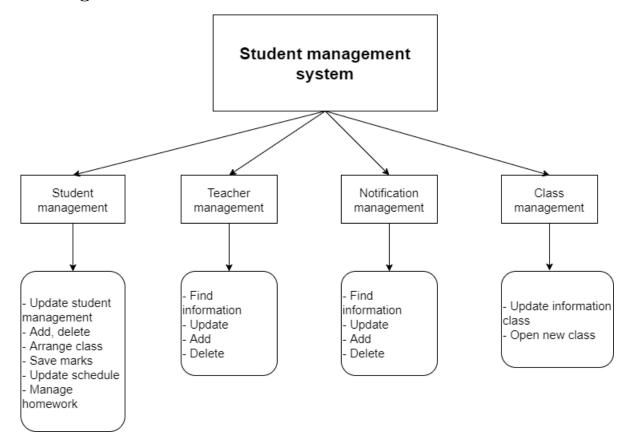
- The system need to be easily upgraded, maintained at the lowest cost and highly interactive.
- The system will protect user information such as information about students' tuition and fees.

2.3 Function's Description

The Actors are: Guest, Student and Staff.

- Guest: Any user who log into the system, have these main function:
- View the course information, the center's notice
- Register test
- Student: The person who take the enroll test and was given an account and password to log into the system by the center, have these main function:
- Check points
- View schedule
- Register for class
- Staff: Include the manager and the teacher, have these main function:
- Management of students: Include activities to delete, add and update student information
- Teacher management: Update center's teacher information
- Managing notifications: add news, updated notification items and posted on the website of the center.
- Course Management: Create, delete, edit course information.
- Classroom management: Attendance information. In addition, the staff manages the maximum number of students per class, if there are too few students registered, the class will not open.
- Statistics: Create a monthly report on the number of students enrolled, absent from school, the number of students passing or failing the final exams,

2.4 Diagram



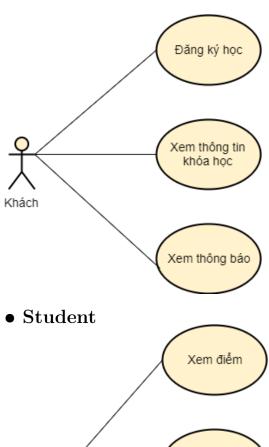
3 Chapter 3. System Design

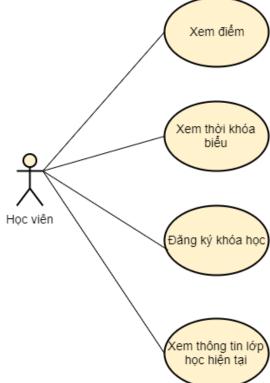
3.1 Model design

3.1.1 Use-case Diagram and Specification

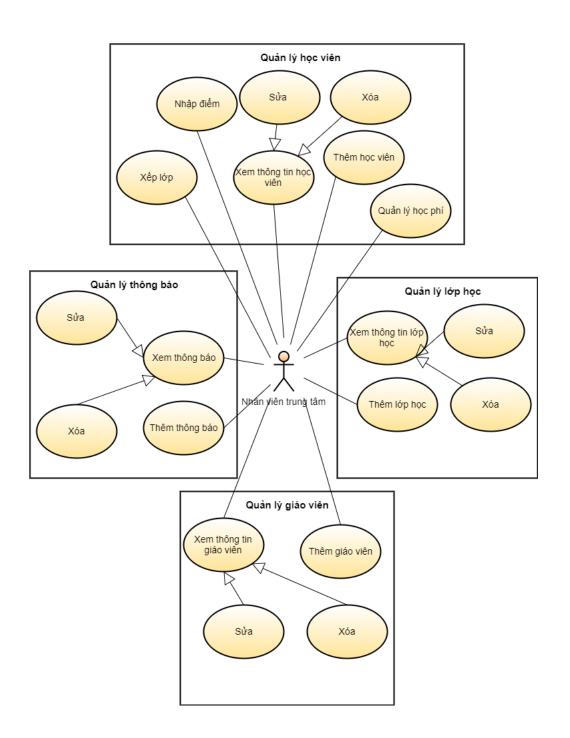
The actors that affect the system are guests, students and staff of the center. The functions will be classified according to the actors that affect the system.

• Guest





• Staff



Use case Description:

1/View course information

y view course information			
Name	View course information		
Description	Before enrolling the course, customer will be able to view the courses offered by the center to make the right choice		
Actor	Customer		
Event Triggered	Customer clicks "View course information"		
Prerequisites	Course information is available in the database		
Main float	Customer 1. Click "View course information" 3. Select courses	2. Show the list of courses 4. View course information	

Alternative float	No
Result	Customer are informed about the upcoming courses of the center
Exception	No
Frequency of use	High

2/Enrollment(Guest)

Name	Enroll the course	
Description	Customers can register for the course, fill in the form, then the staff will call to give consultant about the course and before registration, customers have to pass a test	
Actor	Customer	
Event Triggered	Cutomers clicks "Enroll the co	ourse"
Prerequisites	No	
	Customer	System
	1. Click "Enroll the course"	
		2. Show the lists of
		courses
Main float	3. Select the course and fill	
	in the registration form	
		4. Record the
		information and the staff
		will call to give the
		consultant
	5. Accept test registration	
		6. Set date for the test
		7. Save to database
Alternative float	No	
Result	Customer are suscessfully reg	istered
Exception	No	
Frequency of use	High	

3/View marks

Name	Check scores	
Description The results of all the test will be saved to students can review it		t will be saved to database and
Actor	Student	
Event Triggered	Students click "Check score	es"
Prerequisites	Already logged in and haved information in the database	
Main float	Student 1. Click "Check scores" 3. Select test	2. View the list of tests 4. Check scores in database 5. Display the corresponding test score
Alternative float No		
Result Student scores are displayed on the screen		d on the screen
Exception	tion When students don't do the test => display "K" score	

Medium

Frequency of use

^{4/}Enrollment(Student)

Name	Enroll the course	
Description	After completing a level of education, students who wish to continue studying at the center will register for the next class	
Actor	Student	
Event Triggered	Students click "Enroll the co	urse"
Prerequisites	Already logged in	
	Student	System
Main float	Click "Enroll the course" 3. Choose classes	Display a list of registered classes 4. Save student information into corresponding classes in the database 5. Display sucess notification
Alternative float	No	
Result	Student register successfully	is stored in the database
Exception	No	
Frequency of use	Medium	

5/Student check schedule

Name Check schedule Desciption Students can check the schedule they have registered Actor Student Event Triggered Students click "Check schedule" Prerequisites Already logged in and haved information in the database Student System 1. Click "Check schedule" 1. Click "Check schedule" 2. Display the schedule Alternative float No Result Student's schedule is displayed on the screen Exception No Frequency of use Medium			
Actor Student Event Triggered Students click "Check schedule" Prerequisites Already logged in and haved information in the database Student System 1. Click "Check schedule" 2. Display the schedule Alternative float No Result Student's schedule is displayed on the screen Exception No	Name	Check schedule	
Event Triggered Students click "Check schedule" Prerequisites Already logged in and haved information in the database Student System 1. Click "Check schedule" 2. Display the schedule Alternative float No Result Student's schedule is displayed on the screen Exception No	Desciption	Students can check the sche	edule they have registered
Prerequisites Already logged in and haved information in the database Student System 1. Click "Check schedule" 2. Display the schedule Alternative float No Result Student's schedule is displayed on the screen Exception No	Actor	Student	
Student System	Event Triggered	Students click "Check sche	dule"
Main float 1. Click "Check schedule" 2. Display the schedule Alternative float No Result Student's schedule is displayed on the screen Exception No	Prerequisites	Already logged in and have	d information in the database
Main float schedule 2. Display the schedule Alternative float No Result Student's schedule is displayed on the screen Exception No		Student	System
Result Student's schedule is displayed on the screen Exception No	Main float		2. Display the schedule
Exception No	Alternative float	No	
	Result	Student's schedule is displayed on the screen	
Frequency of use Medium	Exception	No	
	Frequency of use	Medium	

^{6/}Staffs input marks

Name	Input scores	
Description	Staff will receive test scores from teachers and upgrade the scores to database	
Actor	Staff	
Event Triggered	Staffs click "Input scores"	
Prerequisites Already logged in & have		test scores
Main float	Staff 1. Click "Input scores" 3. Select student 5. Enter corresponding scores for each students	2. Display lists of students 4. View input scores
		6. Update to database

Alternative float	No
Result	Student 's scores are updated in the database
Exception	No
Frequency of use	High

7/Staffs arrange class

Name	Arrange Class	
Description	When students enroll course, the staff will arrange the class depend on the level and needs of students	
Actor	Staff	
Event Triggered	Staffs click "Arrange class"	
Prerequisites	Already logged in and haved	information in the database
	Staff	System
	1. Click "Arrange class"	
		Display the list of information of students who did not classify
Main float	3. Assign classes to students according to their needs	
		4. Display the list of new
		classes for the staff
	5. Confirm	
		1
		6. Update to database

Alternative float	No
Result	New classes and students are added to the class
Exception	No

Frequency of use Medium

8/View student informations

Name	View student informations	
Description	A. Add	
• -	When the new student enrolls in and has passed a test, the student is added to database.	
	B. Edit	
	When the student informations change or while in "View student information", the staffs will detect the errors and correct it. The correct informations are saved in the database	
	C. Delete	
	When the students are no longer in the center, staff will reserve within 6 months, after 6 months will remove/delete student information from the database	
Actor	Staff	
Event Triggered	Staffs click "View students informations"	
Prerequisites	Already logged in and haved information in the database	
Main float	A. Add	
	1. Click "Add student"	
	2. Display form for the staff to input student information	
	3. Fill in the student information	
	4. Save student information to database	
	5. Display sucess notification	
	B. Edit	
	1. Click "Edit student informations"	
	2. Display the form for the staff to edit	
	3. Edit	
	4. Save to database	
	C. Delete	
	1. Click "Delete student informations"	
	2. Ask if the staff want to delete or not	
	3. Select "Delete".	
	4. Delete student informations if the staff click "Yes"	
Alternative float	No	
Result	Display student informations	
Exception	No	
Frequency of use	High	

9/View teacher informations

Name	View teacher informations	
Description	A. Add	
•	Once a teacher was hired, the staffs add the teacher to the center's database	
	B. Edit	
	When the teacher informations change or while in "View teacher informations", the staffs will detect the errors and correct it. The correct informations are saved in the database C. Delete	
	When the teachers are no longer work in the center, staff will remove/delete teacher informations from the database	
Actor	Staff	
Event Triggered	Staffs click "View teacher information"	
Prerequisites	Already logged in and haved information in the database	
Main float	A.Add	
	1. Click "Add new teacher"	
	2. Display the "input inforrmations" form	
	3. Input the informations	
	4. Save to database	
	5. Display success notification	
	B. Edit	
	1. Click "Edit teacher informations"	
	2. Display the form for the staff to edit	
	3. Edit	
	4. Save to database	
	C. Delete	
	1. Click "Delete teacher informations"	
	2. Ask if the staff want to delete or not	
	3. Select "Delete"	
	4. Delete teacher informations if the staff click "Yes"	
Alternative float	No	
Result	Display teacher informations	
Exception	No	
Frequency of use	Medium	

10/View announcements

10/ VICW a	w announcements		
Name	View announcements		
Description	After log into the system, the staff will go to the information management menu and the announcements viewer to see the news posted on the system, this is for the edit, delete work more convenient		
	A. Add		
	Staff will post the new announcement on the website of the center and this aanouncement will be saved in the database B. Edit		
	When the announcements change or while in "View announcements", the staffs will detect the errors and correct it. The correct informations are saved in the database		
Actor	Staff		
Event Triggered	Staffs click "View announcements"		
Prerequisites	Already logged in and haved information in the database		
Main float	A. Add		
	1. Click "Add announcements"		
	2. Display the form		
	3. Fill in the form.		
	4. Save to databse		
	5. Display success notification		
	B. Edit		
	1. Click "Edit announcements"		
	2. Display the form for the staff to edit		
	3. Edit		
	4. Save to database		
Alternative float	No		
Result	Staff can see the announcements		
Exception	No		
Frequency of use	Medium		

11/View class informations

Name	View class informations		
Description	The staff will see the information of each class to consider		
	open, delete or edit class informations		
	A. Add		
	When there're classes full of students, the staffs will add another new class to database		
	B. Edit		
	When the class change or while in "View class		
	informations", the staffs will detect the errors and correct it.		
	The correct informations are saved in the database		
Actor	Staff		
Event Triggered	Staffs click "View class informations"		
Prerequisites	Already logged in and haved information in the database		
Main float	A. Add		
	1. Click "Add class"		
	2. Display the form to add classes		
	3. Fill in the form		
	Save to databse Display success notification.		
	B. Edit		
	1. Click "Edit teacher informations"		
	2. Display the form for the staff to edit		
	3. Edit		
	4. Save to database		
Alternative float	No		
Result	Staffs can see class informations		
Exception	No		
Frequency of use	High		

12/Management of tuition fee

Name	Management of tuition fee		
Mô tả	When the parents want to see the tuition informations, staff will extract the student list with the tuition informations about that student by name or ID		
Actor	Staff		
Event Triggered	Staffs click "Management of tuition fee"		
Prerequisites	Already logged in and haved student informations in the database		
Main float	Staff 1. Find students who want to check tuition fees 3. Click "View tuition fee"	2. Display the list of students by name or ID 4. Display success notification. 5. Save to databse	
Alternative float	No		
Result	Display student's fees informations		
Exception	No		
Frequency of use	Medium		

3.1.2 ERD Diagram

Description:

The center needs to build a database for the teaching activities. Center opens many courses: courseID, name, duration, type, fee. Each course consists of several classes: roomID, startdate, session. Each class only taught by a teacher but a teacher can teach several different classes. Teacher's informations consists of: teacherID, name, birthday,

gender, phone, email, address, admission, status. Students can take many courses as they like. Student's informations consists of: studentID, name, birthday, gender, phone, email, address, admission, status. Student's test results consists of: result1, result2, result3, test1, test2. Every student and teacher will be managed by the center staff (admin). Admin's informations consists of: adminID, name, birthday, gender, phone, email, address, admission, status.

- Class Student consists of:
 - + studentID : Student ID
 - + firstname : Student's name
 - + lastname : Student's name
 - + birthday : Student's birthday
 - + gender : Student's Gender
 - + phone : Student's phone number
 - + email : Student's email
 - + address : Student's address
 - + admission : admission date
 - + status : Student's status
- Class Admin consists of:
 - + adminID : Admin ID
 - + firstname : Admin's name
 - + lastname : Admin's name
 - + birthday : Admin's birthday
 - + gender : Admin's Gender
 - + phone : Admin's phone number
 - + email : Admin's email
 - + address : Admin's address
 - + admission : admission date
 - + status : admin's status
- Class Teacher consists of:
 - + teacherID : Teacher ID

- + firstname : Teacher's name
- + lastname : Teacher's name
- + birthday : Teacher's birthday
- + gender : Teacher's Gender
- + phone : Teacher's phone number
- + email: Teacher's email
- + address : Teacher's address
- + admission : admission date
- + status : Teacher's status
- Class Room consists of:
 - + RoomID : Room ID
 - + startdate : Course ID
 - + section : class section
- Class Course consists of:
 - + courseID : Course ID
 - + name : Course's name
 - + duration : Course's duration
 - + fee: Course's fee
 - + type : Course's type
- Class Point consists of:
 - + result1 : result 1
 - + result2 : result 2
 - + result3 : result 3
 - + test 1: test 1
 - + test2: test 2

3.1.3 Relation Diagram

Student(studentID, name, birthday, gender, phone, email, address, admission, status)

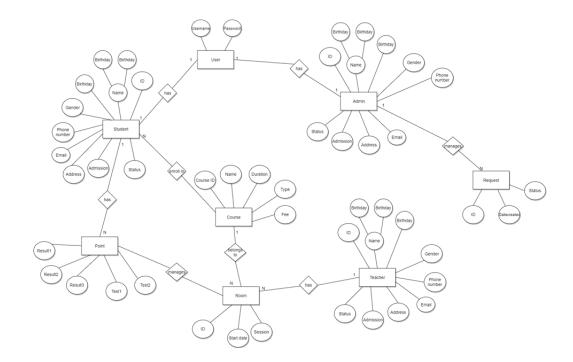
Admin (adminID, name, birthday, gender, phone, email, address, admission, status)

Teacher(teacherID, name, birthday, gender, phone, email, address, admission, status)

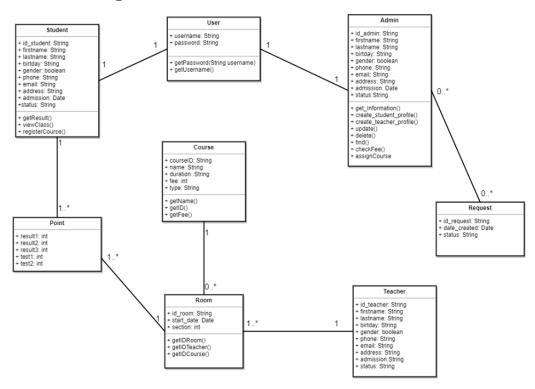
Roon(roomID, startdate, session)

Course(courseID, name, duration, type, fee)

Point (result1, result2, result3, test1, test2)

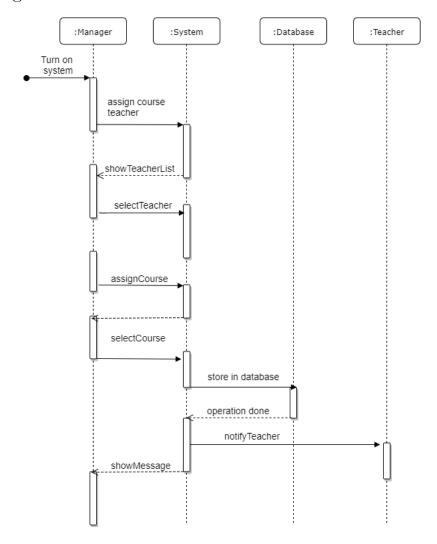


3.1.4 Class Diagram

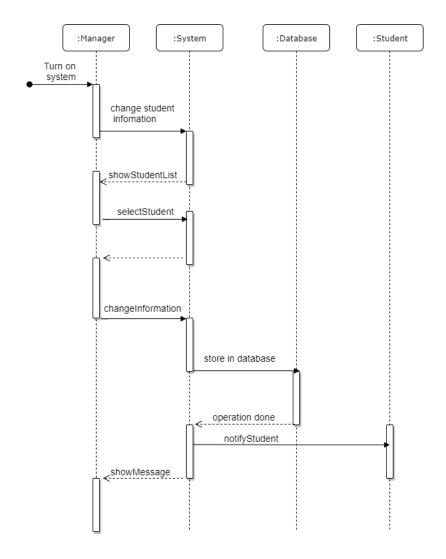


3.1.5 Sequence Diagram

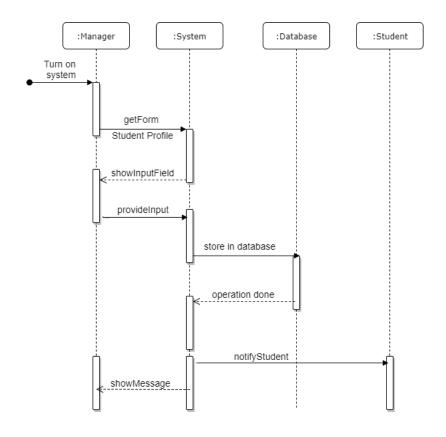
1/Assign Teacher



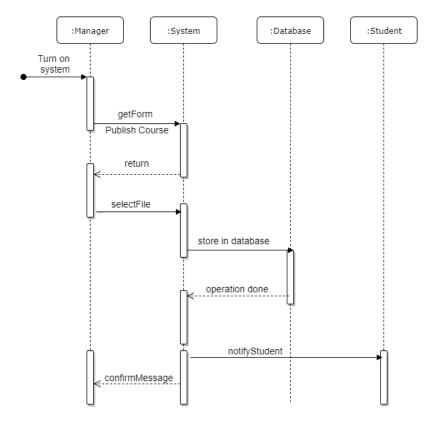
2/Change Student Profile(Teacher Profile and Class are same)



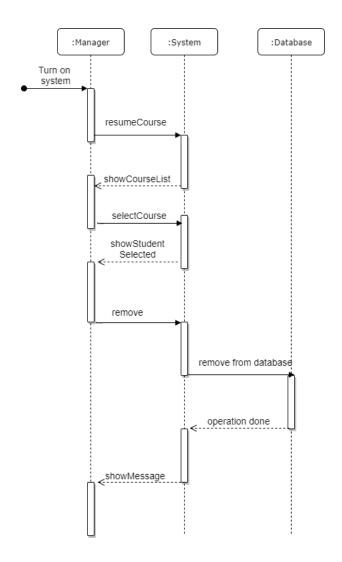
3/Create Student Profile(Teacher and Class are same)



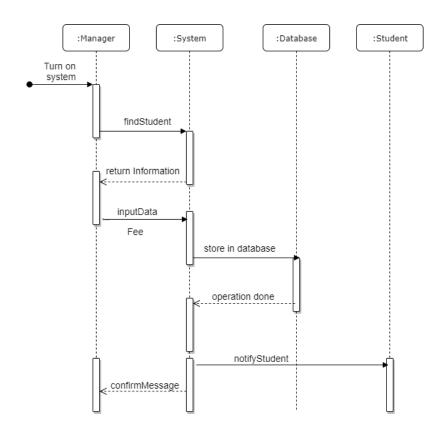
4/Publish course



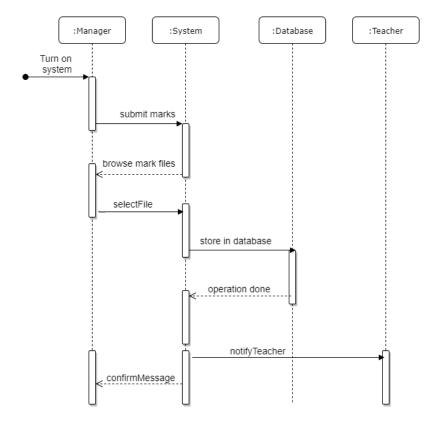
5/Remove Class Profile(Teacher and Student are same)



6/Record fee

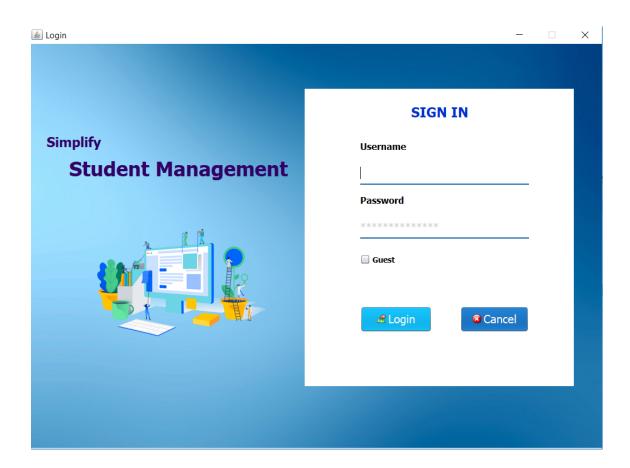


7/Submit Mark

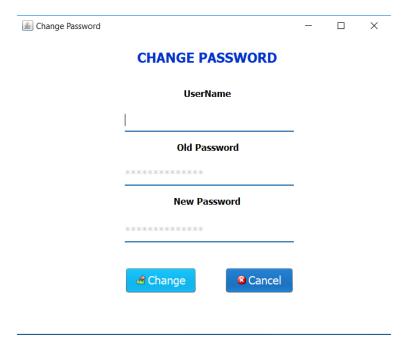


3.2 Interface

1/Login

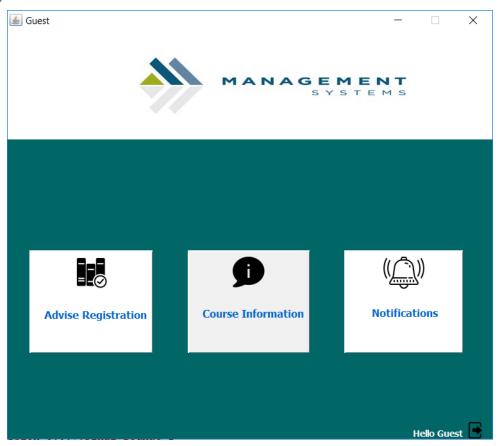


2/Change Password

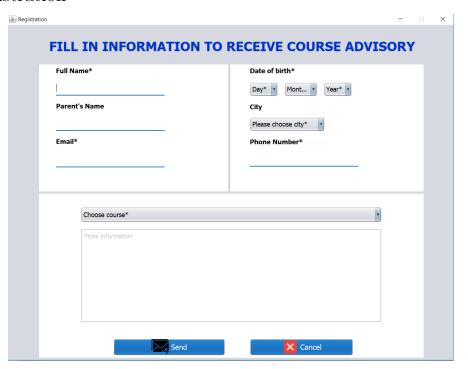


3.2.1 Guest

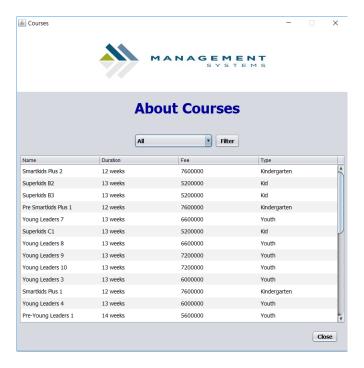
1/Guest View



2/Registration



3/Course's Information



4/Notification

Motifications

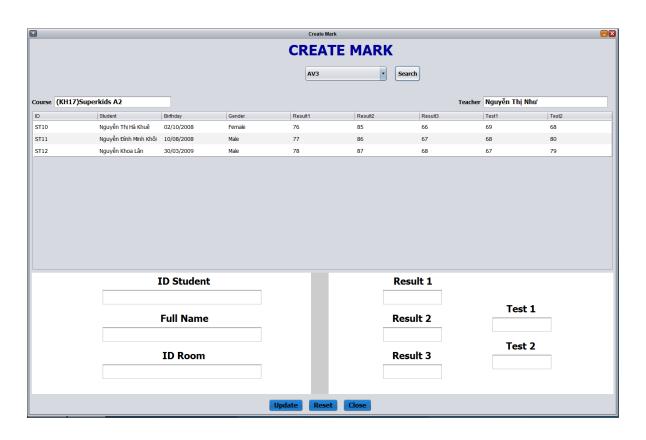


3.2.2 Admin

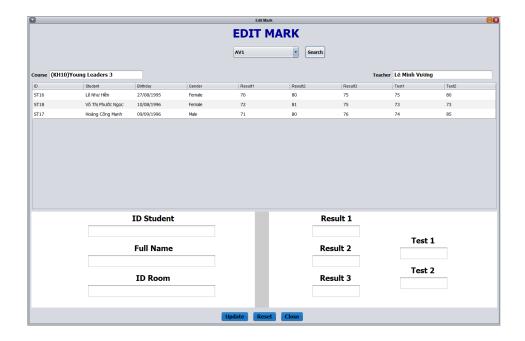
1/Admin View



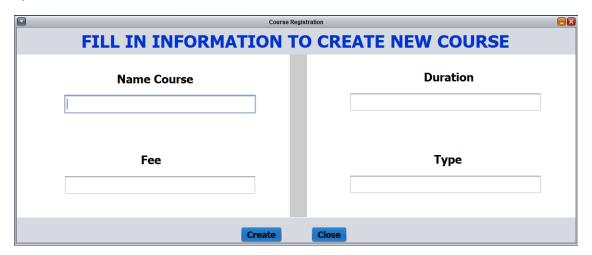
2/Input Marks



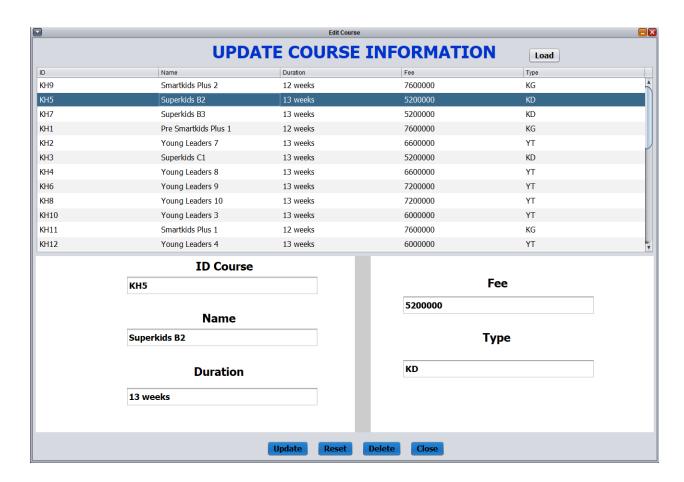
3/Edit Marks



4/New Course



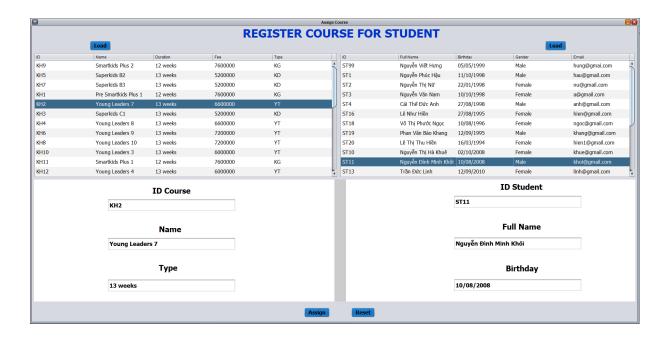
5/Edit Course



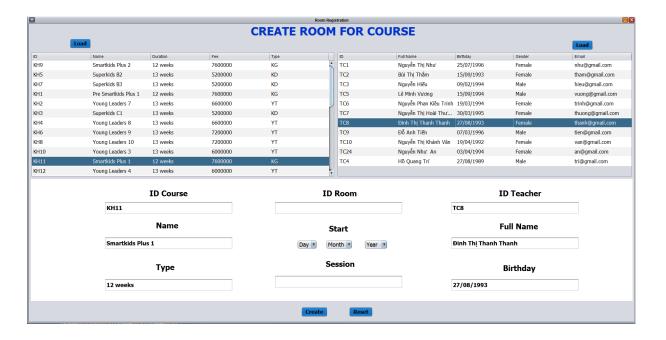
6/View course registered



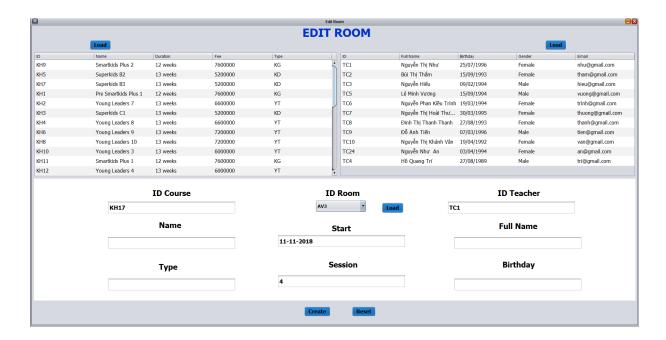
7/Register course for student



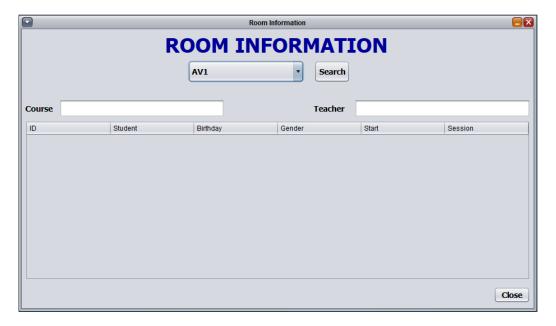
8/Make room for course



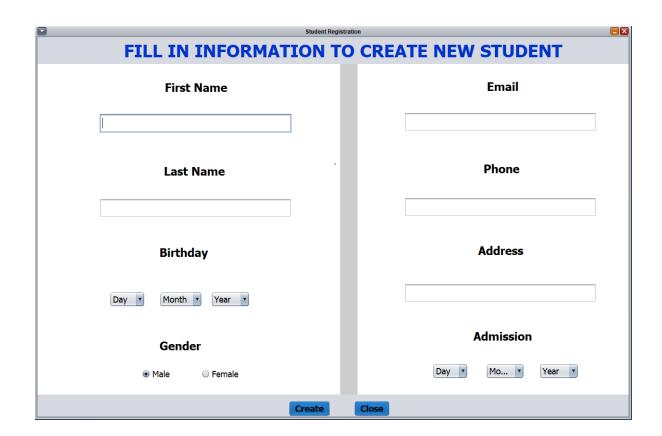
9/Edit Room



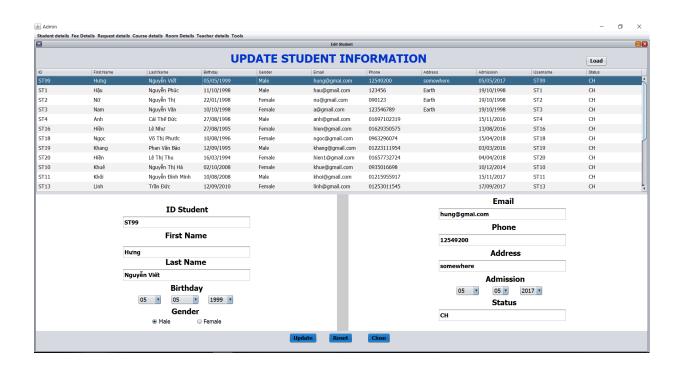
10/View Room



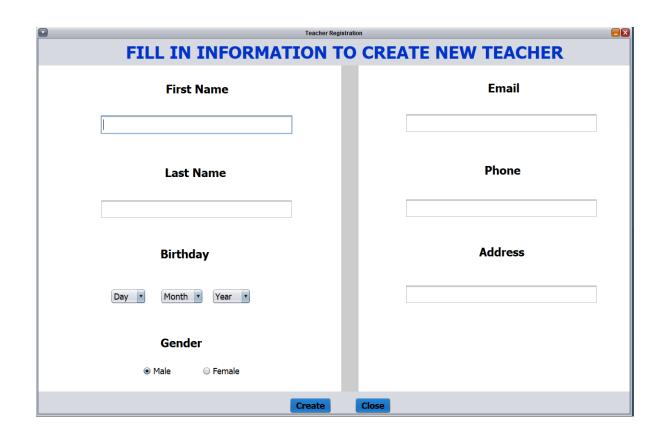
11/Add new student



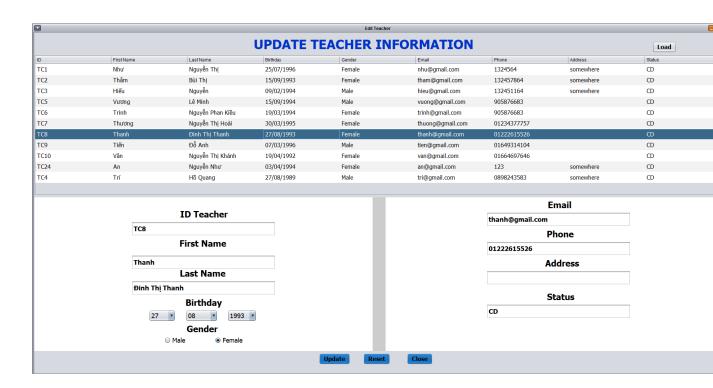
12/Edit Student



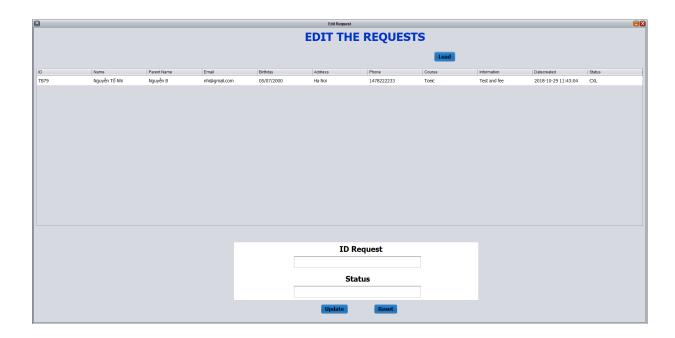
13/Add new teacher



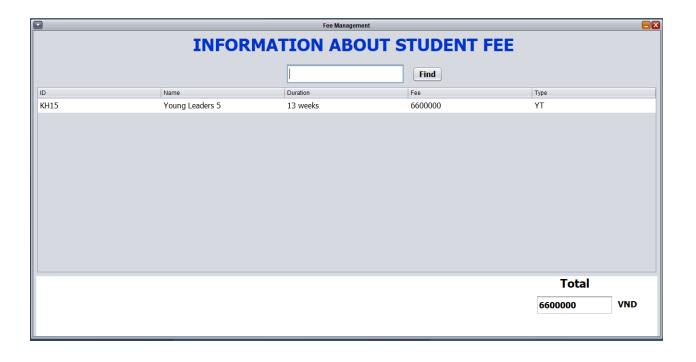
14/Edit Teacher



 $15/\mathrm{Check}$ and edit request

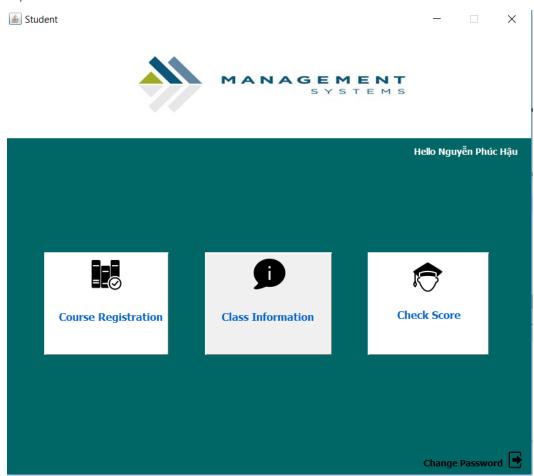


16/Check Fee

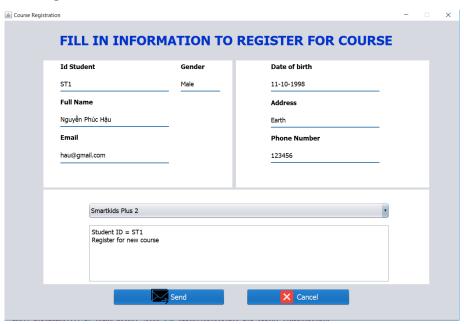


3.2.3 Student

1/Student View



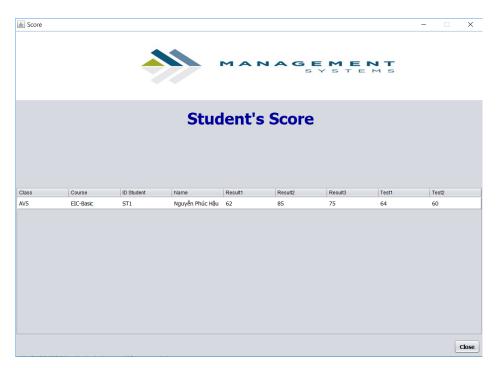
2/Course Registration



3/Class's information



4/Student's score



4 Reference Material

- 1/ Danny Poo, [2014], Enterprise JavaBeans for Students, Cengage Learning, Singapore.
- 2/ Eric Jendrock, Ricardo Cervera-Navarro, Ian Evans, Devika Gollapudi, Kim Haase, William Markito, Chinmayee Srivathsa, [2013], The Java EE 7 Tutorial, Release 7 for Java EE Platform, Oracle, United States.
- 3/ Andrew Lee Rubinger, Bill Burke, [2010], Enterprise JavaBeans 3.1, O'Reilly Media, United States.
- 4/ Michał Ćmil, Michał Matłoka, Francesco Marchioni, [2014], Java EE 7 Development with WildFly, Packt Publishing, United States.
- 5/ Rima Patel Sriganesh, Gerald Brose, Micah Silverman, [2006], Mastering Enterprise JavaBeansTM 3.0, Wiley Publishing, Canada.