



CAPSTONE PROJECT REPORT

Report 4 – Software Design Document

– Hanoi, September 2024 –

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I. Record of Changes

Date	A* M, D	In charge	Change Description

*A - Added M - Modified D - Deleted

II. Software Design Document

1. System Design

1.1 System Architecture

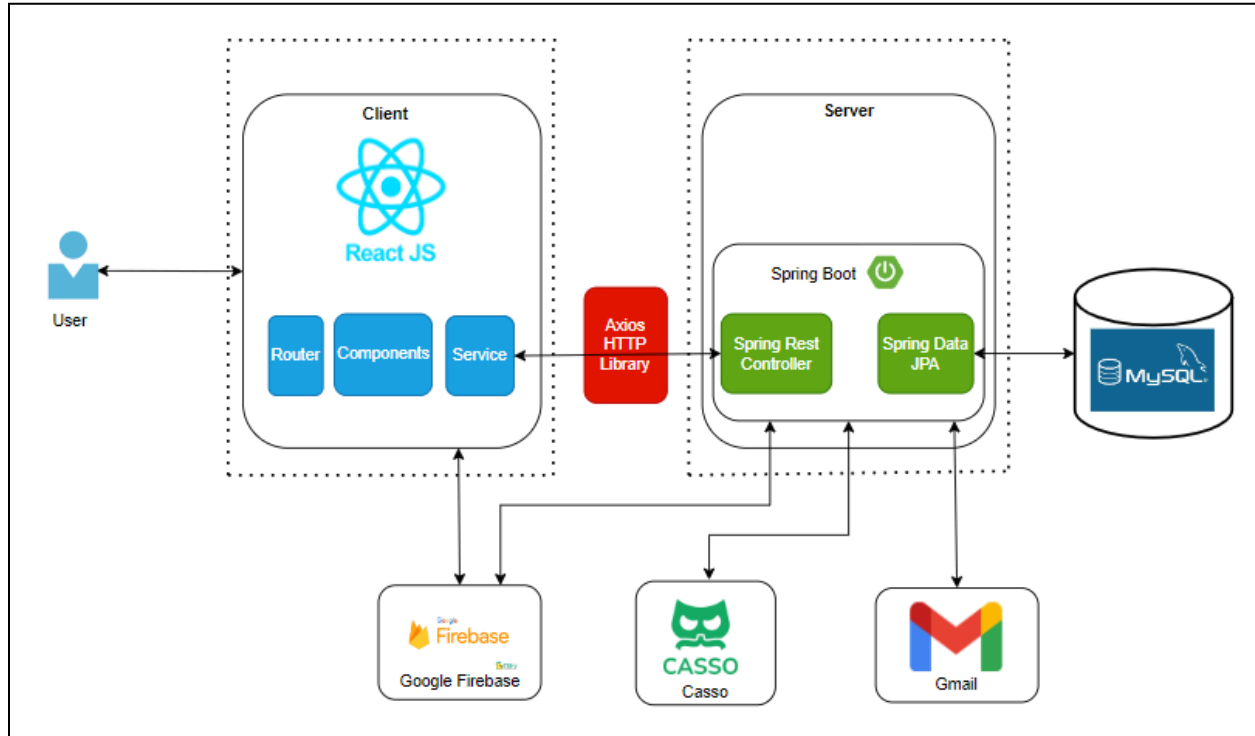


Figure 4.1 System Architecture

1.2.1. FE Package Diagram

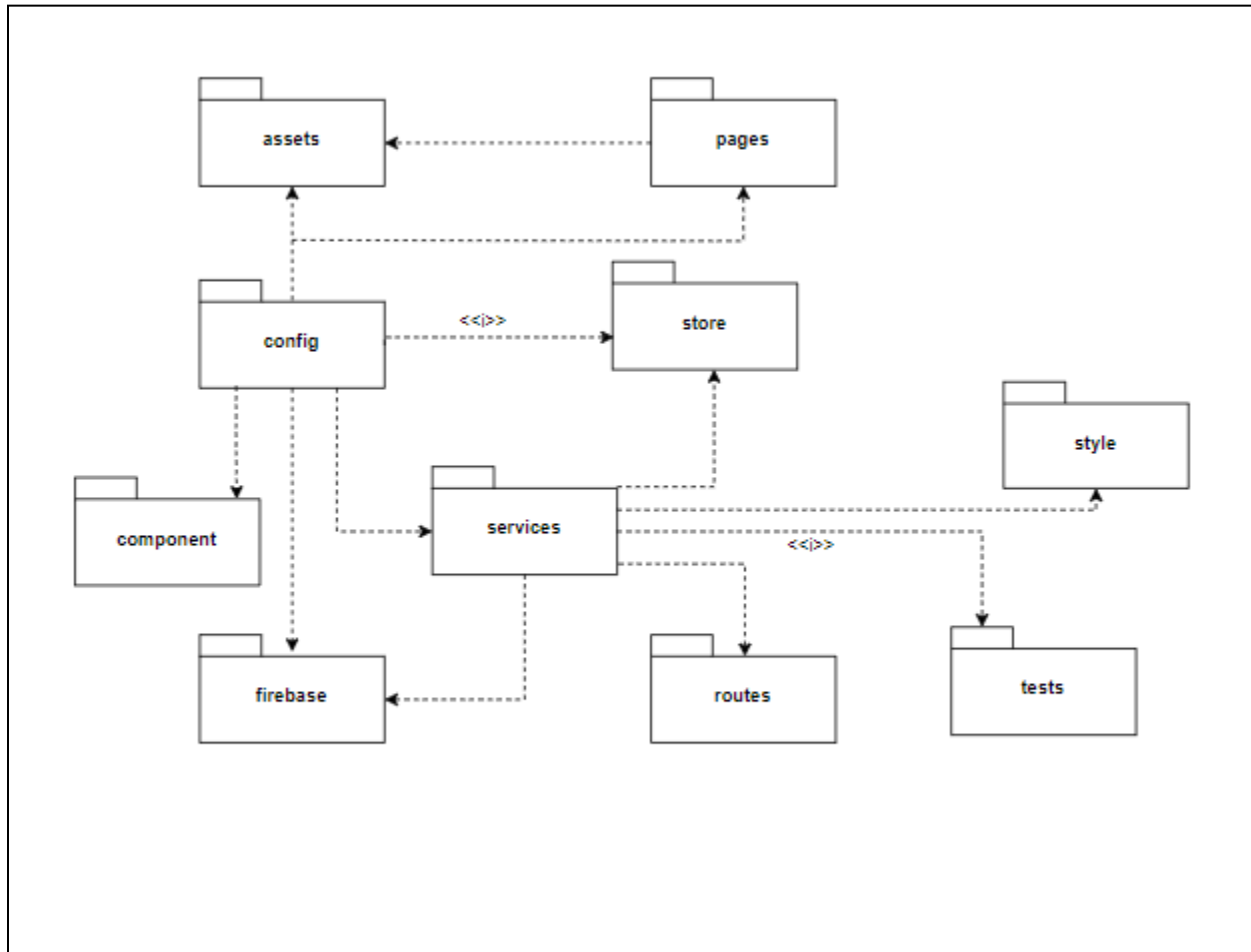


Figure 4.2 FE Package diagram

1.2.2. Package descriptions

No	Package	Description
01	config	Contains configuration files and settings for the application, such as environment variables, API keys, and other system-wide settings.
02	assets	Houses static files and resources used by the application, including images, fonts, icons, and other media files.

03	pages	Contains the main pages or views of the application, which typically represent different screens or routes that users can navigate to.
04	store	Manages the application's state using a state management library (such as Redux or Vuex), including actions, reducers, and state definitions.
05	component	Includes reusable UI components that are used across different pages and parts of the application, such as buttons, forms, and modals.
06	services	Contains service files that handle business logic and API calls, such as authentication, data fetching, and other background processes.
07	style	Includes styling files such as CSS, SCSS, or styled-components that define the visual appearance of the application.
08	firebase	Holds files and configurations related to Firebase services, such as authentication, Firestore, real-time database, and cloud functions.
09	routes	Manages the application's routing logic, defining how different URLs map to specific pages or components within the app.
10	tests	Contains test files and test suites for the application, including unit tests, integration tests, and end-to-end tests to ensure code quality and functionality.

Table 4.1 FE Package descriptions

1.3 BE Package Diagram

1.3.1. BE Package Diagram

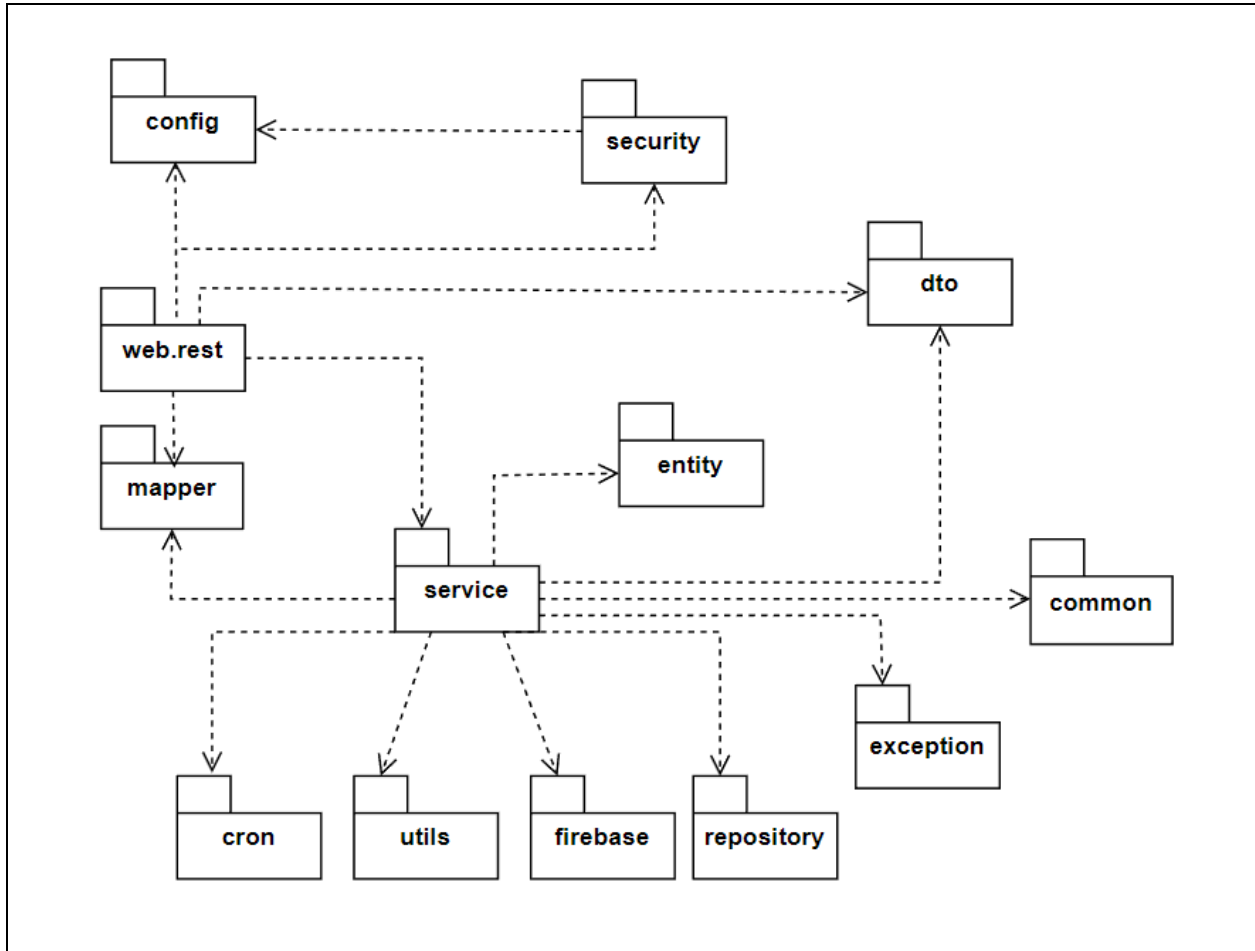


Figure 4.3 BE Package diagram

1.3.2. Package descriptions

No	Package	Description
01	web.rest	The primary classes in the web.rest package are typically annotated with <code>@RestController</code> . These classes serve as the endpoints for HTTP requests (such as GET, POST, PUT, DELETE).
02	common	Includes shared utilities, constants, and helper functions that can be used across different parts of the application to promote code reuse.

03	config	Houses configuration files and settings for the application, such as environment variables, application properties, and other system-wide settings.
04	entity	Defines the data models or entities used by the application, representing the core objects that are persisted in the database.
05	exception	Contains custom exception classes and error-handling logic, defining how the application responds to various error conditions.
06	repository	Manages data access logic, including interfaces and implementations for interacting with the database or other data sources.
07	dto	Stands for Data Transfer Objects; includes classes that define how data is transferred between different layers of the application, such as between the service layer and the API layer.
08	service	Contains the business logic of the application, including service classes that perform operations, enforce rules, and process data according to the application's requirements.
09	security	Handles security-related functionality, including authentication, authorization, and protection of sensitive data within the application.
10	mapper	Includes classes and interfaces for mapping between different object models, such as converting between entities and DTOs, ensuring data consistency and separation of concerns.
11	cron	The primary classes in the cron package are often annotated with <code>@Scheduled</code> , which is used to define methods that should be executed at fixed intervals or according to a cron expression.
12	utils	This is where you'd find general-purpose static methods that perform common operations, such as string manipulation, date formatting, or mathematical calculations.

13	firebase	This section of the package would include classes responsible for configuring Firebase within the Spring Boot application, often using the Firebase Admin SDK.
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Table 4.2 BE Package descriptions

2. Database Design

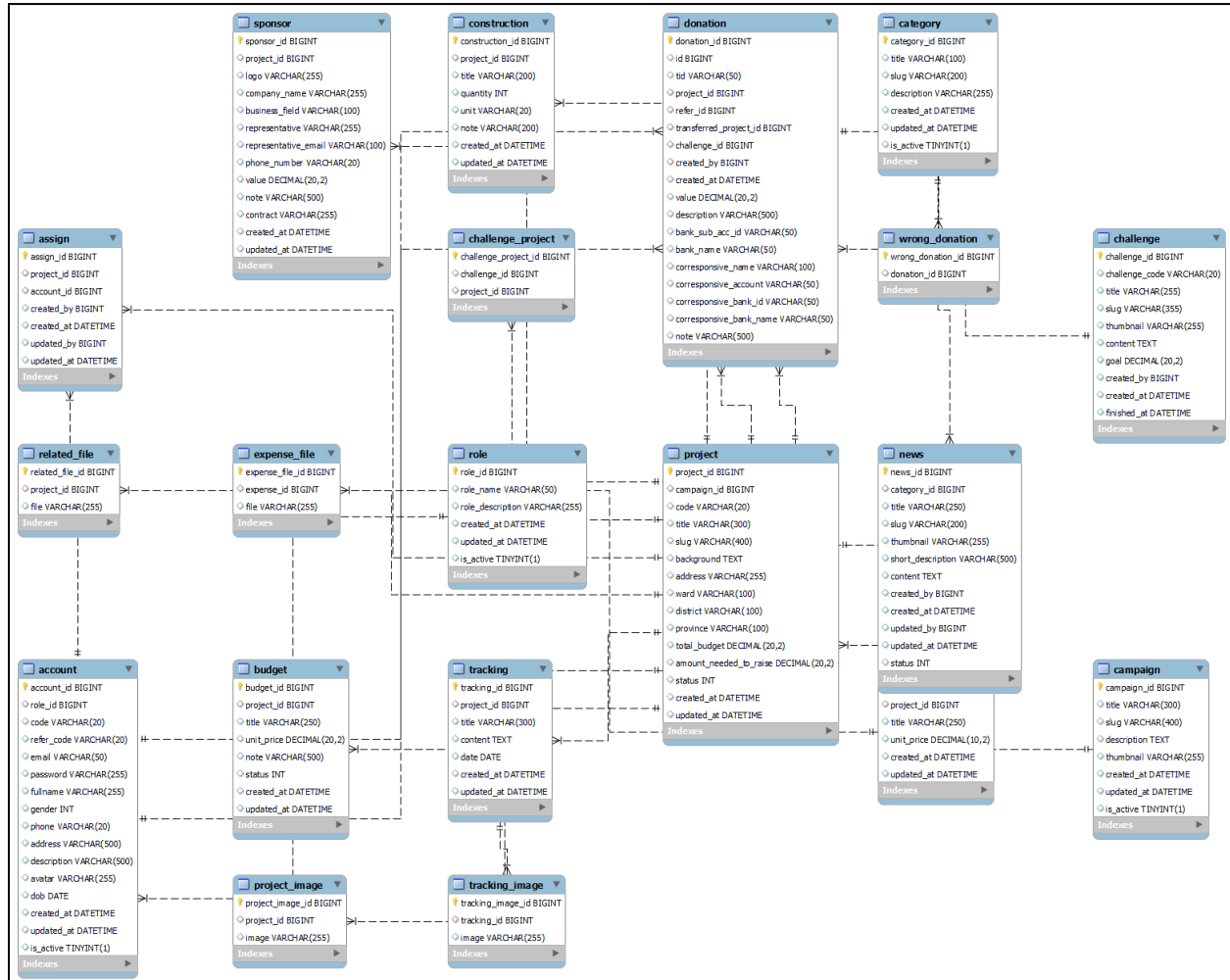


Figure 4.4 Database design

2.1. Table Descriptions

No	Entity	Description
01	campaign	Including individual contribution campaigns of the project.

02	project	Includes information about the project so users can view and donate
03	budget	Includes the budget to build up the project
04	role	These are decentralized roles in the system
05	account	Includes management accounts and user accounts in the system
06	assign	Let the admin assign members to the project
07	project_image	Contains images of the project
08	related_file	Contains project related files
09	construction	Include construction information when creating a project
10	challenge	These are challenges that users create to call for donations for the project
11	challenge_project	These are projects selected into the project so users can donate
12	donation	A table that records statements when users donate to a project or challenge
13	wrong_donation	To record incorrect donations and check any transfers that have not yet entered the project
14	category	These are the categories of news created
15	news	Is a list of news created so that users can read it
16	tracking	Is the progress to check the status of the project at what stage
17	tracking_image	Includes photos of the project's current status, progress, and completion
18	expense	These are costs in project expenses
19	expense_file	Includes related files of costs
20	sponsor	Are sponsors, benefactors, for the project

Table 4.3 Table descriptions

2.1.1. Table “Category”

No	Field Name	Type	Unique	Not Null	PK/FK	Description
01	category_id	bigint	x	x	PK	This field represents the primary key uniquely identifying each user in GPM.
02	tittle	nvarchar(300)	x			Title of category
03	slug	varchar(400)	x	x		Link to page source
04	description	text				Description of category
05	created_at	datetime				Time to create category
06	updated_at	datetime				Time to update category
07	is_active	boolean				Active of category

Table 4.4 Table “Category” descriptions

2.1.2. Table “News ”

No	Field Name	Type	Unique	Not Null	PK/FK	Description
01	news_id	bigint	x	x	PK	Id of news
02	category_id	bigint	x	x	FK	Id of category
03	title	varchar(250)	x			Title of news
04	slug	varchar(200)	x	x		Link to page source
05	thumbnail	varchar(255)				Image to create news
06	short_description	nvarchar(500)				Short description of news
07	content	text				Content of news
08	created_by	bigint				The creator of news
09	created_at	datetime				Time to create news
10	update_by	bigint				The updater of news
11	update_at	datetime				Time to update news

12	status	int				Status of news
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Table 4.5 Table "News" descriptions

2.1.3. Table "Account"

No	Field Name	Type	Unique	Not Null	PK/FK	Description
01	account_id	bigint	x	x	PK	Id of account
02	role_id	bigint	x	x	FK	Id of account
03	code	varchar(20)	x			Code of account
04	refer_code	varchar(20)	x			Refer code of account
05	email	varchar(50)	x			Email of account
06	password	varchar(255)				Password of account
07	fullname	nvarchar(255)				Full name of account
08	gender	int				Gender of account
09	phone	varchar(20)				Phone of account
10	address	nvarchar(500)				Address of account
11	description	nvarchar(500)				Description of account
12	avatar	nvarchar(255)				Avatar of account
13	dob	date				Date of birth of account
14	created_at	datetime				Time to create account
15	updated_at	datetime				Time to update account
16	is_active	boolean				Active of account

Table 4.6 Table "Account" descriptions

2.1.4. Table “Role”

No	Field Name	Type	Unique	Not Null	PK/FK	Description
01	role_id	bigint	x	x	PK	Id of role
02	role_name	nvarchar(50)	x	x		Name of role
03	role_description	nvarchar(255)				Description of role
04	created_at	datetime				Time to create role
05	updated_at	datetime				Time to update role
06	is_active	boolean				Active of role

Table 4.7 Table “Role” descriptions

2.1.5. Table “Donation”

No	Field Name	Type	Unique	Not Null	PK/FK	Description
01	donation_id	bigint	x	x	PK	Id of donate
02	id	bigint	x	x		Id of casso
03	tid	varchar(50)	x	x		Tid of casso
04	project_id	bigint	x	x	FK	Id of project
05	refer_id	bigint	x		FK	Id of refer
06	tranfered_project_id	bigint	x		FK	Id of transfer project
07	challenge_id	bigint	x		FK	Id of challenge
08	created_by	bigint	x		FK	The creator of donation
09	created_at	datetime				Id of account
10	value	decimal(20,2)				Value of donation

11	description	nvarchar(500)				Description of donation
12	bank_sub_acc_id	varchar(50)				Id of bank sub acc
13	bank_name	nvarchar(50)				Name of bank
14	corresponsive_name	varchar(100)				Name of corresponsive
15	corresponsive_account	varchar(50)				Account of corresponsive
16	corresponsive_bank_id	varchar(50)				If of bank corresponsive
17	corresponsive_bank_name	varchar(50)				Name of bank corresponsive
18	note	nvarchar(500)				Note for donation

Table 4.8 Table "Donation" descriptions

2.1.6. Table "Assign"

No	Field Name	Type	Unique	Not Null	PK/FK	Description
01	assign_id	bigint	x	x	PK	Id of assign
02	project_id	bigint	x	x	FK	Id of project
03	account_id	bigint	x	x	FK	Id of account
04	created_by	bigint				The creator of assign
05	created_at	datetime				Time to create assign
06	updated_by	bigint				The updater of assign
07	updated_at	datetime				Time to update assign

Table 4.9 Table "Assign" descriptions

2.1.7. Table "Campaign"

No	Field Name	Type	Unique	Not Null	PK/FK	Description
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01	campaign_id	bigint	x	x	PK	Id of campaign
02	tittle	nvarchar(300)	x			Title of campaign
03	slug	varchar(400)	x	x		Slug of campaign
04	description	text				Description of campaign
05	thumbnail	nvarchar(255)				Thumbnail of campaign
06	created_at	datetime				Time to create campaign
07	updated_at	datetime				Time to create campaign
08	is_active	boolean				Time to update campaign

Table 4.10 Table "Campaign" descriptions

2.1.8. Table "Project"

No	Field Name	Type	Unique	Not Null	PK/FK	Description
01	project_id	bigint	x	x	PK	Id of project
02	campaign_id	bigint	x	x	FK	Id of campaign
03	code	varchar(20)	x	x		Code of project
04	tittle	nvarchar(300)	x			Tittle of project
05	slug	varchar(400)	x	x		Link to page source
06	background	text				Background of project
07	address	nvarchar(255)				Address of project
08	ward	nvarchar(100)				Ward of project
09	district	nvarchar(100)				District of project
10	province	nvarchar(100)				Province of project

11	total_budget	decimal(20,2)				Total budget of project
12	amount_needed_to_raise	decimal(20,2)				Amount needed to raise of project
13	status	int				Status of project
14	created_at	datetime				Time to create project
15	updated_at	datetime				Time to update project

Table 4.11 Table "Project" descriptions

2.1.9. Table "Project_Image"

No	Field Name	Type	Unique	Not Null	PK/FK	Description
01	project_image_id	bigint	x	x	PK	Id of project image
02	project_id	bigint	x	x	FK	Id of project
03	image	varchar(255)				Image of project image

Table 4.12 Table "Project_image" descriptions

2.1.10. Table "Budget"

No	Field Name	Type	Unique	Not Null	PK/FK	Description
01	budget_id	bigint	x	x	PK	Id of budget
02	project_id	bigint	x	x	FK	Id of project
03	tittle	nvarchar(250)				Title of budget
04	unit_price	decimal(20,2)		x		Unit price of budget
05	note	nvarchar(500)				Note of budget
06	status	int				Status of budget
07	create_at	datetime				Time to create budget

08	update_at	datetime				Time to update budget
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Table 4.13 Table "Budget" descriptions

2.1.11. Table "Tracking"

No	Field Name	Type	Unique	Not Null	PK/FK	Description
01	tracking_id	bigint	x	x	PK	Id of tracking
02	project_id	bigint	x	x	FK	Id of project
03	tittle	nvarchar(300)				Id of tracking
04	content	text				Content of tracking
05	date	date				Date of tracking
06	create_at	date				Time to create tracking
07	update_at	date				Time to update tracking

Table 4.14 Table "Tracking" descriptions

2.1.11. Table "Tracking_Image"

No	Field Name	Type	Unique	Not Null	PK/FK	Description
01	tracking_image_id	bigint	x	x	PK	Id of tracking image
02	tracking_id	bigint	x	x	FK	Id of tracking
03	image	varchar(255)				Image of tracking image

Table 4.15 Table "Tracking_Image" descriptions

2.1.13. Table "Expense"

No	Field Name	Type	Unique	Not Null	PK/FK	Description
01	expense_id	bigint	x	x	PK	Id of expense
02	project_id	bigint	x	x	FK	Id of project
03	tittle	nvarchar(250)				Title of expense

04	unit_price	decimal(10,2)		x		Unit price of expense
05	create_at	datetime				Time to create expense
06	update_at	datetime				Time to update expense

Table 4.16 Table "Expense" descriptions

2.1.14. Table "Expense_File"

No	Field Name	Type	Unique	Not Null	PK/FK	Description
01	expense_file_id	bigint	x	x	PK	Id of expense file
02	expense_id	bigint	x	x	FK	Id of expense
03	file	varchar(255)				File of expense file

Table 4.17 Table "Expense_File" descriptions

2.1.15. Table "Sponsor"

No	Field Name	Type	Unique	Not Null	PK/FK	Description
01	sponsor_id	bigint	x	x	PK	Id of sponsor
02	project_id	bigint	x	x	FK	Id of project
03	company_name	nvarchar(255)				Name of company
04	business_field	nvarchar(100)				Field of business
05	representative	nvarchar(255)				Representative of sponsor
06	representative_email	varchar(100)				Representative email of sponsor
07	phone_number	varchar(20)				Phone number of sponsor
08	value	decimal(20,2)				Value of sponsor

09	note	nvarchar(500)				Note of sponsor
10	contract	varchar(255)		x		File up load from sponsor
11	created_at	datetime				Time to create sponsor
12	updated_at	datetime				Time to update sponsor

Table 4.18 Table "Sponsor" descriptions

2.1.16. Table "Challenge"

No	Field Name	Type	Unique	Not Null	PK/FK	Description
01	challenge_id	bigint	x	x	PK	Id of challenge
02	challenge_code	varchar(20)	x	x		Code of challenge
03	title	nvarchar(255)	x			Title of challenge
04	slug	varchar(355)	x	x		Link to page source
06	thumbnail	nvarchar(255)				
07	content	text				Content of challenge
08	goal	decimal(20,2)				Goal of challenge
09	created_by	bigint				The creator of challenge
08	created_at	datetime				Time to create challenge
10	finished_at	datetime				

Table 4.19 Table "Challenge" descriptions

2.1.17. Table "Challenge_project"

No	Field Name	Type	Unique	Not Null	PK/FK	Description
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01	challenge_project_id	bigint	x	x	PK	Id of challenge project
02	challenge_id	bigint	x	x		Id of challenge
03	project_id	bigint	x	x	FK	Id of project

Table 4.20 Table "Tracking" descriptions

2.1.18. Table "Related_file"

No	Field Name	Type	Unique	Not Null	PK/FK	Description
01	related_file_id	bigint	x	x	PK	Id of challenge project
02	project_id		x	x	FK	Id of project
03	file	varchar(255)				File of related

Table 4.21 Table "Related_file" descriptions

2.1.19. Table "Construction"

No	Field Name	Type	Unique	Not Null	PK/FK	Description
01	construction_id	bigint	x	x	PK	Id of challenge project
02	project_id	bigint	x	x	FK	Id of project
03	title	nvarchar(200)				Title of construction
04	quantity	int				Quantity of construction
05	unit	nvarchar(20)				Unit of construction
06	note	nvarchar(200)				Note of construction
07	created_at	datetime				The creator of construction
08	updated_at	datetime				Time to update construction

Table 4.22 Table "Construction" descriptions

2.1.20. Table “Wrong donation”

No	Field Name	Type	Unique	Not Null	PK/FK	Description
01	wrong_donation_id	bigint	x	x	PK	Id of wrong donation
02	donation_id	bigint	x	x	FK	Id of donation

Table 4.23 Table “Wrong_donation” descriptions

3. Detailed Design

3.1 Authentication

3.1.1 Class Diagram

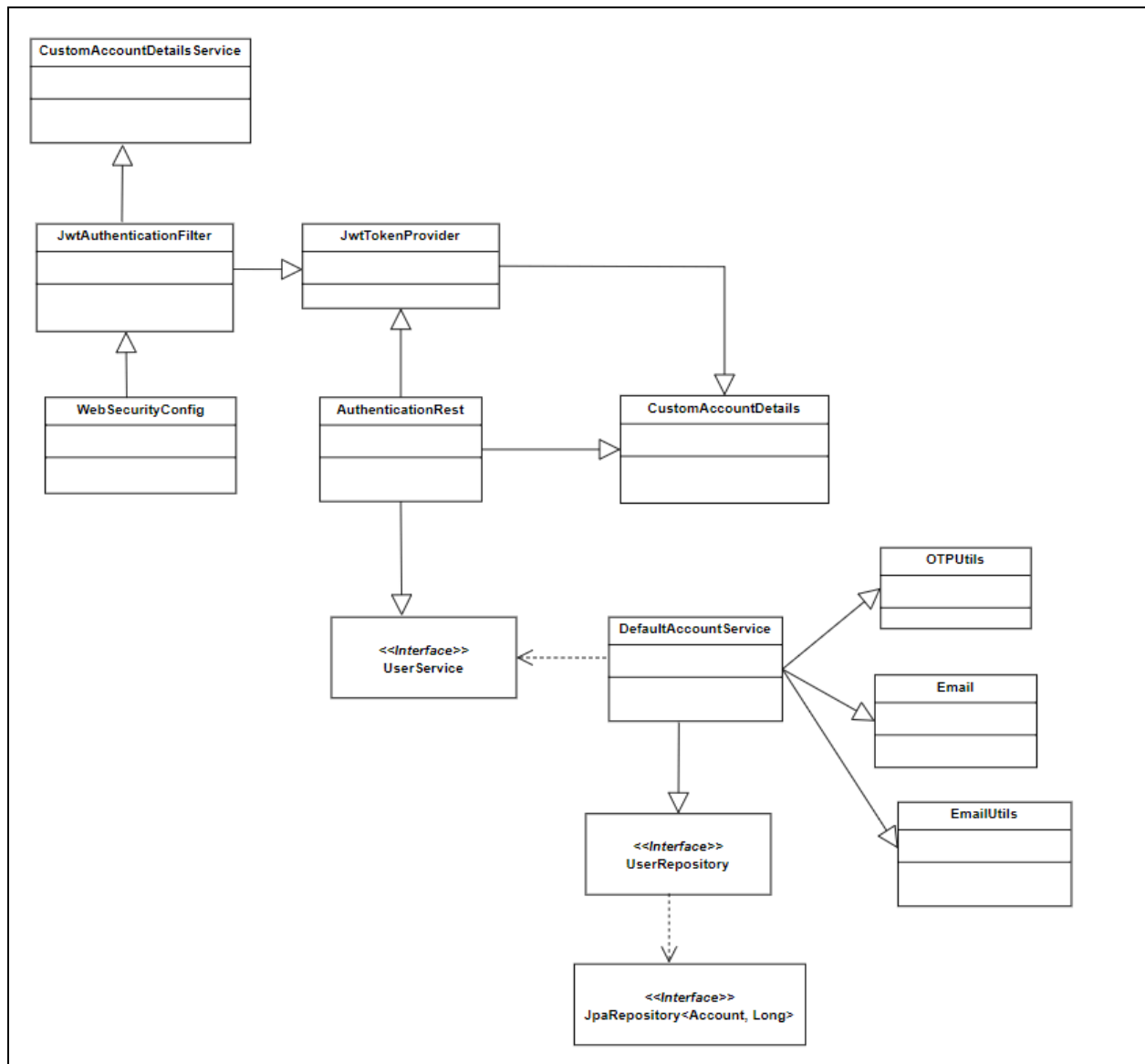


Figure 4.5 Class diagram

3.1.2 Sequence Diagram of “Sign in”

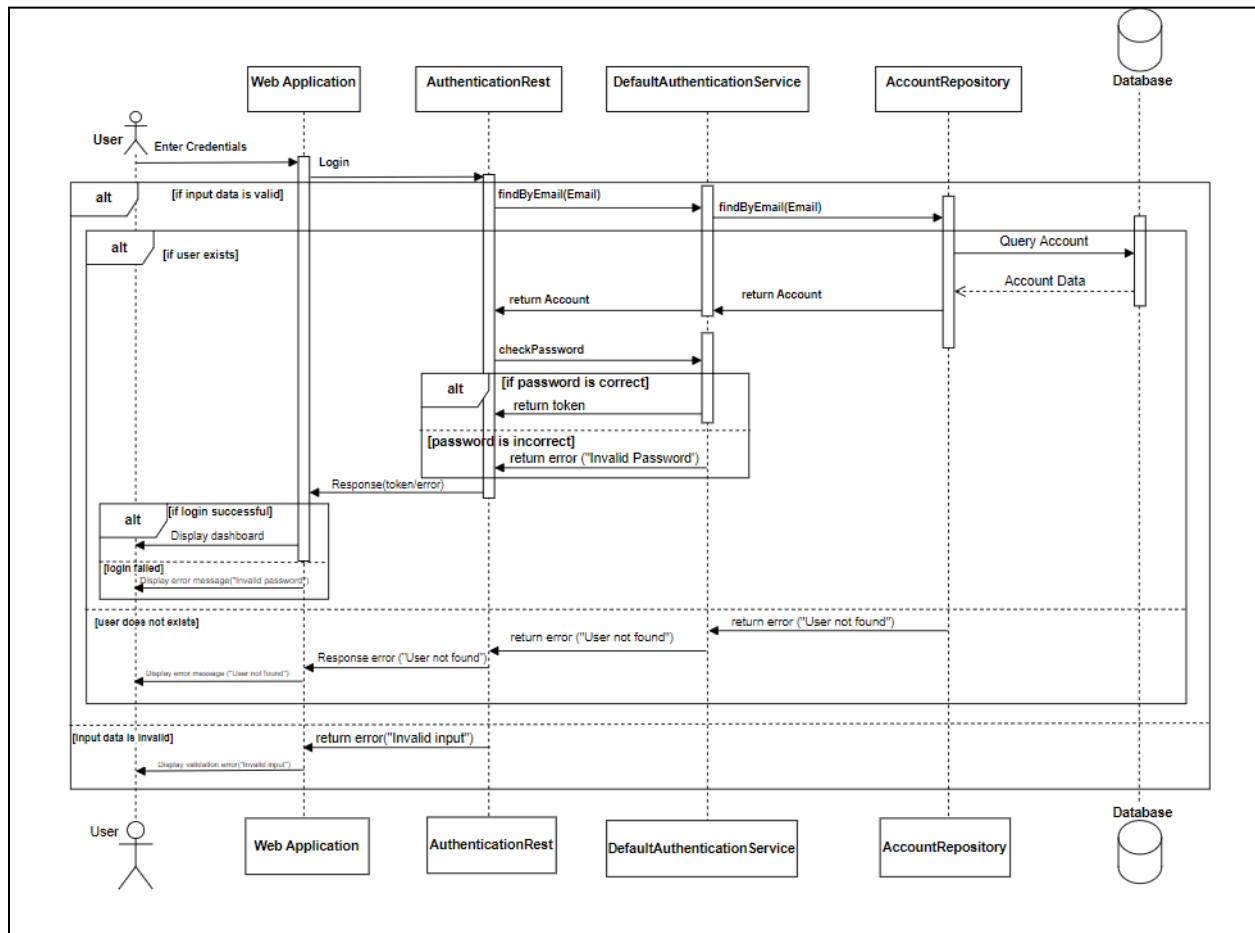


Figure 4.6 Sequence Diagram of “Sign Up”

3.1.3 Sequence Diagram of “Register”

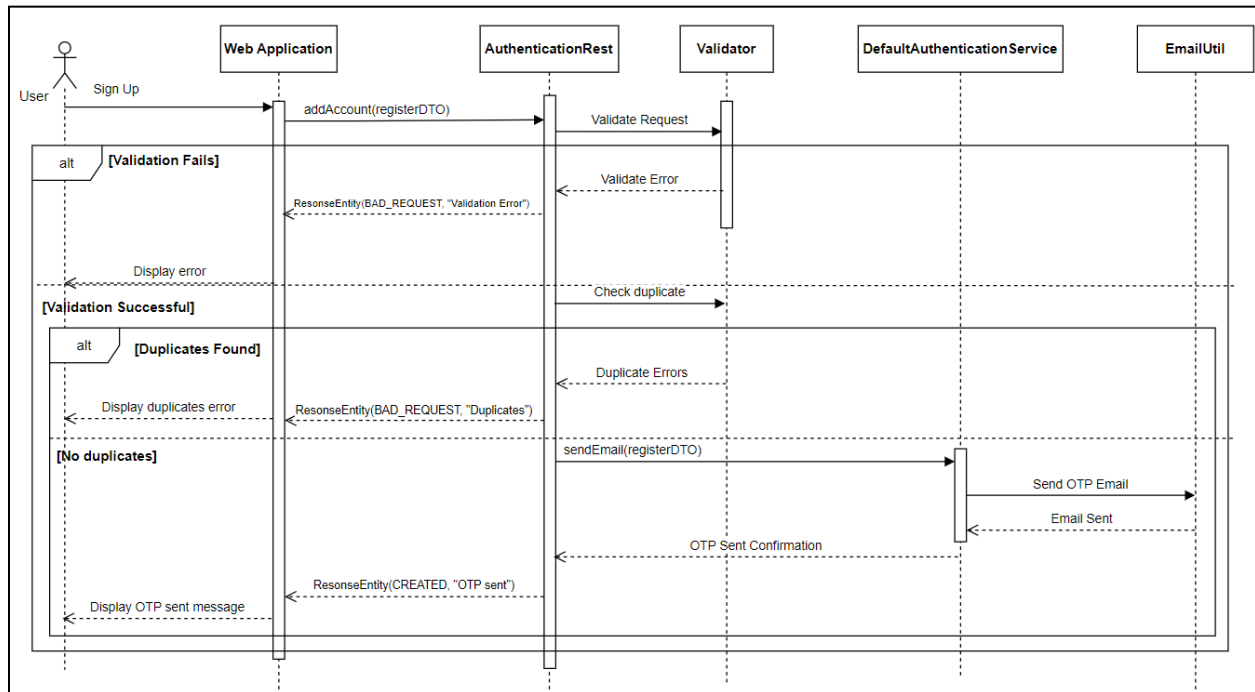


Figure 4.7 Sequence Diagram of “Register”

3.1.4 Sequence Diagram of “Forgot Password”

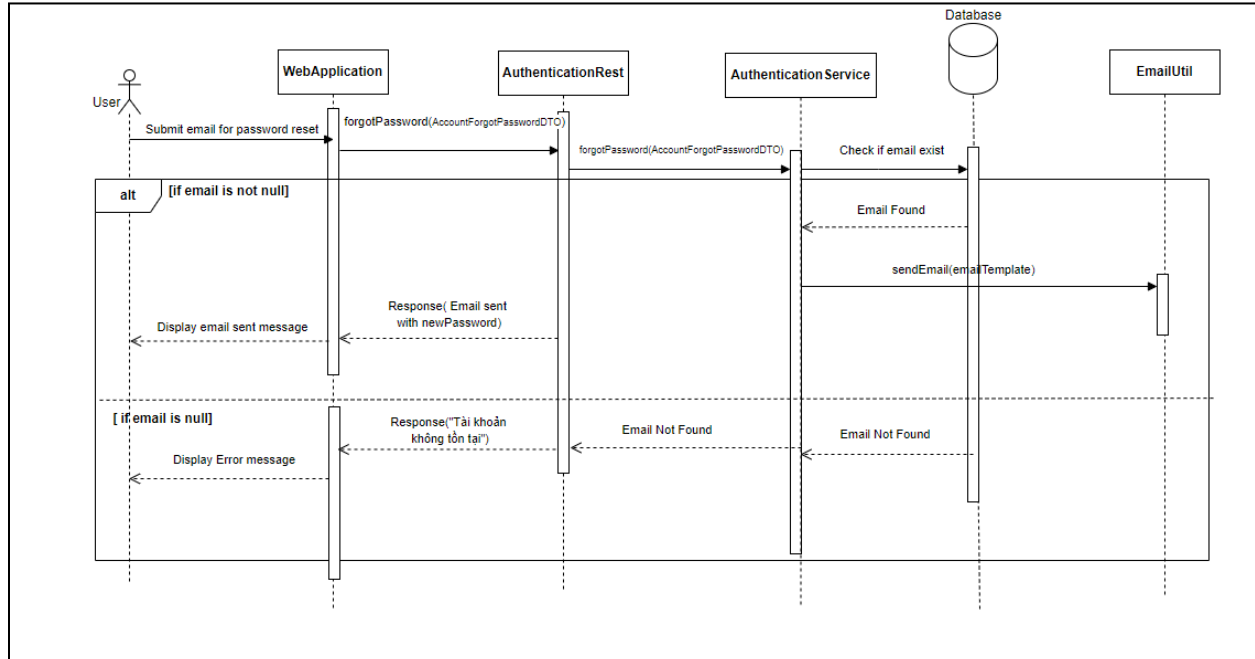


Figure 4.8 Sequence Diagram of “Forgot password”

3.2 Campaign Management

3.2.1 Class Diagram

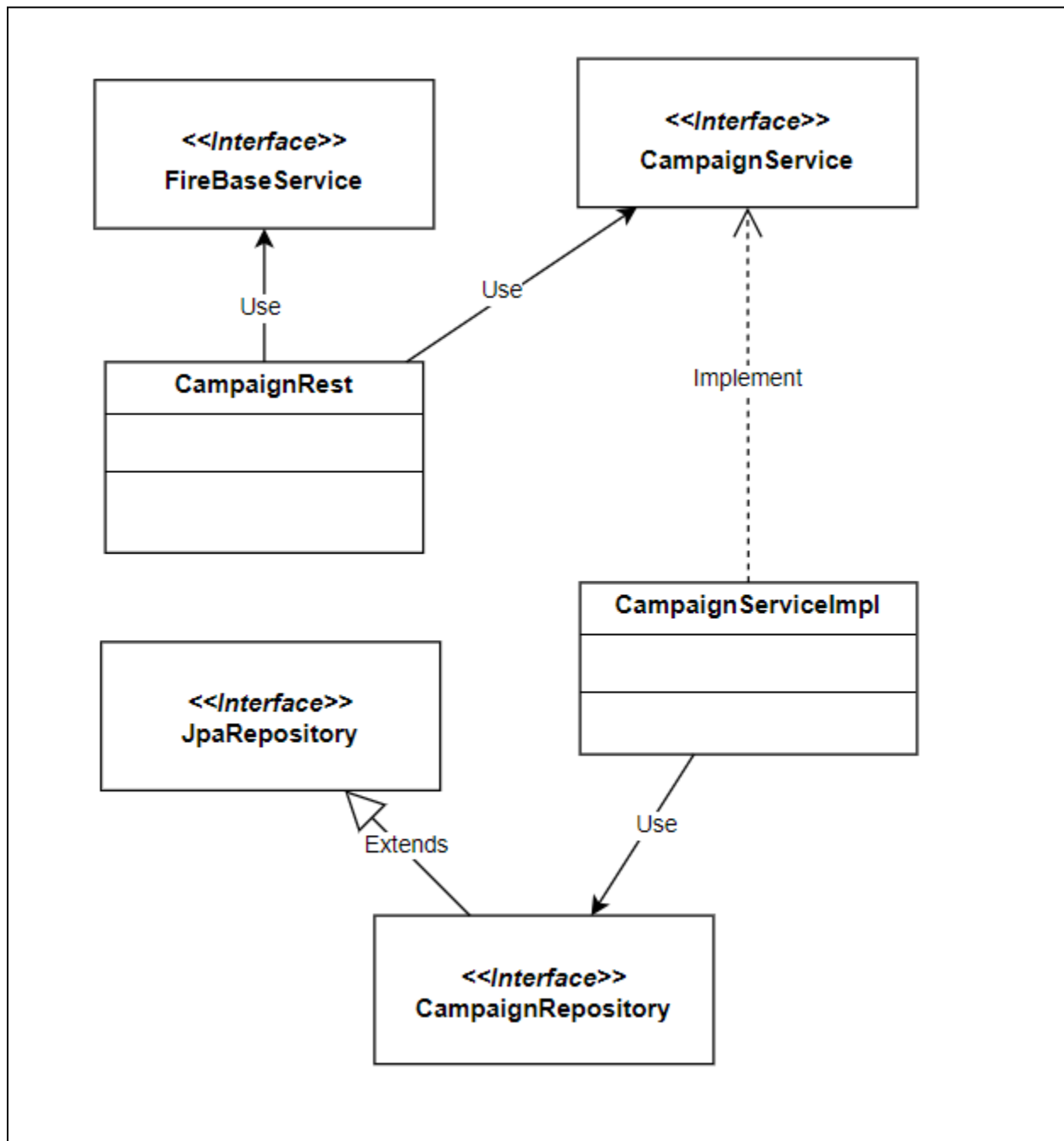


Figure 4.9 Class diagram of campaign management

3.2.2 Sequence Diagram of “View Campaign List”

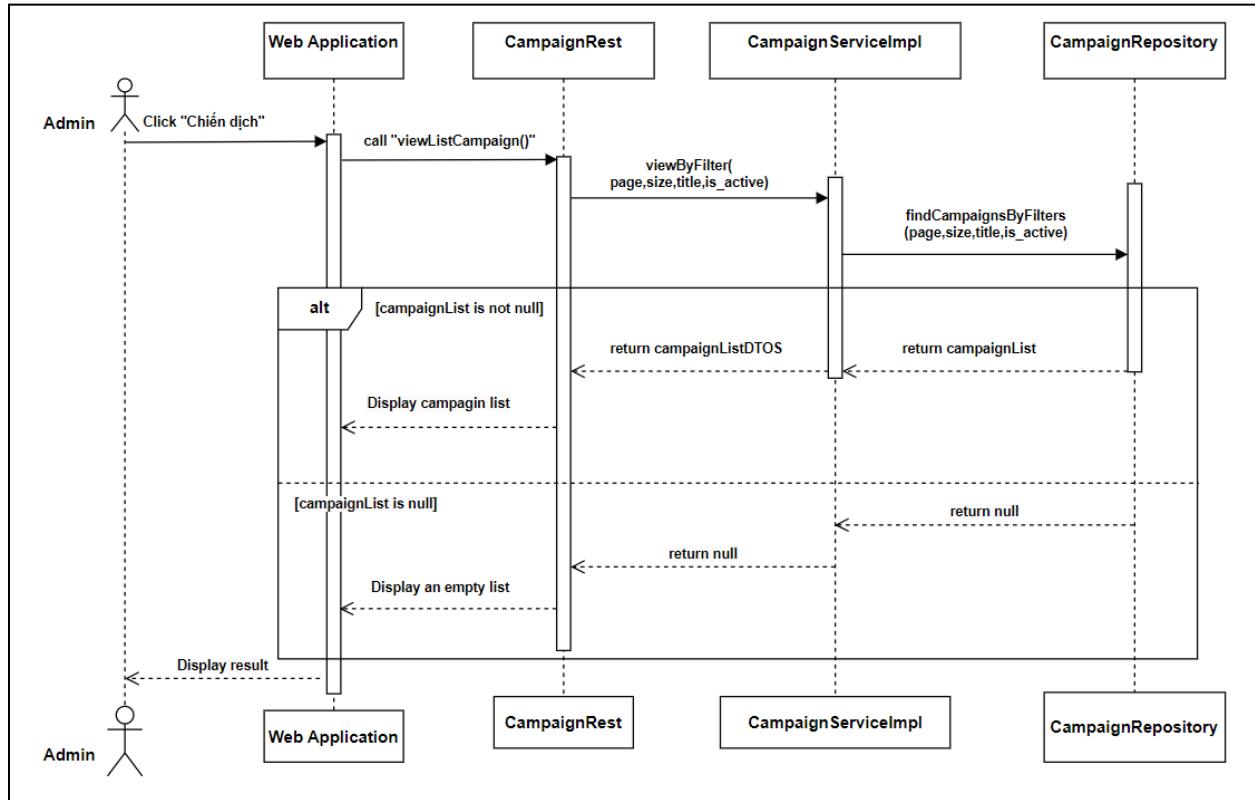


Figure 4.10 Sequence Diagram of “View campaign list”

3.2.3 Sequence Diagram of “Create Campaign”

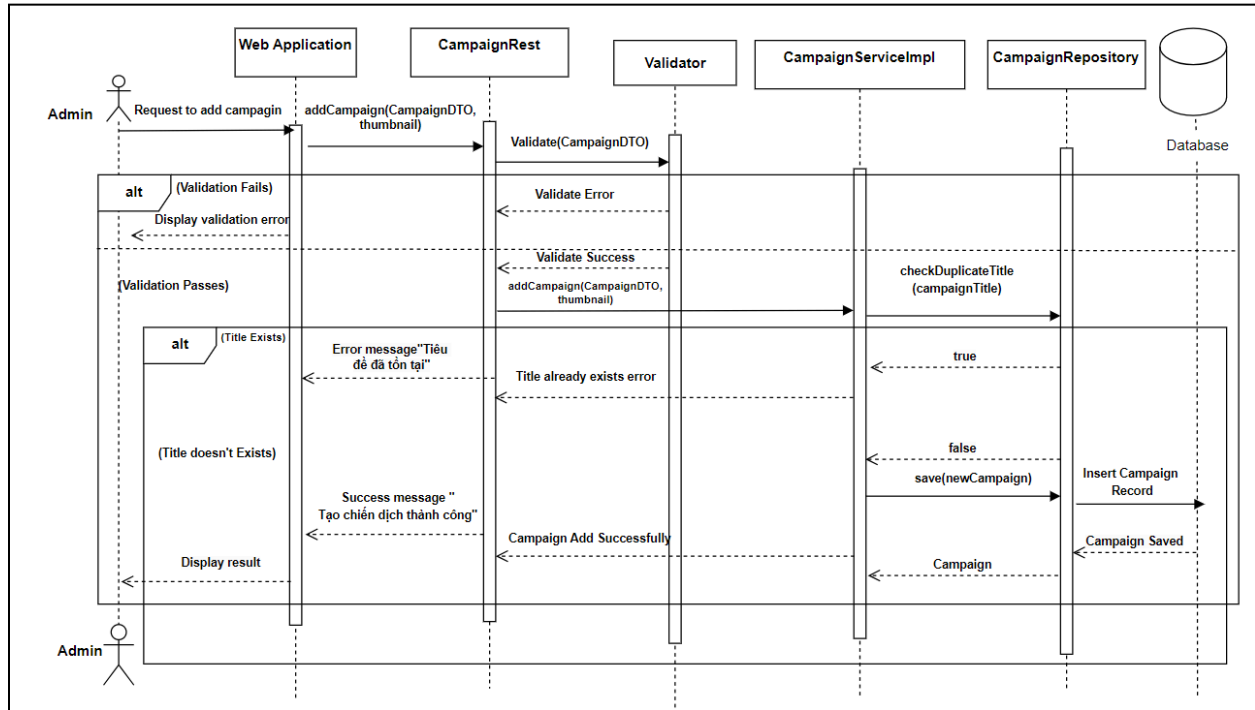


Figure 4.11 Sequence Diagram of “Create campaign”

3.2.4 Sequence Diagram of “View Detail Campaign”

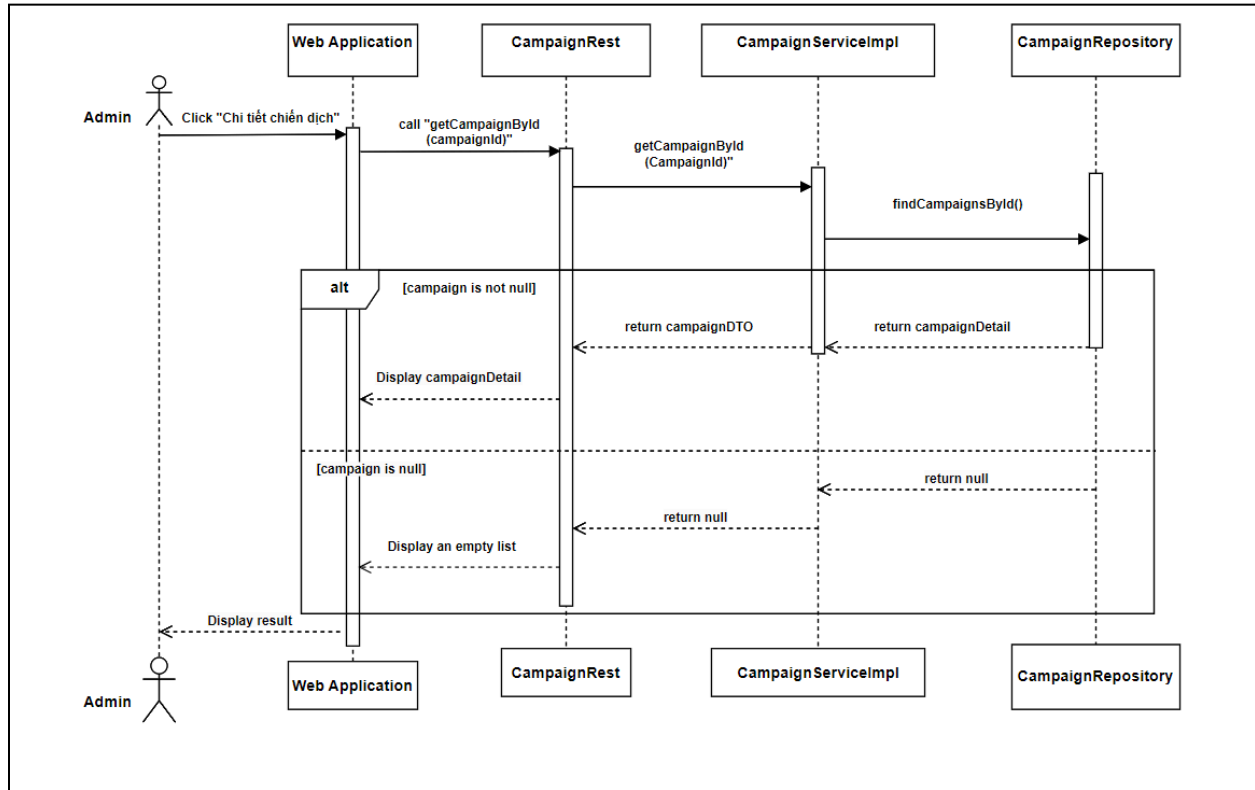


Figure 4.12 Sequence Diagram of “View Detail Campaign”

3.2.5 Sequence Diagram of “Update Campaign”

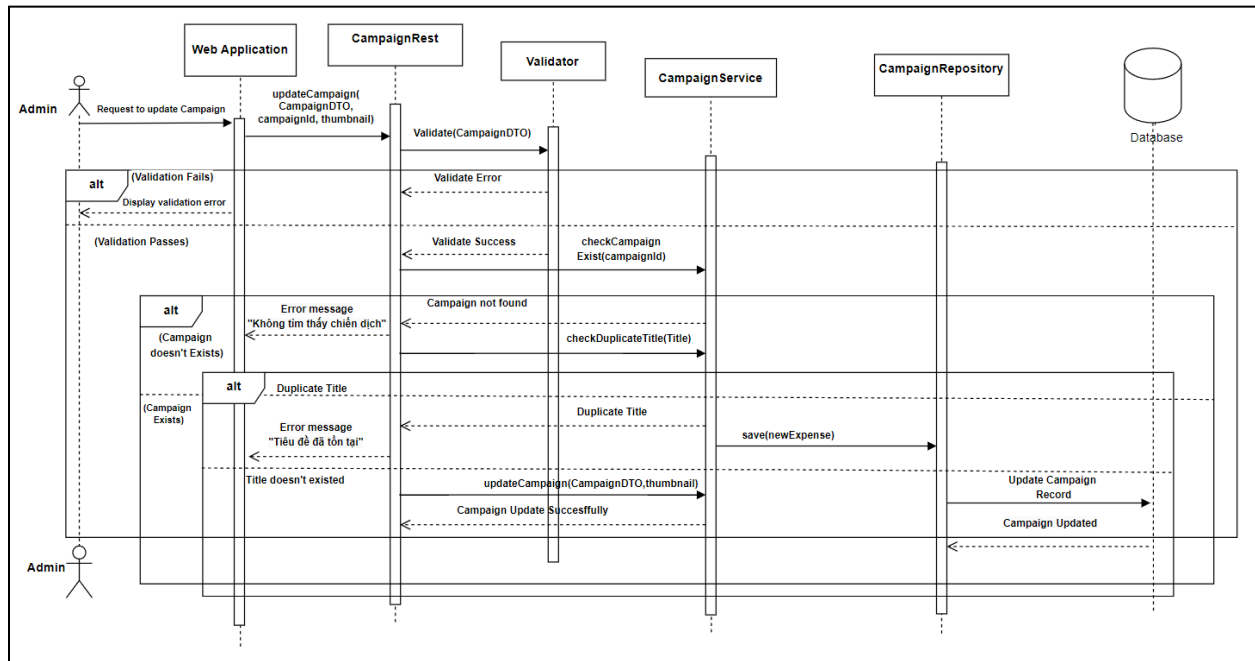


Figure 4.13 Sequence Diagram of “Update campaign”

3.3 Profile Management

3.3.1 Class Diagram

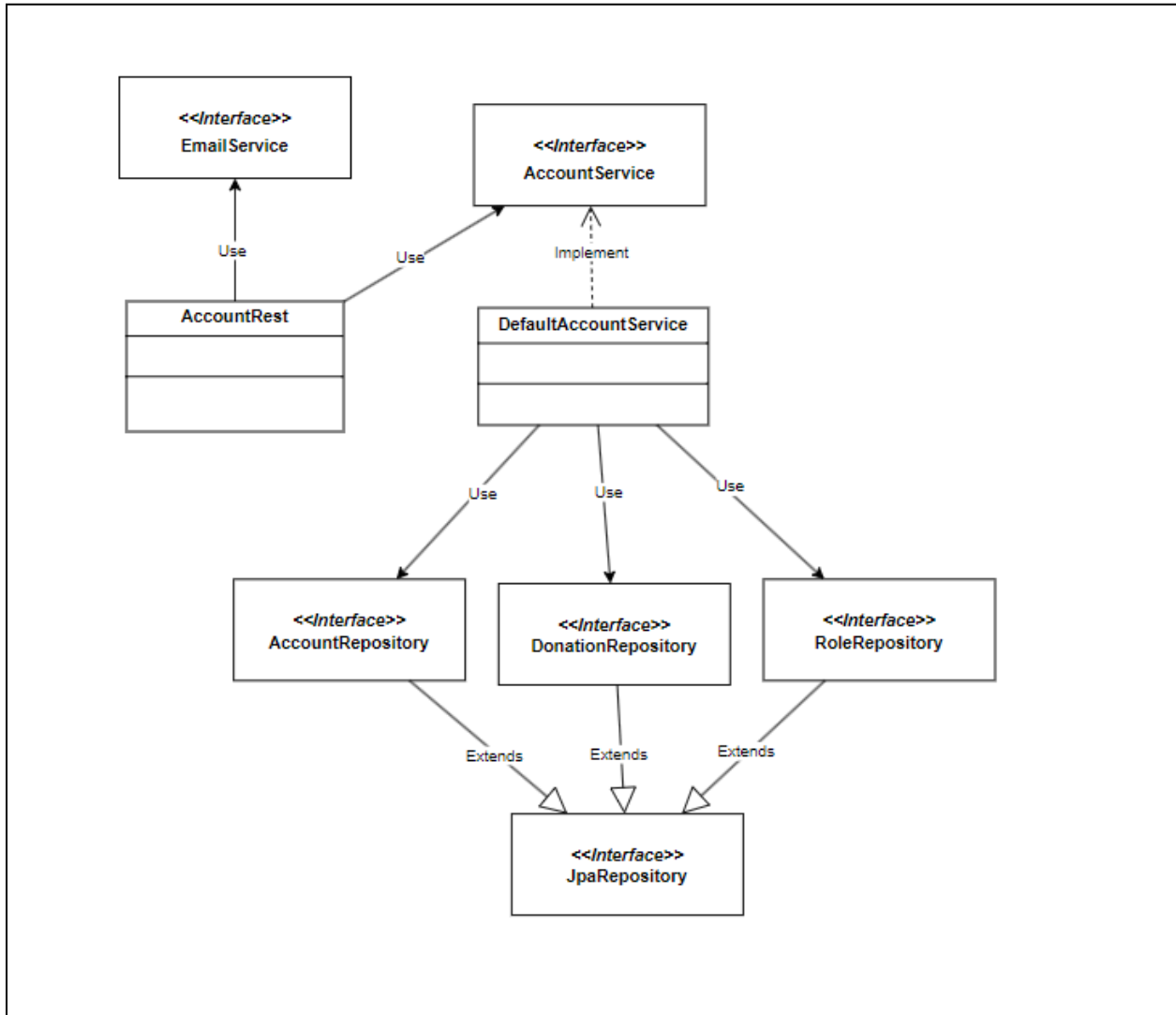


Figure 4.14 Class diagram of profile management

3.3.2 Sequence Diagram of “Edit Profile”

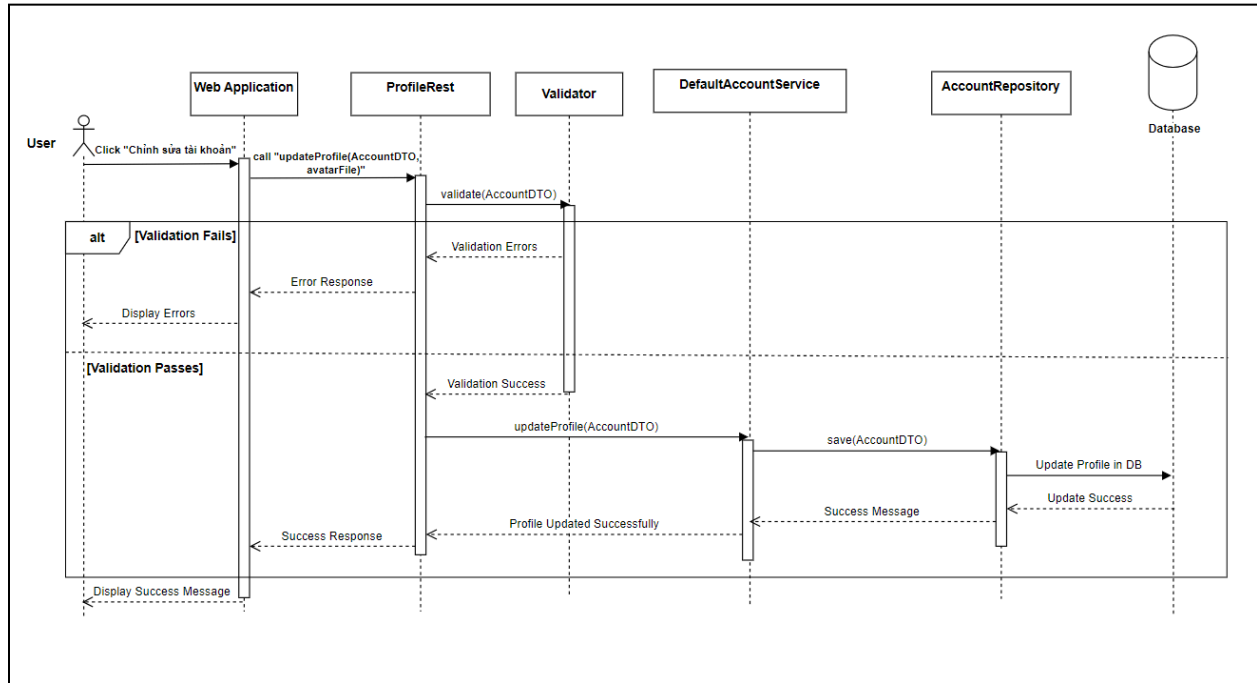


Figure 4.15 Sequence Diagram of “Edit profile”

3.3.3 Sequence Diagram of “Change Password”

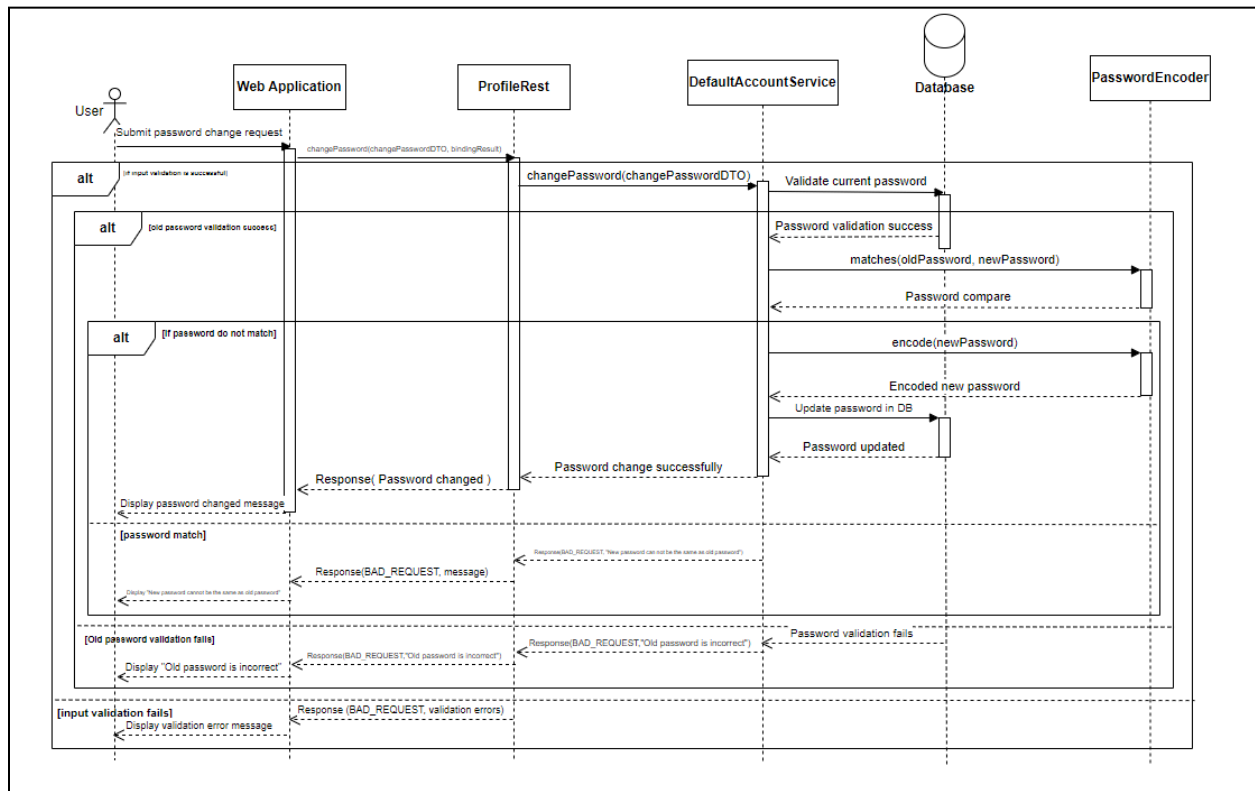


Figure 4.16 Sequence Diagram of “Change password”

3.4 News Management

3.4.1 Class Diagram

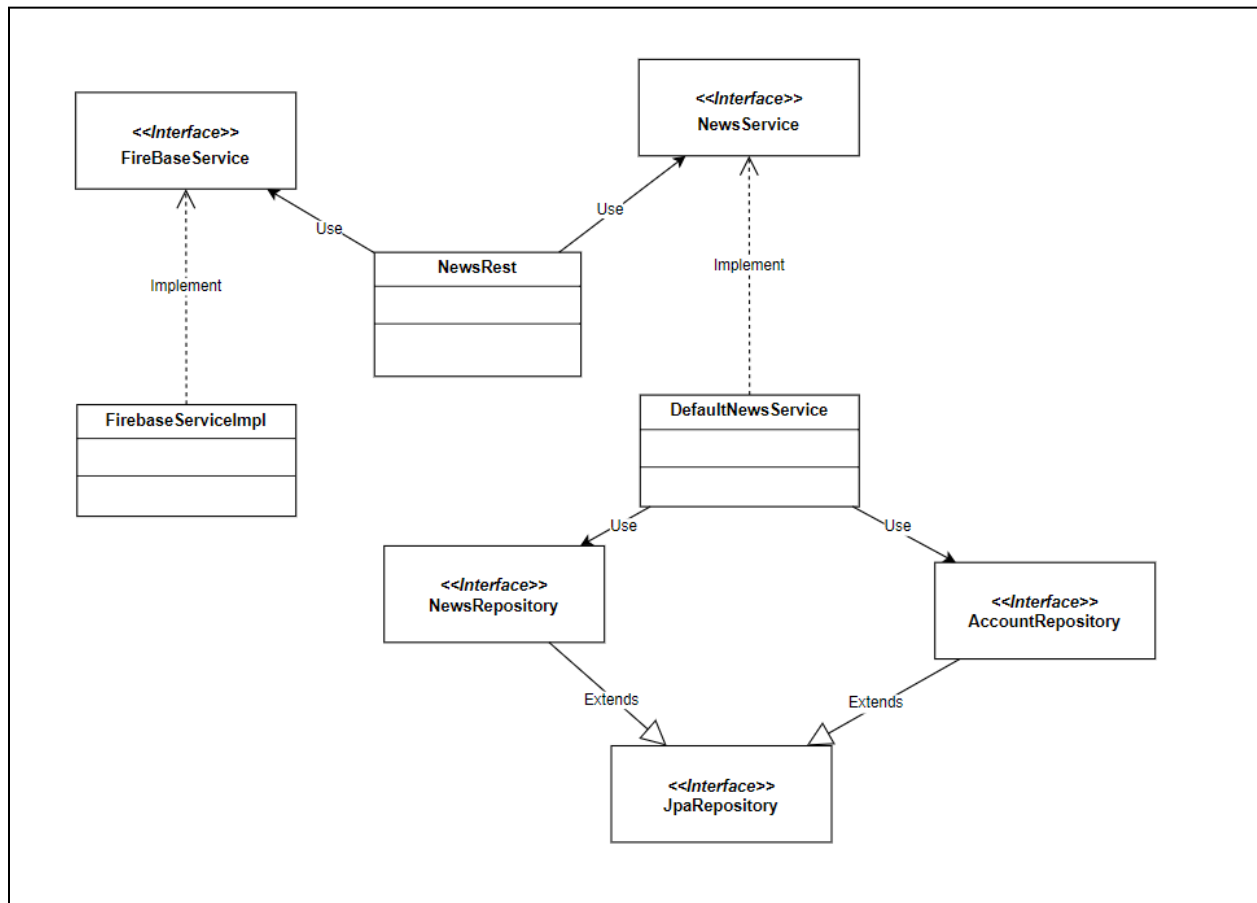


Figure 4.17 Class diagram of news management

3.4.2 Sequence Diagram of “View List News”

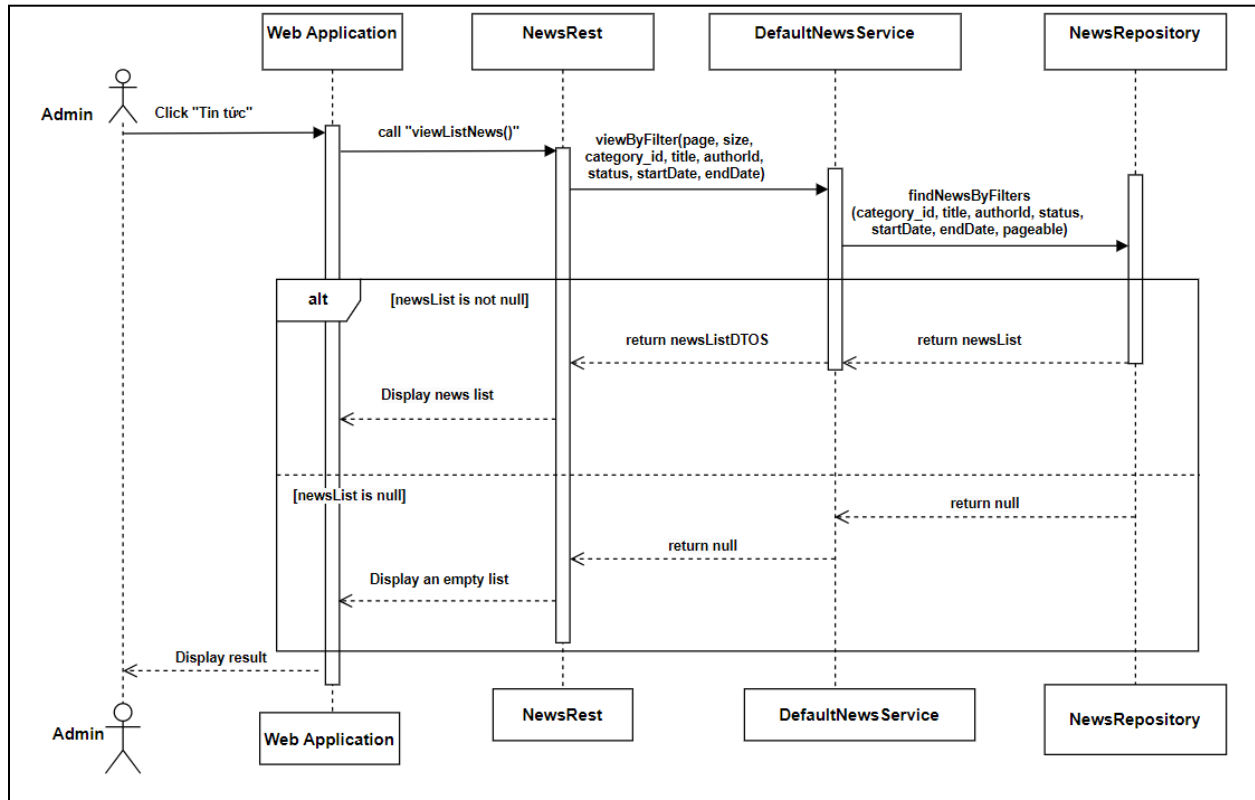


Figure 4.18 Sequence Diagram of “View list news”

3.4.3 Sequence Diagram of “View Detail News”

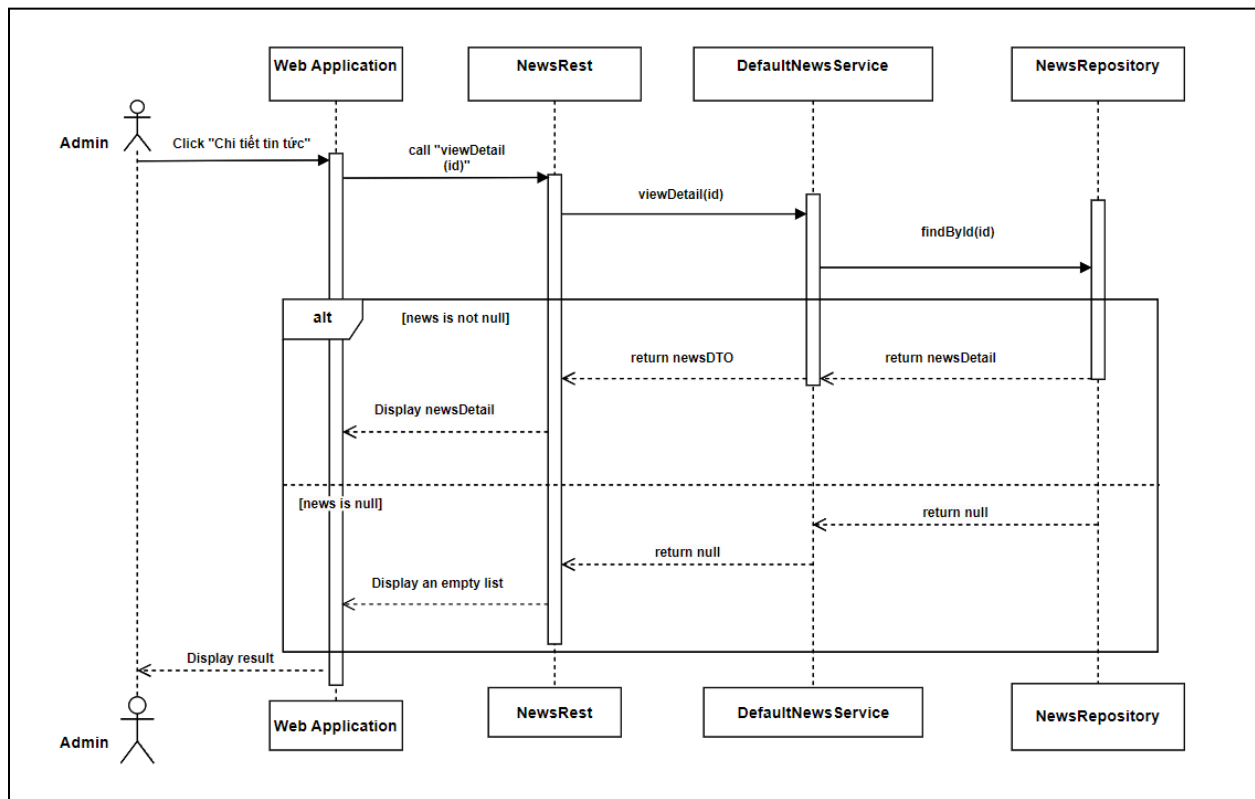


Figure 4.19 Sequence Diagram of “View detail news”

3.4.4 Sequence Diagram of “Create News”

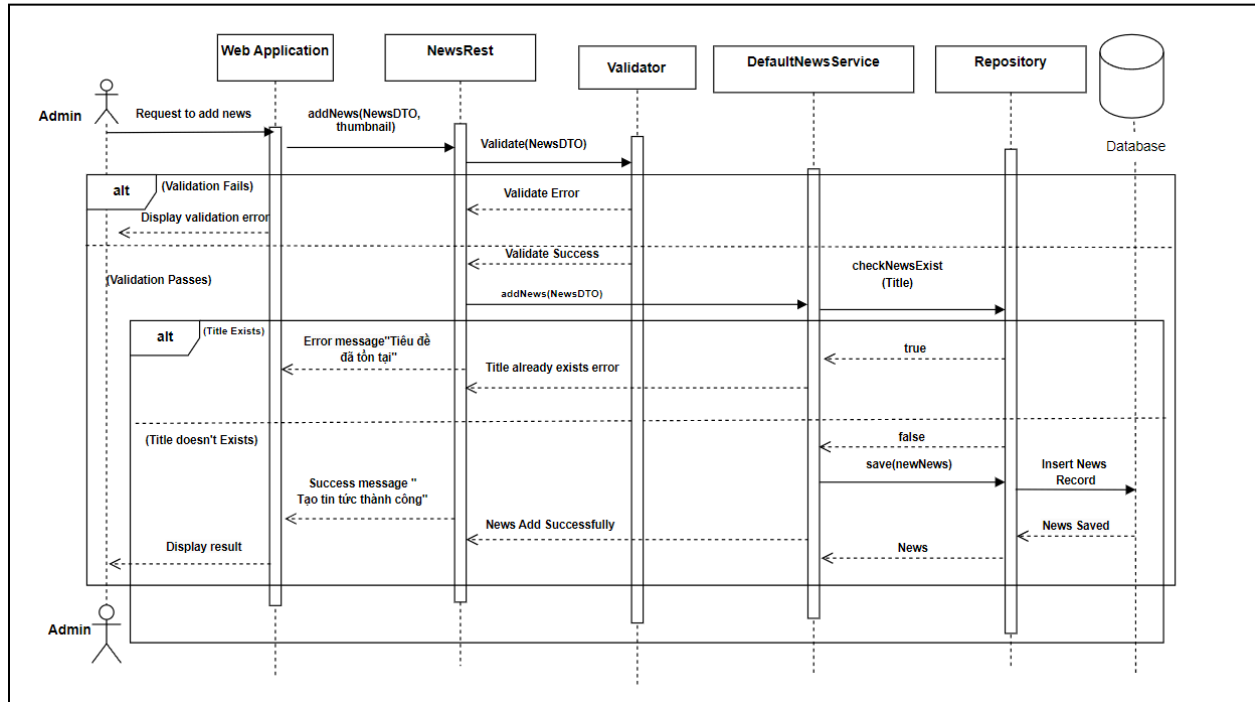


Figure 4.20 Sequence Diagram of “Create news”

3.4.5 Sequence Diagram of “Update News”

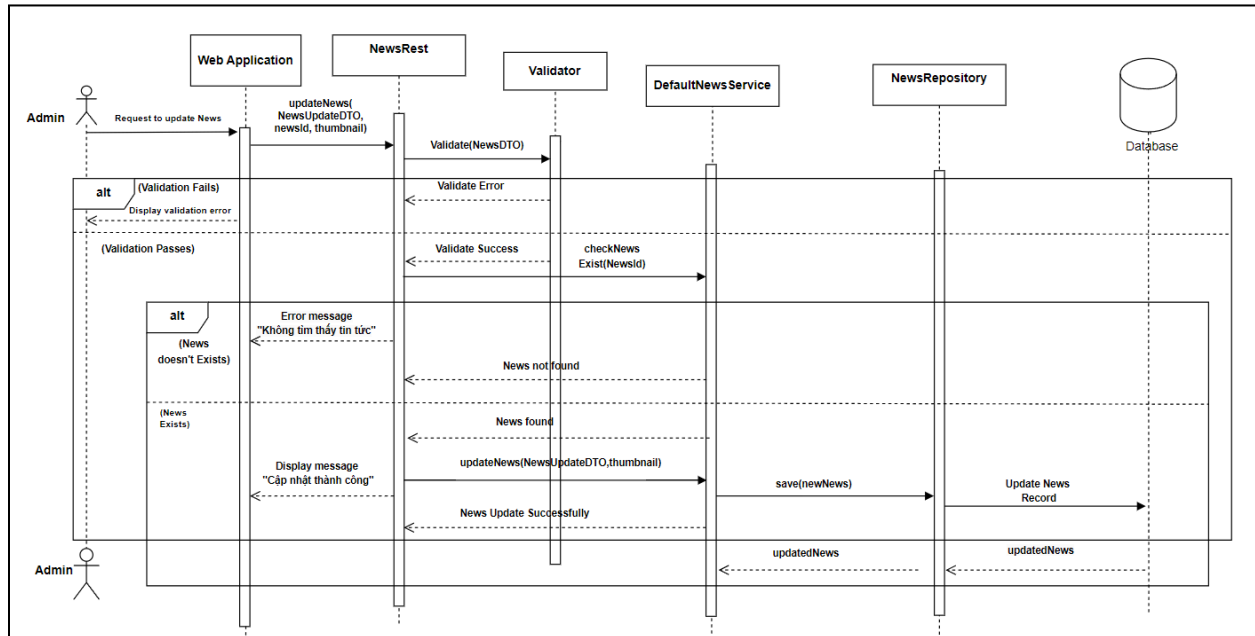


Figure 4.21 Sequence Diagram of “Update news”

3.5 Account Management

3.5.1 Class Diagram

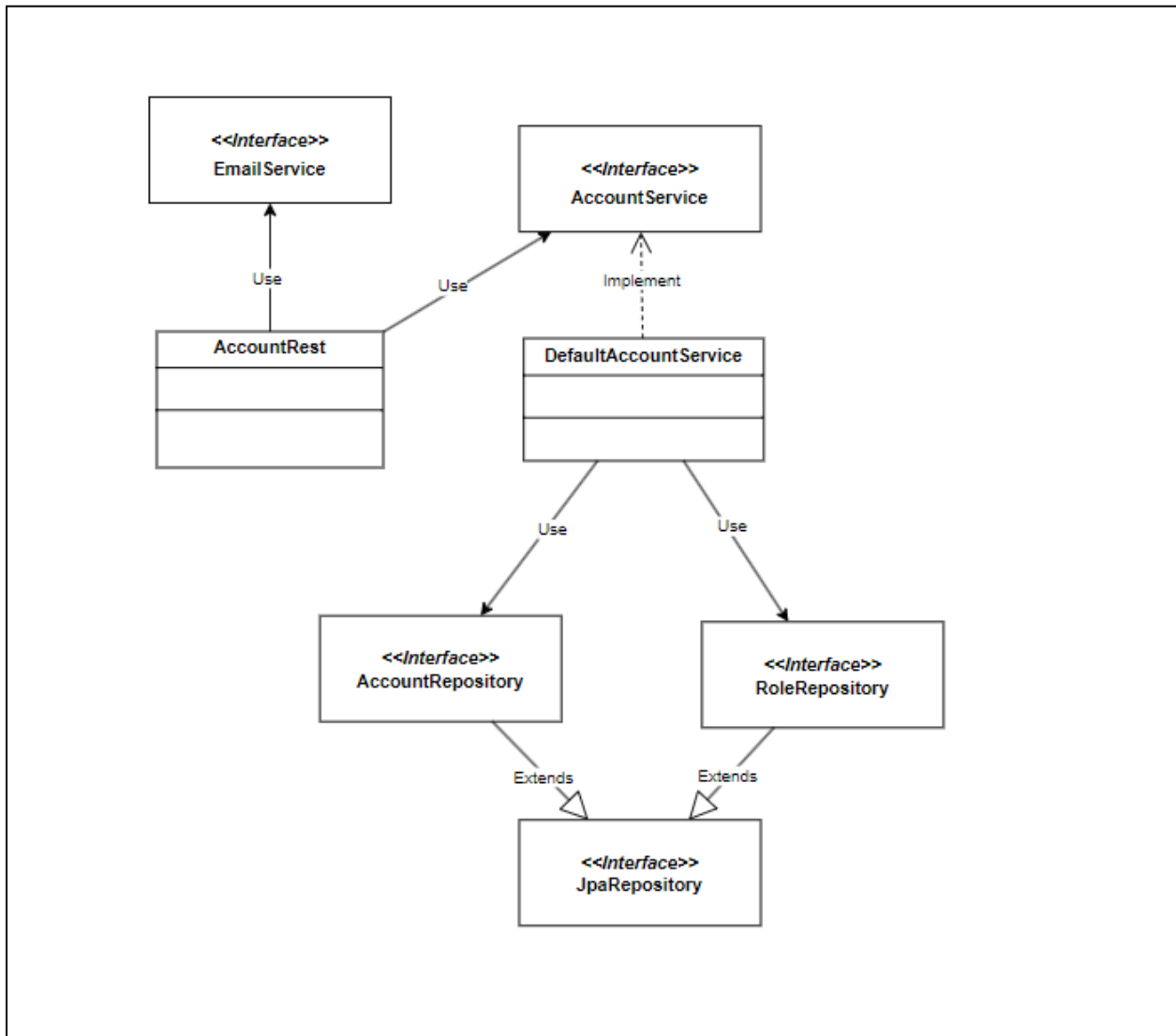


Figure 4.22 Class diagram of account management

3.5.2 Sequence Diagram of “View List Account”

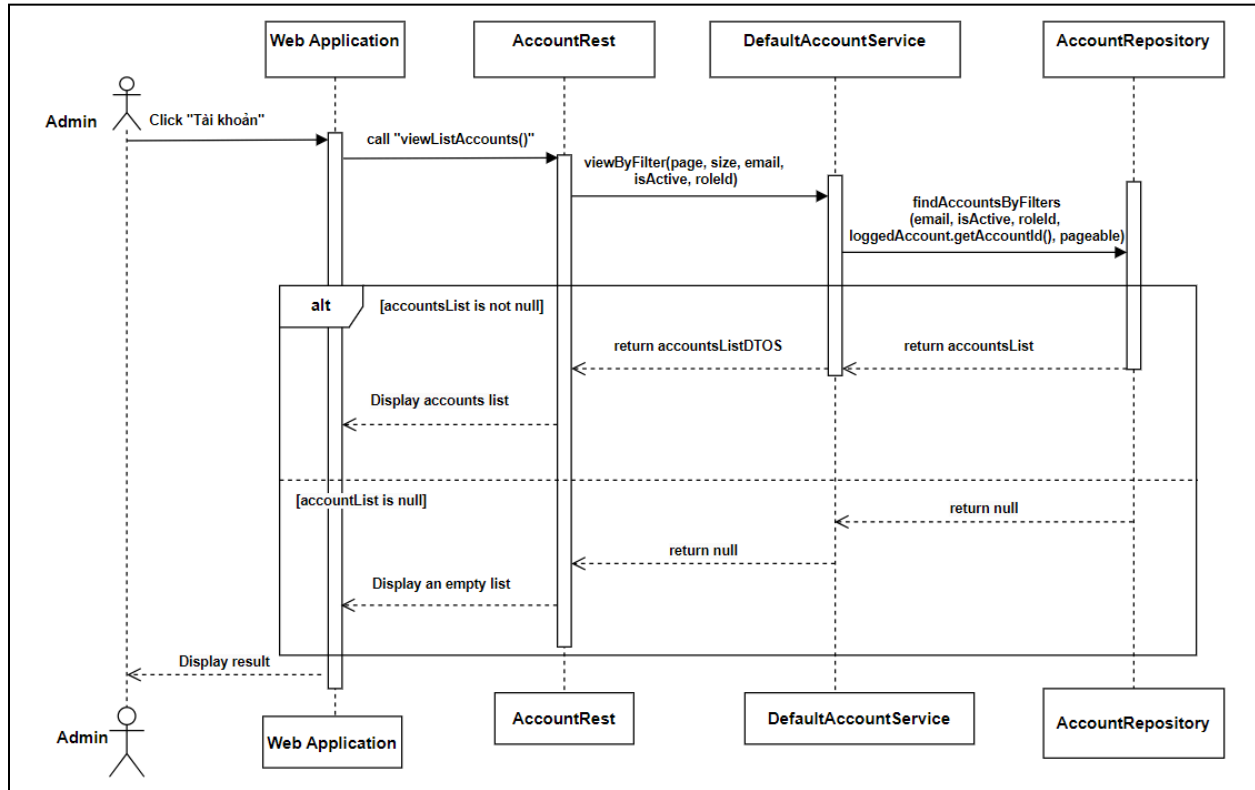


Figure 4.23 Sequence Diagram of “View list account”

3.5.3 Sequence Diagram of “View Detail Account”

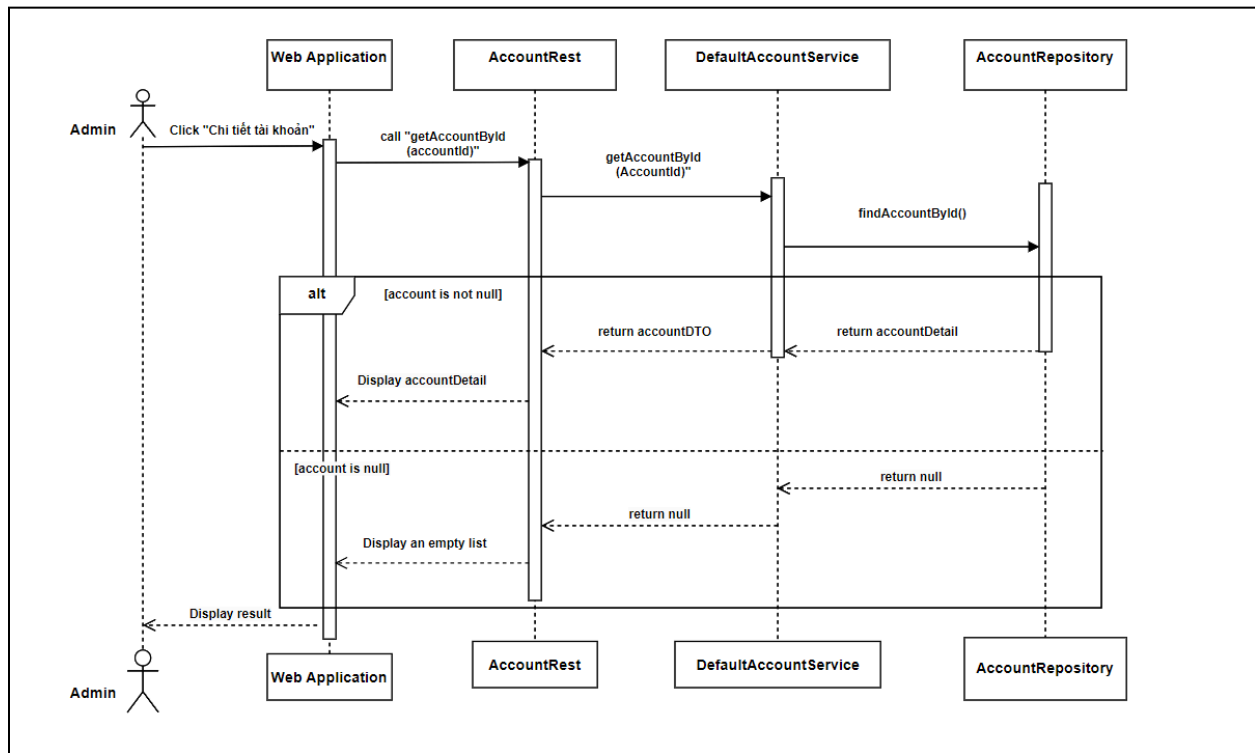


Figure 4.24 Sequence Diagram of “View detail account”

3.5.4 Sequence Diagram of "Create Account"

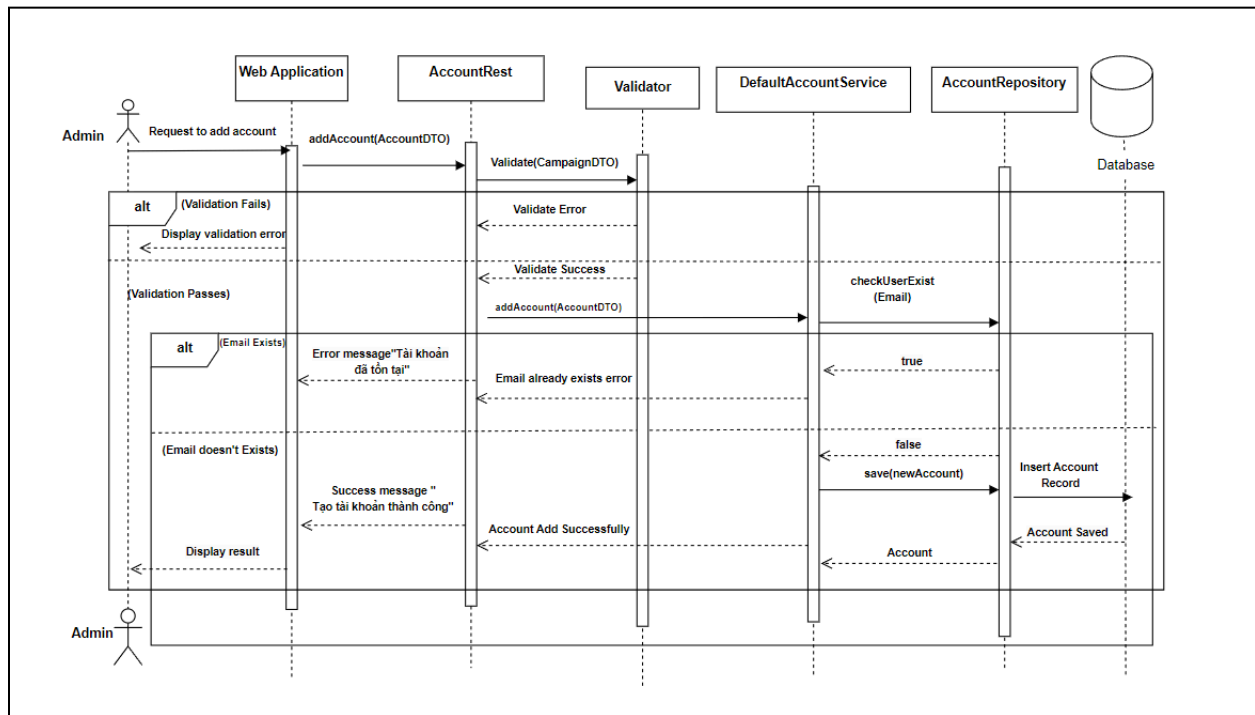


Figure 4.25 Sequence Diagram of "Create account"

3.5.5 Sequence Diagram of "Update Account"

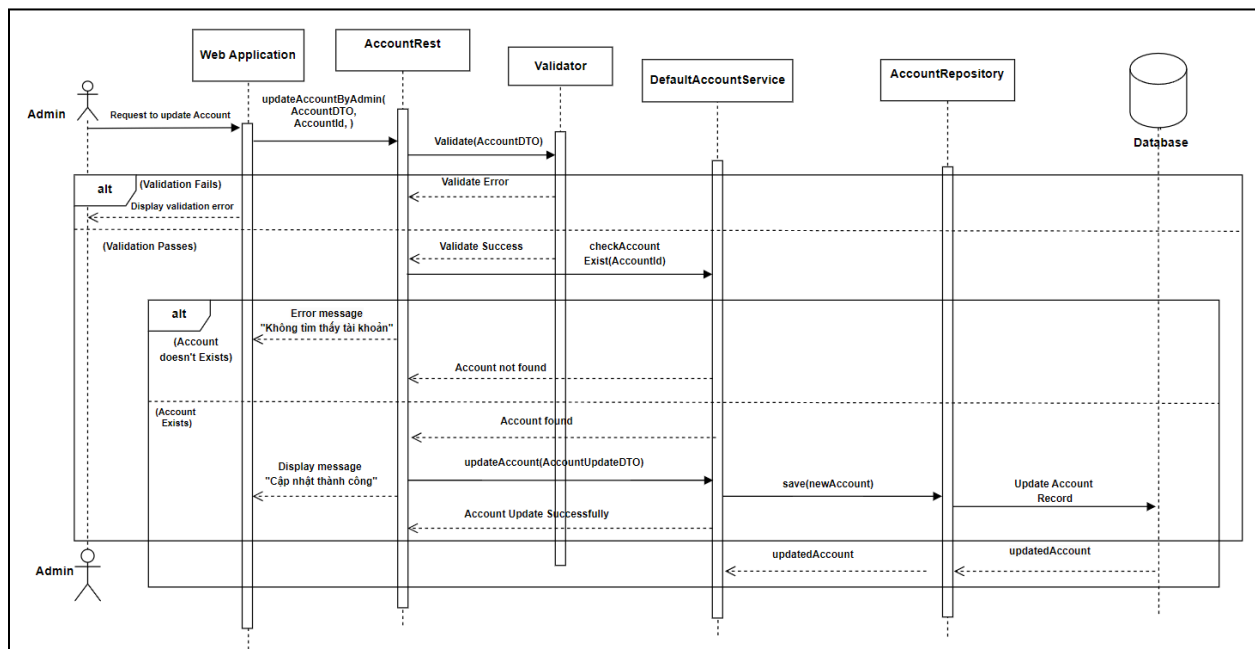


Figure 4.26 Sequence Diagram of “Update account”

3.6 Project Management

3.6.1 Class Diagram

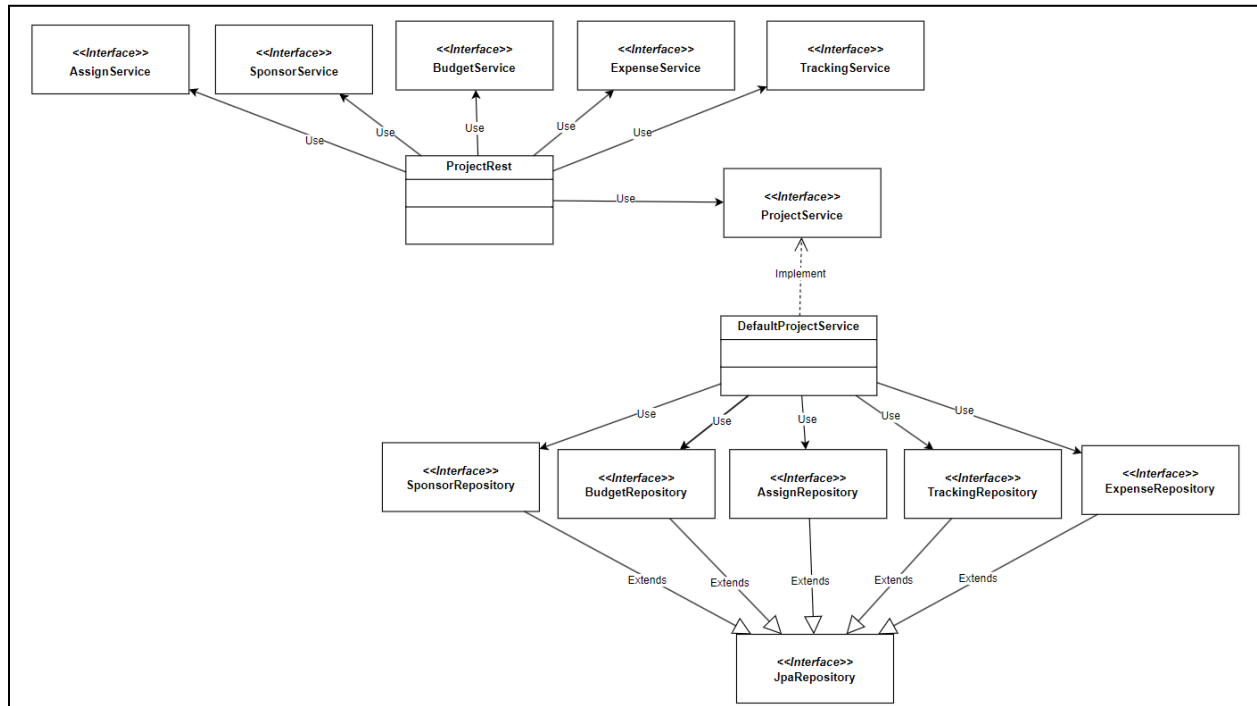


Figure 4.27 Class diagram of project management

3.6.2 Sequence Diagram of “View List Project”

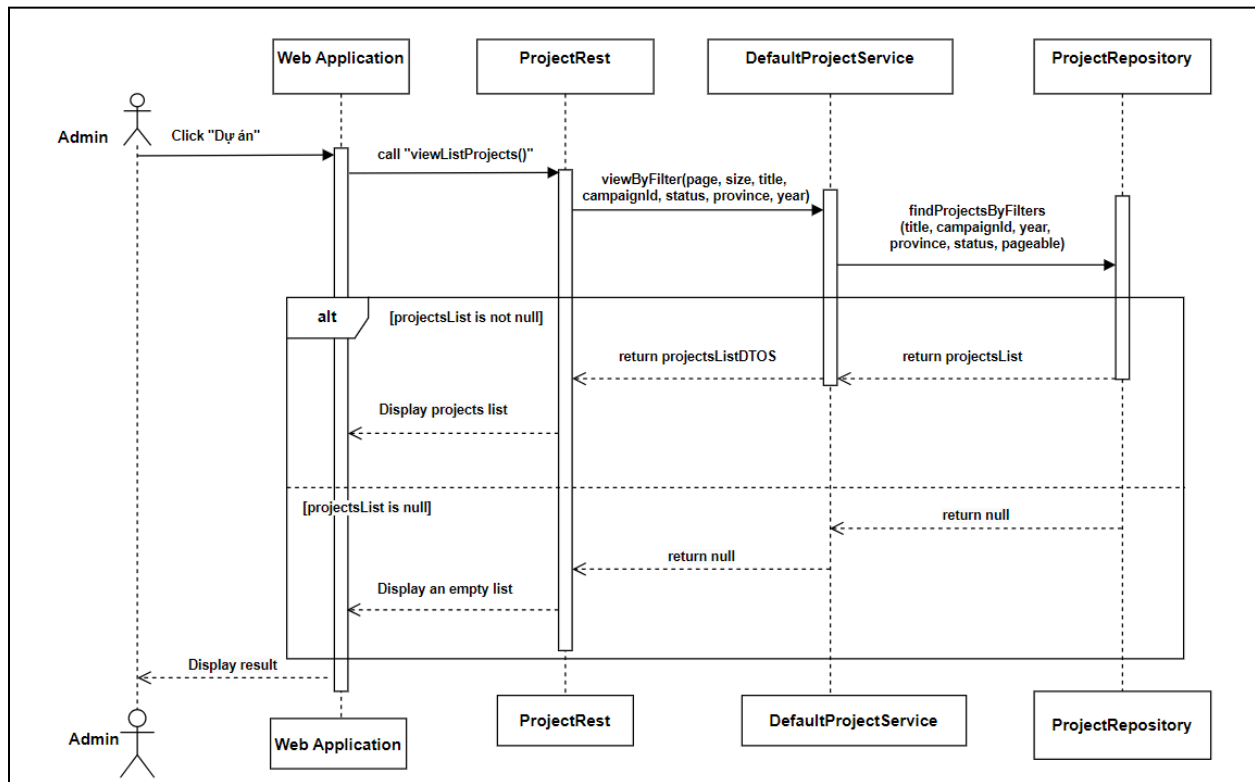


Figure 4.28 Sequence Diagram of “View list project”

3.6.3 Sequence Diagram of “View Detail Project”

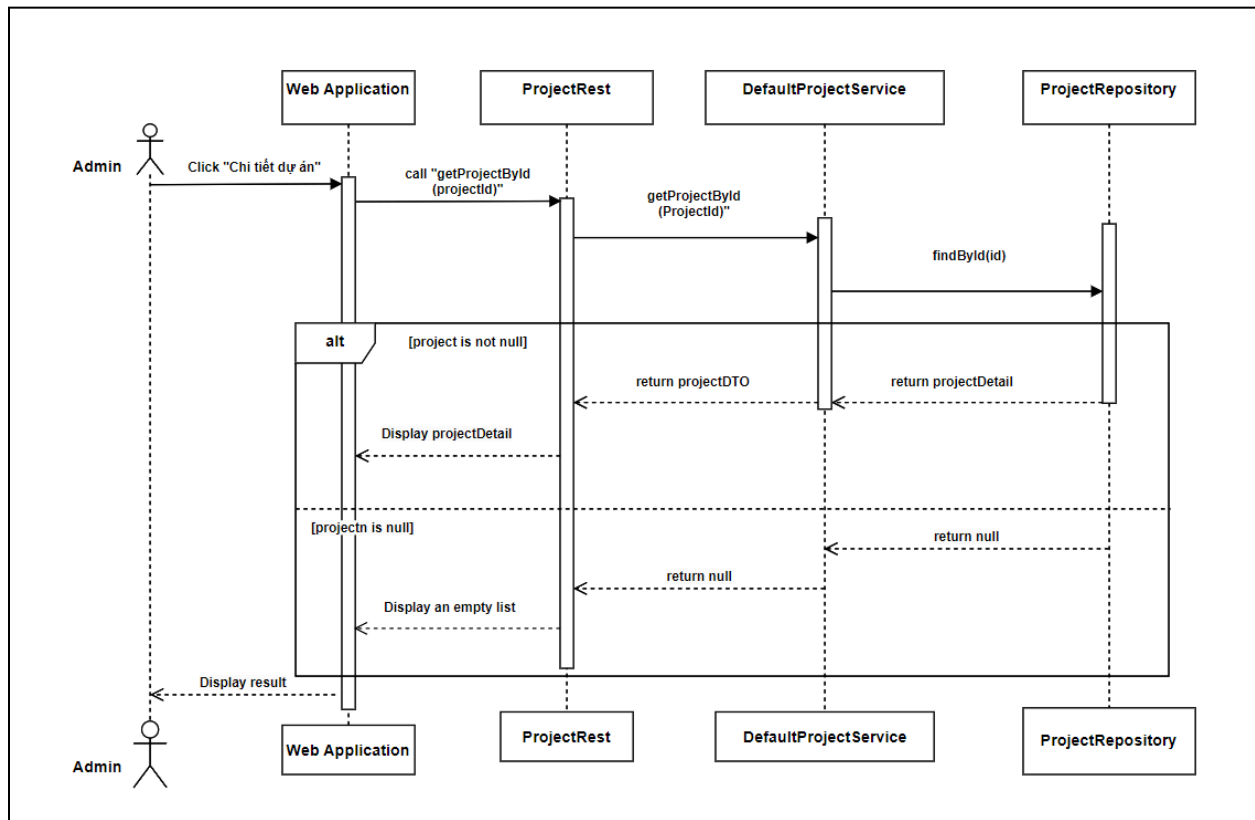


Figure 4.29 Sequence Diagram of “View detail project”

3.6.4 Sequence Diagram of "Create Project"

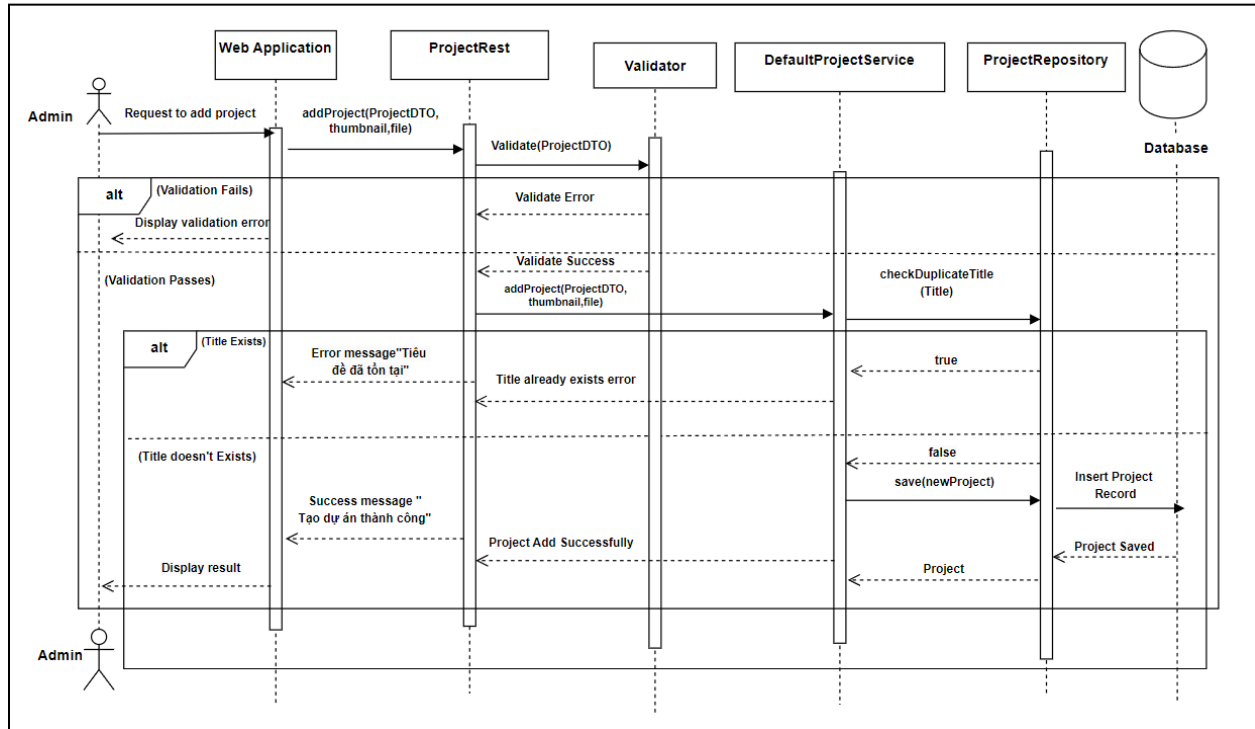


Figure 4.30 Sequence Diagram of "Create project"

3.6.5 Sequence Diagram of "Update Project"

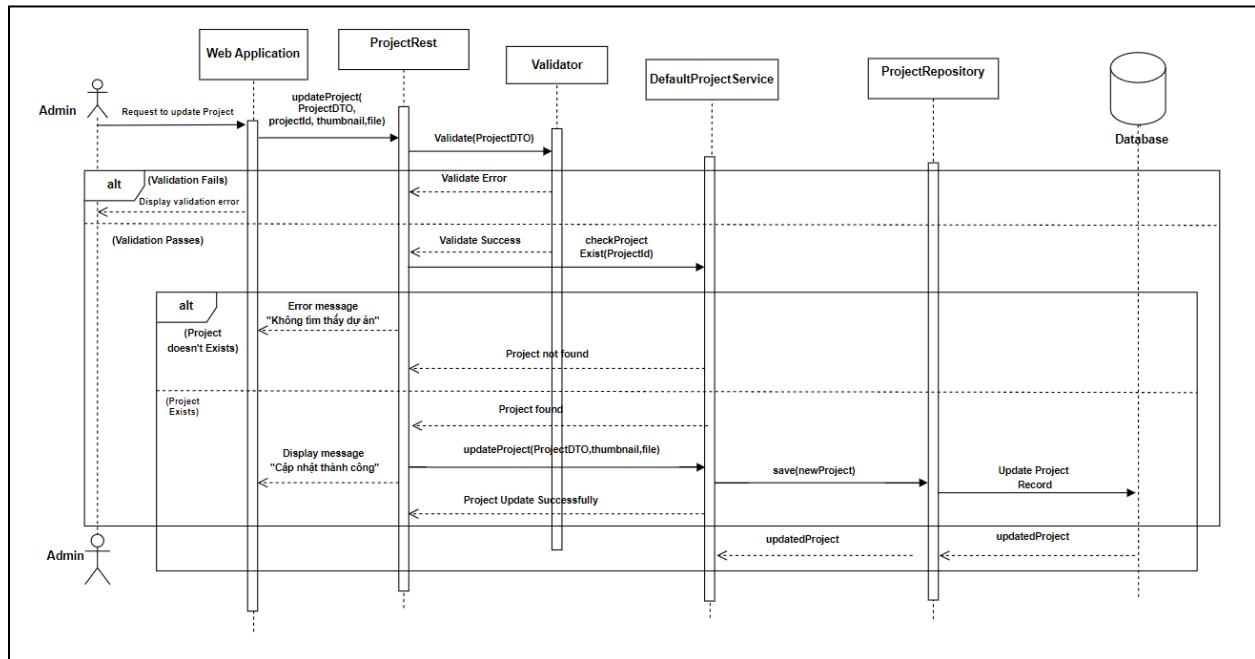


Figure 4.31 Sequence Diagram of "Update project"

3.6.6 Sequence Diagram of "View List Budget"

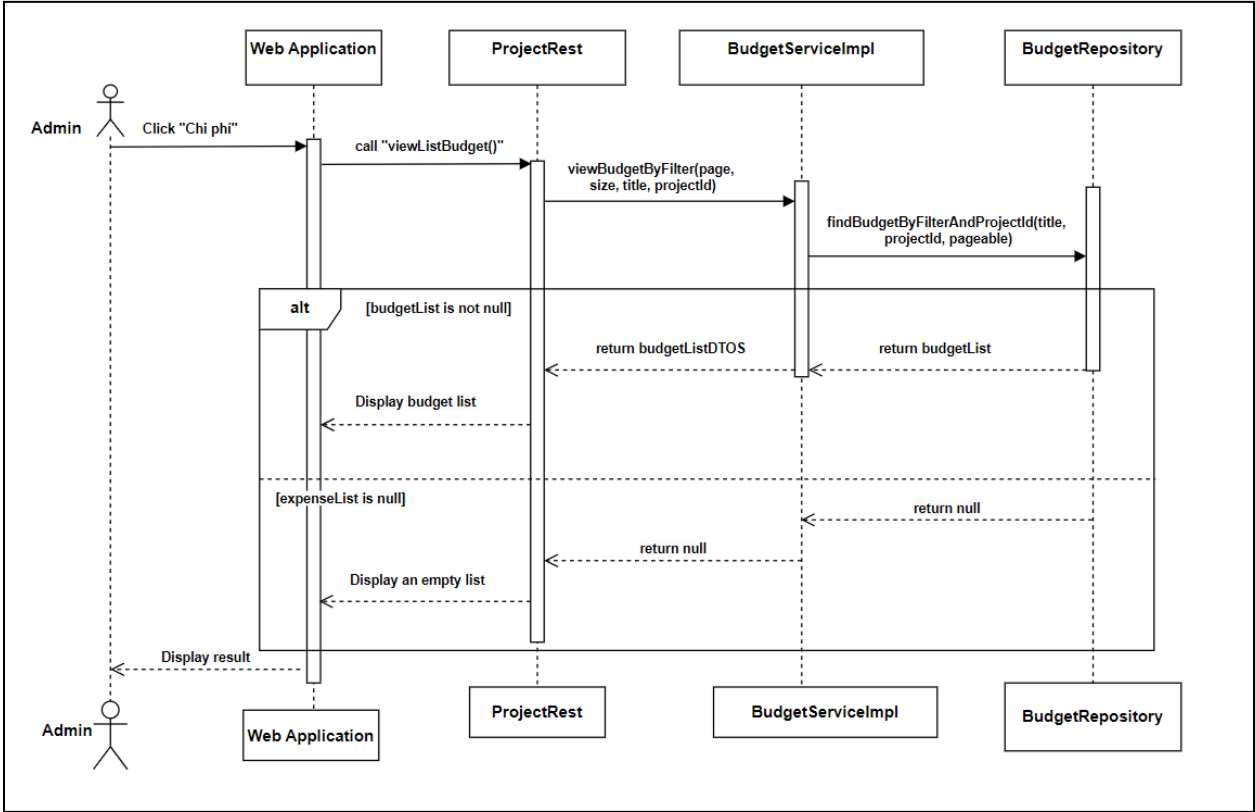


Figure 4.32 Sequence Diagram of "View list budget"

3.6.7 Sequence Diagram of "Create Budget"

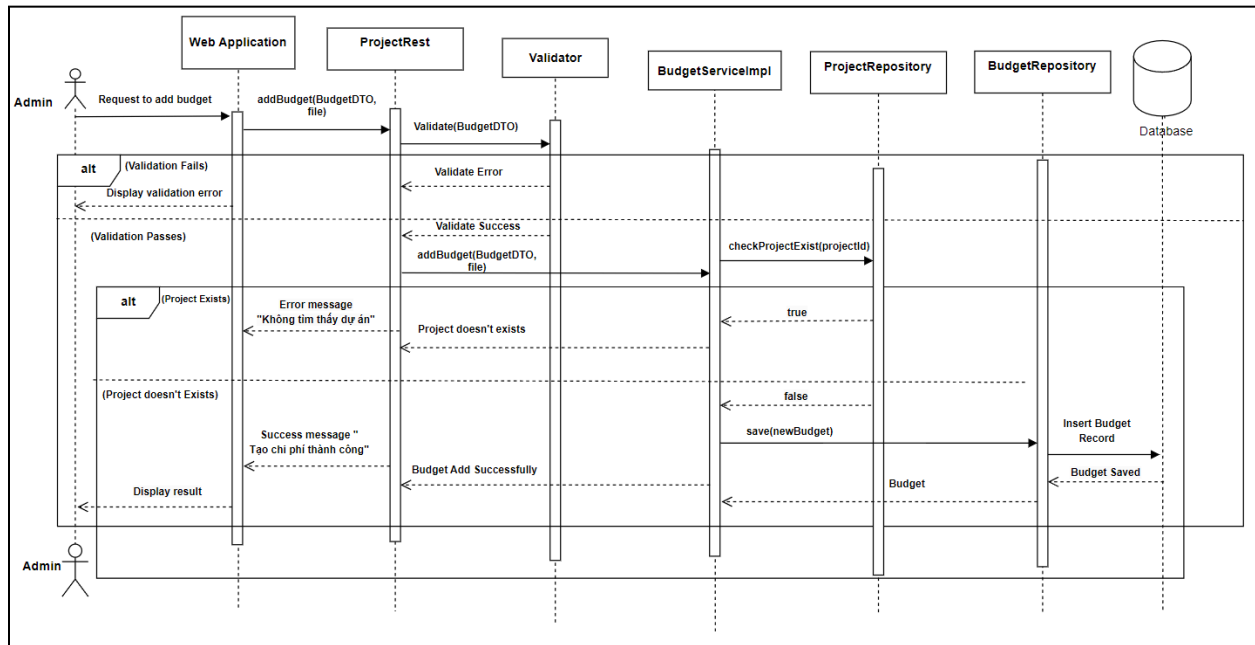


Figure 4.33 Sequence Diagram of "Create budget"

3.6.8 Sequence Diagram of "View Detail Budget"

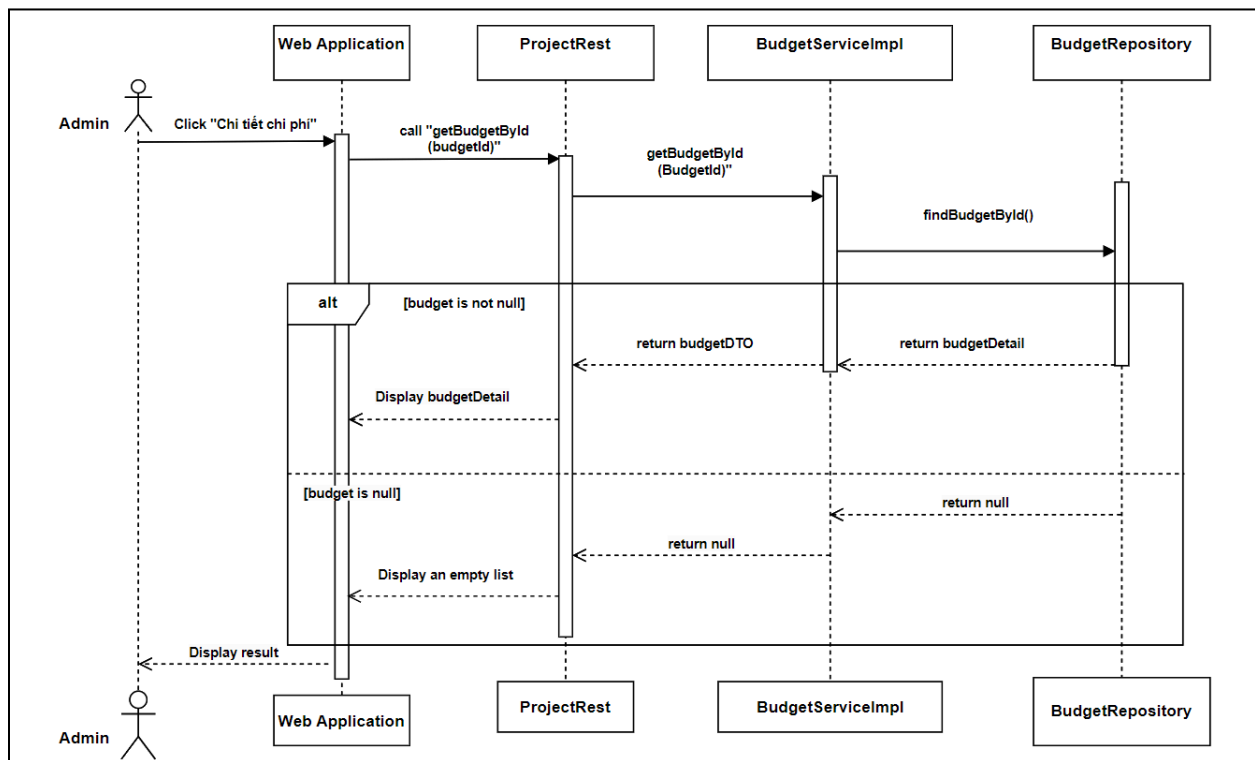


Figure 4.34 Sequence Diagram of “View detail budget”

3.6.9 Sequence Diagram of “Update Budget”

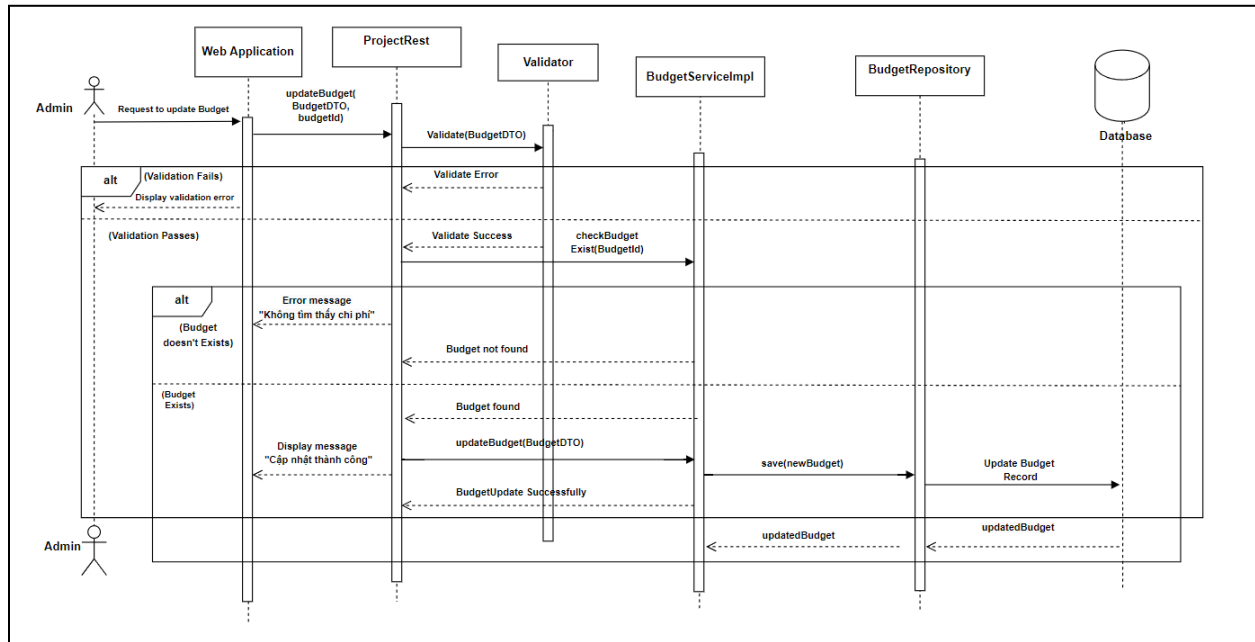


Figure 4.35 Sequence Diagram of “Update budget”

3.6.10 Sequence Diagram of “Delete Budget”

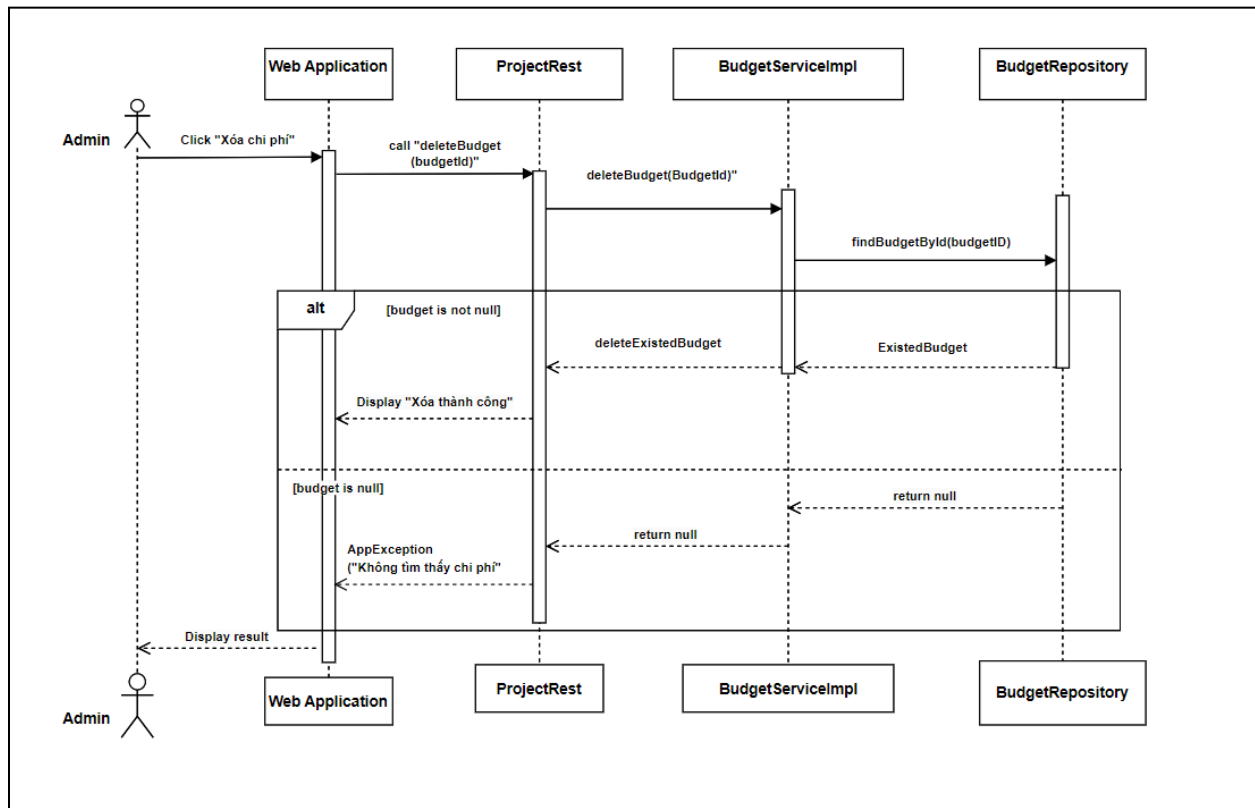


Figure 4.36 Sequence Diagram of “Delete budget

3.6.11 Sequence Diagram of "View List Expense"

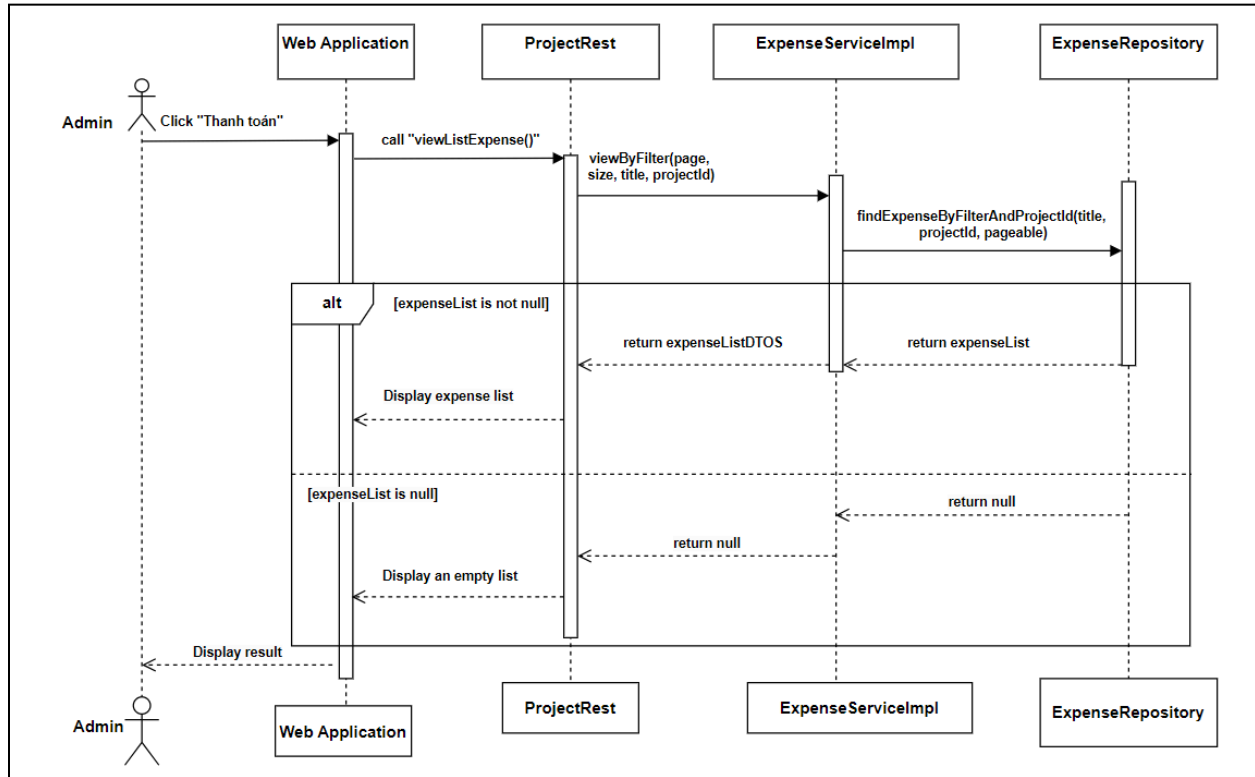


Figure 4.37 Sequence Diagram of "View list expense"

3.6.12 Sequence Diagram of "Create Expense"

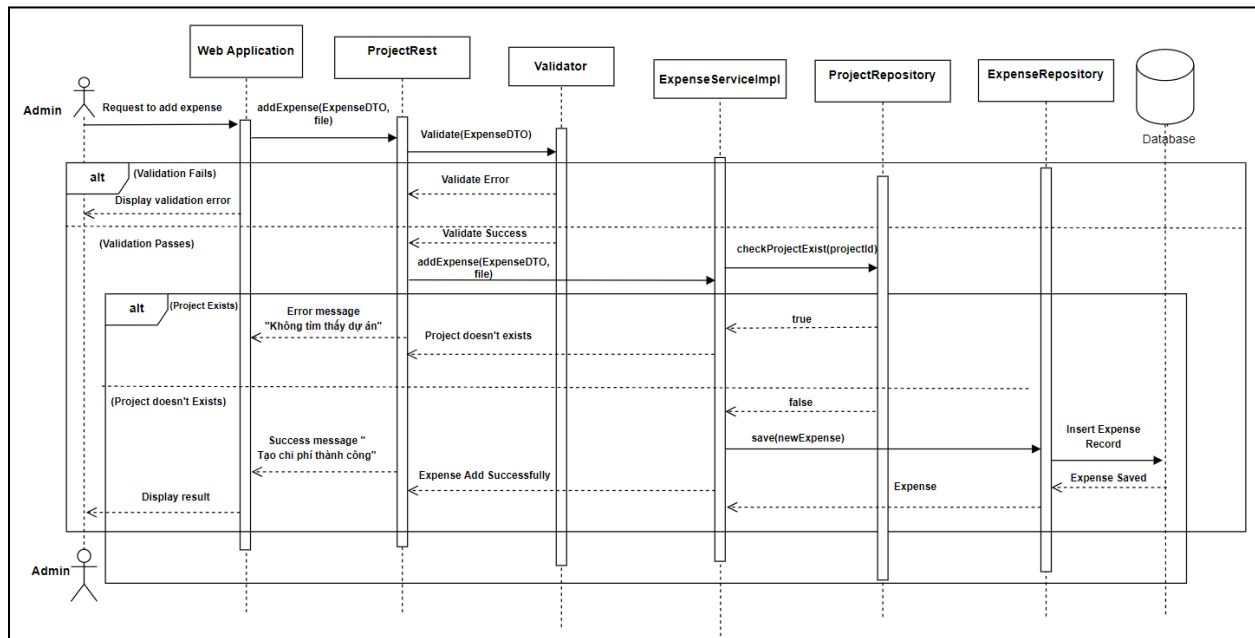


Figure 4.38 Sequence Diagram of “Create expense”

3.6.13 Sequence Diagram of “View Detail Expense”

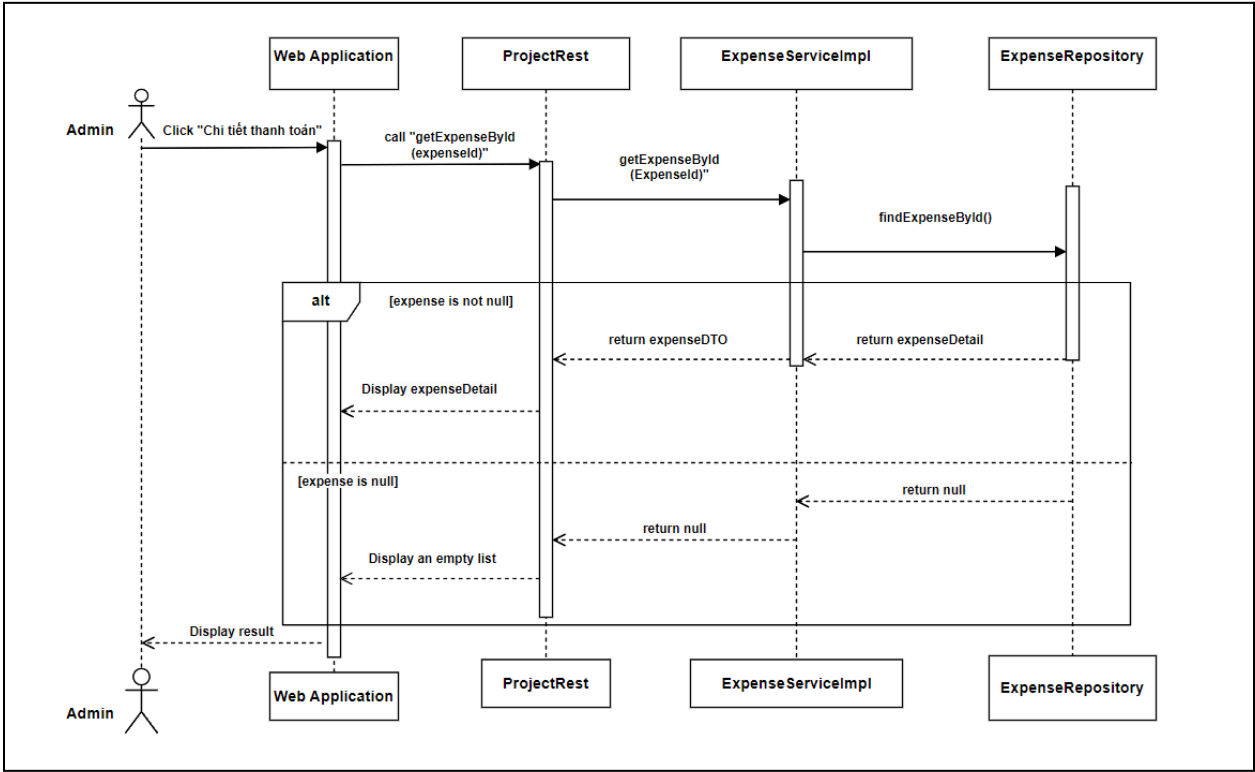


Figure 4.39 Sequence Diagram of “View detail expense”

3.6.14 Sequence Diagram of "Update Expense"

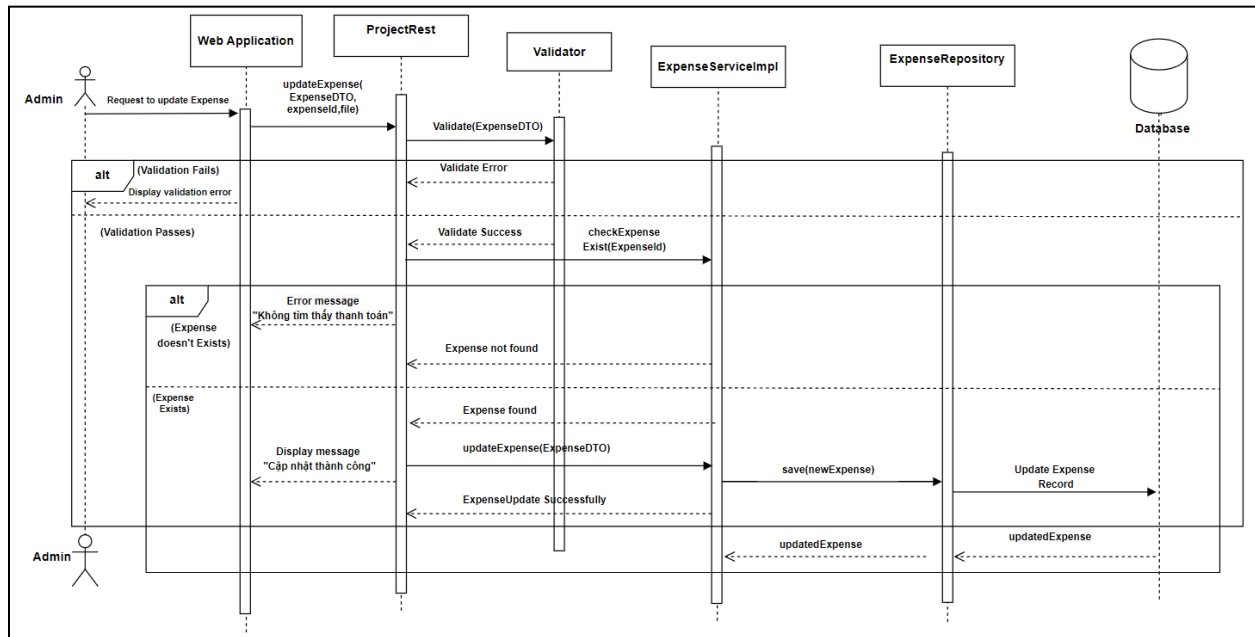


Figure 4.40 Sequence Diagram of "Update expense"

3.6.15 Sequence Diagram of "Delete Expense"

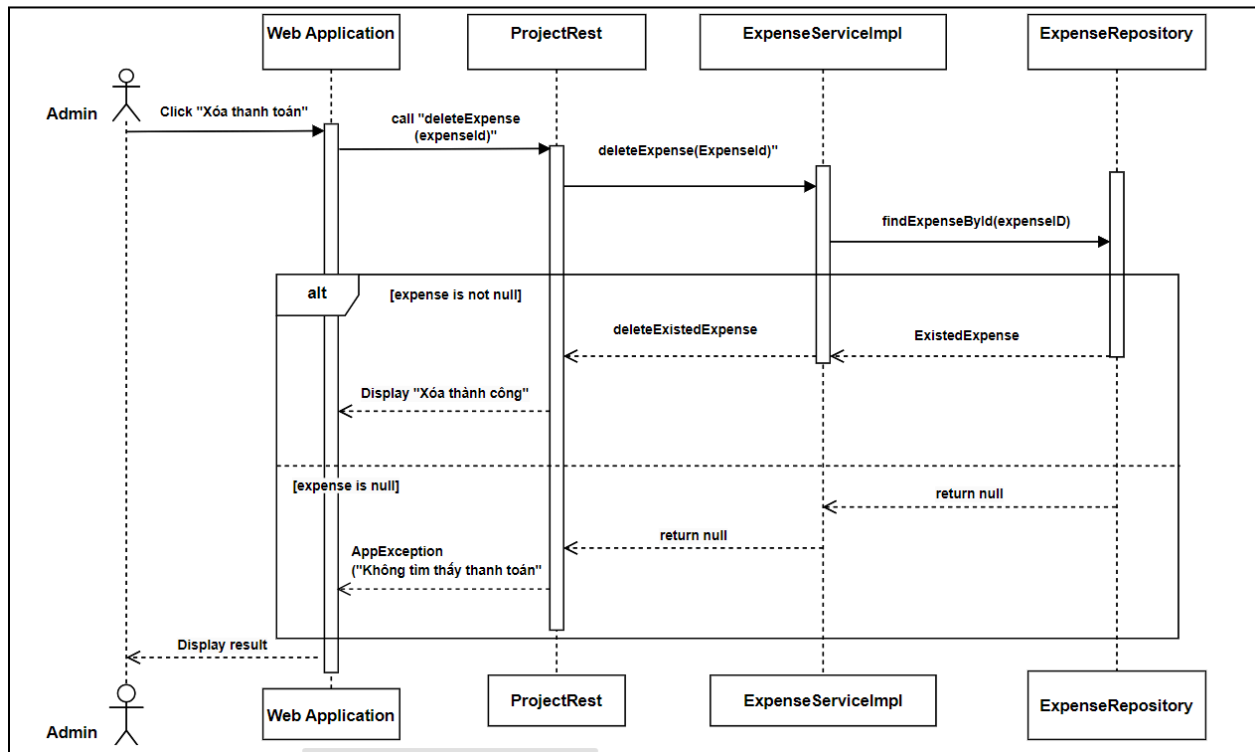


Figure 4.41 Sequence Diagram of “Delete expense”

3.6.16 Sequence Diagram of “View List Sponsor”

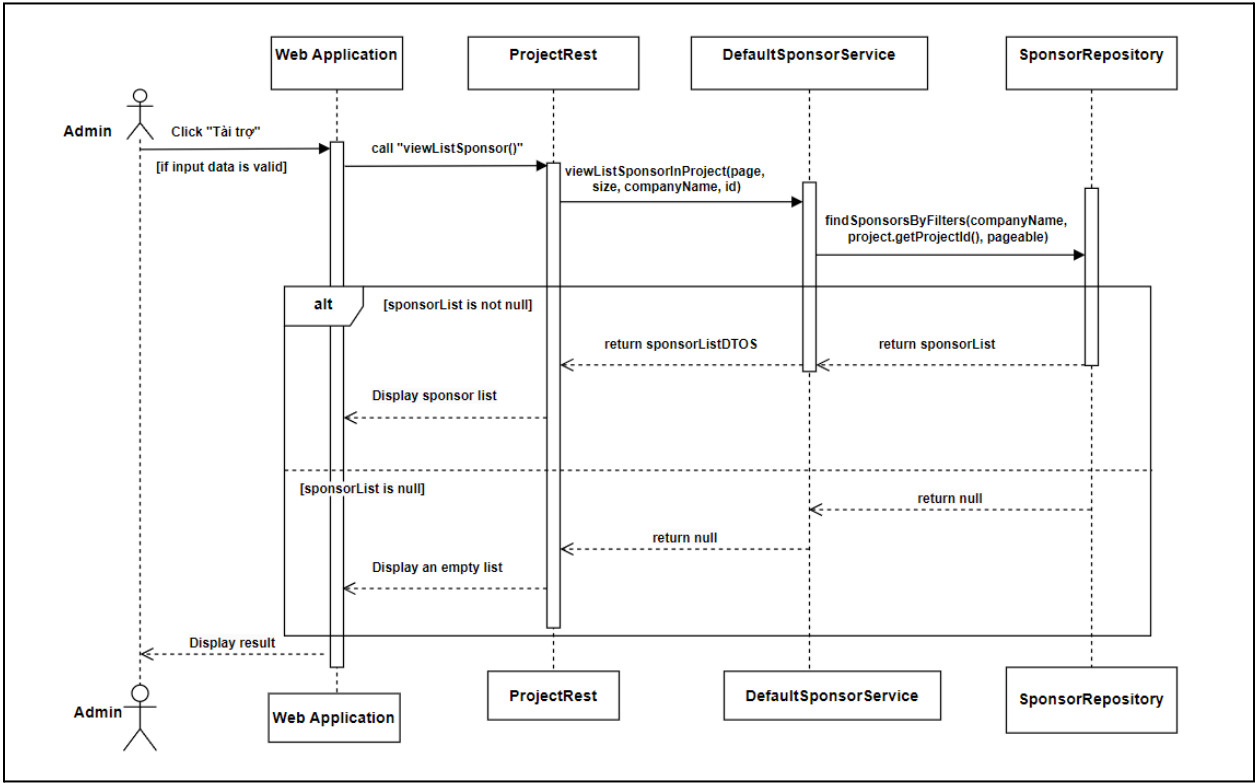


Figure 4.42 Sequence Diagram of “View list sponsor”

3.6.17 Sequence Diagram of “Create Sponsor”

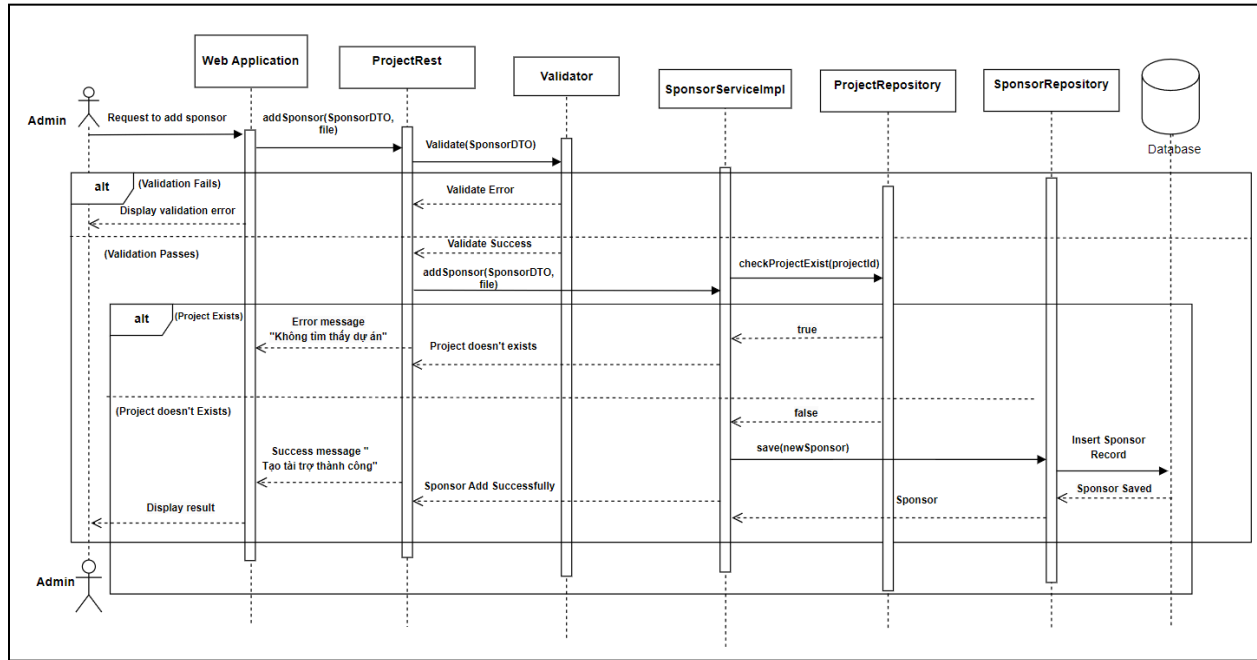


Figure 4.43 Sequence Diagram of “Create sponsor”

3.6.18 Sequence Diagram of “View Detail Sponsor”

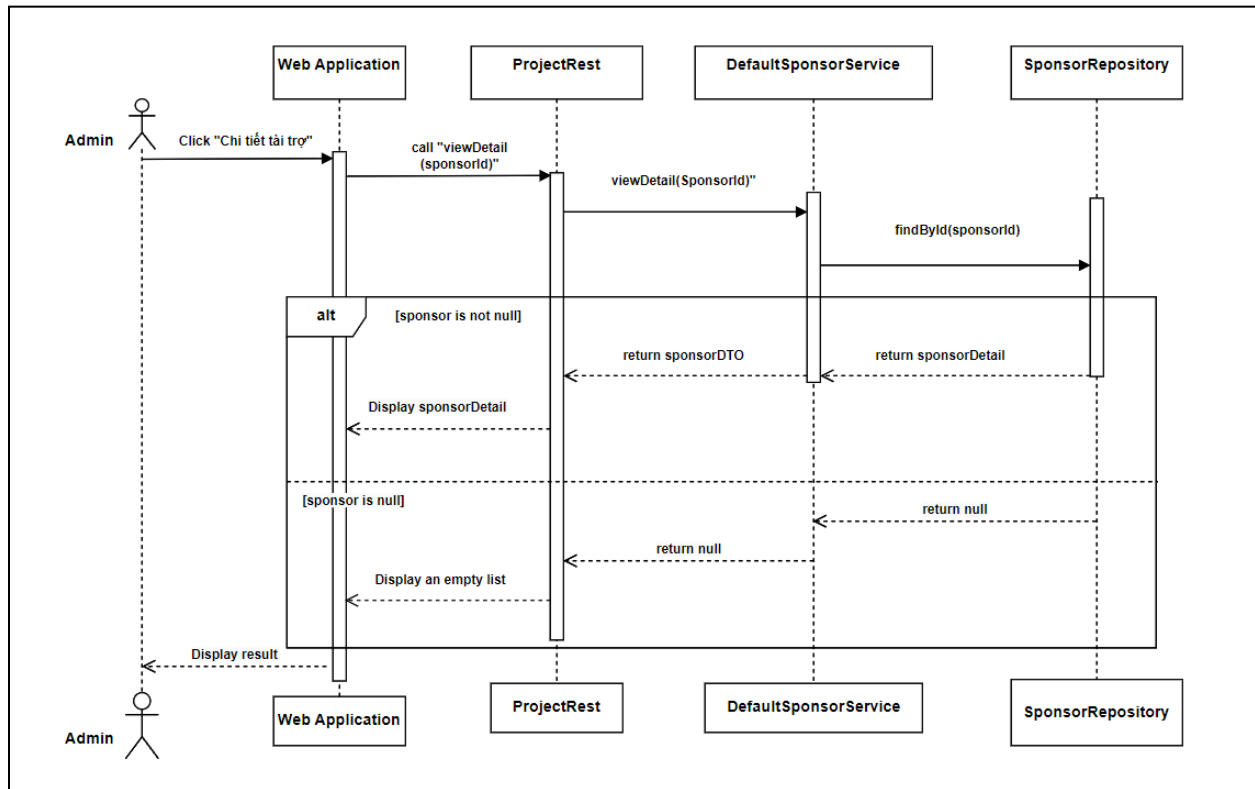


Figure 4.44 Sequence Diagram of “View detail sponsor”

3.6.19 Sequence Diagram of "Update Sponsor"

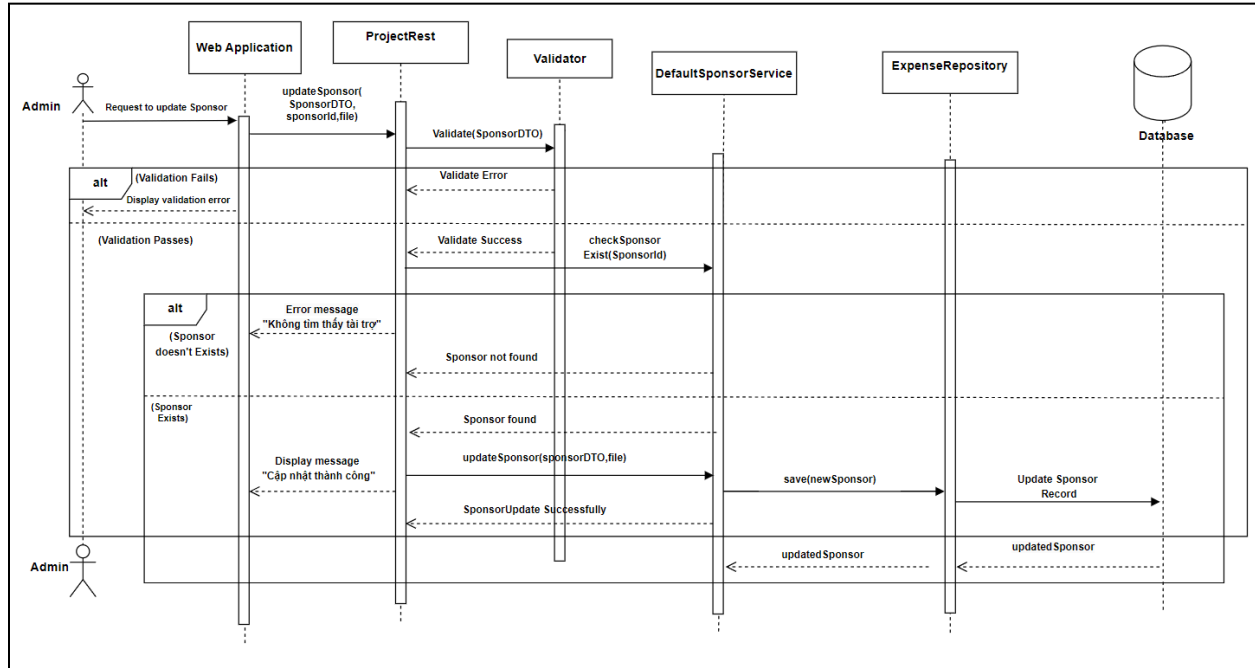


Figure 4.45 Sequence Diagram of "Update sponsor"

3.6.20 Sequence Diagram of “Delete Sponsor”

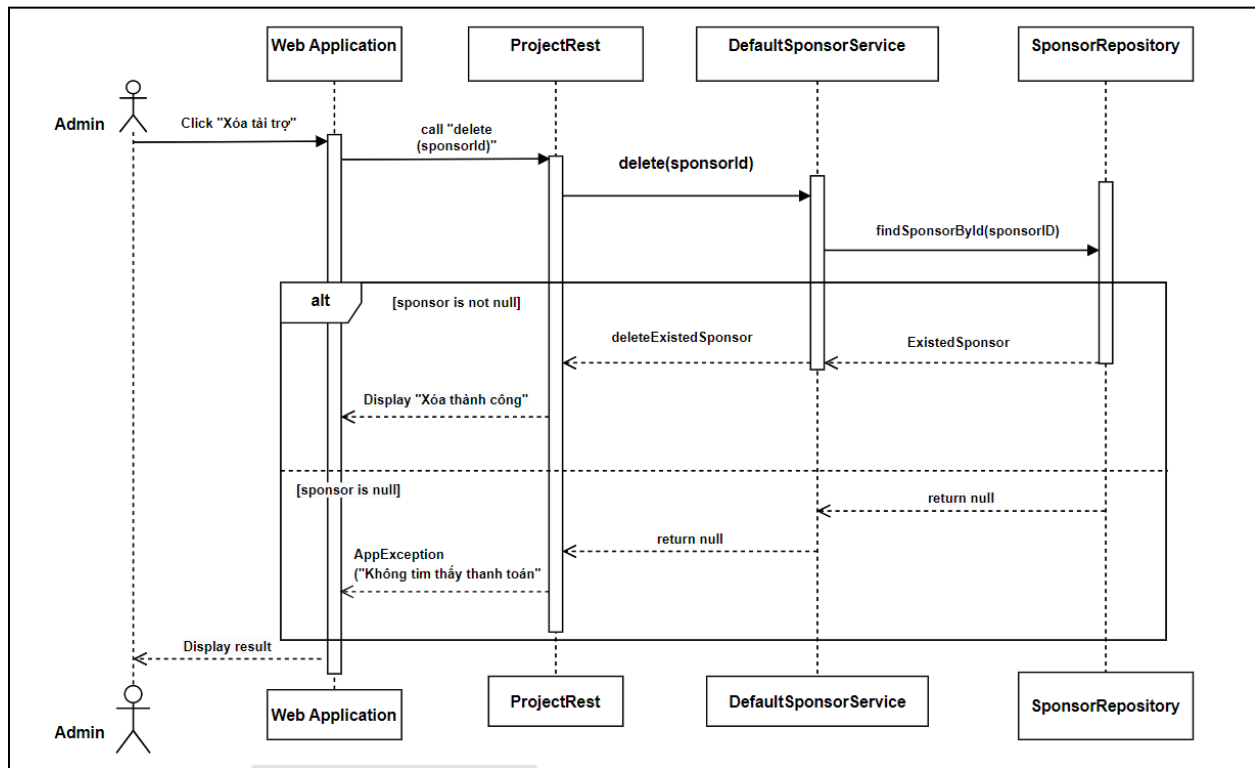


Figure 4.46 Sequence Diagram of “Delete sponsor”

3.6.21 Sequence Diagram of “View List Tracking”

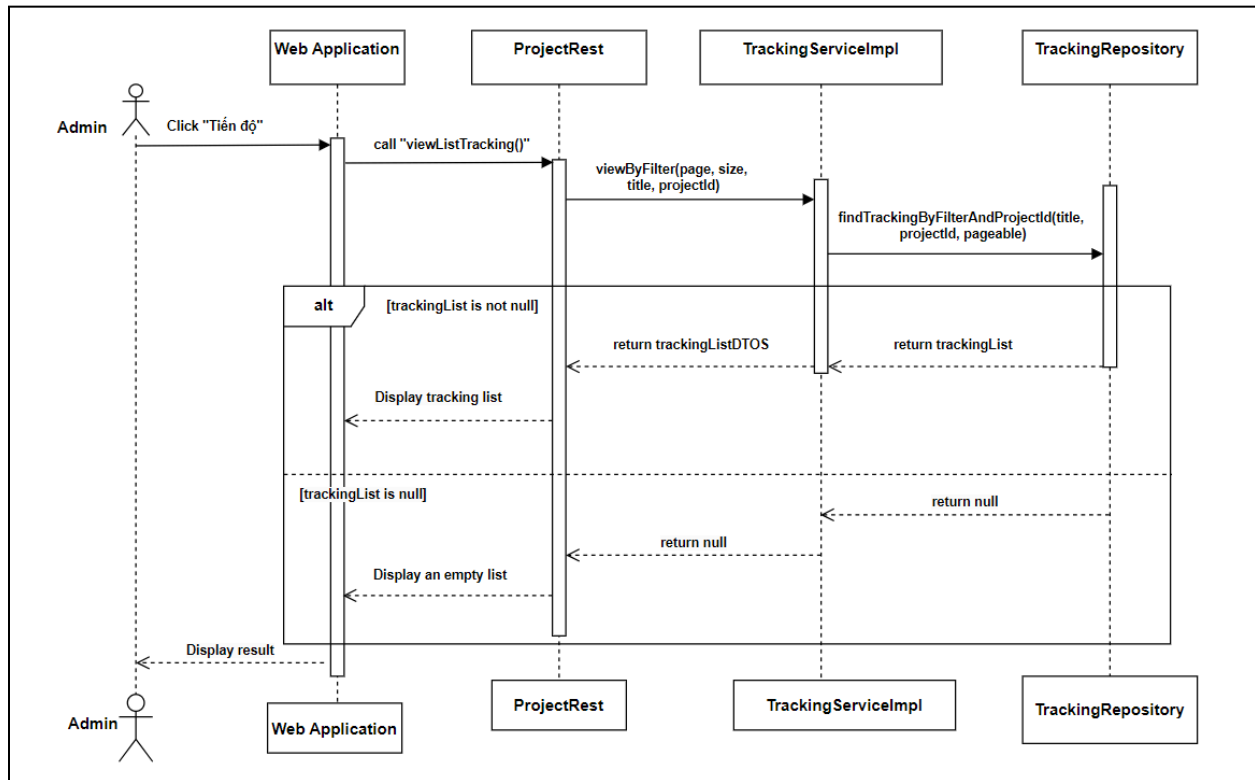


Figure 4.47 Sequence Diagram of “View list tracking”

3.6.22 Sequence Diagram of “Create Tracking”

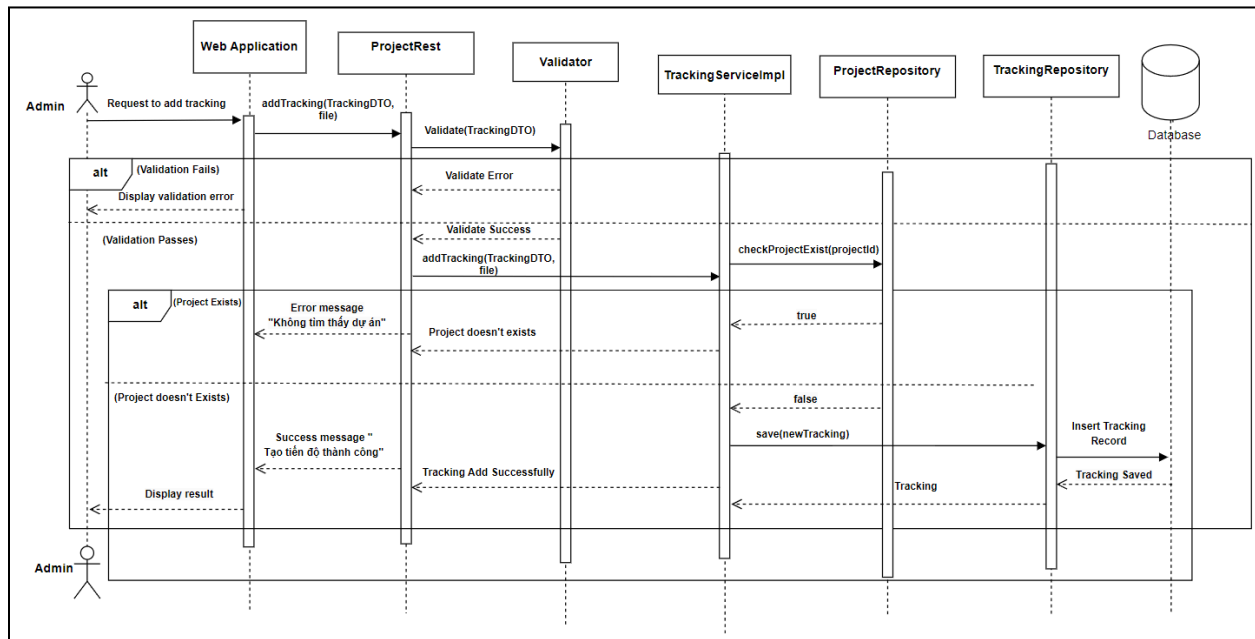


Figure 4.48 Sequence Diagram of “Create tracking”

3.6.23 Sequence Diagram of “View Detail Tracking”

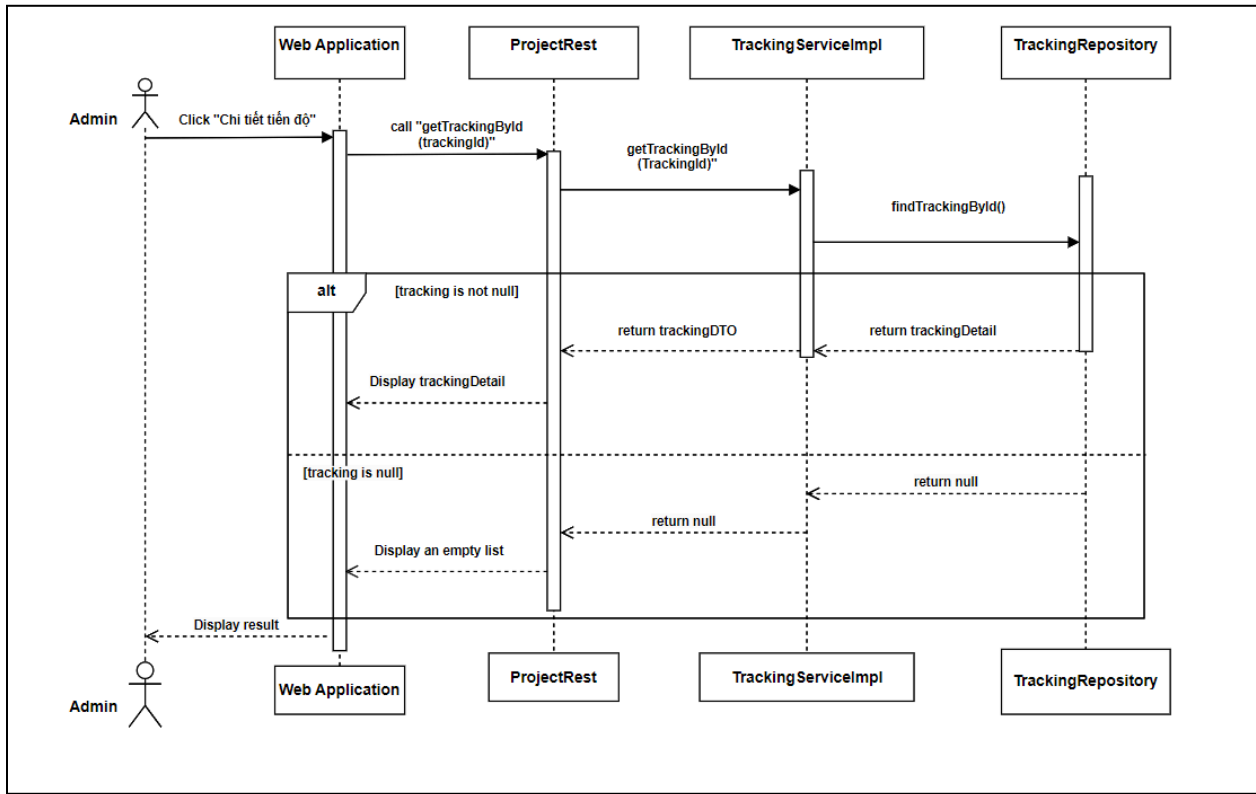


Figure 4.49 Sequence Diagram of “View detail tracking”

3.6.24 Sequence Diagram of "Update Tracking"

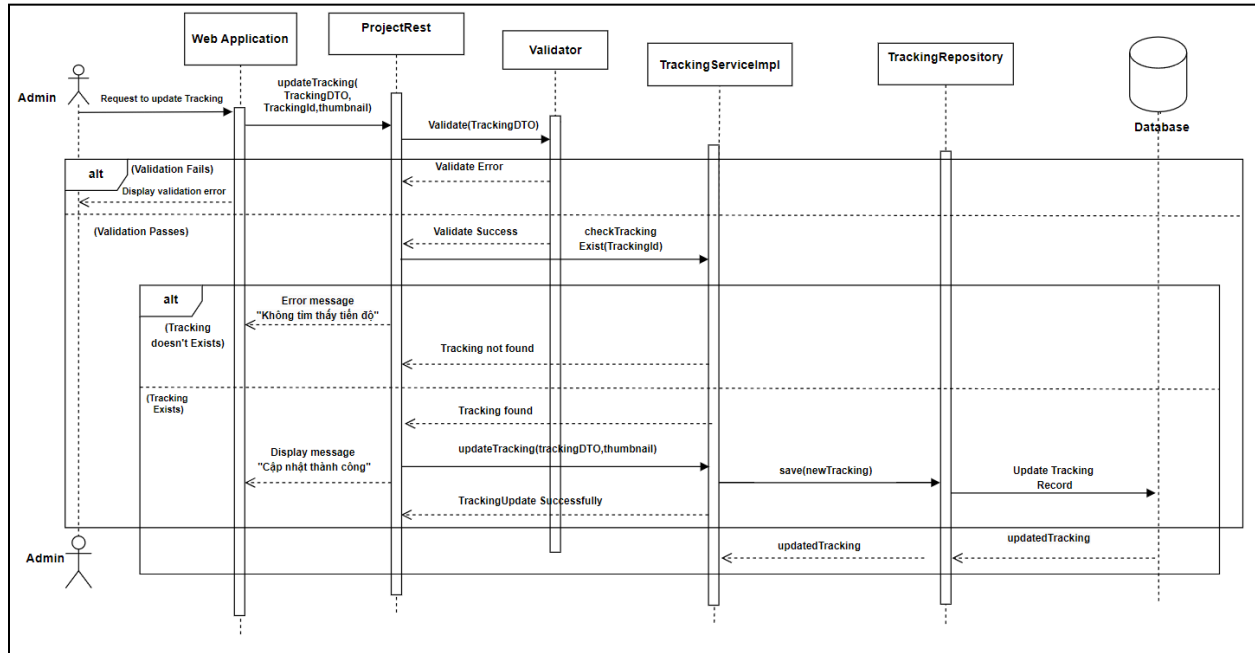


Figure 4.50 Sequence Diagram of "Update tracking"

3.6.25 Sequence Diagram of "Delete Tracking"

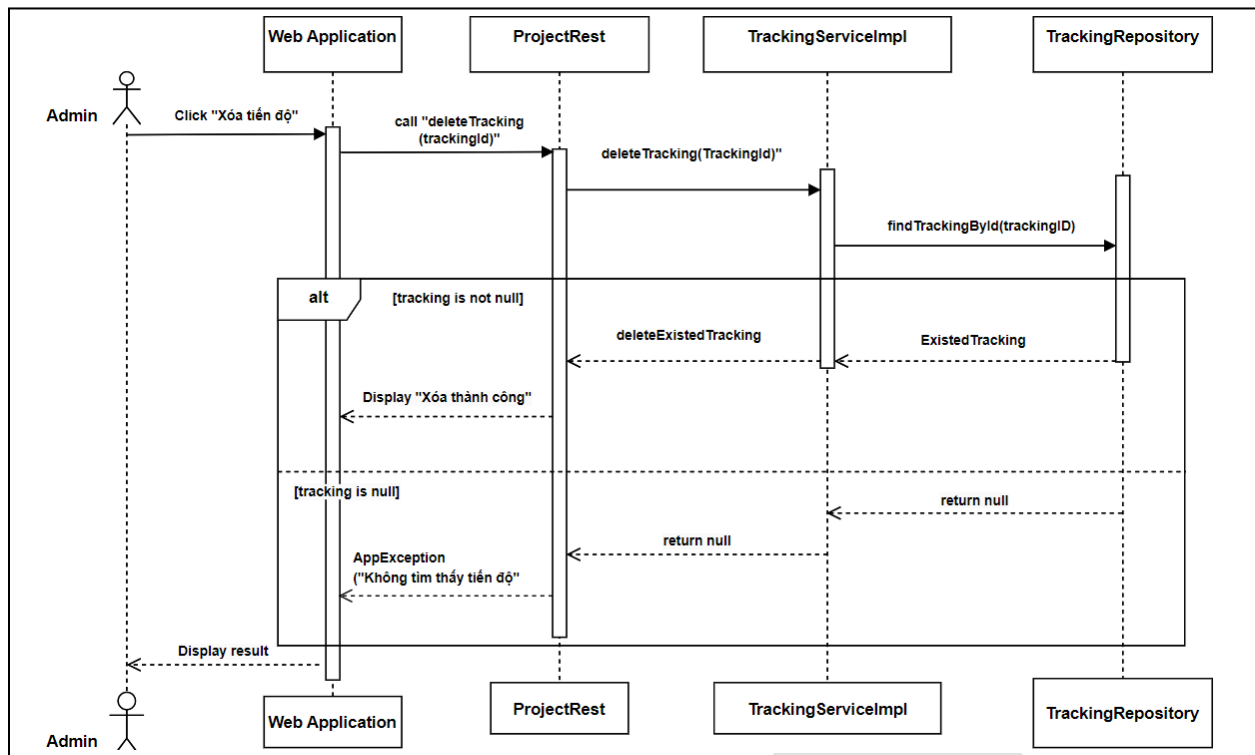


Figure 4.51 Sequence Diagram of “Delete tracking”

3.7 Assign Management

3.7.1 Class Diagram

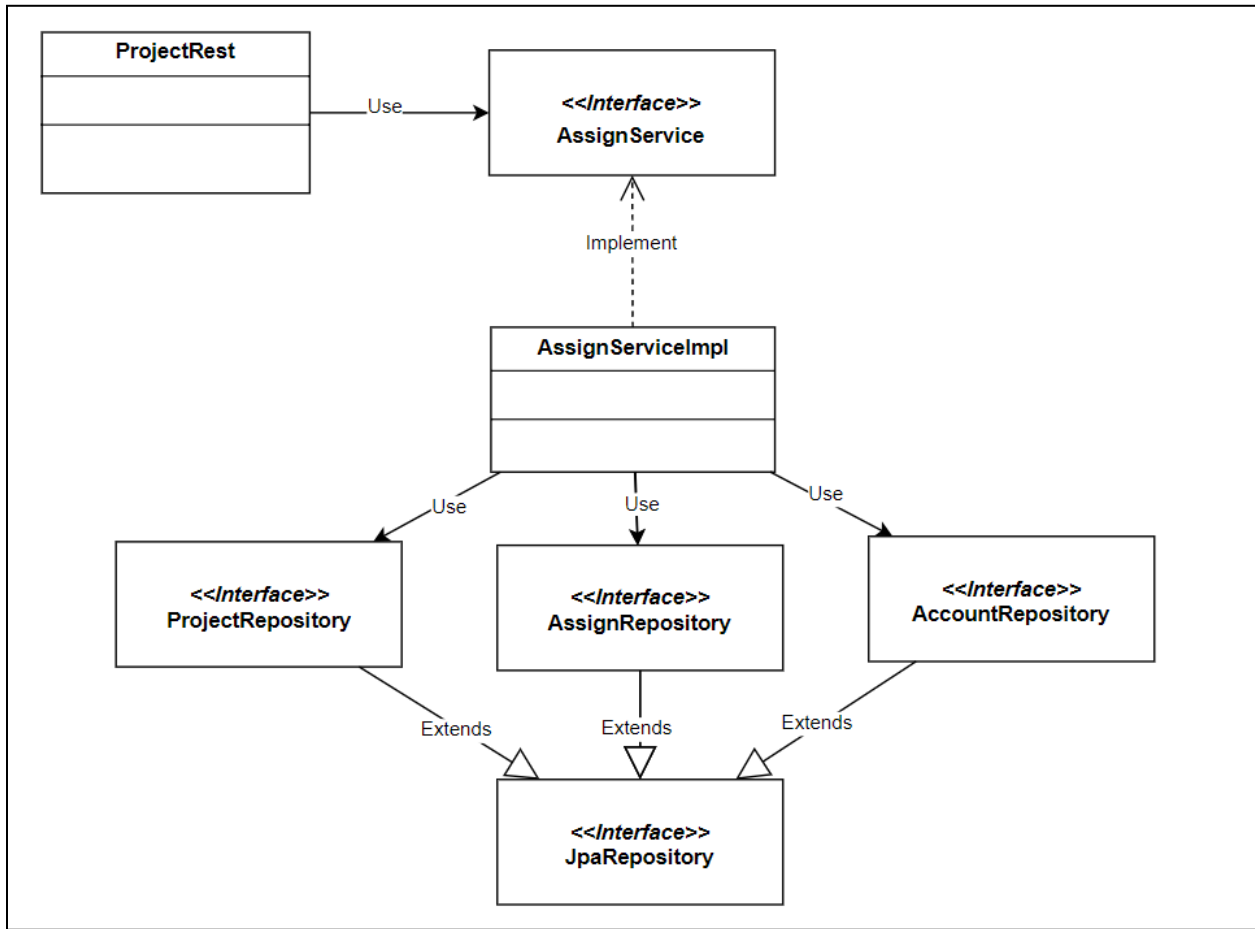


Figure 4.52 Class diagram of assign management

3.7.2 Sequence Diagram of “View List Assign”

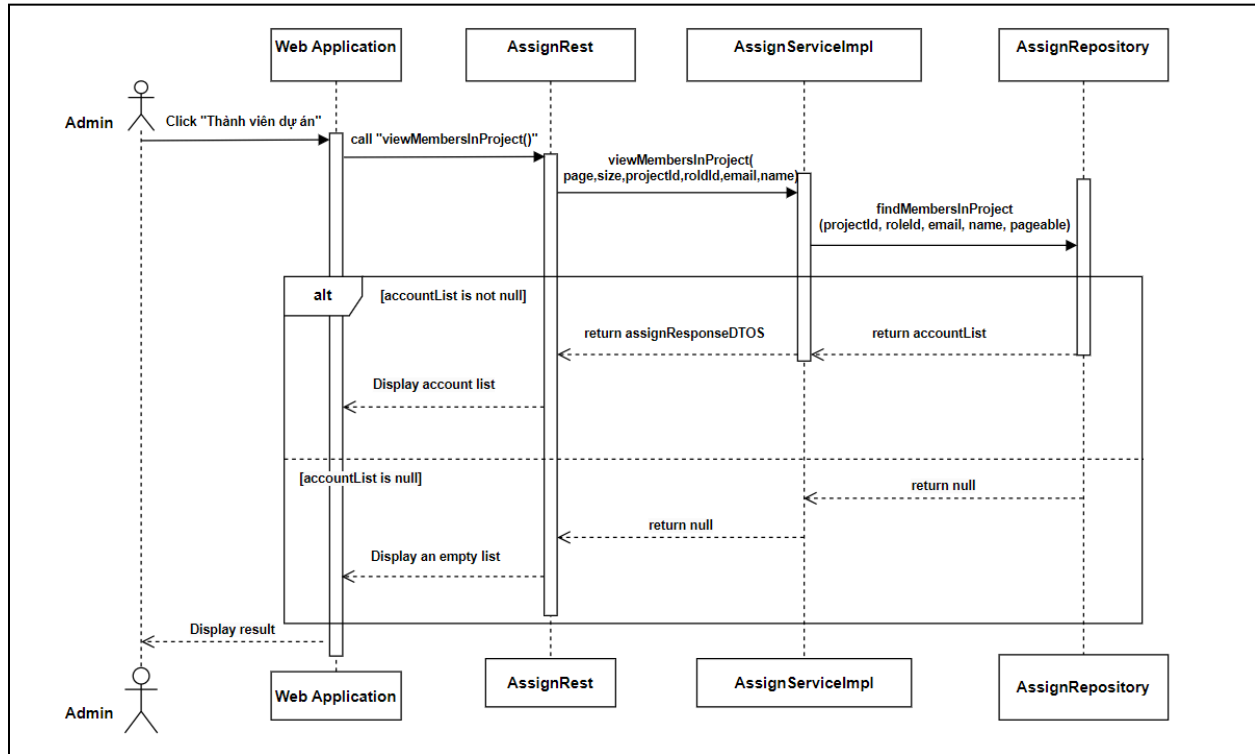


Figure 4.53 Sequence Diagram of “View list assign”

3.7.3 Sequence Diagram of “Add Assign”

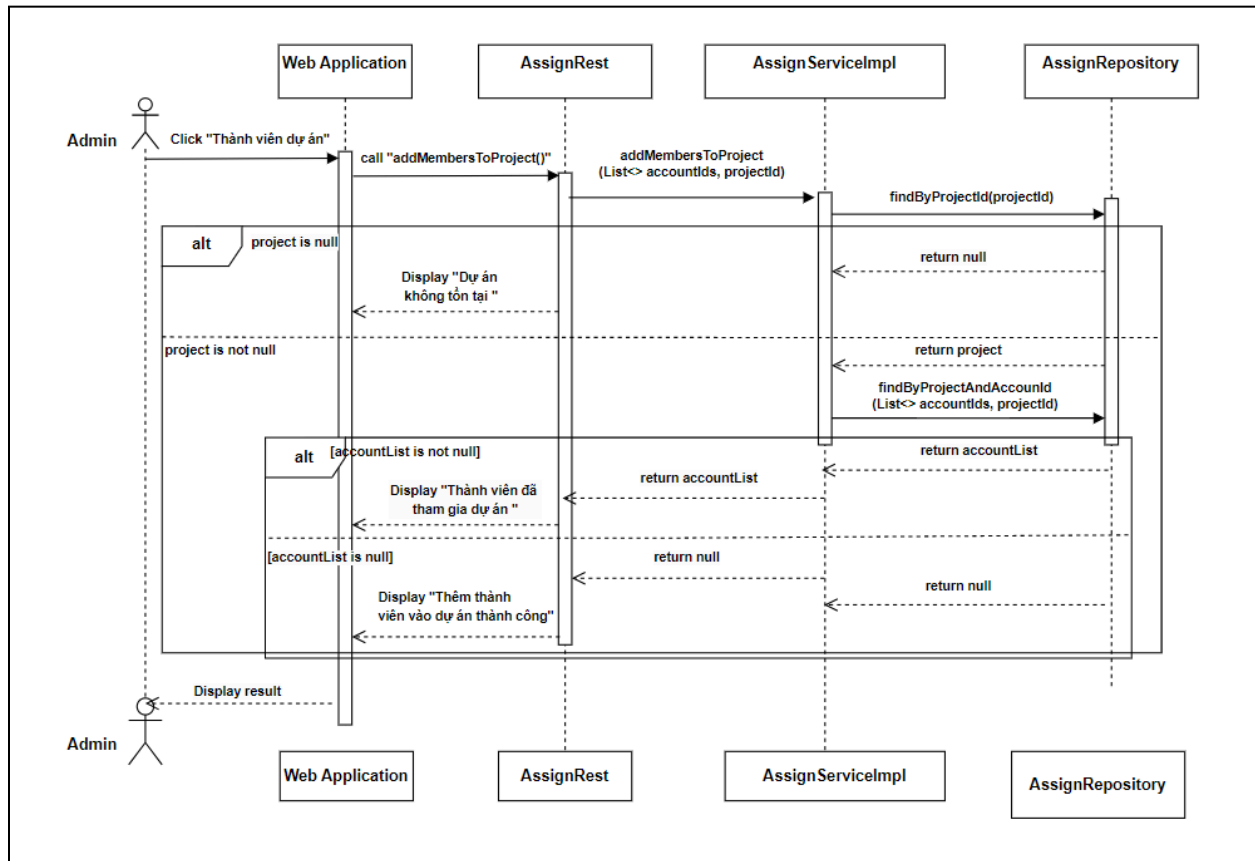


Figure 4.54 Sequence Diagram of “Add assign”

3.7.4 Sequence Diagram of “Delete Assign”

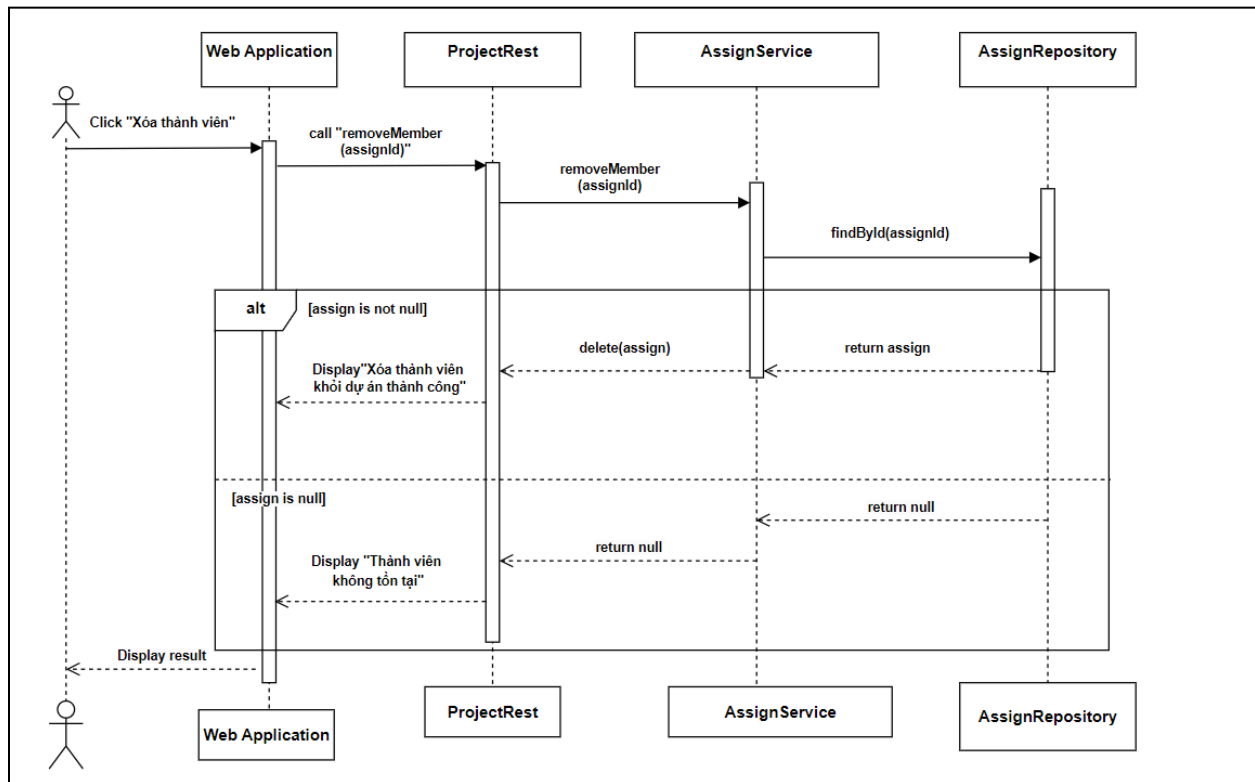


Figure 4.55 Sequence Diagram of “Delete assign”

3.8 Challenge Management

3.8.1 Class Diagram

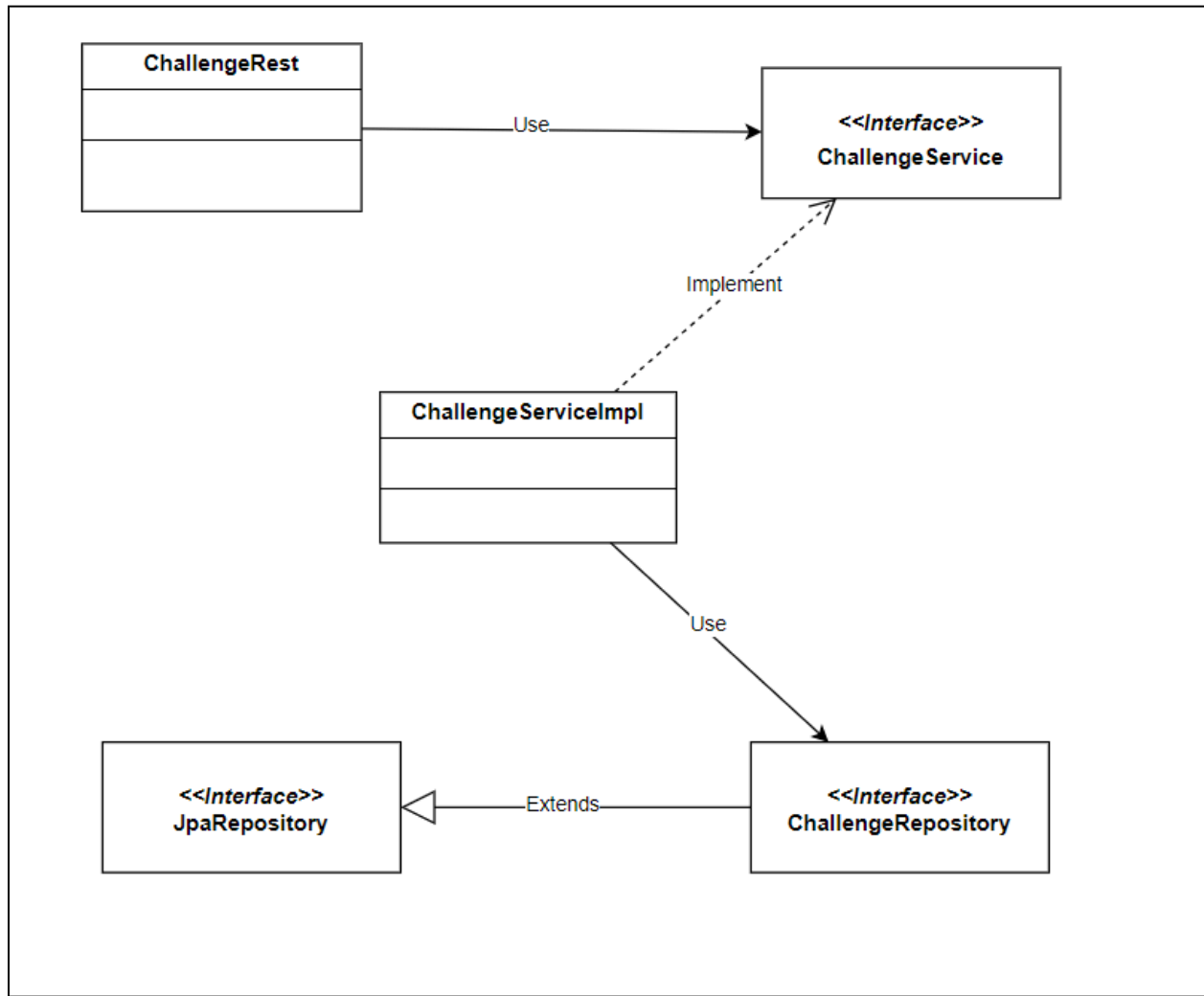


Figure 4.56 Class diagram of challenge management

3.8.2 Sequence Diagram of “View List Challenge”

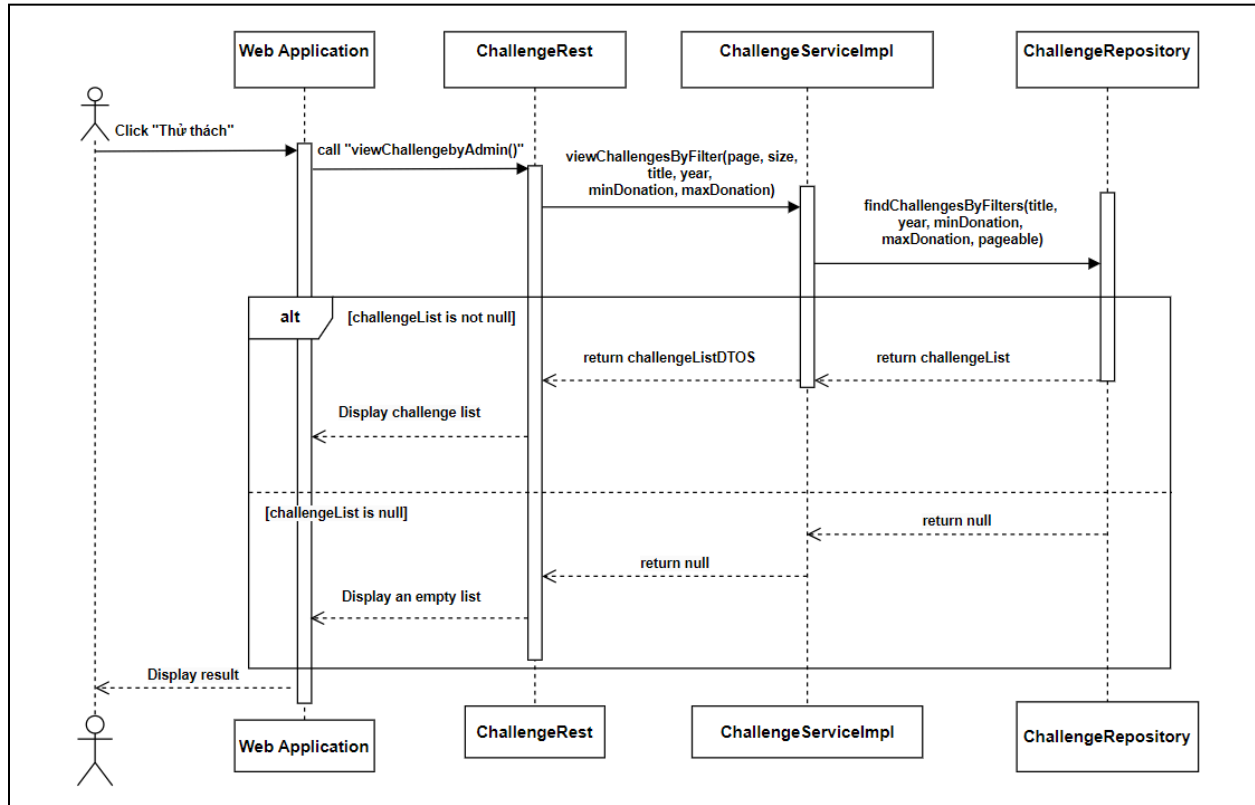


Figure 4.57 Sequence Diagram of “View list challenge”

3.8.3 Sequence Diagram of “Create Challenge”

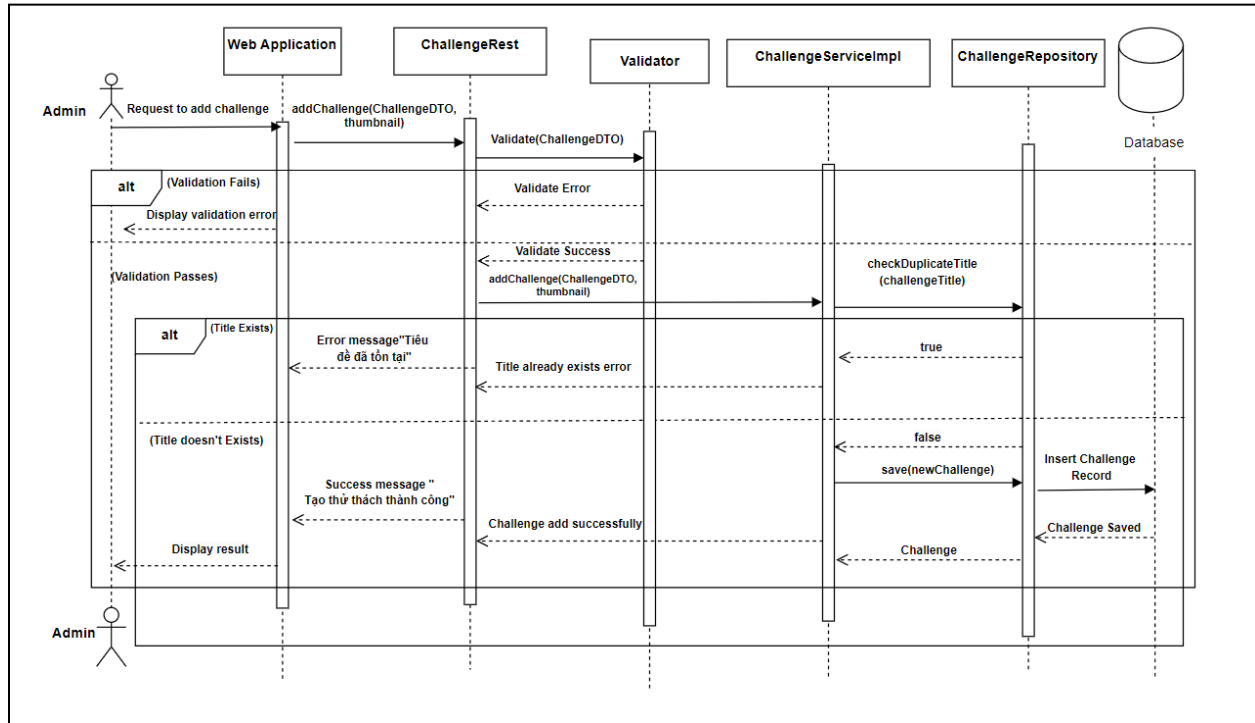


Figure 4.58 Sequence Diagram of “Create challenge”

3.8.4 Sequence Diagram of “Update Challenge”

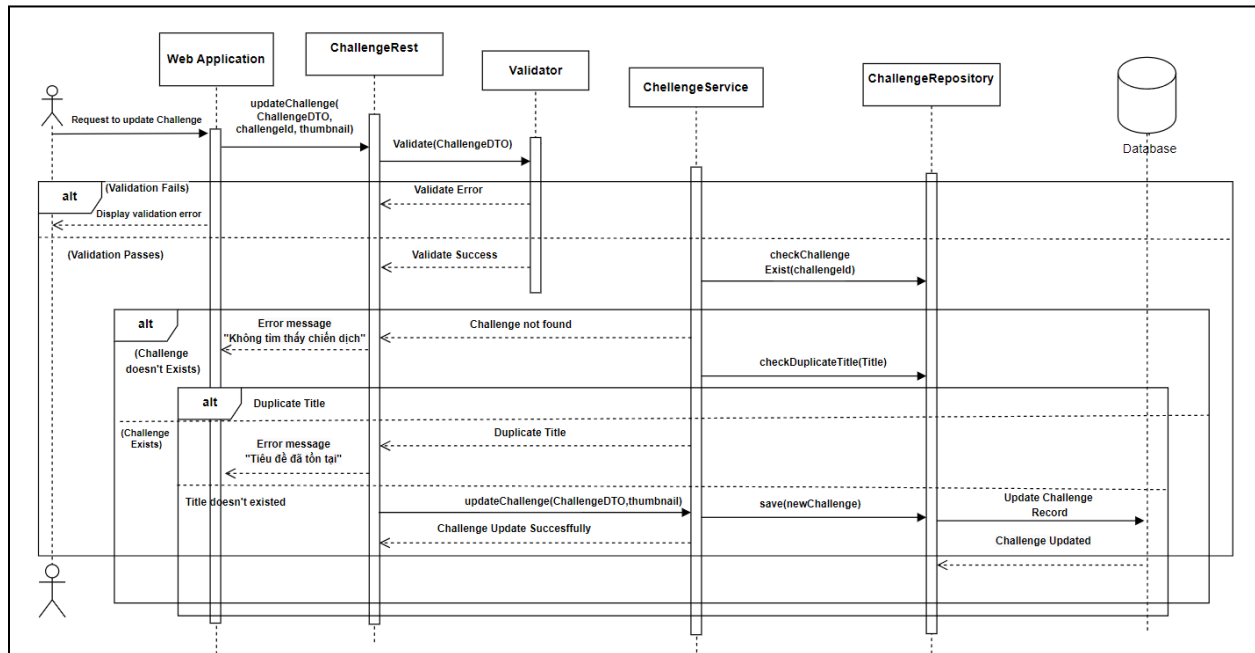


Figure 4.59 Sequence Diagram of “Update challenge”