Sri Lanka Institute of Information Technology

Software Engineering (SE2030)

Year 02 Semester 01 – 2025

Group ID – 55 (2025-Y2-S1-MLB-B3G2-05)

Lab Sheet 05

# Web-based Educational Institute Management System

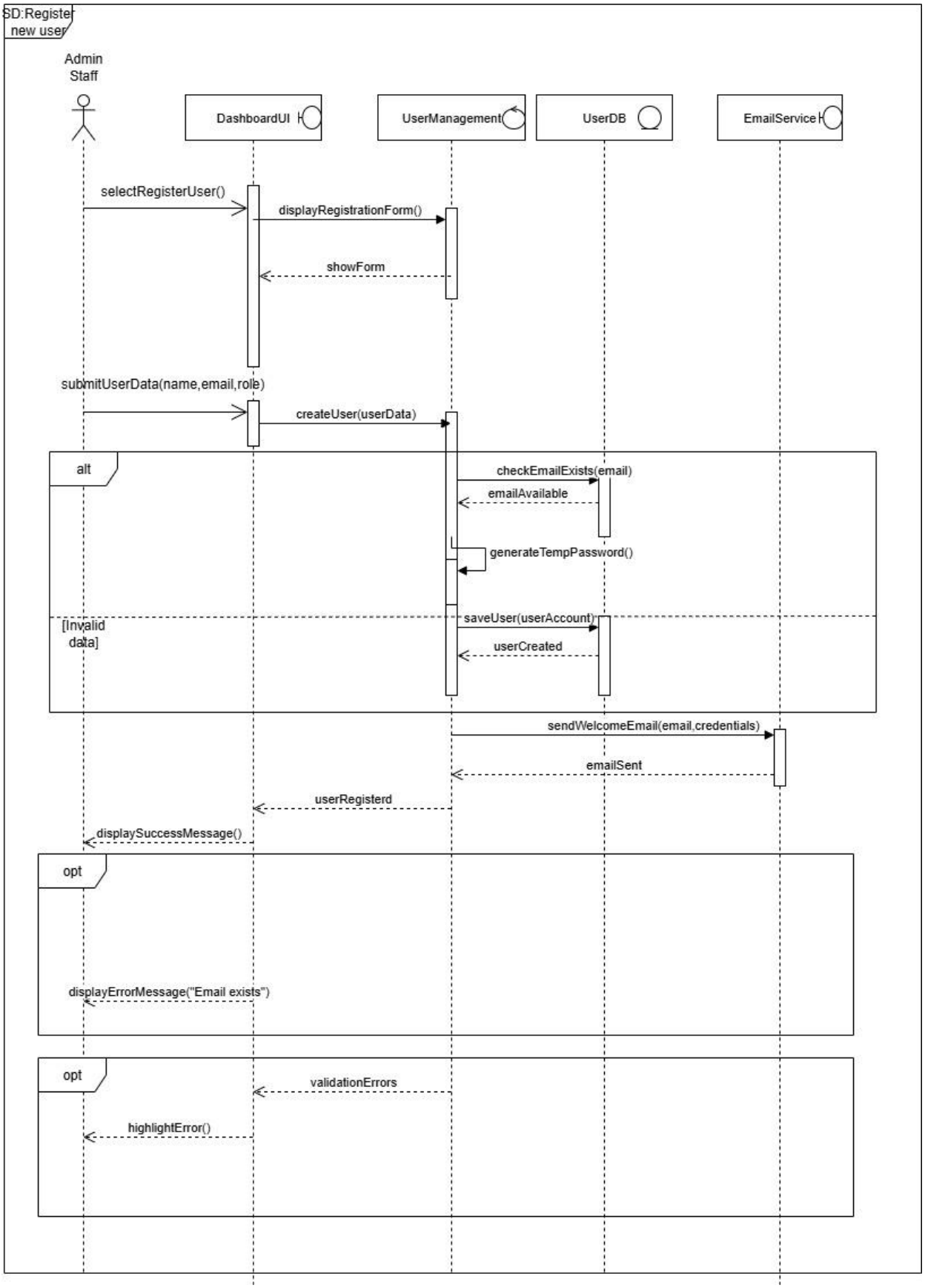
## Sequence Diagram

Group Members –


| Student ID | Student Name |
|---|---|
| IT24100300 | Dulakshika A.L.S.H |
| IT24100263 | Dilhani W. P. K. A |
| IT24100239 | Disanayaka D.M.C.N |
| IT24100283 | Devinda S. U. V |
| IT24100314 | Dahanayake L.K |
| IT24100237 | Bandara R. M. G. L |

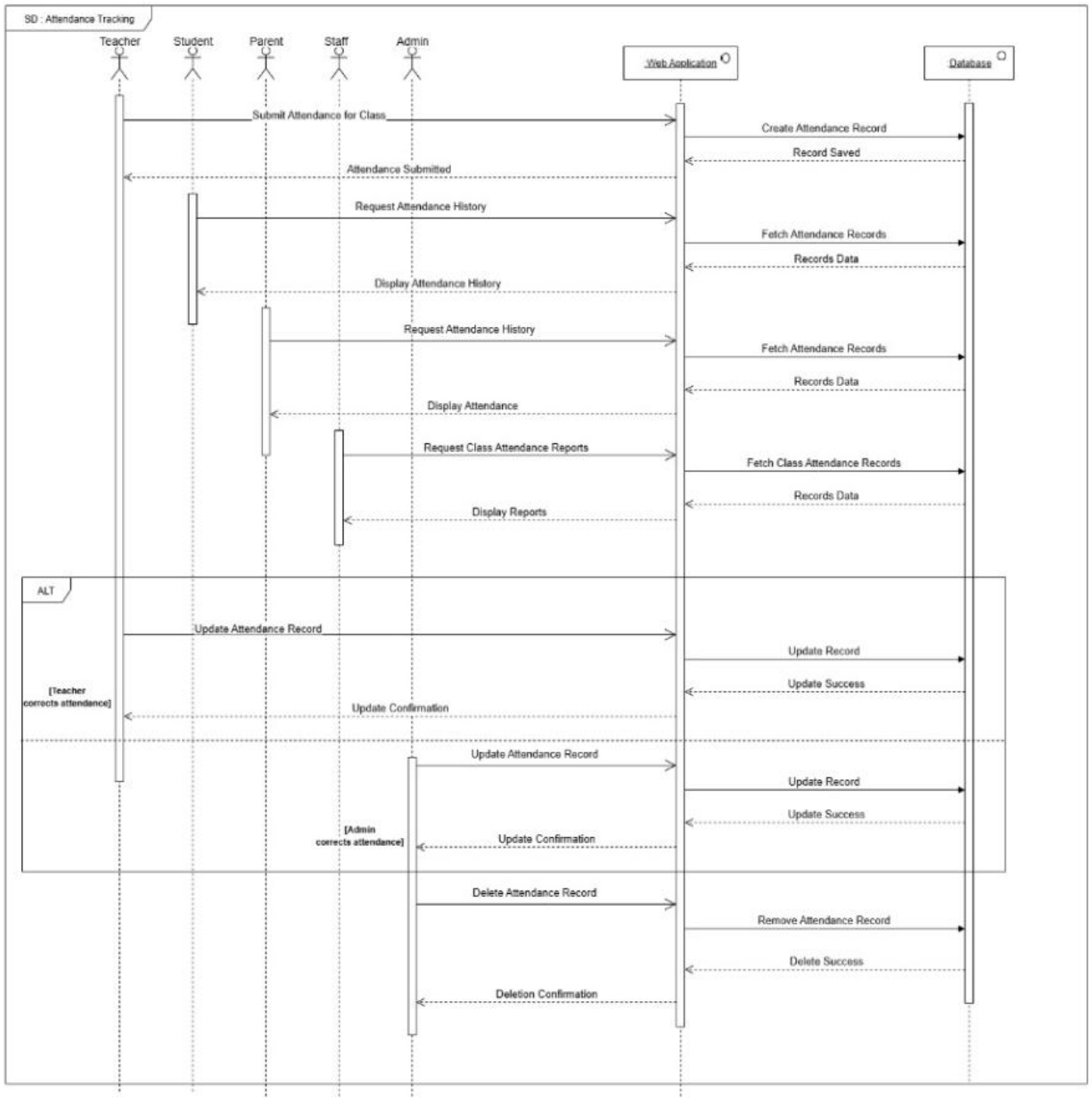
# **User Management** (IT24100300 - Dulakshika A.L.S.H)

| | | |
|---|---|---|
| Number | UC-101 | |
| Name | Register New User | |
| Summary | An Admin Staff member creates a new user account (Student, Teacher, Parent, etc.) in the system and assigns them a role. | |
| Priority | 5 | |
| Preconditions | 1. The Admin Staff is logged into the system.<br>2. The Admin Staff has the necessary permissions to create users. | |
| Postconditions | 1. A new user account is created in the system.<br>2. Login credentials are generated and sent to the user's email. | |
| Primary Actor(s) | Admin Staff | |
| Secondary Actor(s) | System (for sending email) | |
| Trigger | Admin Staff selects the "Register New User" option from the dashboard. | |
| Main Scenario | Step | Action |
| | 1 | Admin selects "Register New User". |
| | 2 | System displays a user registration form (Name, Email, Role, etc.). |
| | 3 | Admin fills in the user's details and selects a role (e.g., "Student"). |
| | 4 | Admin submits the form. |
| | 5 | System validates the data, creates the account, and generates a temporary password. |
| | 6 | System sends a welcome email with login instructions to the new user. |
| | 7 | System confirms successful registration to the Admin. |
| Extensions | Step | Branching Action |
| | 5a | The entered email already exists in the system. System notifies the Admin and asks them to use a different email. |
| | 5b | Form validation fails (e.g., missing required field). System highlights the errors and asks the Admin to correct them. |
| Open Issues | 1 | Should the system allow bulk upload of users via a CSV file? |


SD:Register new user
Admin Staff
DashboardUI
UserManagement
UserDB
EmailService
selectRegisterUser()
displayRegistrationForm()
showForm
submitUserData(name,email,role)
createUser(userData)
alt
checkEmailExists(email)
emailAvailable
generateTempPassword()
[Invalid data]
saveUser(userAccount)
userCreated
sendWelcomeEmail(email,credentials)
emailSent
userRegisterd
displaySuccessMessage()
opt
displayErrorMessage("Email exists")
opt
validationErrors
highlightError()

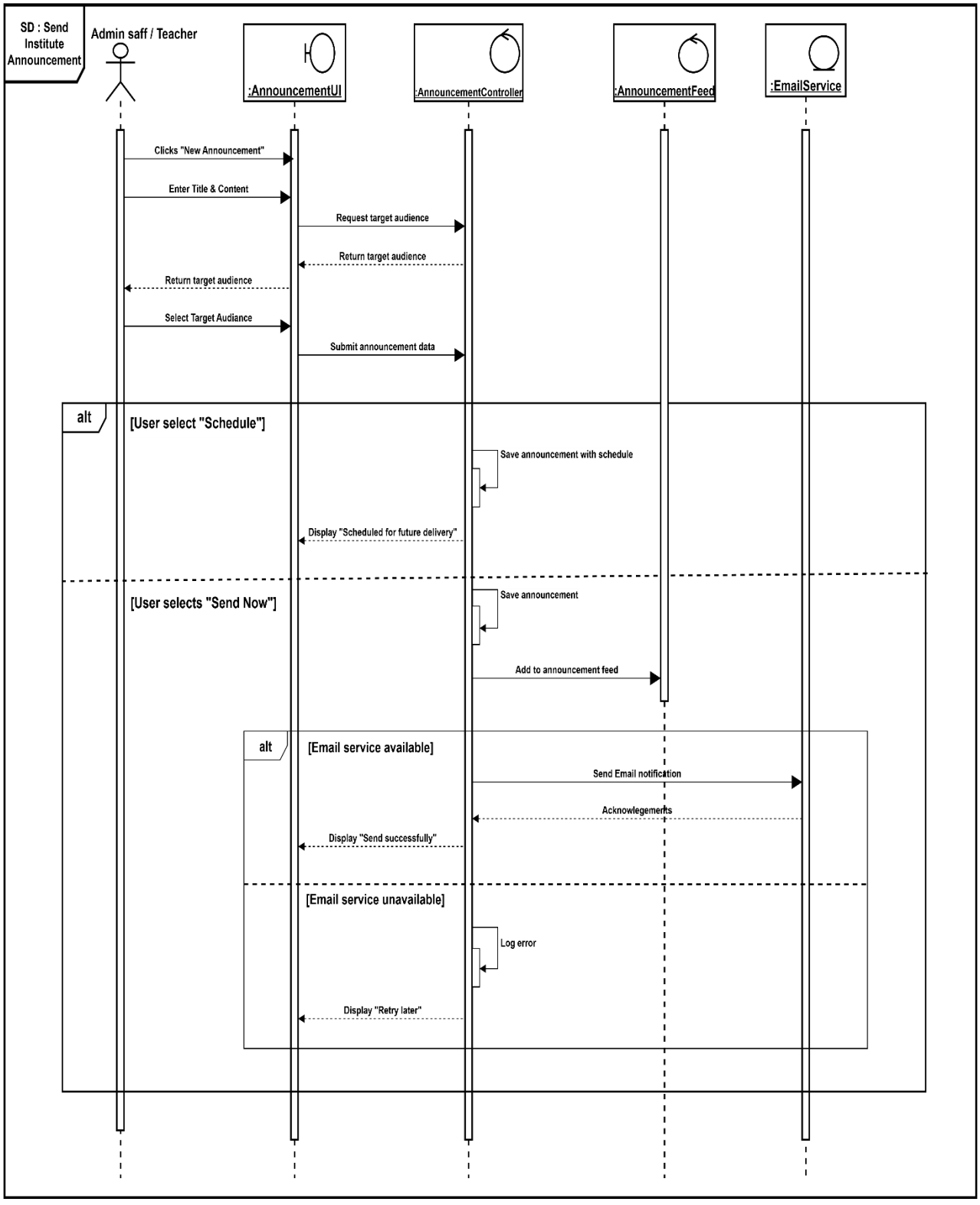
## **Attendance Tracking** (IT24100263 - Dilhani W. P. K. A )

| | | |
|---|---|---|
| Number | UC-301 | |
| Name | Mark Daily Attendance | |
| Summary | A Teacher records which students are Present, Absent, or Late for a specific class. | |
| Priority | 5 | |
| Preconditions | 1. Teacher is logged in.<br>2. The current time is within the scheduled time for one of the Teacher's classes. | |
| Postconditions | 1. Attendance records for the class are updated.<br>2. The system's attendance reports reflect the new data. | |
| Primary Actor(s) | Teacher | |
| Secondary Actor(s) | - | |
| Trigger | Teacher navigates to the "My Classes" section and selects a ongoing/upcoming class. | |
| Main Scenario | Step | Action |
| | 1 | Teacher selects the class for which to mark attendance. |
| | 2 | System displays a list of students enrolled in that class with radio buttons (Present/Absent/Late). |
| | 3 | Teacher marks the status for each student. |
| | 4 | Teacher submits the attendance. |
| | 5 | System saves the attendance records with a timestamp. |
| | 6 | System confirms successful submission. |
| Extensions | Step | Branching Action |
| | 5a | Teacher tries to mark attendance outside the class time. System displays a warning but may allow it with an "override" reason. |
| | 5b | The system fails to save (e.g., network error). System alerts the Teacher to try again. |
| Open Issues | 1 | Should the system allow marking attendance for a past date? |


SD : Attendance Tracking
Teacher
Student
Parent
Staff
Admin
Web Application
Database
Submit Attendance for Class
Create Attendance Record
Record Saved
Attendance Submitted
Request Attendance History
Fetch Attendance Records
Records Data
Display Attendance History
Request Attendance History
Fetch Attendance Records
Records Data
Display Attendance
Request Class Attendance Reports
Fetch Class Attendance Records
Records Data
Display Reports
ALT
Update Attendance Record
Update Record
Update Success
[Teacher corrects attendance]
Update Confirmation
Update Attendance Record
Update Record
Update Success
[Admin corrects attendance]
Update Confirmation
Delete Attendance Record
Remove Attendance Record
Delete Success
Deletion Confirmation

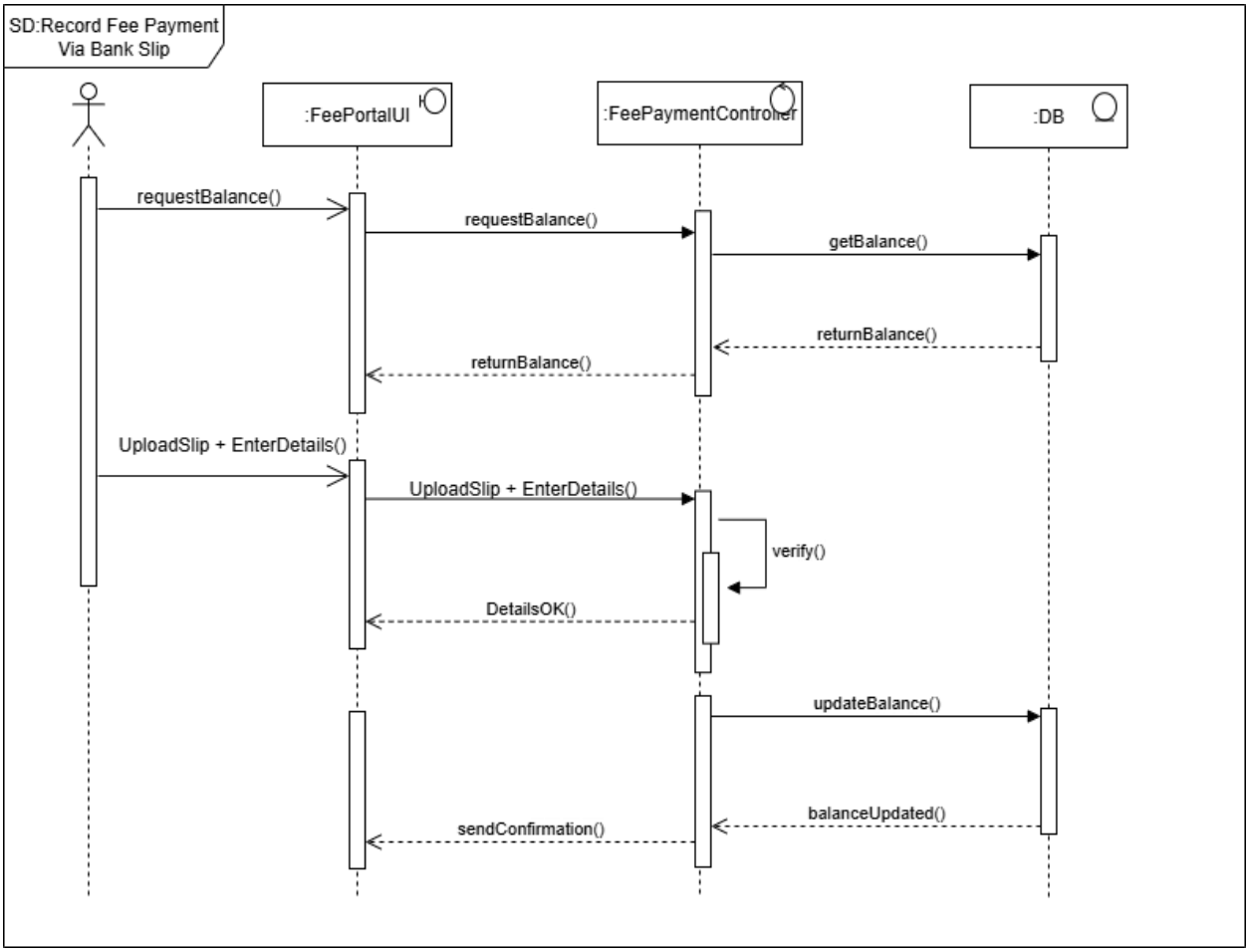
## **Communication and Notifications** (IT24100239 - Disanayaka D.M.C.N)

| | | |
|---|---|---|
| Number | UC-601 | |
| Name | Send Institute Announcement | |
| Summary | Admin Staff or Teacher creates and sends an announcement to a selected group of users (e.g., all parents, Grade 10 students). | |
| Priority | 3 | |
| Preconditions | 1. Admin Staff/Teacher is logged in.<br>2. The actor has permission to send announcements. | |
| Postconditions | 1. The announcement is saved in the system.<br>2. Targeted users receive a notification (in-app and/or email). | |
| Primary Actor(s) | Admin Staff, Teacher | |
| Secondary Actor(s) | System (for sending email) | |
| Trigger | User clicks the "New Announcement" button. | |
| Main Scenario | Step | Action |
| | 1 | User writes the announcement title and content. |
| | 2 | User selects the target audience (e.g., "All Users", "Grade 5 Parents"). |
| | 3 | User clicks "Send". |
| | 4 | System saves the announcement and places it in the announcement feed for the target users. |
| | 5 | System triggers emails to the target users. |
| | 6 | System confirms the announcement was sent successfully. |
| Extensions | Step | Branching Action |
| | 4a | User chooses "Schedule" instead of "Send". System saves the announcement to be sent at a specified future date and time. |
| | 5a | The email service is temporarily unavailable. System logs the error and retries later. |
| Open Issues | 1 | Should there be a character limit for announcements sent via SMS? |


SD : Send Institute Announcement
Admin saff / Teacher
:AnnouncementUI
:AnnouncementController
:AnnouncementFeed
:EmailService
Clicks "New Announcement"
Enter Title & Content
Request target audience
Return target audience
Return target audience
Select Target Audiance
Submit announcement data
alt
[User select "Schedule"]
Save announcement with schedule
Display "Scheduled for future delivery"
[User selects "Send Now"]
Save announcement
Add to announcement feed
alt
[Email service available]
Send Email notification
Acknowlegements
Display "Send successfully"
[Email service unavailable]
Log error
Display "Retry later"

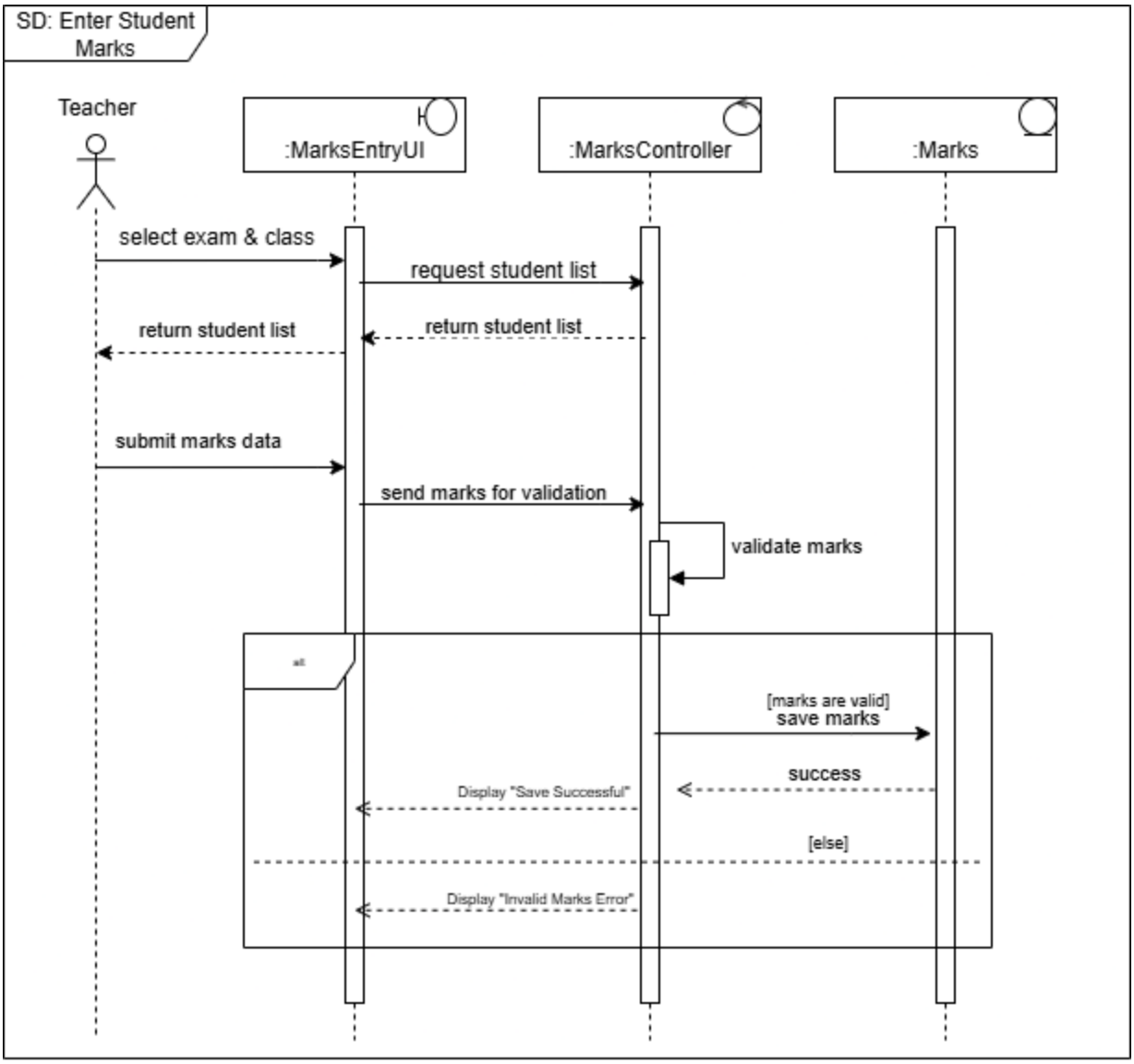
## **Fee management** (IT24100283 - Devinda S. U. V)

| | | |
|---|---|---|
| Number | UC-501 | |
| Name | Record Fee Payment via Bank Slip | |
| Summary | A Parent makes a fee payment via a bank deposit, uploads the payment slip as proof, and an Admin Staff verifies the slip to update the official fee record. | |
| Priority | 4 | |
| Preconditions | 1. Parent is logged into the system.<br>2. The parent's account is linked to a student.<br>3. The student has outstanding fees.<br>4. Admin Staff is logged in (for verification step). | |
| Postconditions | 1. A payment slip is submitted and awaits verification.<br>2. Upon verification-The student's fee balance is updated and a receipt is generated. | |
| Primary Actor(s) | Parent, Admin staff | |
| Secondary Actor(s) | - | |
| Trigger | Parent navigates to the "Fee Statement" section from their dashboard. | |
| Main Scenario | Step | Action |
| | 1 | Parent views the outstanding fee balance. |
| | 2 | Makes a cash or transfer deposit to the institute's designated bank account. |
| | 3 | Returns to the "Fee Statement" page and clicks "Submit Payment Proof". |
| | 4 | Displays a form to upload a scanned image/photo of the bank slip and enter payment details (Amount, Date, Bank Name, Reference No.). |
| | 5 | Uploads the slip image, enters the details, and submits the form. |
| | 6 | If details match: Marks the payment as "Verified". |
| | 7 | Sends an automated confirmation email with the receipt to the Parent. |
| Extensions | Step | Branching Action |
| | 5a | Parent uploads an invalid file type. System validates and rejects the upload, requesting a valid image (JPG, PNG, PDF). |
| | 5b | Entered amount is less than the outstanding balance. System shows a warning but allows the submission to proceed (e.g., for partial payments). |
| Open Issues | 1 | How will partial payments be handled? Will the system allow it and how will it reflect on the balance? |


SD:Record Fee Payment
Via Bank Slip
:FeePortalUI
:FeePaymentController
:DB
requestBalance()
requestBalance()
getBalance()
returnBalance()
returnBalance()
UploadSlip + EnterDetails()
UploadSlip + EnterDetails()
verify()
DetailsOK()
updateBalance()
balanceUpdated()
sendConfirmation()

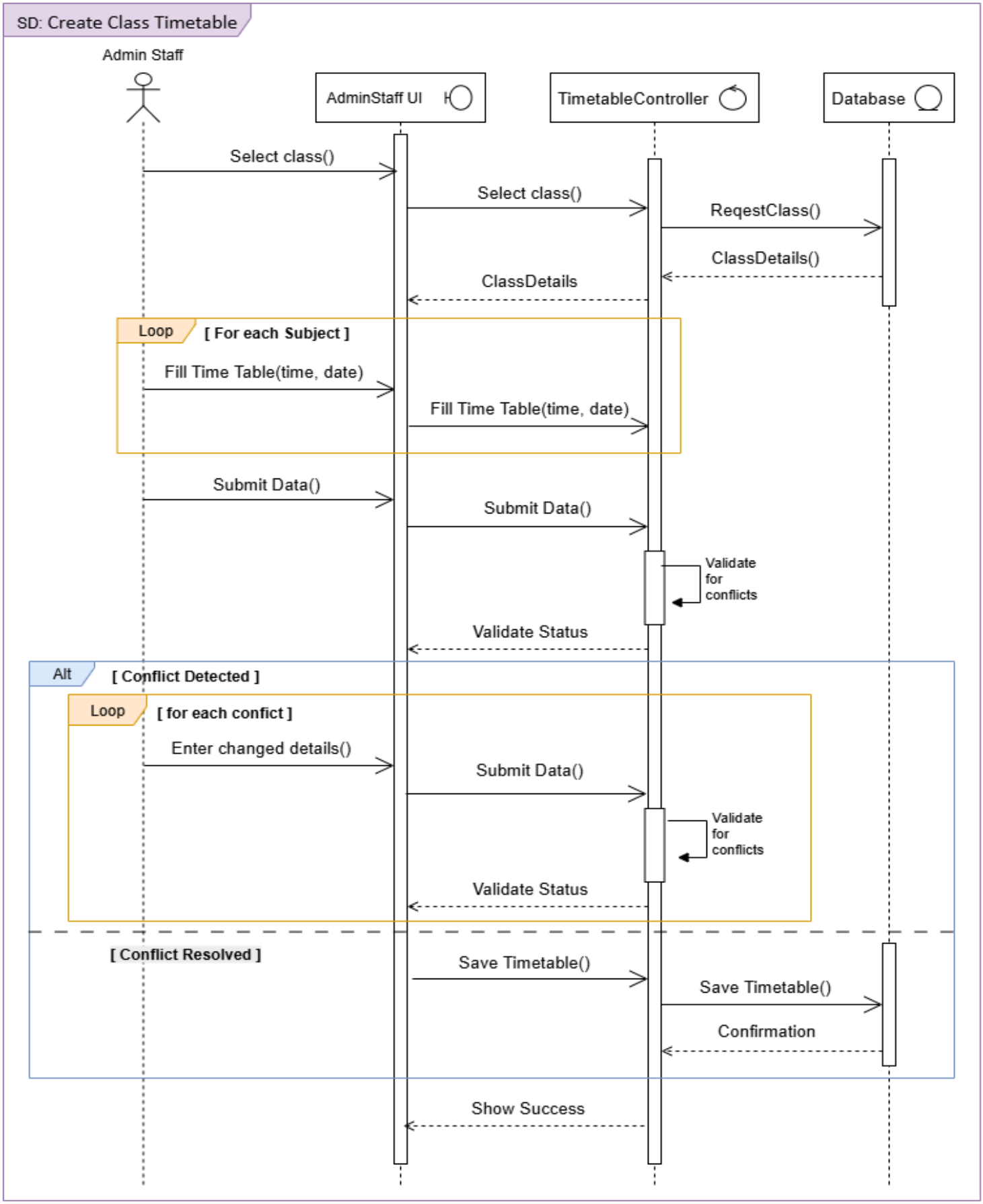
## **Exams & Marks management** (IT24100314 - Dahanayake L.K)

| | | |
|---|---|---|
| Number | UC-401 | |
| Name | Enter Student Marks | |
| Summary | A Teacher enters the marks students achieved for a specific exam or assignment. | |
| Priority | 4 | |
| Preconditions | 1. Teacher is logged in.<br>2. The exam/assignment has been created in the system.<br>3. The Teacher is assigned to that subject. | |
| Postconditions | 1. Marks are saved to the students' records.<br>2. Once published, students/parents can view the marks. | |
| Primary Actor(s) | Teacher | |
| Secondary Actor(s) | - | |
| Trigger | Teacher selects an exam from their list of "My Subjects" and chooses "Enter Marks". | |
| Main Scenario | Step | Action |
| | 1 | Teacher selects the exam and class. |
| | 2 | System displays a list of students with a text field for marks next to each name. |
| | 3 | Teacher enters the marks for each student. |
| | 4 | Teacher submits the marks. |
| | 5 | System validates the marks (e.g., ensures they are within the allowed range). |
| | 6 | System saves the marks with a status of "Draft" or "Published". |
| | 7 | System confirms successful submission. |
| Extensions | Step | Branching Action |
| | 5a | A mark is entered above the maximum possible score. System highlights the error and prevents submission. |
| | 6a | Teacher saves as "Draft". Marks are saved but not visible to students. |
| Open Issues | 1 | Should the system calculate and display the class average automatically upon entry? |


SD: Enter Student Marks
Teacher
:MarksEntryUI
:MarksController
:Marks
select exam & class
request student list
return student list
return student list
submit marks data
send marks for validation
validate marks
alt
[marks are valid]
save marks
success
Display "Save Successful"
[else]
Display "Invalid Marks Error"

## **Create Class Timetable** (IT24100237 - Bandara R.M.G.L)

| | | |
|---|---|---|
| Number | UC-201 | |
| Name | Create Class Timetable | |
| Summary | Admin Staff creates a new class schedule, assigning subjects, teachers, times, and classrooms. | |
| Priority | 4 | |
| Preconditions | 1. Admin Staff is logged in.<br>2. Subjects, Teachers, and Classrooms are already set up in the system. | |
| Postconditions | 1. A new timetable is saved and published.<br>2. Affected users (Teachers, Students) can see the new schedule. | |
| Primary Actor(s) | Admin Staff | |
| Secondary Actor(s) | - | |
| Trigger | Admin selects "Create New Timetable" from the management menu. | |
| Main Scenario | Step | Action |
| | 1 | Admin selects a class/grade to create a timetable for. |
| | 2 | System displays a weekly grid (Days vs. Periods). |
| | 3 | For each period, Admin selects a Subject and a Teacher from dropdown lists. |
| | 4 | Admin submits the completed timetable. |
| | 5 | System validates for conflicts (e.g., teacher double-booked). |
| | 6 | System saves the timetable and marks it as "Published". |
| | 7 | System confirms successful creation to the Admin. |
| Extensions | Step | Branching Action |
| | 5a | A scheduling conflict is detected. System displays the conflict and prevents saving until it is resolved. |
| | 5b | Admin chooses to "Save Draft" instead of publishing. System saves the timetable in an unpublished state. |
| Open Issues | 1 | How should the system handle timetable changes after it's published? (e.g., notify users of the change). |


SD: Create Class Timetable
Admin Staff
AdminStaff UI
TimetableController
Database
Select class()
Select class()
ReqestClass()
ClassDetails()
ClassDetails
Loop
[ For each Subject ]
Fill Time Table(time, date)
Fill Time Table(time, date)
Submit Data()
Submit Data()
Validate for conflicts
Validate Status
Alt
[ Conflict Detected ]
Loop
[ for each confict ]
Enter changed details()
Submit Data()
Validate for conflicts
Validate Status
[ Conflict Resolved ]
Save Timetable()
Save Timetable()
Confirmation
Show Success