University of Prince Mugrin

SE 262 – Software Engineering

Project – Semester II (Spring 2022)

Educational Platform System

منصة سنك

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Chapter 1: Introduction

1.1   System Overview

The system will be in the form of a website to facilitate access by all members of UPM University. It is an integrated environment that allows access to various educational services in one place. The functionalities will be available to each member in different forms according to their authority.

When the system is implemented, the user will be able to access three different types of services. The first one is called "Videos Board" with this service, a student who wishes to explain a particular subject or a specific topic can upload a video of his/her explanation, with the possibility of deleting the video later. In addition, the user will be able to search for a specific video among many videos. Furthermore, the user can also save the videos she/he wants to come back to later. To ensure the correctness of the information given through this platform, the content of the videos is verified by only one instructor who has related major with the category of the video.

The second service offered by the platform is called "Group Study Room" where a student and his or her colleagues can open a meeting (public or private) with each other and study the materials or discuss projects. Moreover, the students who liked explaining a particular student through the uploaded videos on the platform can ask him/her to explain it to them, and that can be done through these rooms.

The third service is called "My Bag", the platform provides a place for students where they can keep all the educational materials for one subject (slides, books and pdf file) in one place. This service helps students organize their study materials and not be distracted by different places of preservation, as everything they will need will be in one place. To sum up, the platform provided an appropriate and integrated environment from students to students.

1.2   Problem Statement

Sometimes students have difficulty following-up on their educational processes because of misunderstanding the material of some courses and often they need to listen to this part with different explanations by different people and in most of the time, they prefer to listen to students at the same academic level or who have taken this course before and that can be challenging, because that cannot be available all the time. In addition, sometimes groups of students like to study together whether to review lectures or prepper for an exam for example,

finding suitable communication channels, or finding a comfortable study environment can be difficult. Due to the information revolution, students have many references and materials for one course beside their other courses. Therefore, it has become necessary for students to have a place to assist them organize this number of materials and references so they can come back to them later.

1.3 System Objective

Our main objective is that rising students' GPA by offering extra classes from and to students with additional assistance from instructors to ensure the platform content. Our platform also helps to develop student academic skills, especially for those who would like to continue as academic instructors. last but not least, the goal of our platform is to make it easier for students to manage everything related to studying in one place, so they don't get confused going to different sources to accomplish their tasks.

1.4 System Scope

The scope of this project is UPM university students and especially those who have talented explanation skills and who struggle in academic life.

1.5 Proposed Solution (System Functions and Features)

There are four main features that our platform provides:

1. The platform provides the ability for students to view the uploaded videos of other students.
2. The platform enables students to create study rooms with other students.
3. The platform provides a private bag that helps students upload the needed materials.
4. The platform enables instructors to verify the uploaded videos.

Chapter 2: Software Requirement
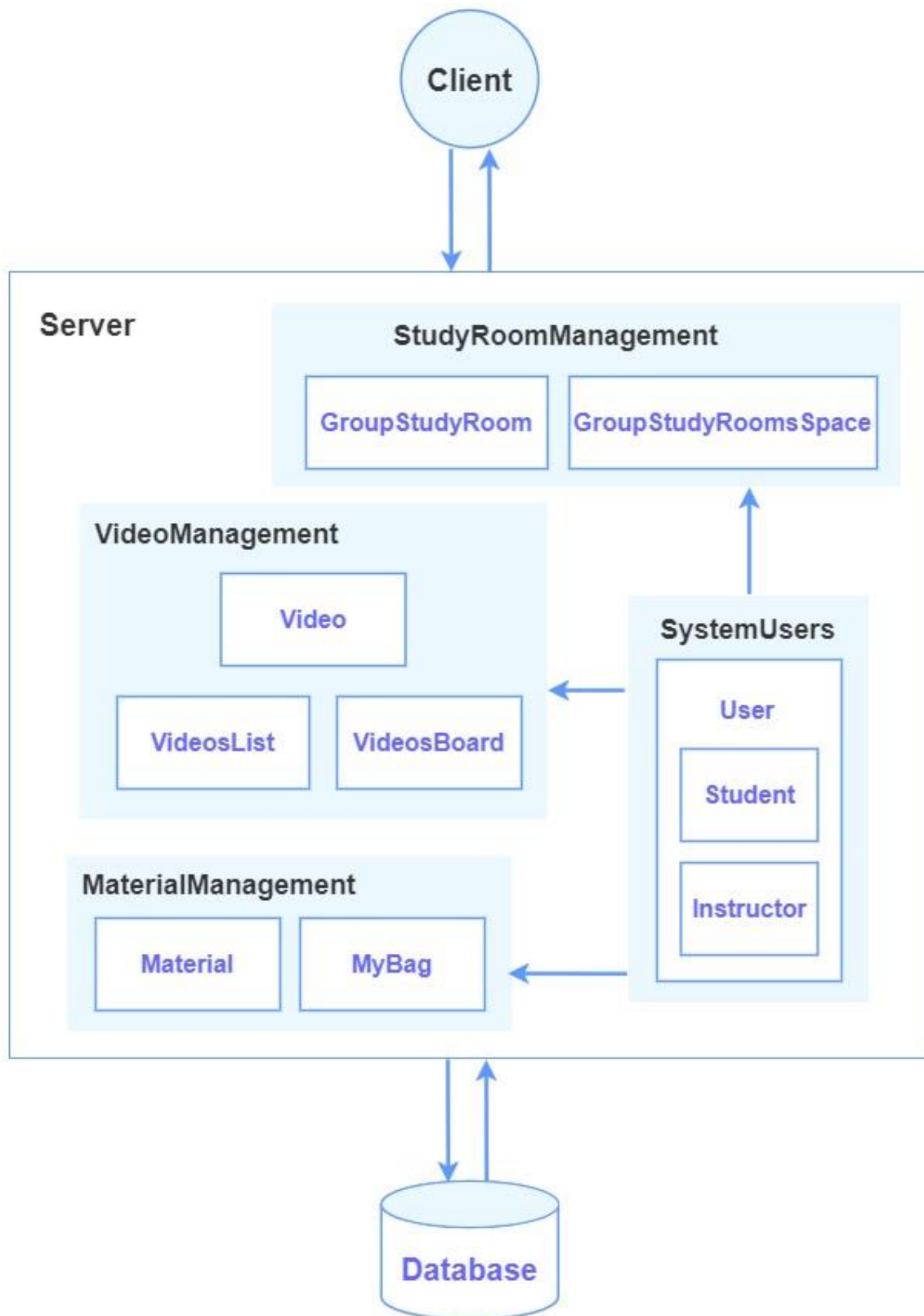
2.1 Functional Requirements

- The user shall be able to log in to the system as either a student or an instructor.
- The student shall be able to view public meetings.
- The student shall be able to start a public / private meeting.
- The student shall be able to end his/her public / private meeting.
- The student shall be able to invite other students to a meeting.
- The student shall be able to join a meeting.
- The student shall be able to upload videos.
- The student shall be able to delete his/her videos.
- The user shall be able to view all videos within video information (name, period, publisher, date of publish, views, verified, description).
- The user shall be able to search for a specific video.
- The instructor shall be able to verify uploaded videos.
- The student shall be able to save the needed videos to the "Saved Videos" list.
- The student shall be able to remove the saved video from the "Saved Videos" list.
- The student shall be able to upload materials (slides, books, and pdf files).
- The student shall be able to delete his/her materials.
- The student shall be able to view only his/her materials.

2.2 Non-functional Requirements

- The video shall be validated by only one instructor who has related major with the category of the video.
- The user shall login after matching his/her email address or username and password. (Security)
- The system shall respond quickly to any transaction in less than 10 seconds. (Speed)
- All data will be backed-up daily automatically at 11:59 pm. (Backup)
- The system shall be available 24/7. (Availability)
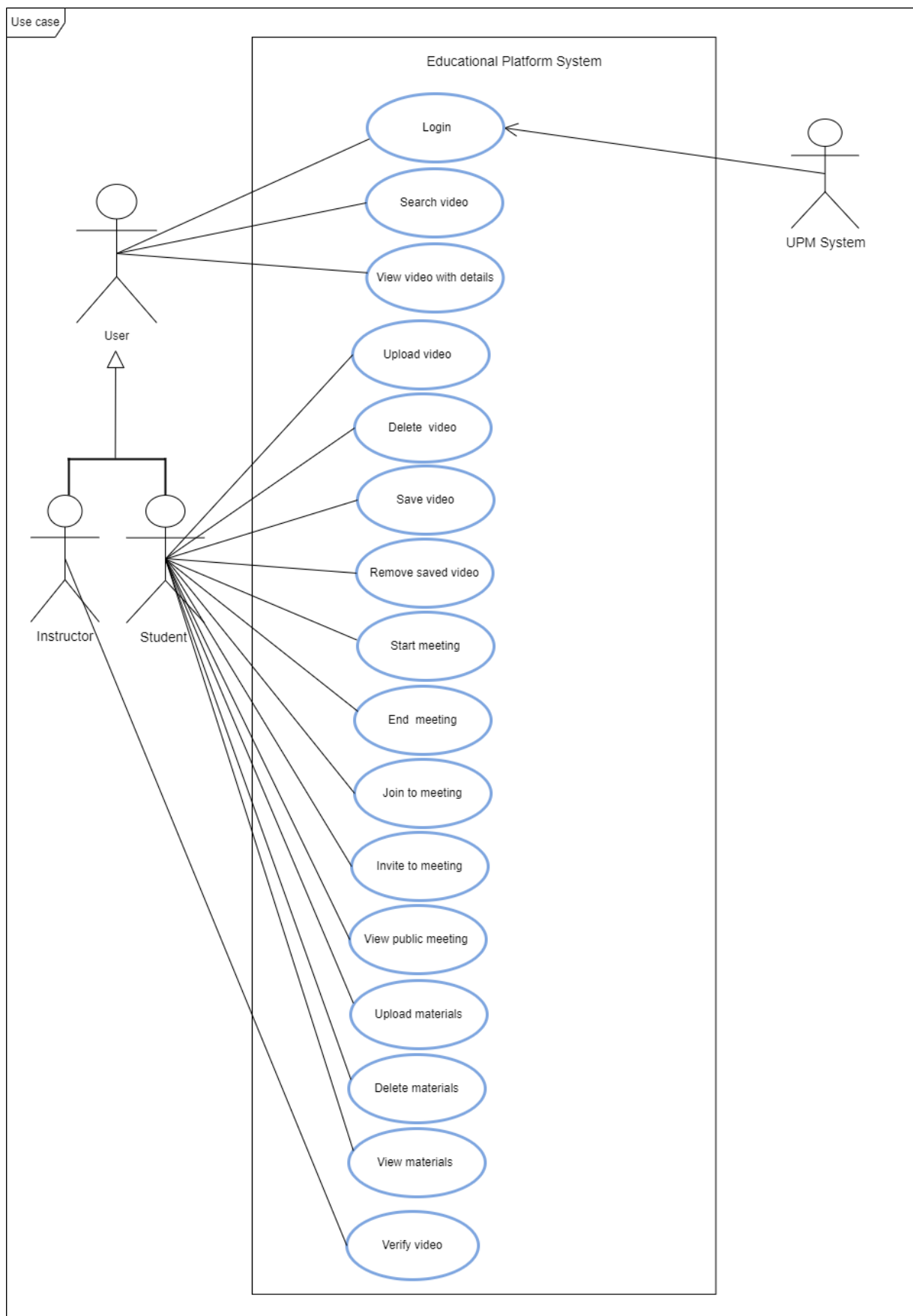- The system shall handle 2000 users at the same time. (Scalability)

Chapter 3: Software Design

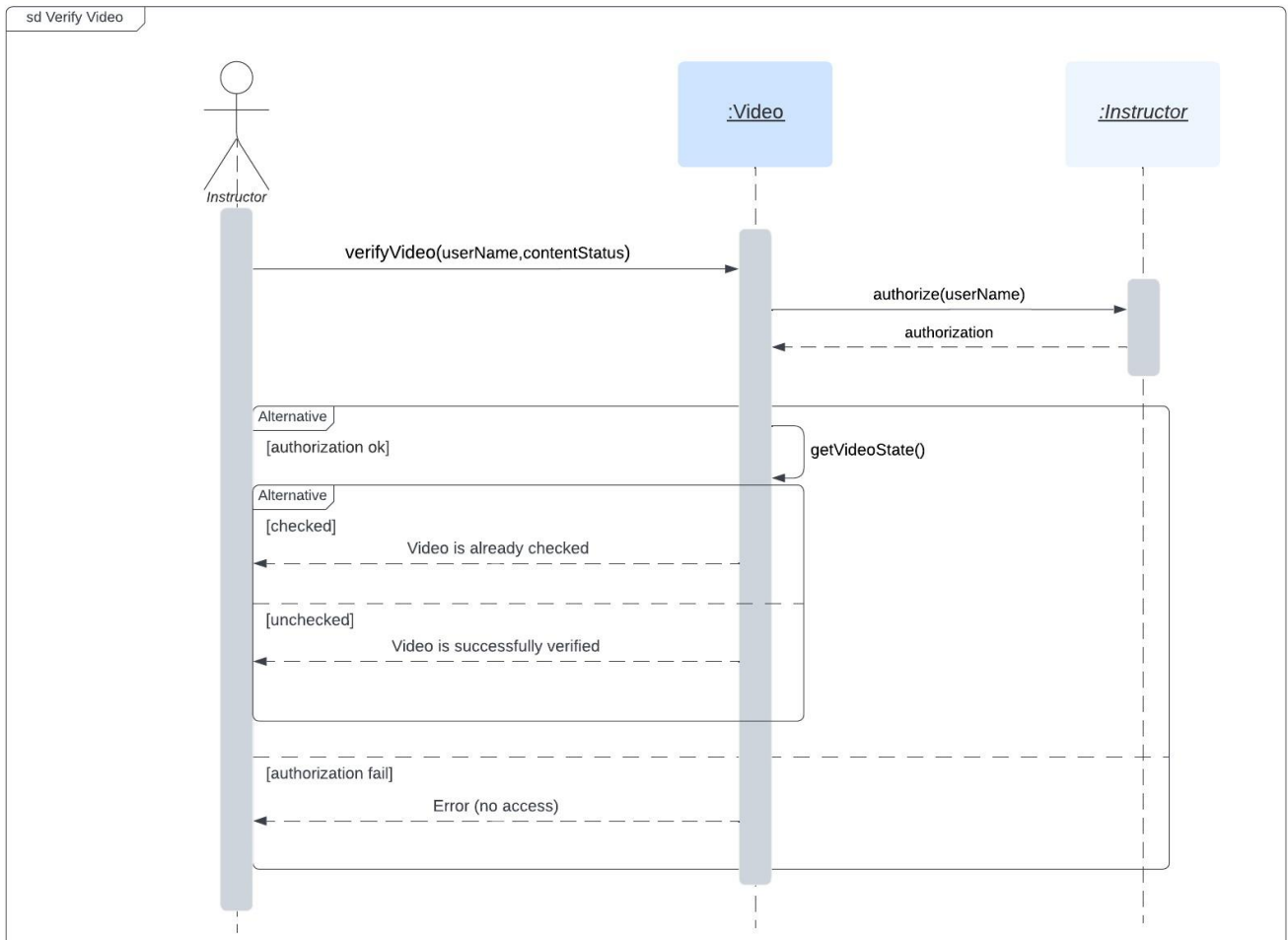**3.1 Architectural Design**

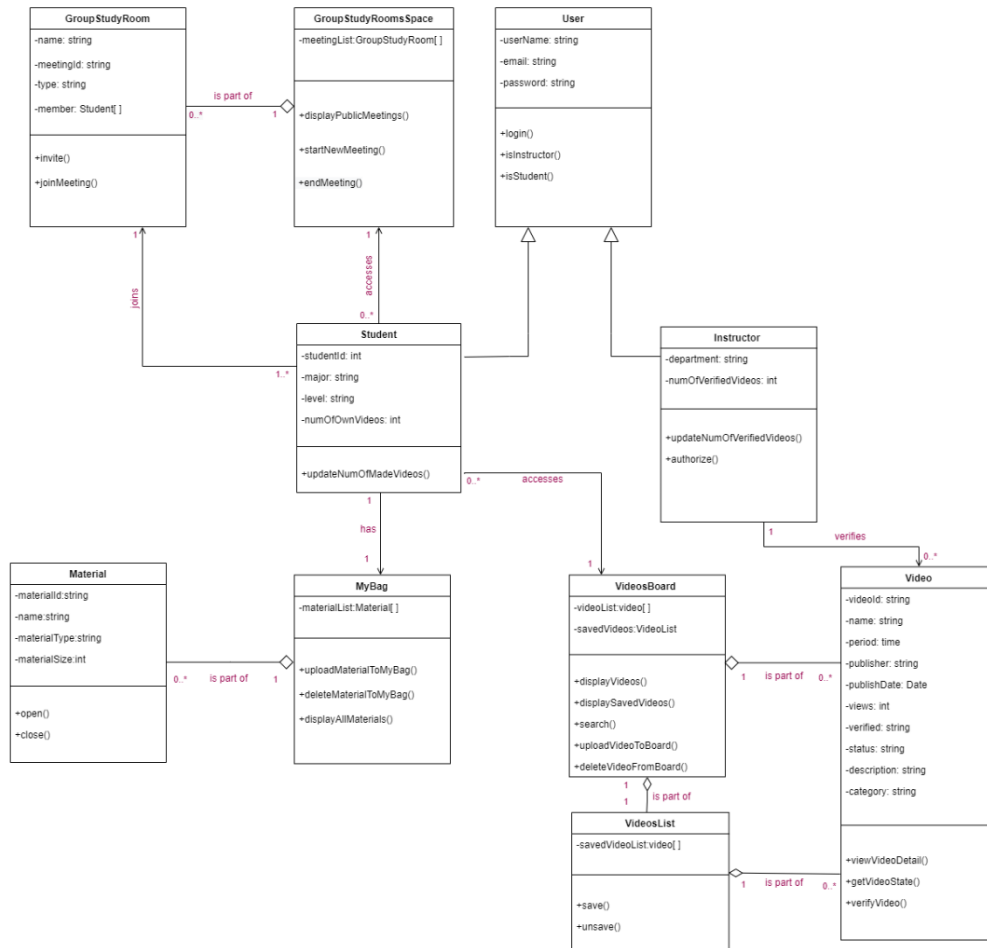## 3.2 Object-oriented analysis and design (OOAD)

3.2.1 Use case diagram

3.2.1.1 Use case description

Use case	Verify video
Brief Description	The verification of the video is described in this use case. The use case begins when the instructor modifies the video's status. The new status of the video can be valid or invalid. By taking into consideration that the default status is unchecked. Then, the video's status will be modified depending on the instructor's assessment.
Actor	Instructor
Pre-Conditions	The instructor has to have account in the platform.
Basic Flow	1.The instructor opens the platform. 2.The instructor logs into her/his account. 3.The instructor sets the status of the video to be vailed or invalid. 4.The system checks the instructor's authorization. 5. The system checks the video status. 6.The system updates the status of the video.
Alternative Flow	Line2. Invalid identifier entered. Indicate errors message. Line4. The instructor is unauthorised. Cancel update on status transection. Line5. The video has already been checked. Cancel update on status transection.
Exception Flow	The video has already been verified by another instructor, which prevents him/his from updating the status. The video category does not match to the department of the instructor.
Post-Condition	The status of the video is adjusted according to the instructor's assessment.
Rules	The instructor should have a username and password to log into the platform. The username and password should be true. The video should be available. The video has to be in an unchecked status. The platform should work fine.
Constraints	1-The instructor is the only user that is able to verify the video 2-The instructor should be able to verify the video that is related to his/her department.

3.2.2 Sequence diagram

3.2.3 Class diagram

GroupStudyRoom
-name: string
-meetingId: string
-type: string
-member: Student[ ]

+invite()
+joinMeeting()

GroupStudyRoomsSpace
-meetingList:GroupStudyRoom[ ]

+displayPublicMeetings()
+startNewMeeting()
+endMeeting()

User
-userName: string
-email: string
-password: string

+login()
+isInstructor()
+isStudent()

is part of
0..*   1

joins
1

1..*

accesses
1

0..*

Student
-studentId: int
-major: string
-level: string
-numOfOwnVideos: int

+updateNumOfMadeVideos()

Instructor
-department: string
-numOfVerifiedVideos: int

+updateNumOfVerifiedVideos()
+authorize()

0..*   accesses

1   verifies   0..*

1   has   1

Material
-materialId:string
-name:string
-materialType:string
-materialSize:int

+open()
+close()

MyBag
-materialList:Material[ ]

+uploadMaterialToMyBag()
+deleteMaterialToMyBag()
+displayAllMaterials()

0..*   is part of   1

VideosBoard
-videoList:video[ ]
-savedVideos:VideoList

+displayVideos()
+displaySavedVideos()
+search()
+uploadVideoToBoard()
+deleteVideoFromBoard()

Video
-videoId: string
-name: string
-period: time
-publisher: string
-publishDate: Date
-views: int
-verified: string
-status: string
-description: string
-category: string

+viewVideoDetail()
+getVideoState()
+verifyVideo()

1   is part of   0..*

1
1   is part of

VideosList
-savedVideoList:video[ ]

+save()
+unsave()

1   is part of   0..*

Chapter 4: Conclusion

4.1 Conclusion

This report provides the analysis and design for the suggested idea for the SE 262: Software Engineering course project, which is an educational platform system. The required tasks were completed in about 4-5 weeks. The first week was spent brainstorming and deciding on a project concept. In the second week, it was the requirements stage. The requirements have been gathered from some suggestions that have been mentioned by team members, and we were looking at similar platforms such as YouTube, Teams, and Noon Academy. For third to forth weeks, we have been working on object-oriented analysis and design (OOAD), which are designed in parallel. Writing the report and refining the models and requirements took two days.

 In addition, the report provides bullet points that are related to the objectives of the project, and which are achieved by following: To meet our first goal, which is related to raising students' GPAs, and our second goal, which is improving student skills, particularly academic explanation skills, two sections have been added: a "Videos Board" and a "Group Study Rooms Space". For our third goal, which is to provide a productive and attractive environment, all the materials needed for a successful learning process are collected in one place, called "My Bag", so that students do not have to switch between applications and other systems and can focus on their assignments.

If given the opportunity, we will do our best to add more features to the platform. The features that we have in our mind now are the ability to upload videos by giving the students two options: make it free for others or make it fee to have a source of income. Also, we are thinking about adding some useful tools in the "My Bag" section, like a calendar to add some big events like the date of submission of projects or the date of exams, plus services to deal with pdf files. In addition, some daily brain training puzzles. Finally, the system may provide some statistics for users about their activities on the platform in the near future.

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