SDD: Internship Application System

1. Introduction

The Internship Application System connects students with internship opportunities posted by company HR representatives. It helps students find and apply for internships while enabling HR professionals to manage postings and review applications.

2. System Overview

The system consists of these main modules:

- User Management (Authentication/Profiles).
- Company/HR Management.
- Internship Postings.
- Application Processing.
- Notification System.

3. Module Details

3.1 User Management

- **Main Job**: Handles all user authentication and profile management.
- **Data**: User credentials, roles (Student/HR/Admin), and profile information.
- **Components**: User, Role, Student, Hr, and Admin entities.

3.2 Company/HR Management

- **Main Job**: Manages company information and HR user accounts.
- **Data**: Company details, HR profiles and their company associations.
- **Components**: Company and Hr entities with related services.

3.3 Internship Postings

- **Main Job**: Creates and manages internship opportunities.
- **Data**: Internship details (title, description, requirements, status).
- **Components**: Internship entity with status tracking.

3.4 Application Processing

- **Main Job**: Handles student applications and status updates.
- **Data**: Application records, status changes, timestamps.
- **Components**: Application entity with status lifecycle.

3.5 Notification System

- **Main Job**: Alerts students about application updates.
- **Data**: Notification messages and read status.
- **Components**: Notification entity with read tracking.

4. Component Interactions

- HR users create internships → Students view and apply → System creates application record.
- When HR updates application status → Notification system alerts student.
- Admin can manage all entities through admin interfaces.
- Authentication system validates users before any actions.

5. User Interface Description

Key Screens:

Student Interface:

- Dashboard: Shows active internships.
- Internship View: Detailed posting with apply button.
- Notifications: Updates about application changes.

HR Interface:

- Internship Management: Create/edit postings.
- Applications Dashboard: View and filter submissions.
- Application Review: Detailed view with status update options.

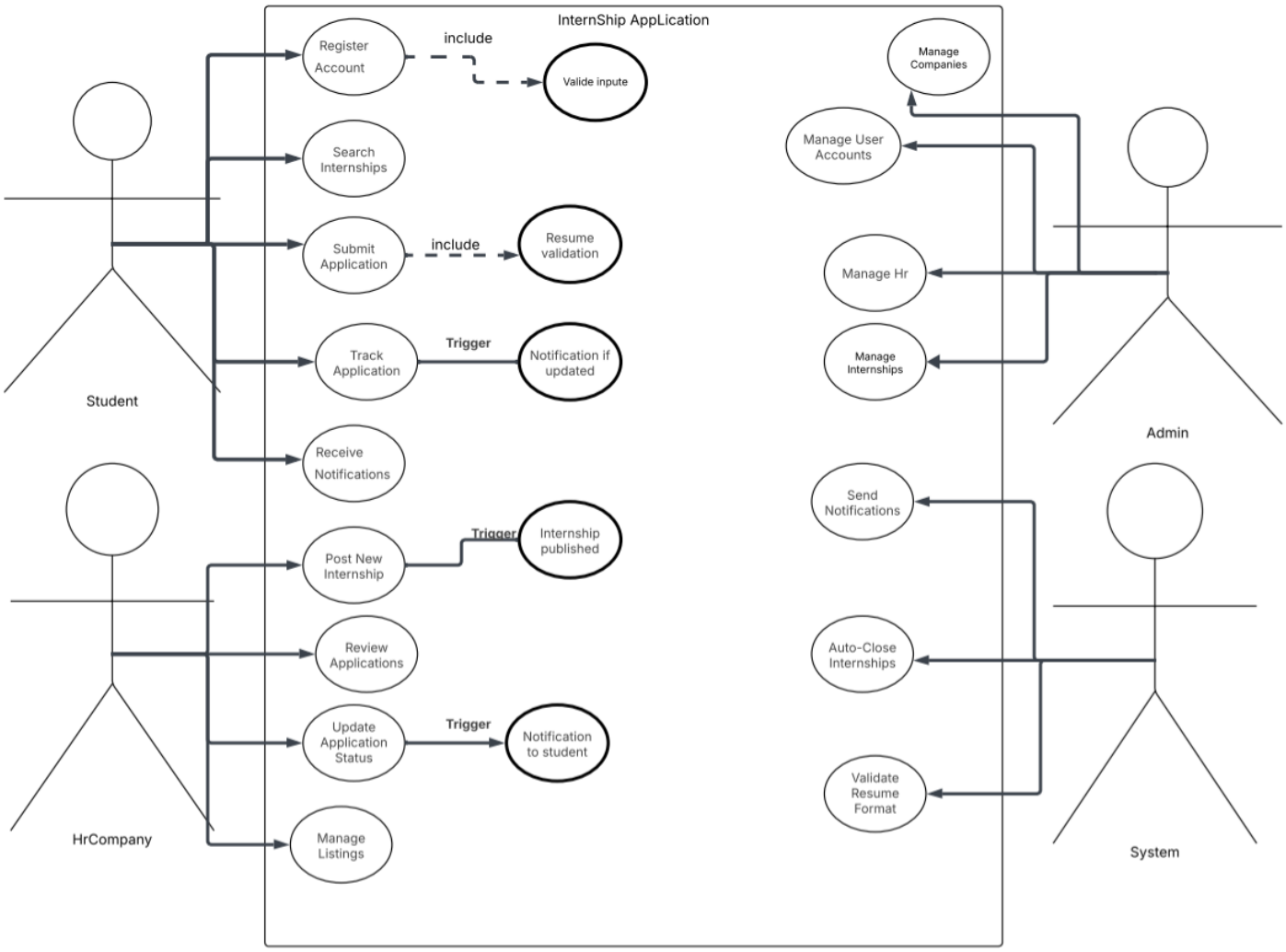
Admin Interface:

- User Management: CRUD operations for all users.
- System Monitoring: Analytics and reporting.

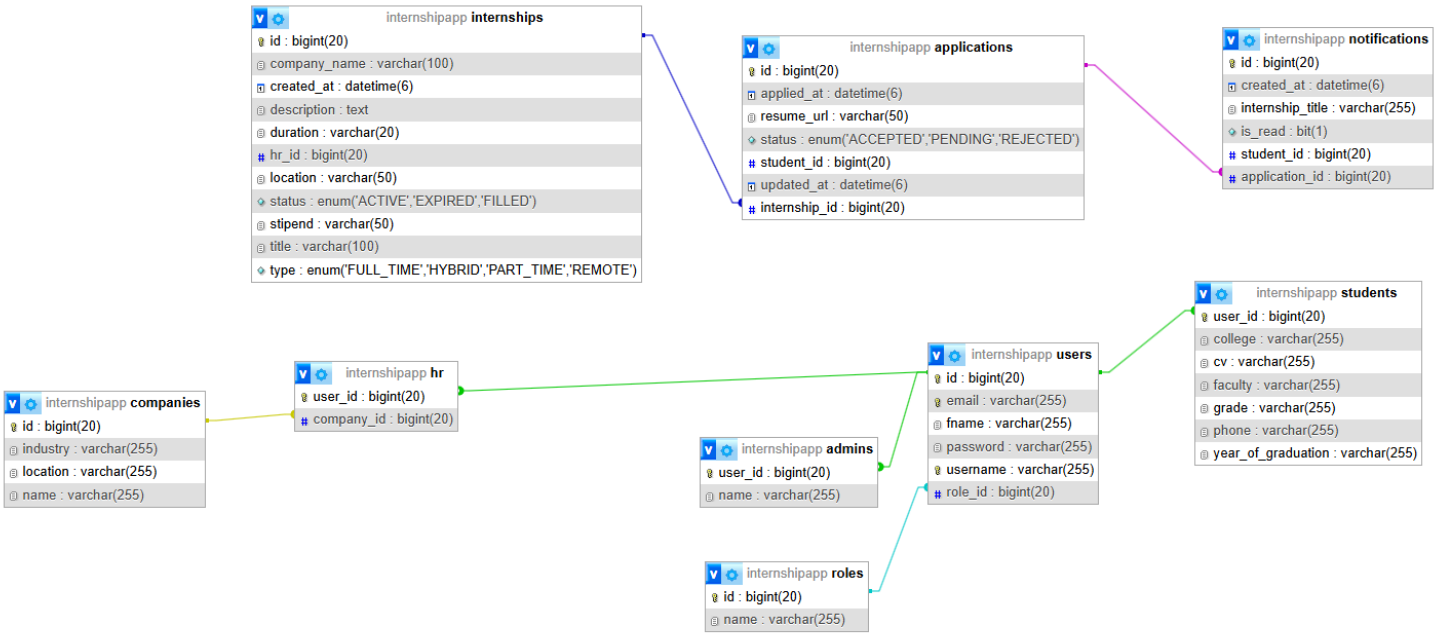
Common Screens:

- Login/Registration: Standard auth flow with role-based redirect.
- Profile Management: Edit personal and account information.

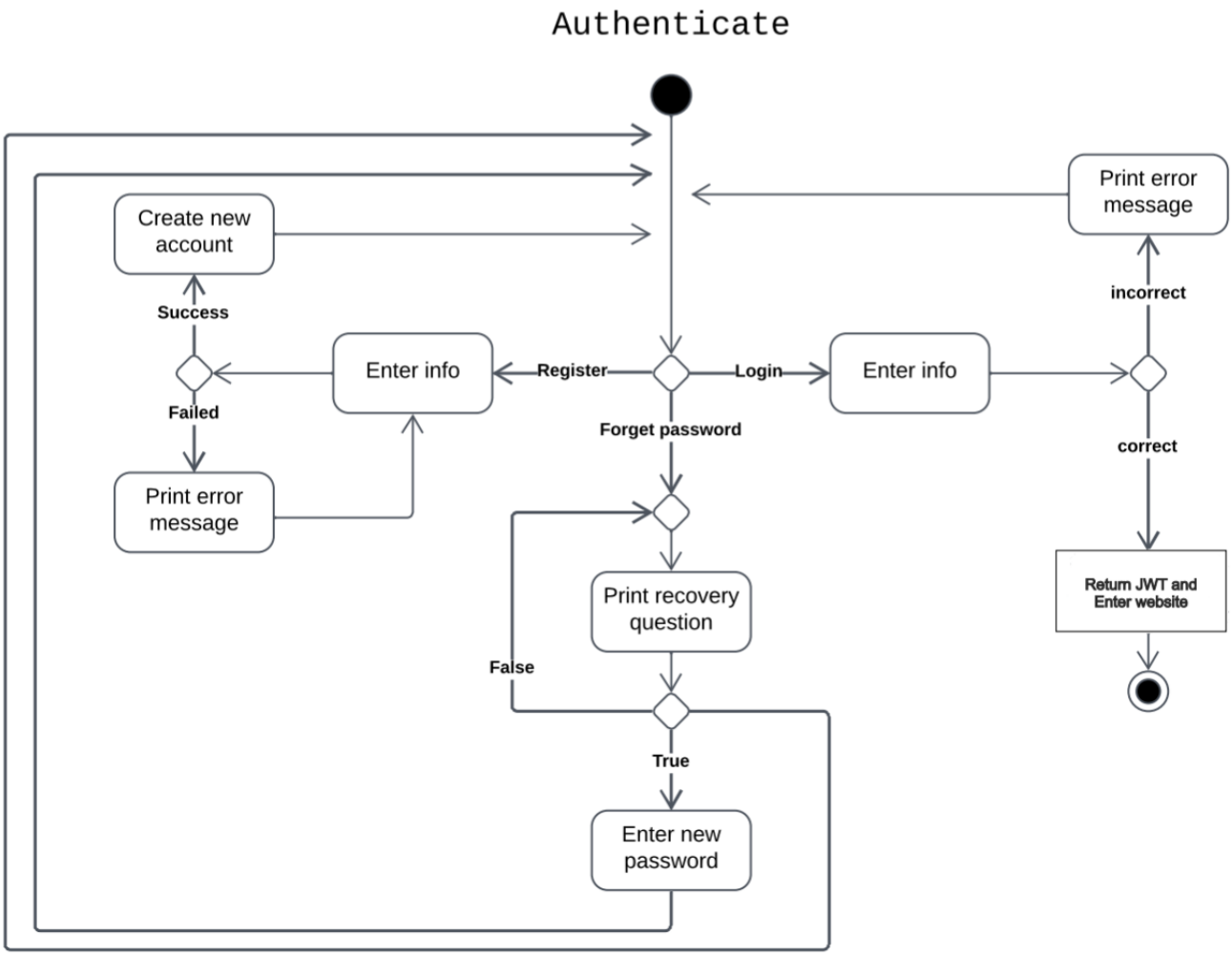
Use Case Diagram

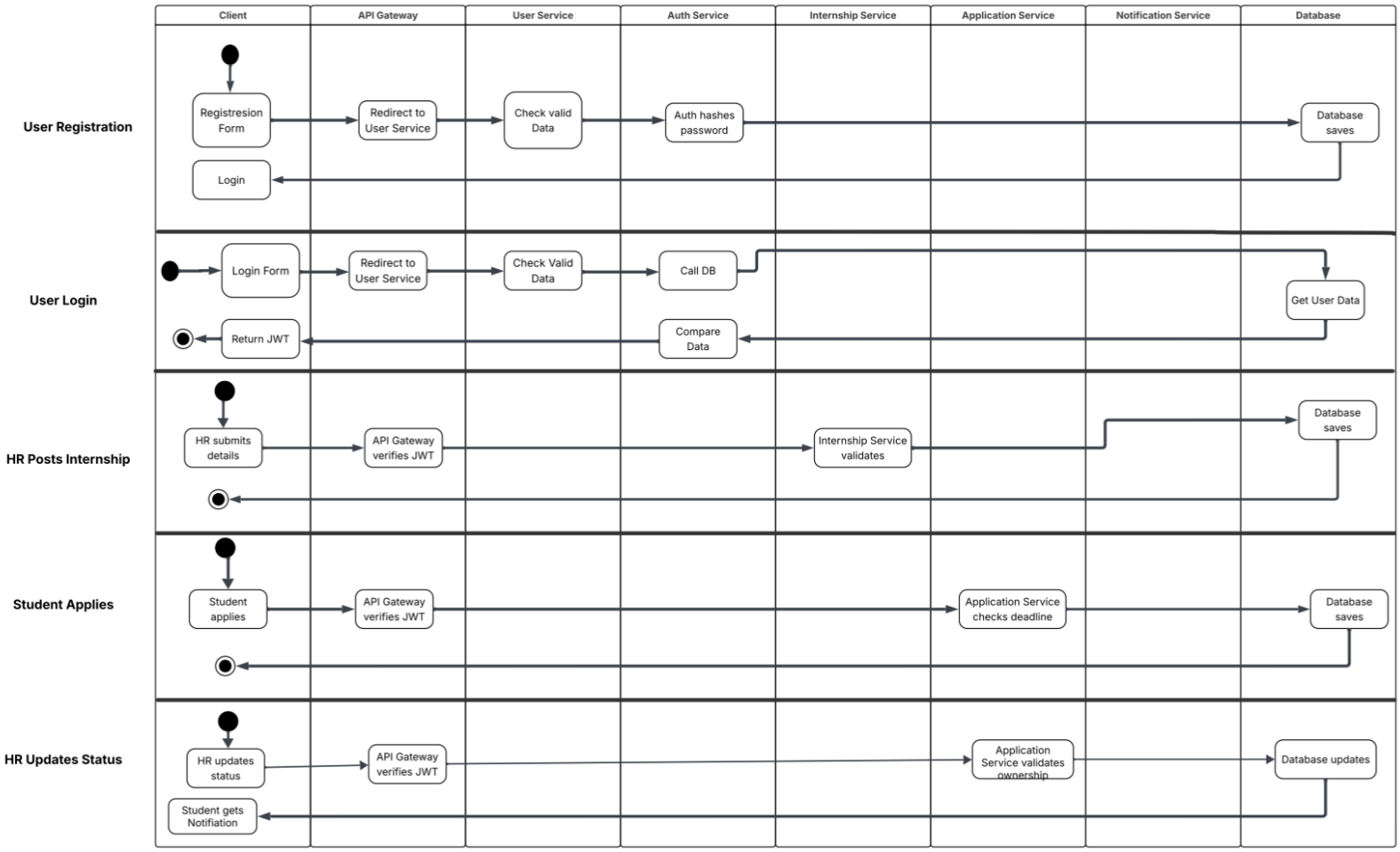


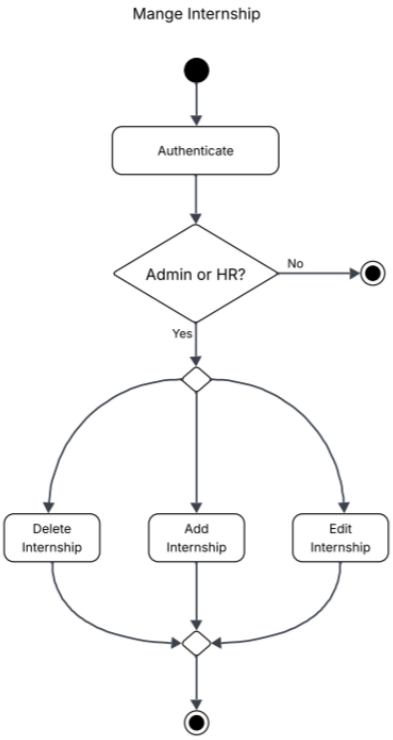
ERD

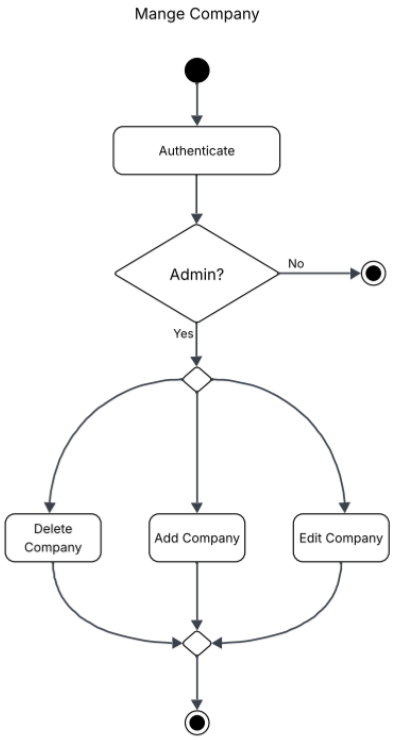

internshipapp internships
id : bigint(20)
company_name : varchar(100)
created_at : datetime(6)
description : text
duration : varchar(20)
hr_id : bigint(20)
location : varchar(50)
status : enum('ACTIVE','EXPIRED','FILLED')
stipend : varchar(50)
title : varchar(100)
type : enum('FULL_TIME','HYBRID','PART_TIME','REMOTE')
internshipapp applications
id : bigint(20)
applied_at : datetime(6)
resume_url : varchar(50)
status : enum('ACCEPTED','PENDING','REJECTED')
student_id : bigint(20)
updated_at : datetime(6)
internship_id : bigint(20)
internshipapp notifications
id : bigint(20)
created_at : datetime(6)
internship_title : varchar(255)
is_read : bit(1)
student_id : bigint(20)
application_id : bigint(20)
internshipapp companies
id : bigint(20)
industry : varchar(255)
location : varchar(255)
name : varchar(255)
internshipapp hr
user_id : bigint(20)
company_id : bigint(20)
internshipapp users
id : bigint(20)
email : varchar(255)
fname : varchar(255)
password : varchar(255)
username : varchar(255)
role_id : bigint(20)
internshipapp students
user_id : bigint(20)
college : varchar(255)
cv : varchar(255)
faculty : varchar(255)
grade : varchar(255)
phone : varchar(255)
year_of_graduation : varchar(255)
internshipapp admins
user_id : bigint(20)
name : varchar(255)
internshipapp roles
id : bigint(20)
name : varchar(255)

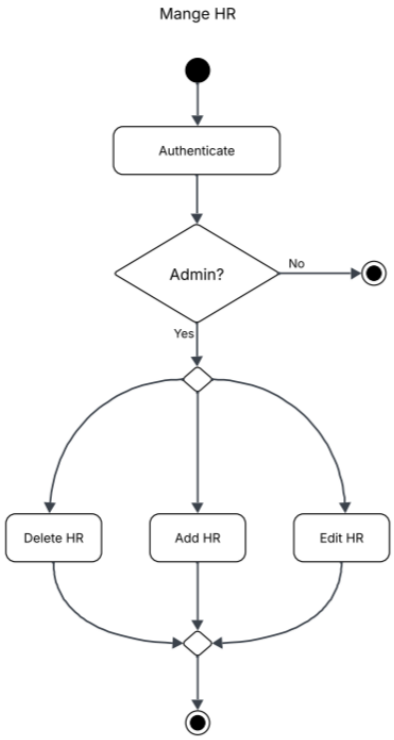
Activity Diagram




Client
API Gateway
User Service
Auth Service
Internship Service
Application Service
Notification Service
Database
User Registration
Registresion Form
Redirect to User Service
Check valid Data
Auth hashes password
Database saves
Login
User Login
Login Form
Redirect to User Service
Check Valid Data
Call DB
Get User Data
Return JWT
Compare Data
HR Posts Internship
HR submits details
API Gateway verifies JWT
Internship Service validates
Database saves
Student Applies
Student applies
API Gateway verifies JWT
Application Service checks deadline
Database saves
HR Updates Status
HR updates status
API Gateway verifies JWT
Application Service validates ownership
Database updates
Student gets Notifiation

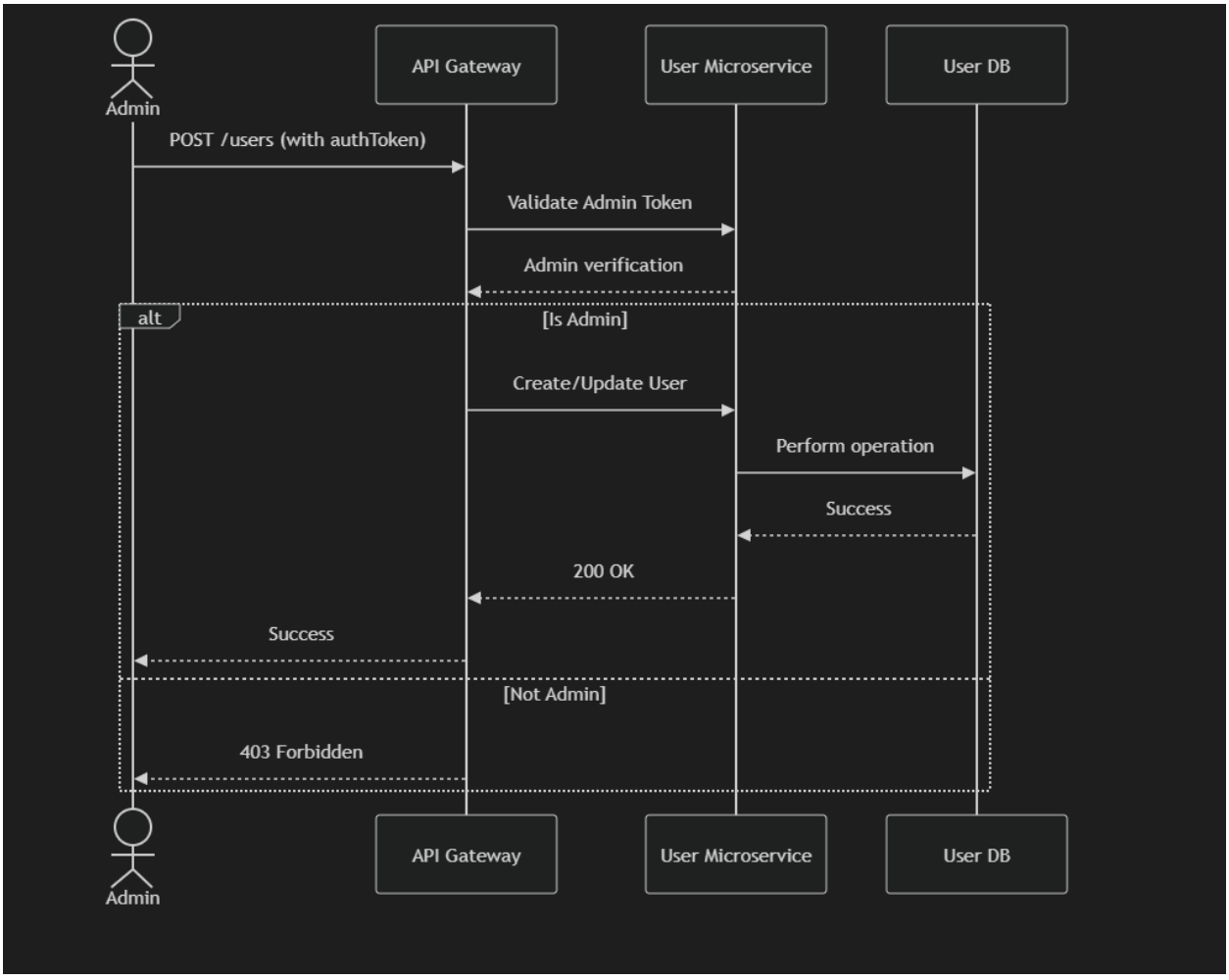

Mange Internship
Authenticate
Admin or HR?
No
Yes
Delete Internship
Add Internship
Edit Internship


Mange Company
Authenticate
Admin?
No
Yes
Delete Company
Add Company
Edit Company

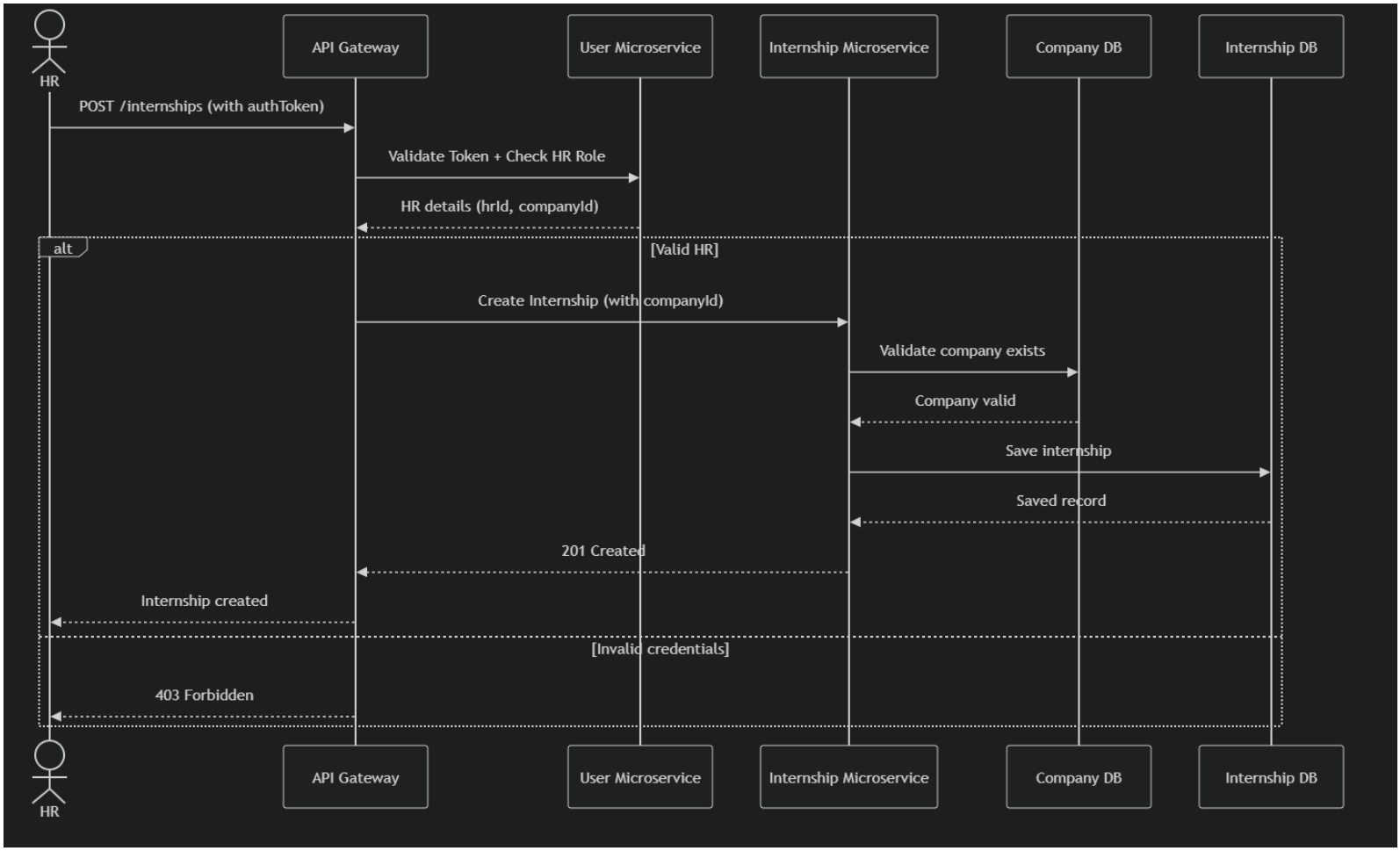

Mange HR
Authenticate
Admin?
No
Yes
Delete HR
Add HR
Edit HR

Sequence Diagram

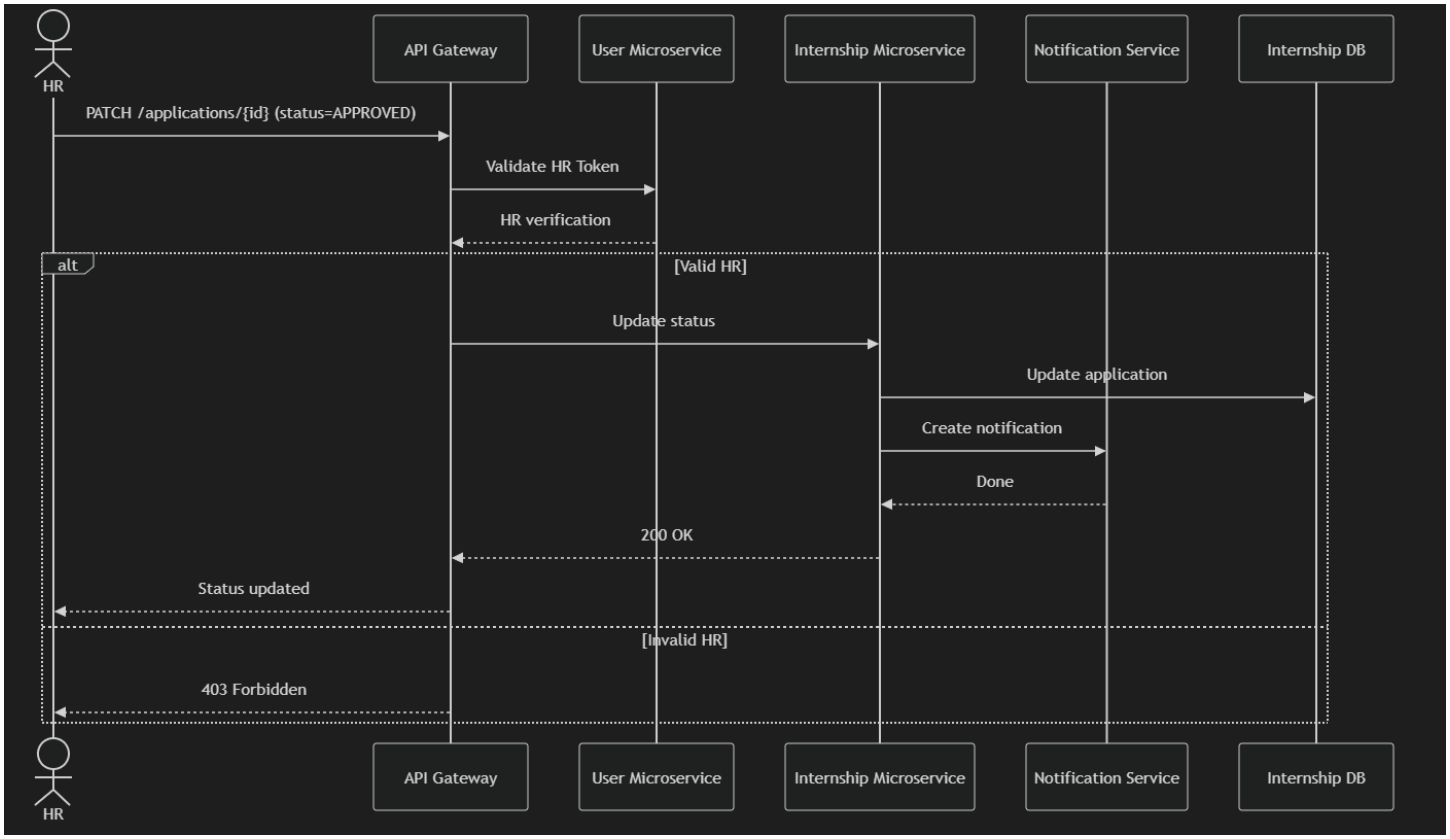
1- Admin Manage Users



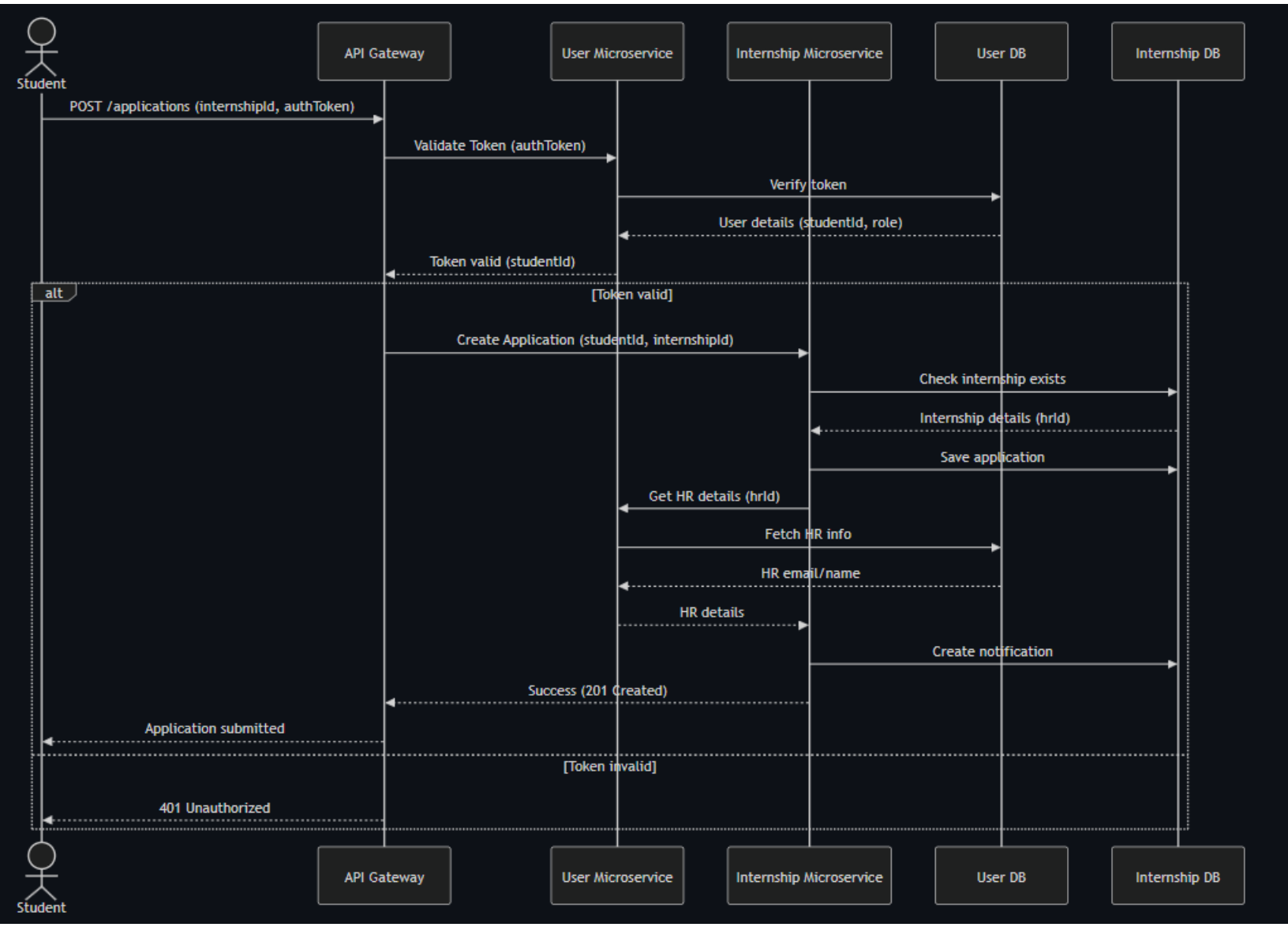
2- HR Creates an internship



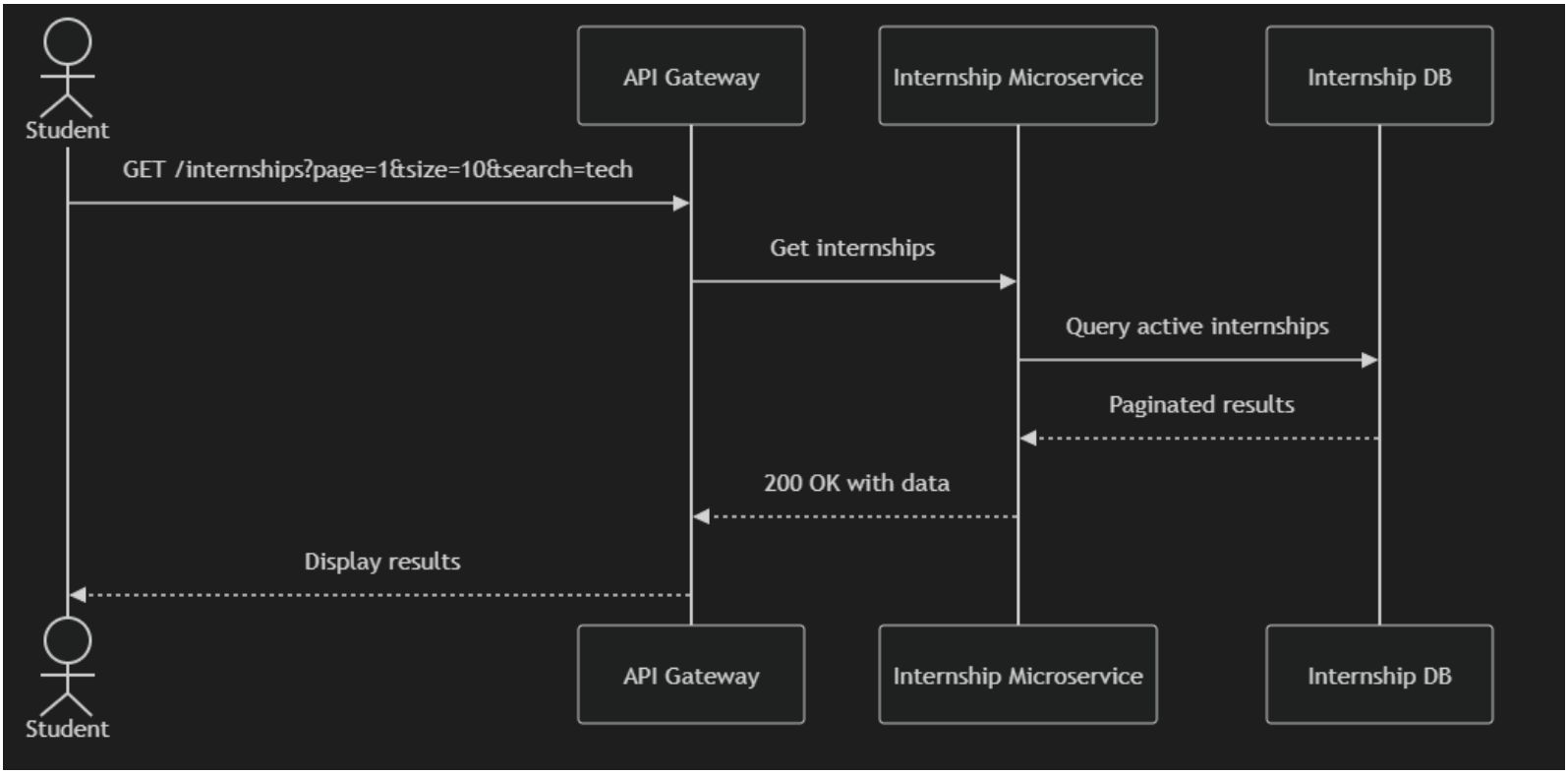
3- HR Reviews Applications (Status Update)



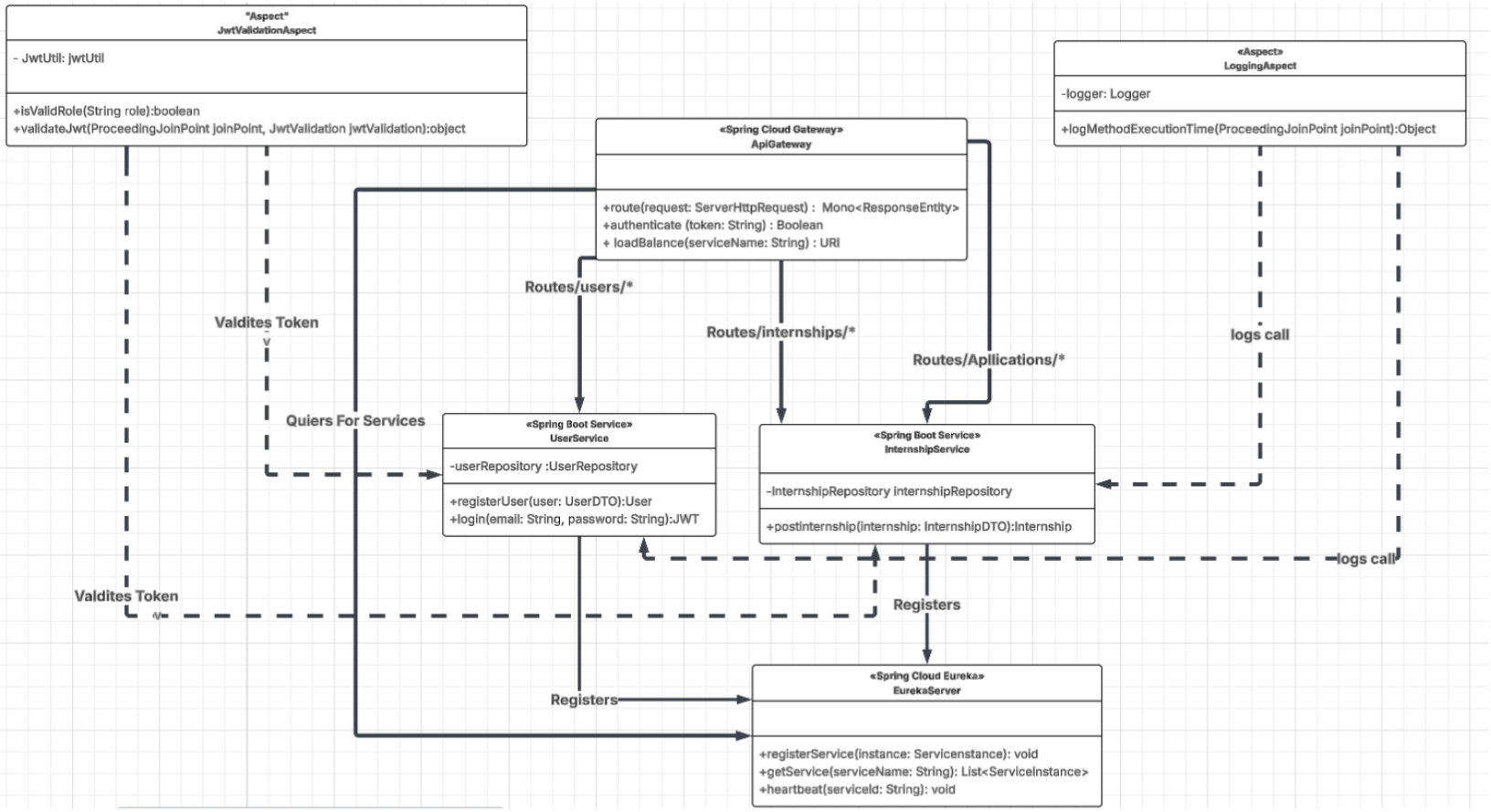
4- Student applies for an internship

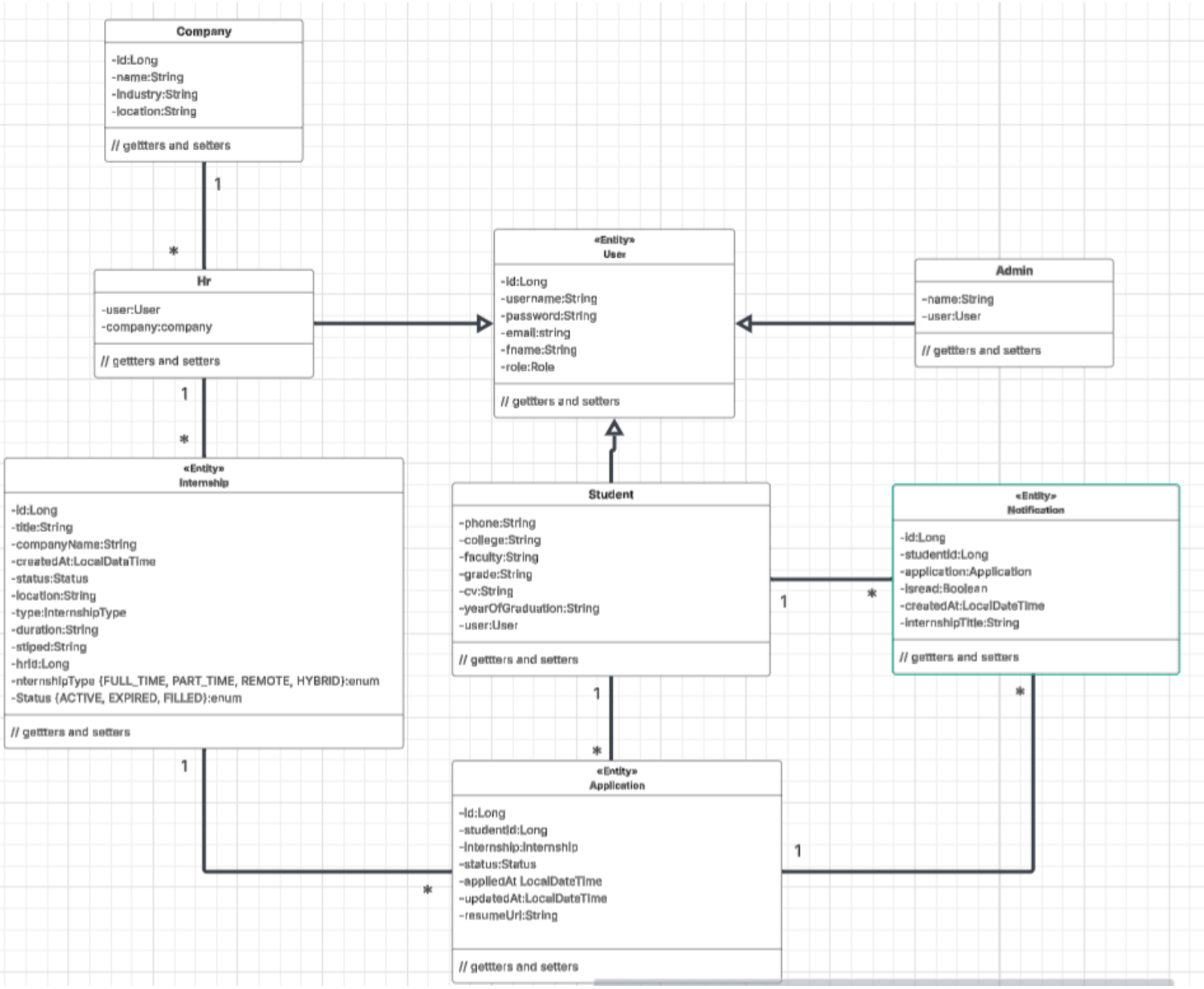


5- Student Views Internships (Paginated Search)



Class Diagram




Company
-Id:Long
-name:String
-Industry:String
-location:String
// gettters and setters
1
*
Hr
-user:User
-company:company
// gettters and setters
1
*
«Entity»
Internship
-Id:Long
-title:String
-companyName:String
-createdAt:LocalDateTime
-status:Status
-location:String
-type:InternshipType
-duration:String
-stiped:String
-hrId:Long
-nternshipType {FULL_TIME, PART_TIME, REMOTE, HYBRID}:enum
-Status {ACTIVE, EXPIRED, FILLED}:enum
// gettters and setters
1
«Entity»
User
-Id:Long
-username:String
-password:String
-email:string
-fname:String
-role:Role
// gettters and setters
Admin
-name:String
-user:User
// gettters and setters
Student
-phone:String
-college:String
-faculty:String
-grade:String
-cv:String
-yearOfGraduation:String
-user:User
// gettters and setters
1
*
«Entity»
Notification
-id:Long
-studentId:Long
-application:Application
-isread:Boolean
-createdAt:LocalDateTime
-internshipTitle:String
// gettters and setters
*
1
*
«Entity»
Application
-Id:Long
-studentId:Long
-Internship:Internship
-status:Status
-appliedAt LocalDateTime
-updatedAt:LocalDateTime
-resumeUrl:String
// gettters and setters
1
*

OCL

USER

context User

inv usernameUnique: User.allInstances()->isUnique(username)

inv emailUnique: User.allInstances()->isUnique(email)

inv: self.oclIsKindOf(Student) or self.oclIsKindOf(HR) or self.oclIsKindOf(Admin)

STUDENT

Context Student

inv: self.applications->forAll(a | a.student = self)

inv: self.notifications->forAll(n | n.recipient = self)

inv YearOfGraduationNotEmpty: not self.yearOfGraduation.oclIsUndefined() and self.yearOfGraduation <> ''

context Student::updateStudent()

pre: self.user.role.name = 'STUDENT'

context Student::applyToInternship(internship: Internship): Application

pre: not self.applications->exists(a | a.internship = internship)

pre: internship.status = Status::ACTIVE

post: result.oclIsNew()

post: self.user.applications->exists(a | a.internship = internship and a.studentId = self.user.id

post: result.status = 'Pending'

HR

context HR

inv: self.internships->forAll(i | i.postedBy = self)

inv: self.company <> null

context HR::postInternship(title: String, description: String, deadline: Date): Internship

pre: self.company <> null

post: result.oclIsNew()

post: internship.status = Status::ACTIVE

post: result.postedBy = self

post: result.company = self.company

context HR::updateApplicationStatus(application: Application, newStatus: String)

pre: application.internship.postedBy = self

pre: newStatus in Set{'Accepted', 'Rejected'}

post: application.status = newStatus

post: application.student.notifications->exists(n | n.message = 'Your application status has changed to ' + newStatus and n.isRead = false)

ADMIN

```
context Admin
        inv: self.companies->forAll(c | c.addedBy = self)
        inv: self.hrs->forAll(h | h.addedBy = self)

context Admin::addCompany(name: String, description: String): Company
        post: result.addedBy = self
        post: result.oclIsNew()

context Admin::addHR(user: User, company: Company): HR
        pre: company <> null
        post: result.company = company
        post: result.addedBy = self
        post: result.oclIsNew()
```

COMPANY

```
context Company
        inv nameUnique: Company.allInstances()->isUnique(name)
        inv: self.hrs->forAll(h | h.company = self)
        inv: self.internships->forAll(i | i.company = self)
```

INTERNSHIP

```
context Internship
        inv: self.postedBy <> null
        inv: self.company <> null
        inv: self.postDate <= Date.now()
        inv: self.deadline >= Date.now() or self.deadline = null
        inv: self.applications->forAll(a | a.internship = self)

context Internship::createInternship(hrId: Long): Internship
        pre: HR.allInstances()->exists(h | h.id = hrId)
        post: result.oclIsNew()
        post: Internship.allInstances()->includes(result)
```

APPLICATION

```
context Application
        inv studentExists: Student.allInstances()->exists(id = studentId)
        inv: self.student <> null
        inv: self.internship <> null
        inv: self.status in Set{'Pending', 'Accepted', 'Rejected'}
        inv: self.applicationDate <= Date.now()
```

NOTIFICATION

context Notification

inv: self.sentDate <= Date.now()

inv: self.isRead implies self.readDate >= self.sentDate

context Notification::markAsRead()

post: isRead = true