

CENG3004: Software Engineering

e-School

Project Design Document

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1 Overview

The systems that are being used today are not sufficient. For example:

- People are spending too much time on paperwork.
- Also due to the big amount of paperwork, there is too much waste of paper
- There are mix-ups about grading, absence etc.

With this project, people will spend less time with paperwork, waste less paper, and finally, there won't be too many mix-ups as before. Target group will be students, lecturers and student affairs personnel.

e-School will be an all-in-one system. We will merge the current Learning Management System and Student Information System. Also, we will add new features.

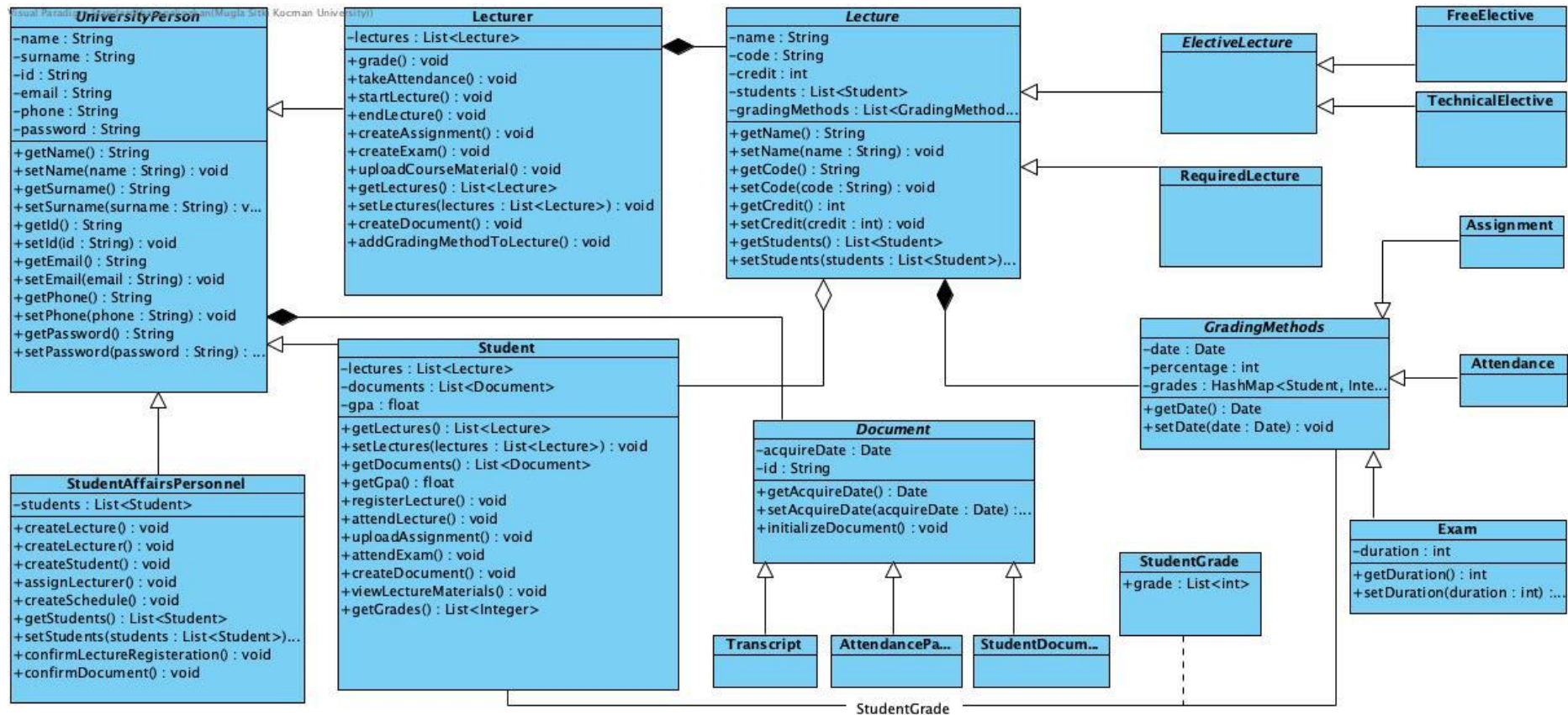
- LMS has features like uploading and accessing course materials, assigning and submitting assignments.
- SIS has features like course registration, grading, checking grades, adding students, lecturers, and lectures to the system.
- New features will be added like digital attendance and sending group messages to whole class.

2 Design Goals

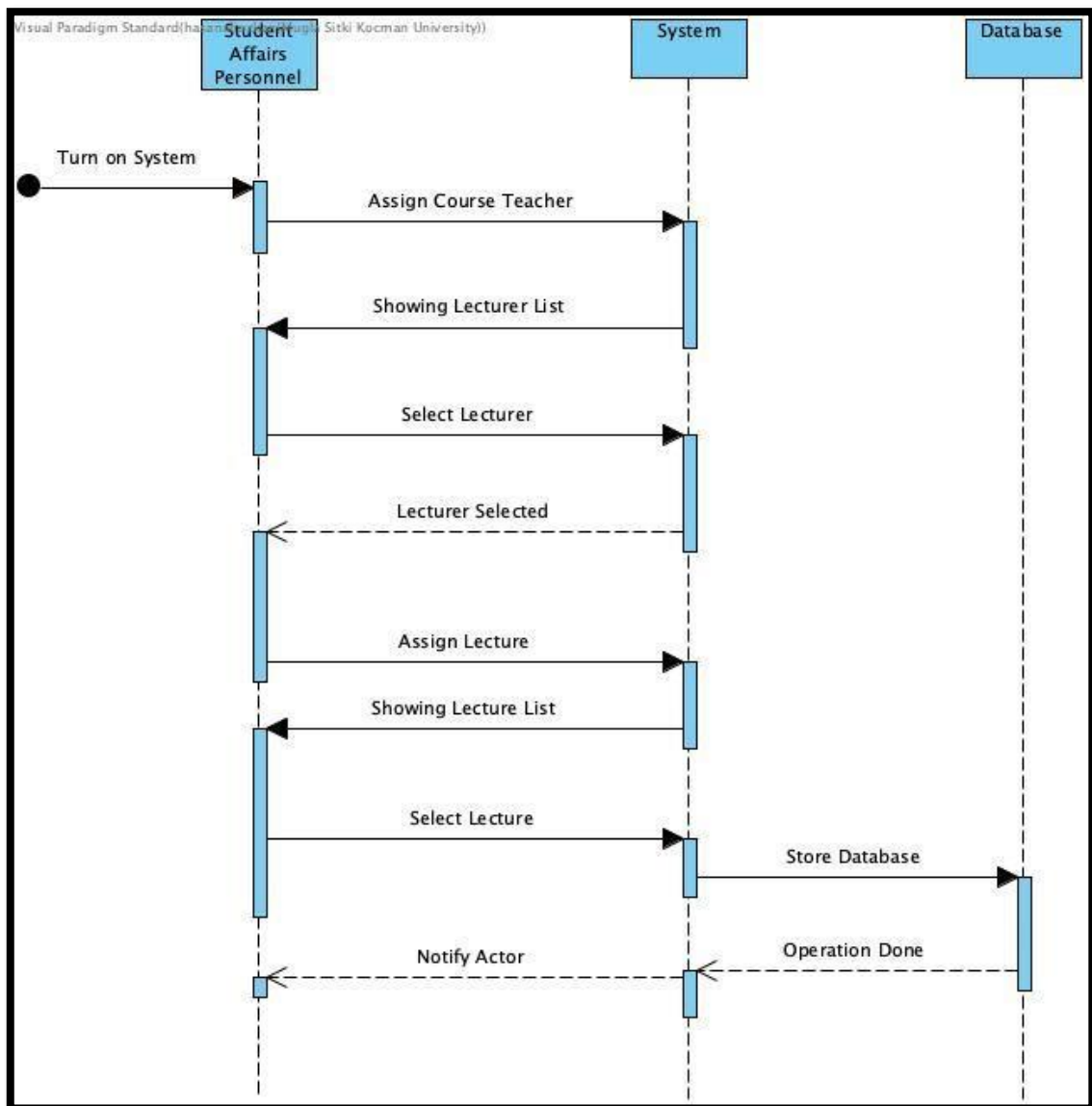
Goal's Concern	Related Requirement Identifier	Description
Reliability	Deduced from NR-1 and NR-2	e-School should be reliable in terms of tracking student behavior during entering an exam and following course material.
Efficiency	NR-3	e-School should be efficient in terms of storage usage.
High-performance	NR-4	e-School should be high performance in terms of network traffic and server usage.
User-friendliness	NR-5	e-School should be user friendly in terms of completing user's unterminated actions automatically.
Fault Tolerance	NR-7	e-School should be fault-tolerant in terms of overlapping course assignments.

3 System Models

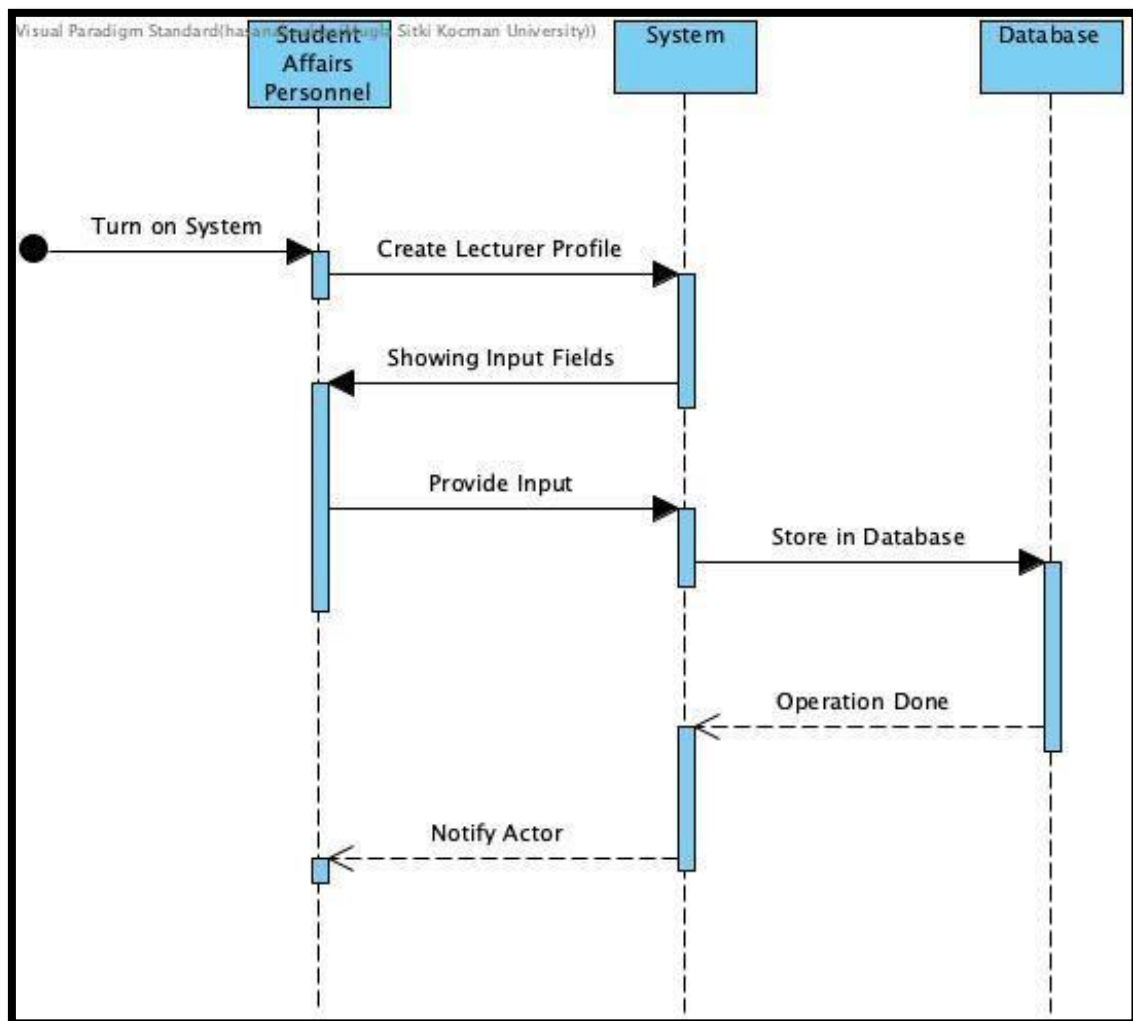
3.1 Class Diagrams



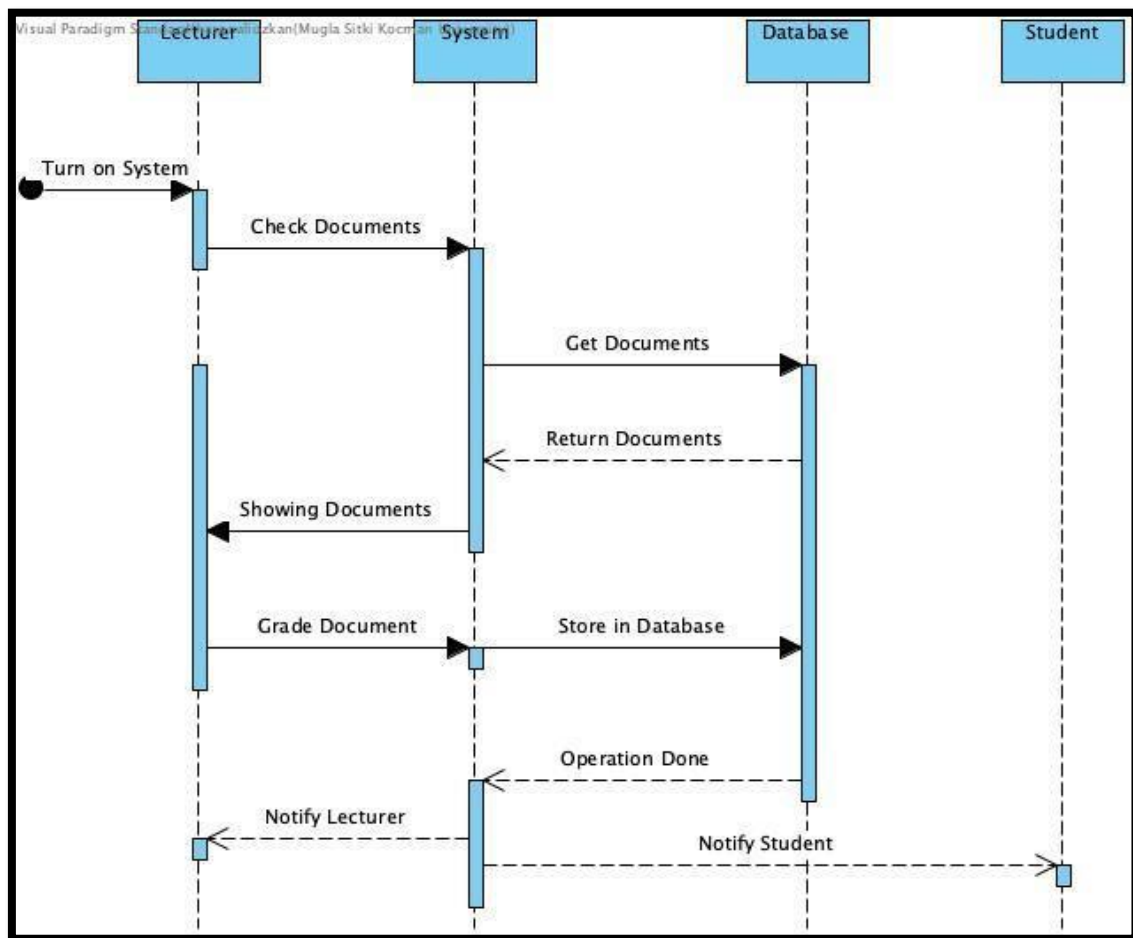
3.2 Sequence Diagrams



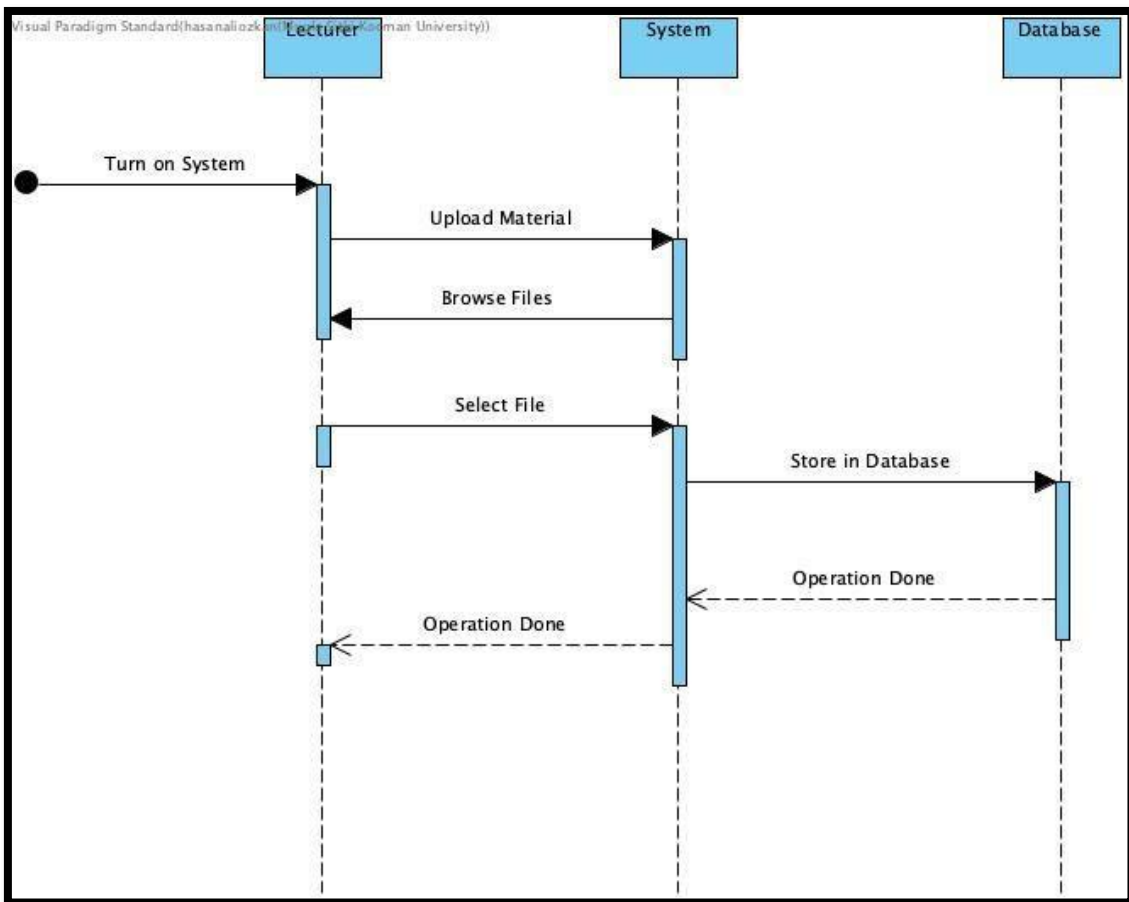
Assign Lecturer to Lecture Sequence Diagram



Create Lecturer Sequence Diagram

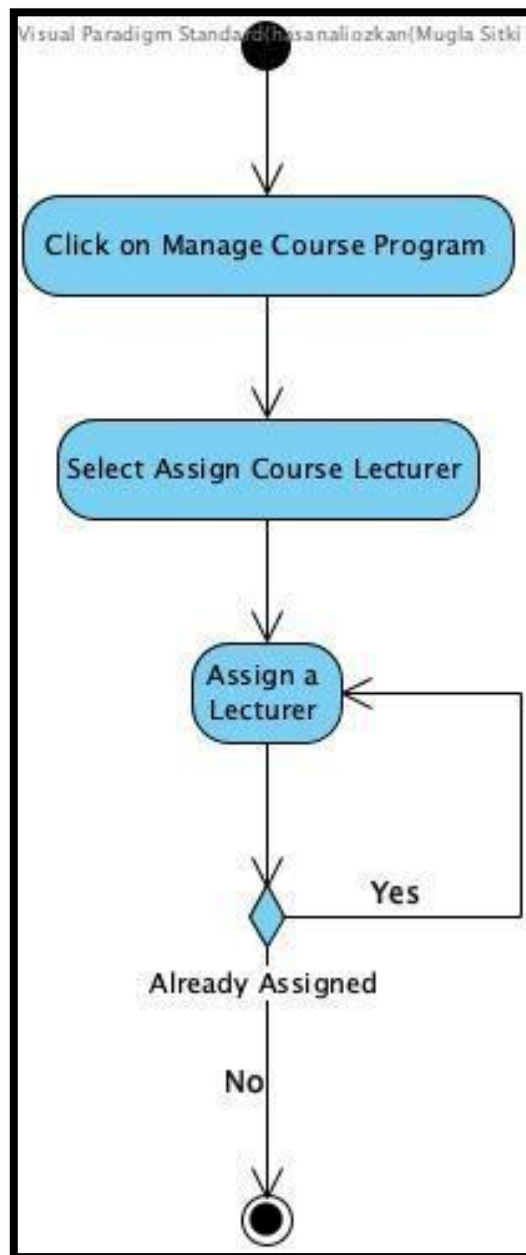


Grade Students Sequence Diagram

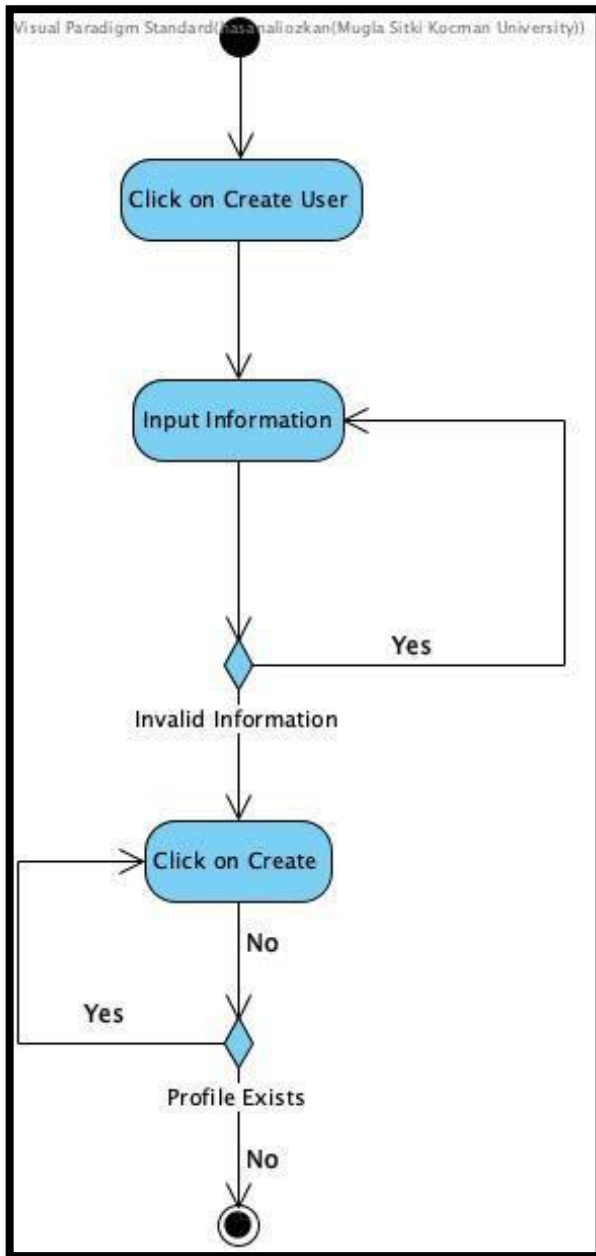


Upload Course Materials Sequence
Diagram

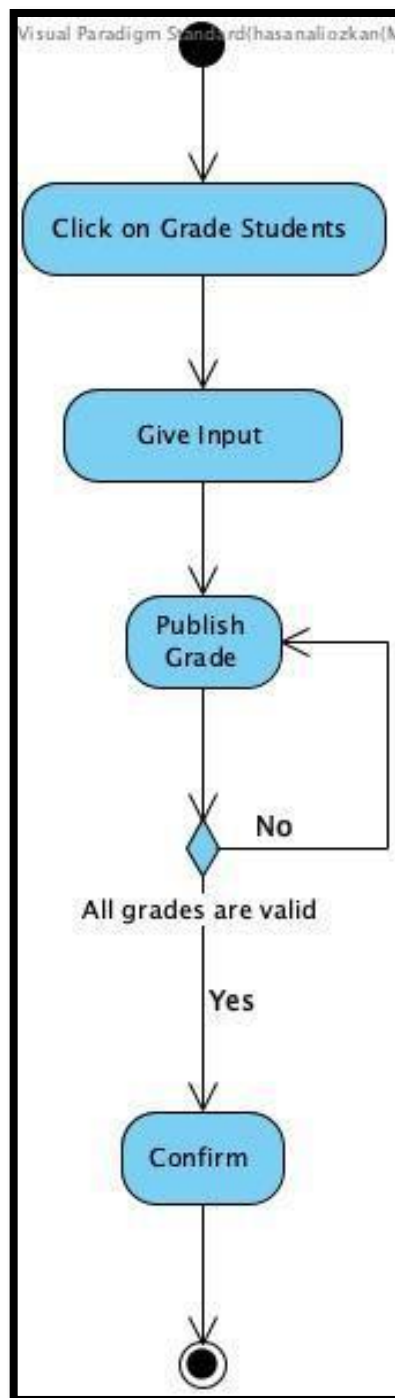
3.3 Activity Diagrams



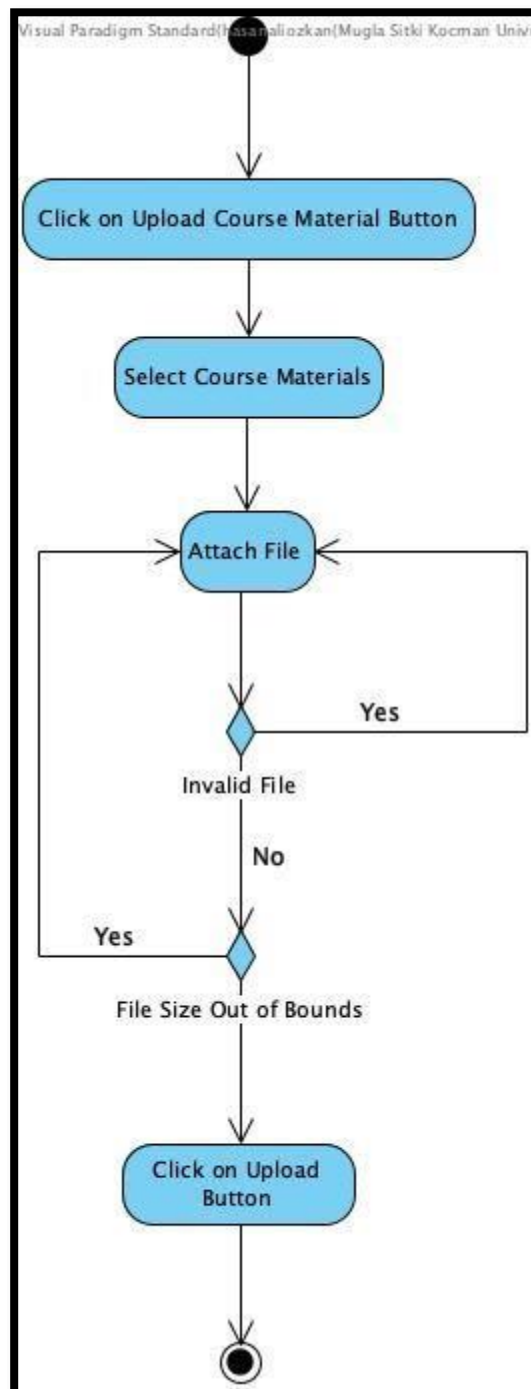
Assign Lecture to Lecturer
Activity Diagram



Create User
Activity Diagram

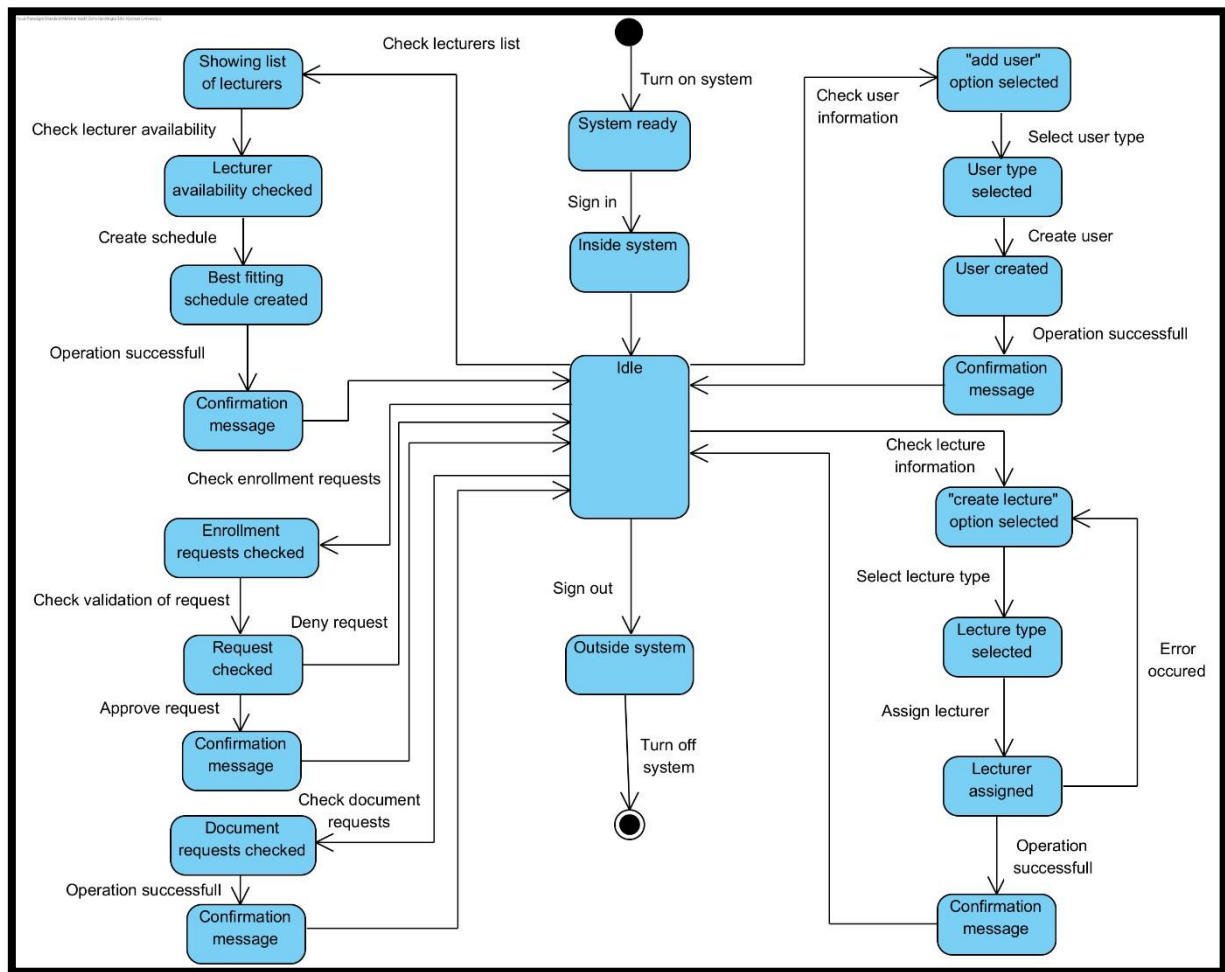


Grade Student
Activity Diagram



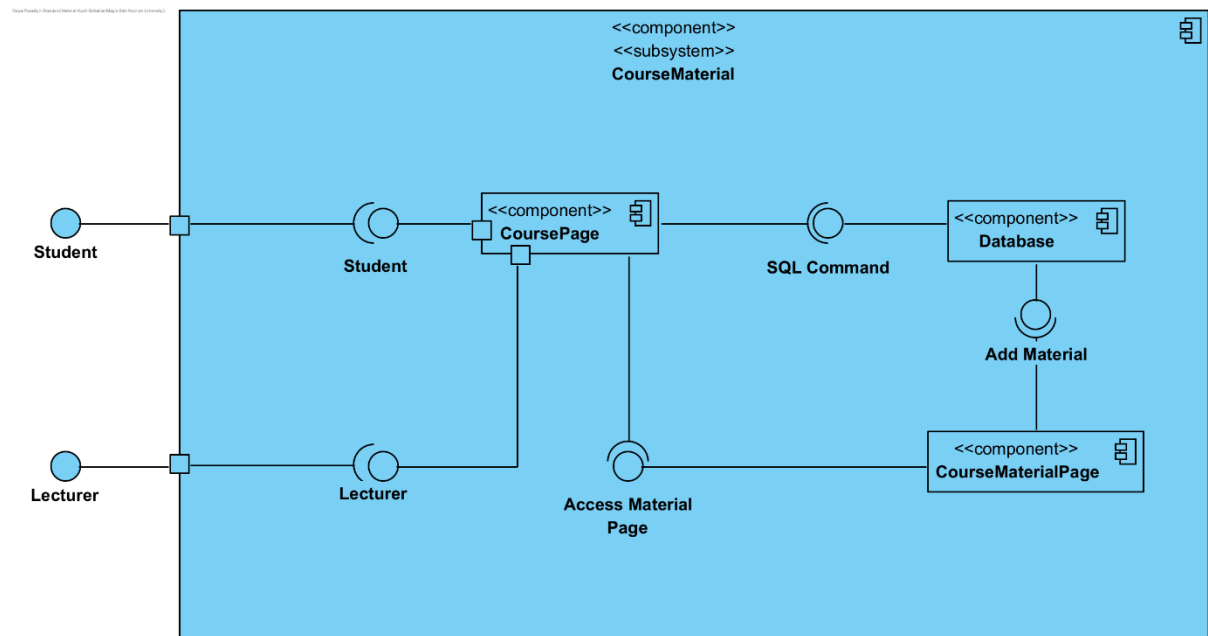
Upload Course Materials
Activity Diagram

3.4 Statechart Diagrams

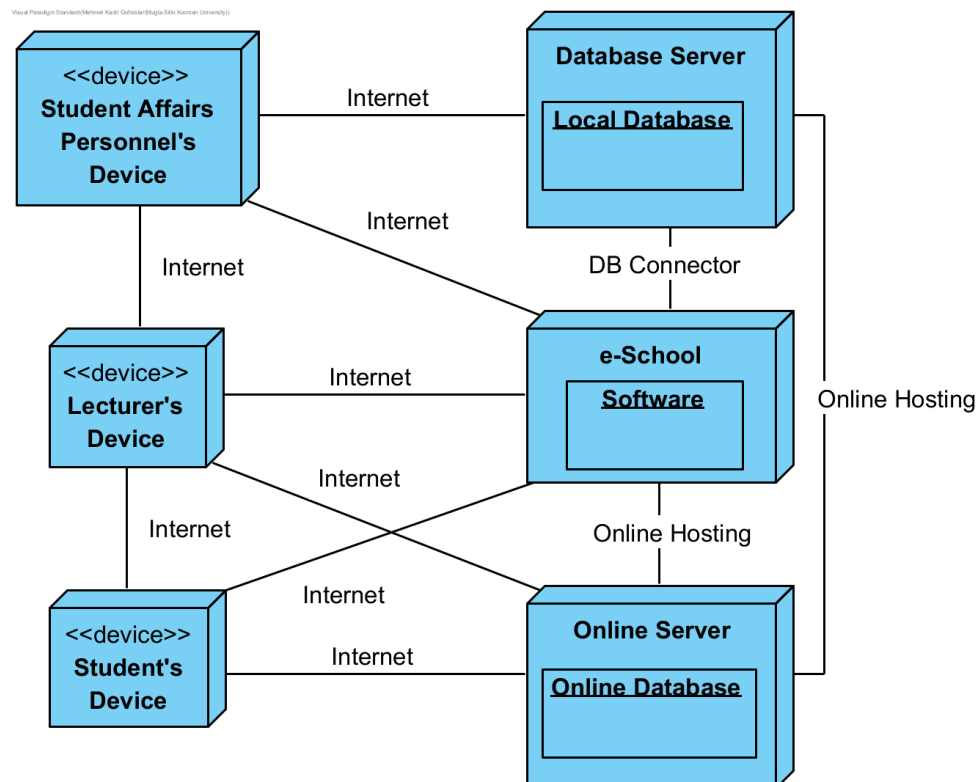


Student Affairs Personnel
Statechart Diagram

4 Subsystem Decomposition



5 Hardware / Software mapping



6 Other Design Concerns

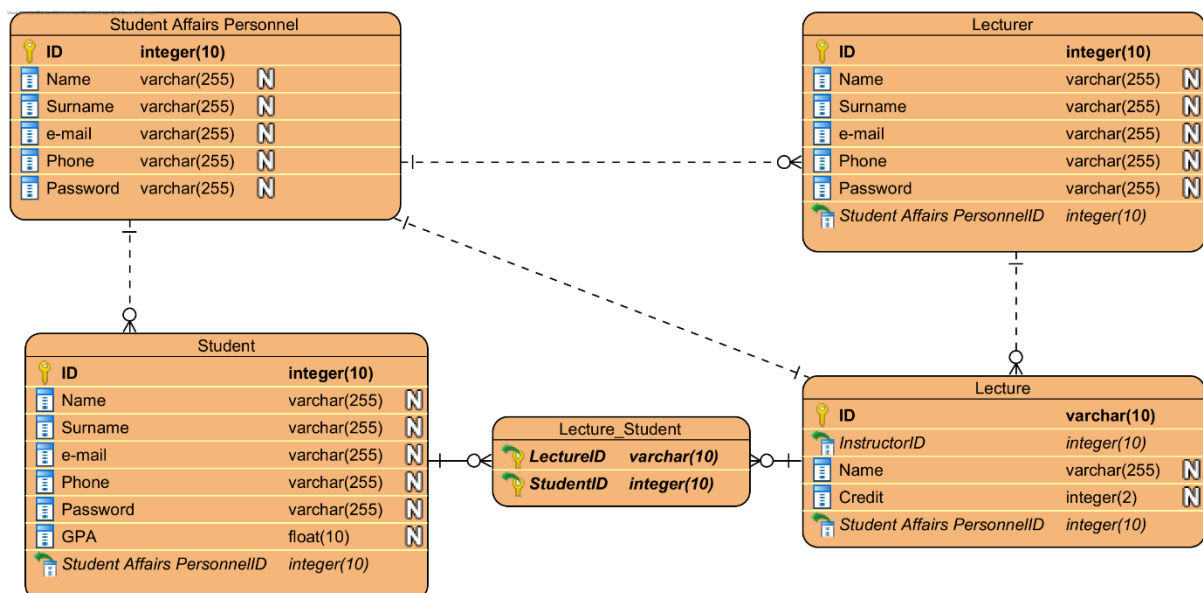
6.1 Concurrency

Every action except student lecture registration can be done simultaneously.

Student lecture registration should be taken into consideration since there might be an overlap when there are no vacancies more than one.

6.2 Data Management

RDBMS and cloud storage will be used in this project.



6.3 Global Resource Handling

Class/Actor	Student Affairs Personnel	Lecturer	Student
Lecturer	<<create>> assignLecturer()		
Student	<<create>> confirmLectureRegistration()	takeAttendance() startLecture() endLecture() createExam() createAssingnment() uploadCouseMaterial()	
Lecture	<<create>>	addGradingMethodToLecture() grade()	registerLecture() attendLecture() uploadAssignment() attendExam() viewLectureMaterials()
Document	confirmDocument()	<<create>>	<<create>>
Grading Methods		<<create>>	getGrades()

6.4 Boundary Conditions

Initialization

- What data need to be accessed at startup time?
User sign in credentials is accessed at startup time.
- What services have to be registered?
Online hosting services and database servers are needed.
- What does the user interface do at startup time?
A login page is displayed.

Termination

- Are single subsystem is allowed to terminate?
Single subsystems are allowed to terminate in case of an error.
- Are subsystems notified if a single subsystem terminates?
Subsystems are notified according to the context, such as terminating an exam.
- How are updates communicated to the database?
In case of an update through software, database is updated via DB Connector. Also student affairs personnel can update database directly.

Failure

- How does the system behave when a node or communication link fails?
System kicks the user and notifies the user when the system is back online.
- How does the system recover from failure?
System is recovered using the data from latest back-up.

7 Glossary

LMS : A learning management system is a software application for the administration, documentation, tracking, reporting, automation, and delivery of educational courses, training programs, or learning and development programs.

SIS : A student information system, school administration software or student administration system is a management information system for education sector establishments used to manage student data.

GPA : Grade Point Average is an average of all the grade points a student has earned over the course of your degree program.

Lecture Information

Credit : A credit is the recognition for having taken a course at school or university, used as measure if enough hours have been made for graduation.

Code : Colleges use course codes to describe and organize their courses in a way that can be easily understood by both colleges and students.

Lecture Types

Required : Courses that must be taken by students.

Elective : Courses that can be taken by students.

Free Elective : Courses that can be taken by students that are given by any department.

Technical Elective : Courses that can be taken by students that are given by their department.

8 References

1. https://en.wikipedia.org/wiki/Learning_management_system
2. https://en.wikipedia.org/wiki/Student_information_system
3. <https://www.cis-spain.com/en/gpa-meaning-and-how-to-calculate-it/>
4. https://en.wikipedia.org/wiki/Course_credit
5. <https://pearsonaccelerated.com/blog/course-codes-101-a-beginners-guide-to-course-codes-and-transfer-credit>