

**Capstone Project Report**

**Report 4 – Software Design Document**

– Ho Chi Minh City, 01/2021 –

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# I. Project Report

## 1. Status Report

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Work Item** | **Status** | **Notes (Work Item in Details)** |
| 1 |  | Pending |  |
| 2 |  | In Progress |  |
| 3 |  | Completed |  |

## 2. Team Involvements

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Task** | **Member** | **Notes (Task Details, etc.)** |
| 1 |  | NguyenLG |  |
| 2 |  | HaPTN |  |
| 3 |  | GiaNG |  |

## 3. Issues/Suggestions

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Issue** | **Status** | **Notes (Solution, Suggestion, etc.)** |
| 1 |  | Pending |  |
| 2 |  | In Progress |  |
| 3 |  | Completed |  |

# II. Software Design Document

## 1. Overall Description

### 1.1 Assumptions

This system is designed basing on these following assumptions:

* Web application
* ReactJS
* Spring boot
* MySQL
* 3-Tier architecture

### 1.2 Design Constraints

This system should be complied with following items:

* The system should work on Laptop, Tablet, Mobile.
* The system must run over the Internet; all the hardware shall require connect to the Internet.
* The system shall communicate through HTTP protocol over the Internet.
* The system shall available 24/7.

## 2. System Architecture Design

### 2.1 Overall Architecture

Our system is built on three-tier architecture, which allows us to modularize the user interface, business logic, and data storage layers. As a result, we gain great flexibility, code reusable, and easy maintenance for not only developing but also implementing the system.

|  |  |
| --- | --- |
| **Overall Architecture Data Dictionary** | |
| **Name** | **Description** |
| Presentation Tier | This tier provides a user interface and handles user interactions. It communicates with the application tier which provides the results to the browser. |
| Application Tier | This tier contains a set of rules for processing information and business logic. All communication goes through the application tier. |
| Data Tier | This tier comprises the database where the information processed by the application tier is stored. |

Table 1. Overall Architecture Data Dictionary

### 2.2 System Architecture

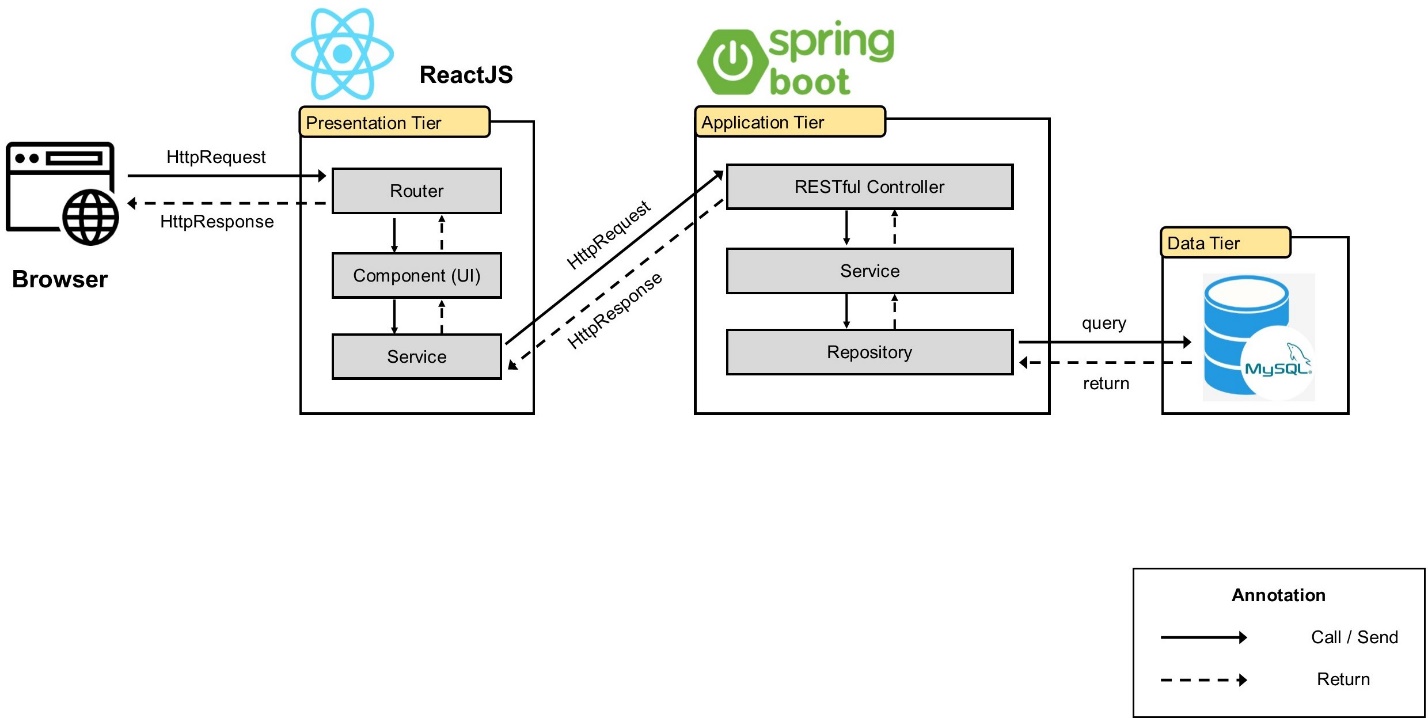


Figure 1. System Architecture

### 2.3. Package Diagram

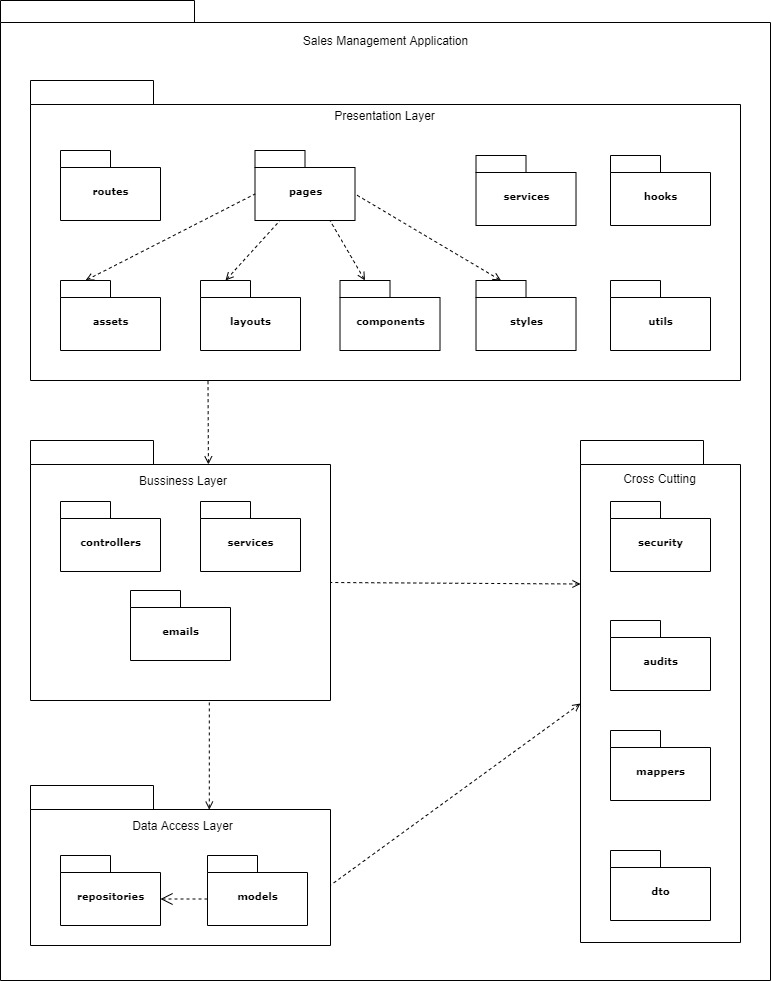


Figure 2. Package Diagram

|  |  |  |
| --- | --- | --- |
| **No** | **Package** | **Description** |
| 01 | routes | The package contains functions for app navigation. |
| 02 | pages | The package contains the pages of the routing. |
| 03 | services | The package contains functions to manage API. |
| 04 | hooks | The package contains custom hook functions. |
| 05 | assets | The package contains images and icons. |
| 06 | layouts | The package contains layout components for the app. |
| 07 | components | The package contains UI components that can be shared. |
| 08 | styles | The package contains global CSS, JavaScript for application-level styles. |
| 09 | utils | The package contains all the helper functions. |
| 10 | controllers | The package contains classes provide RESTful web services. |
| 11 | services | The package contains classes for business logic. |
| 12 | emails | The package contains a class provides email service. |
| 13 | repositories | The package contains classes responsible for communicating with data sources, processing queries, and returning data types requested by the Service layer. |
| 14 | models | The package contains classes that represent persisted data to the database. |
| 15 | security | The package contains classes for JWT handling, authentication, and authorization. |
| 16 | audits | The package contains classes for auditing entity objects. |
| 17 | mappers | The package contains a class to convert data between the DTO and entity objects. |
| 18 | dto | The package contains classes to aggregate and encapsulate data for transfer. |

Table 2. Package Diagram Specifications

## 3. System Detailed Design

### 3.1 Class Diagram

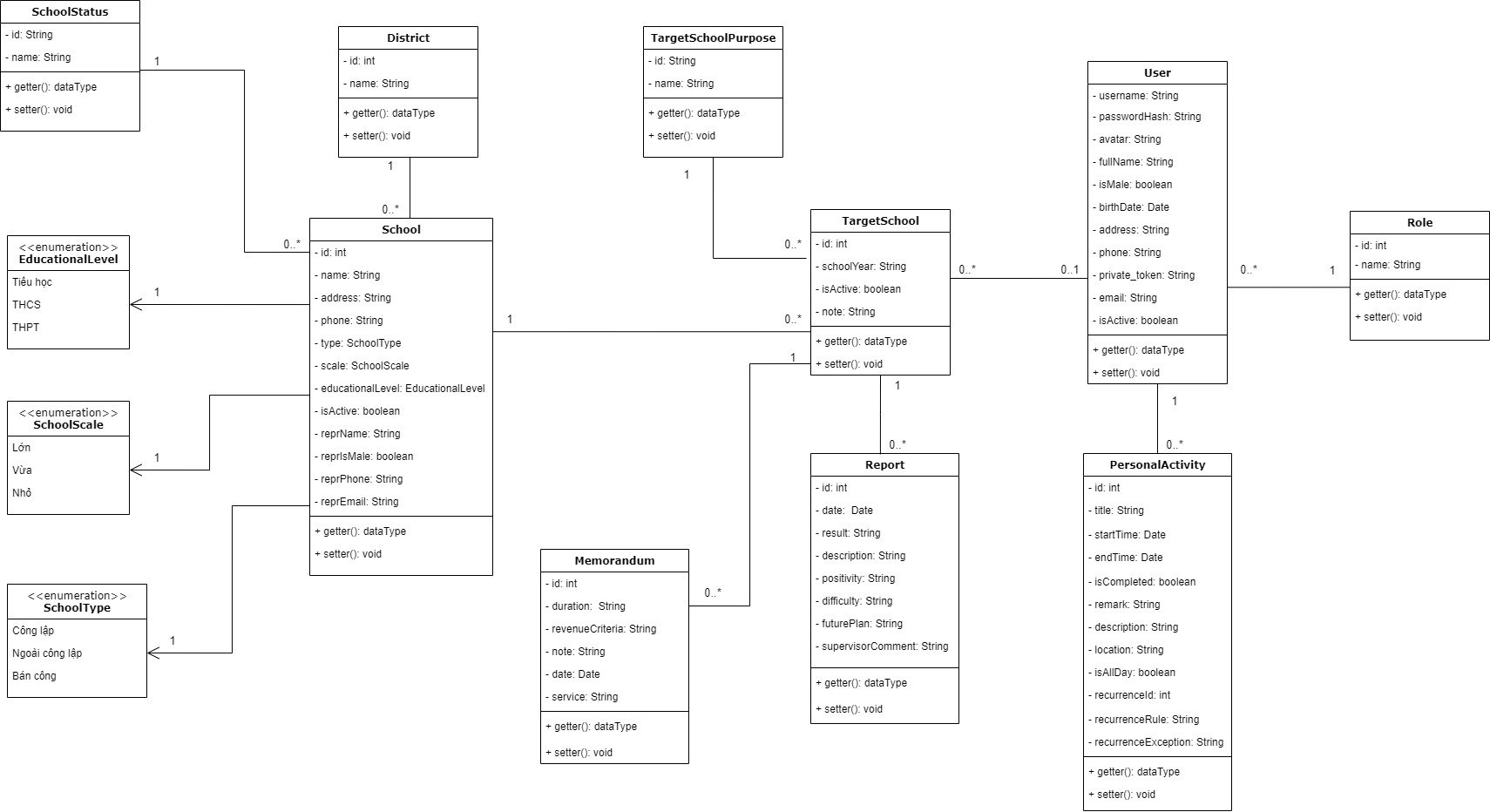


Figure 3. Class Diagram

### 3.2 Sequence Diagram(s)

#### <Salesman> Create memorandum

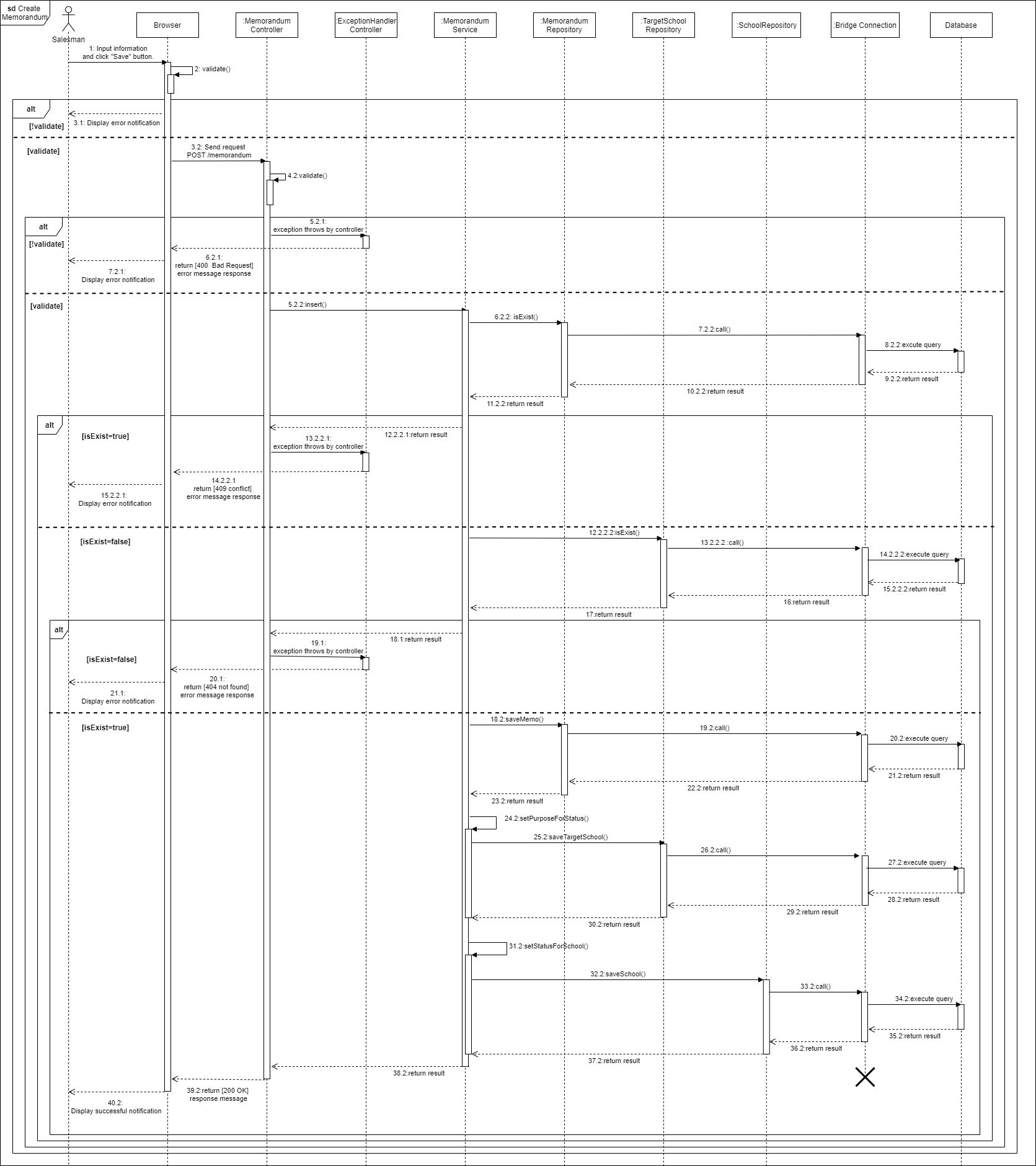


Figure 4. Create memorandum

#### <Administrator> Create new accounts

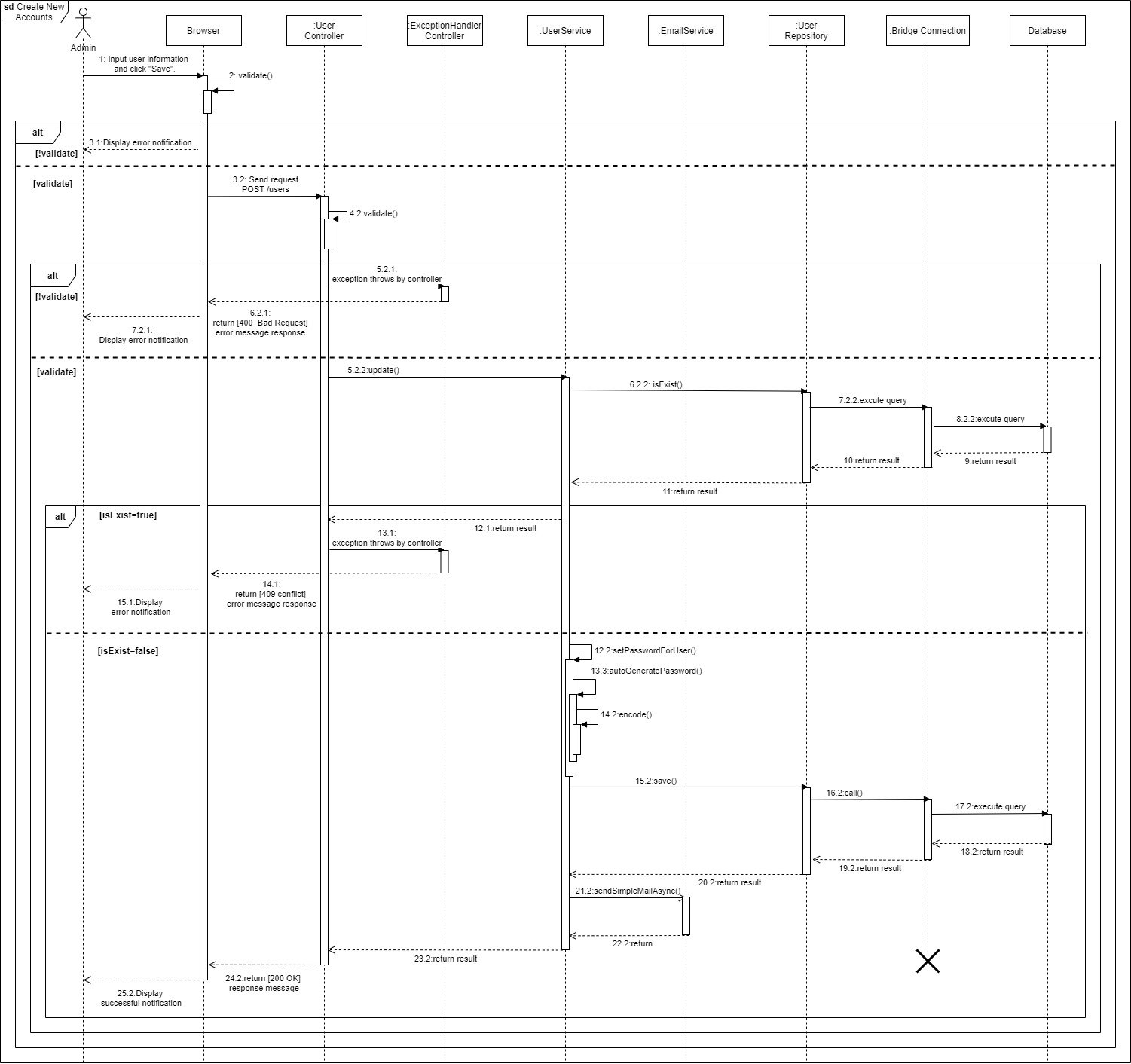


Figure 5. Create new accounts

#### <Administrator> Edit school’s information

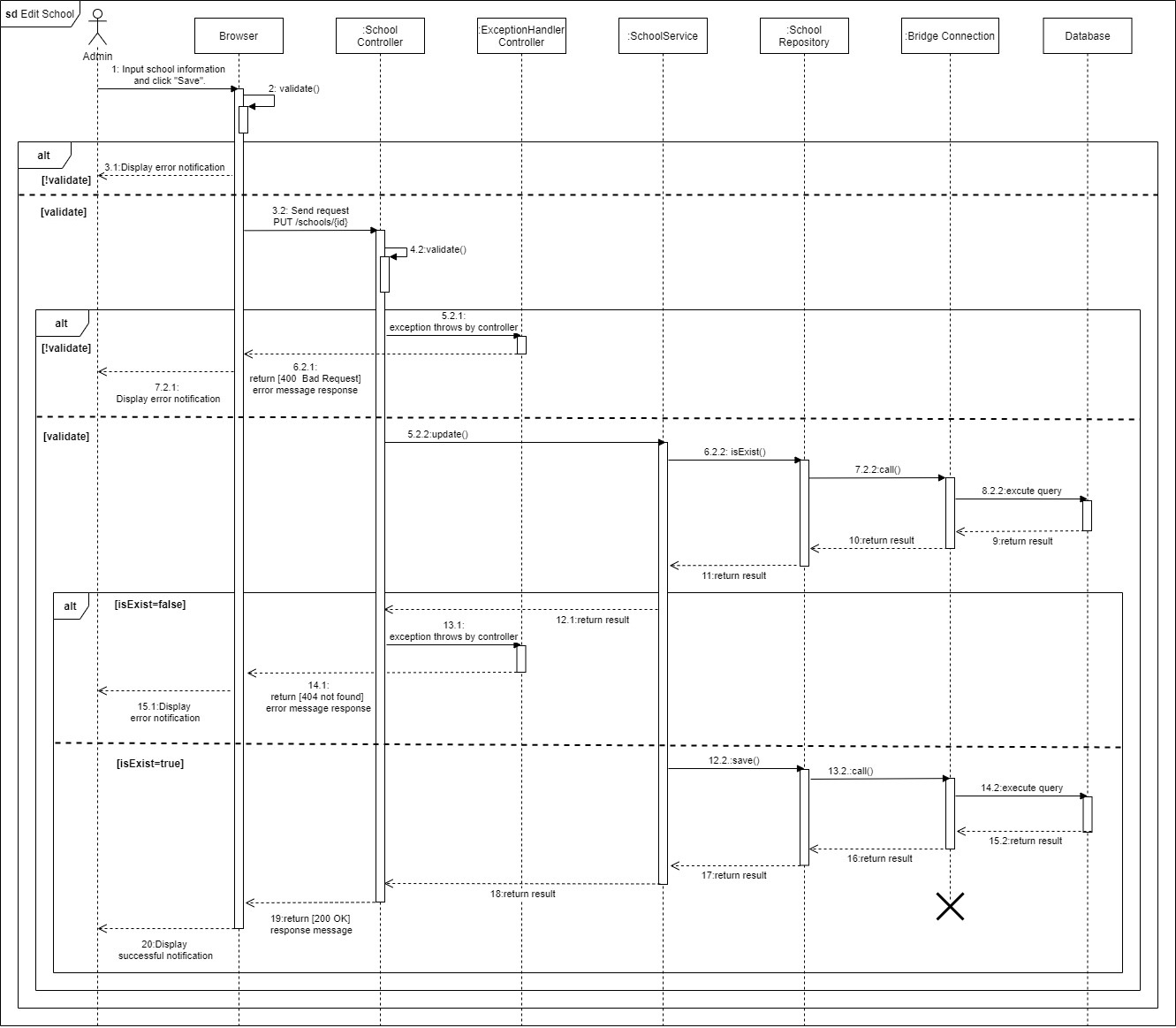


Figure 6. Edit school’s information

#### <Salesman> Remove personal activities

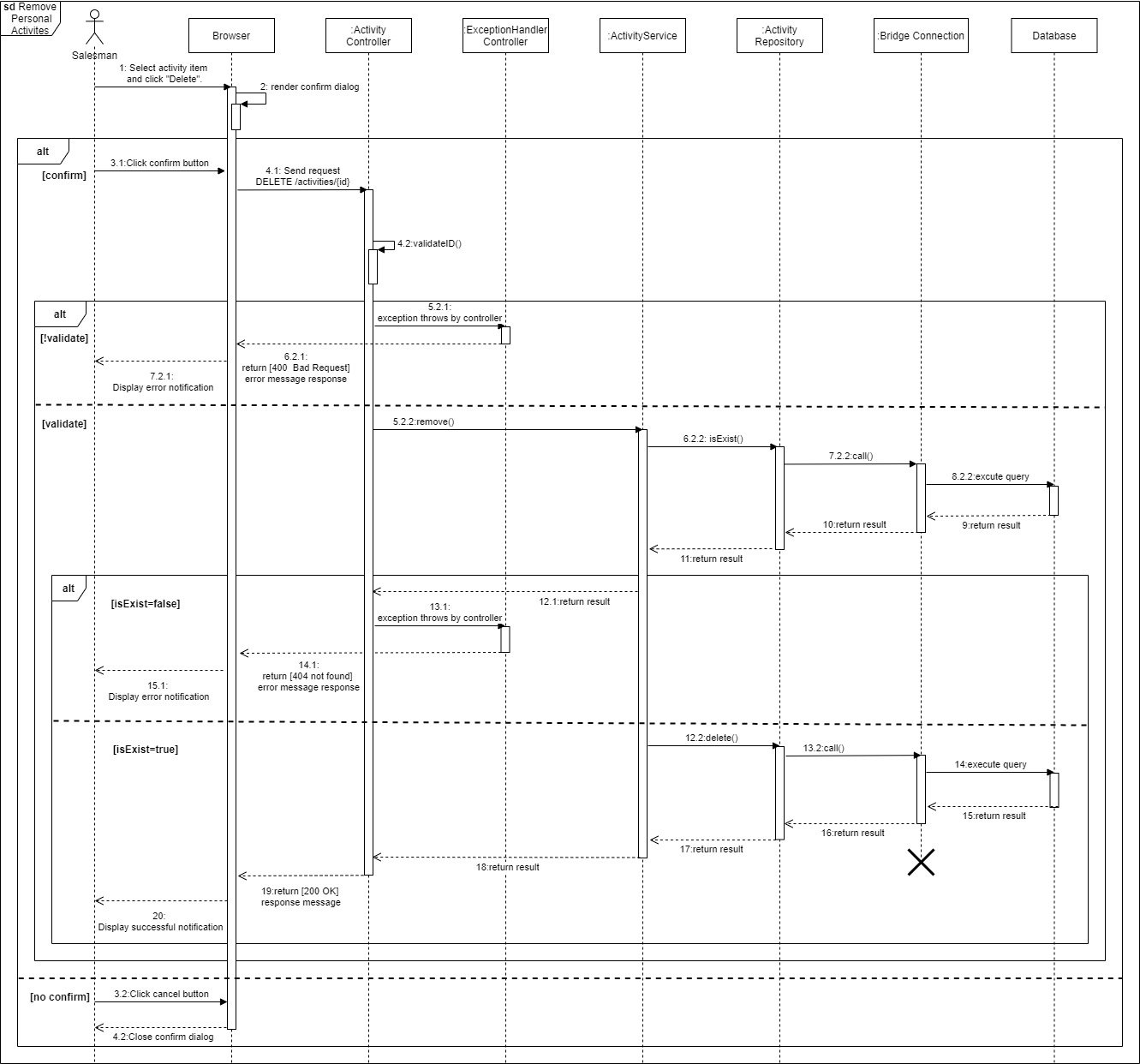


Figure 7. Remove personal activities

#### <Salesman> Edit personal activities

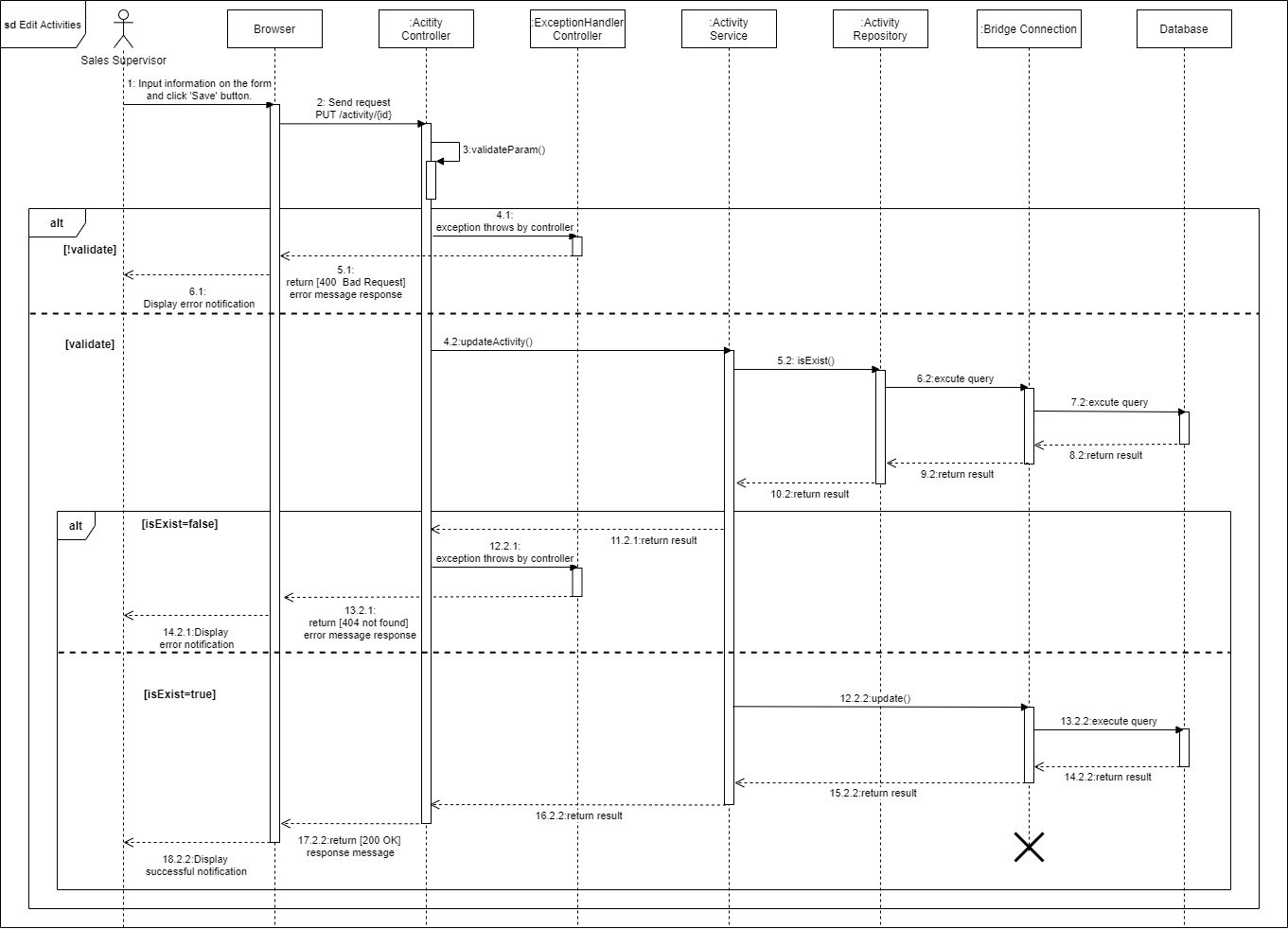


Figure 8. Edit personal activities

#### <Sales Manager> View target school details

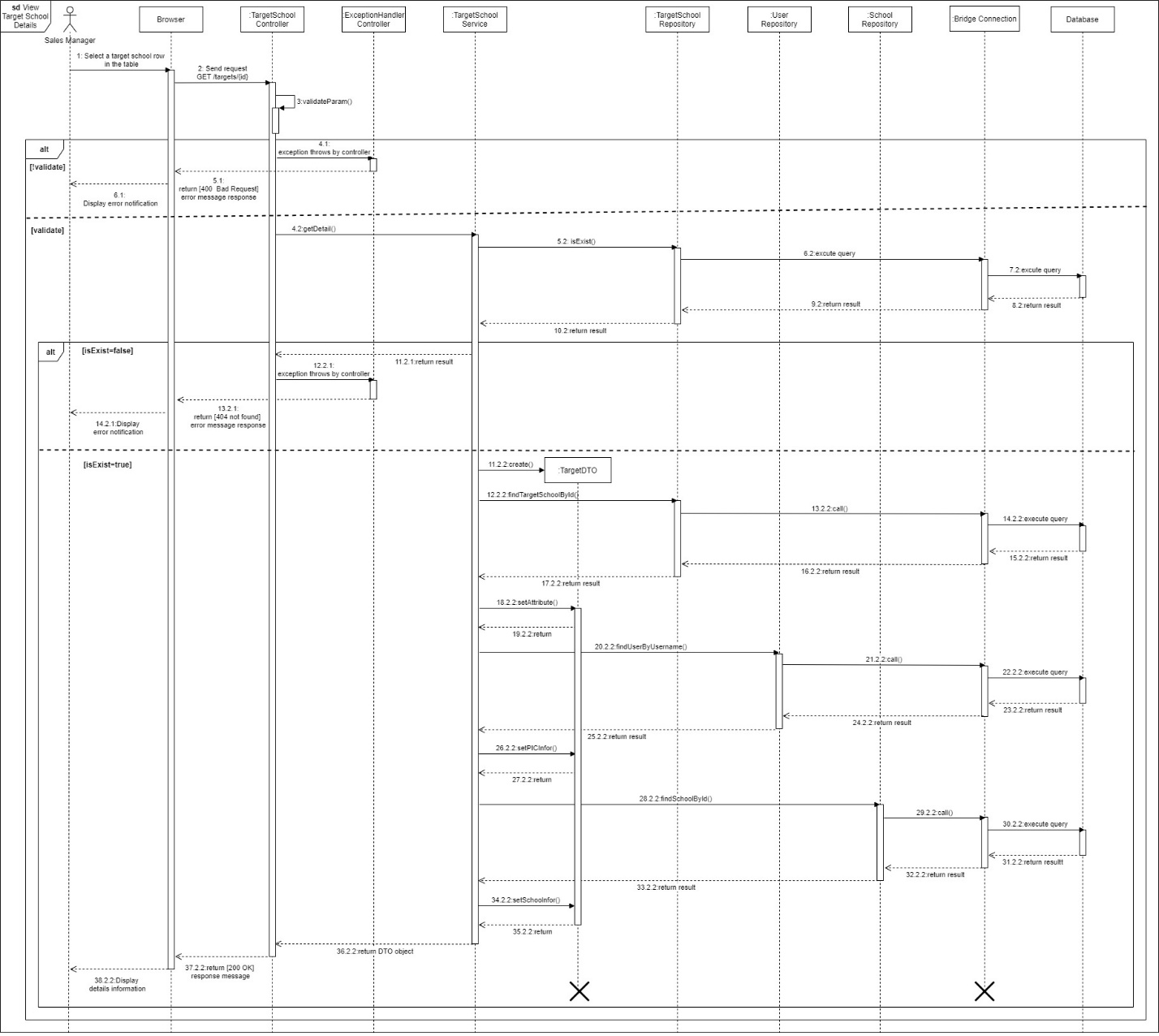


Figure 9. View target school details

#### <Salesman> Remove report

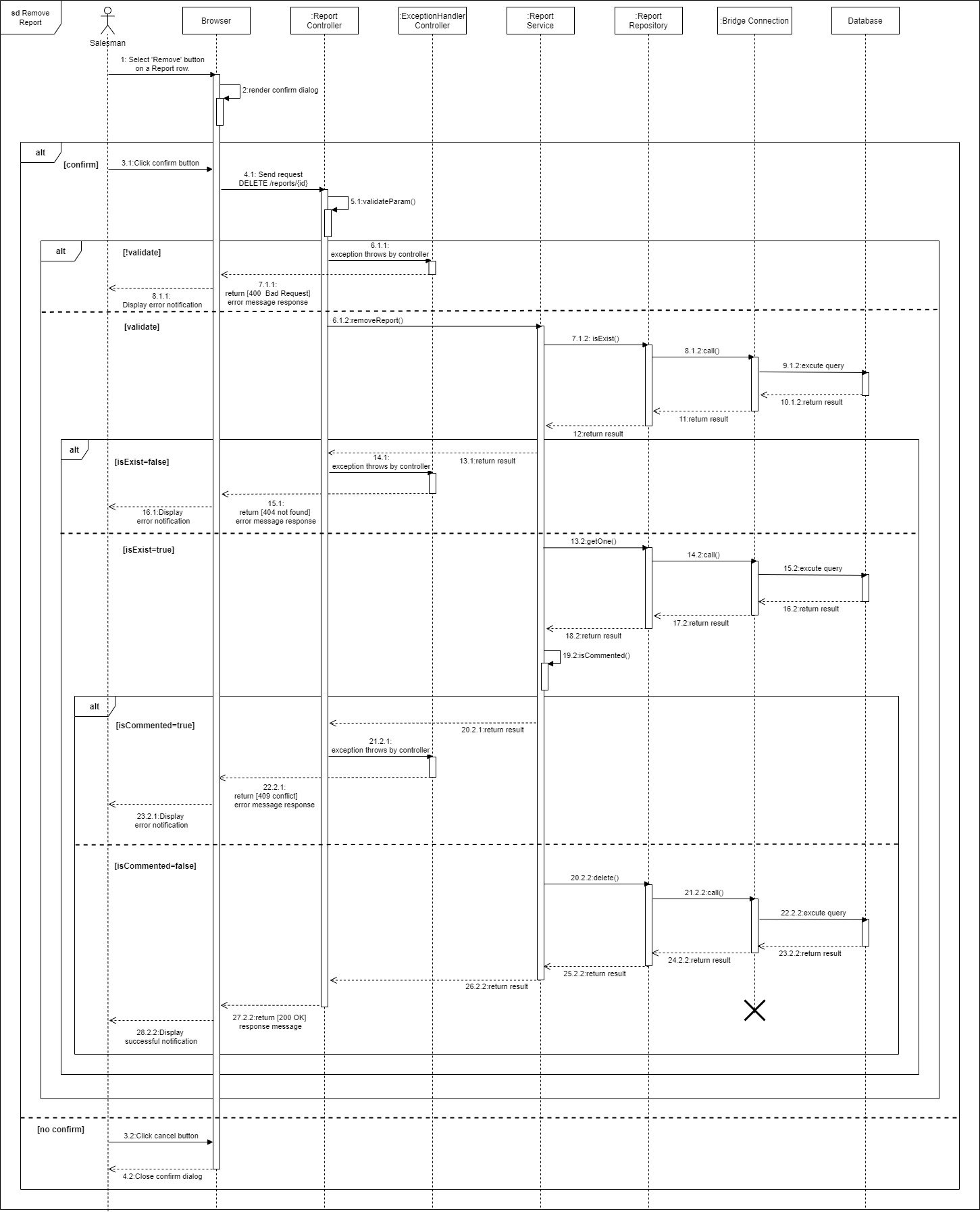


Figure 10. Remove report

#### <Salesman> Edit report

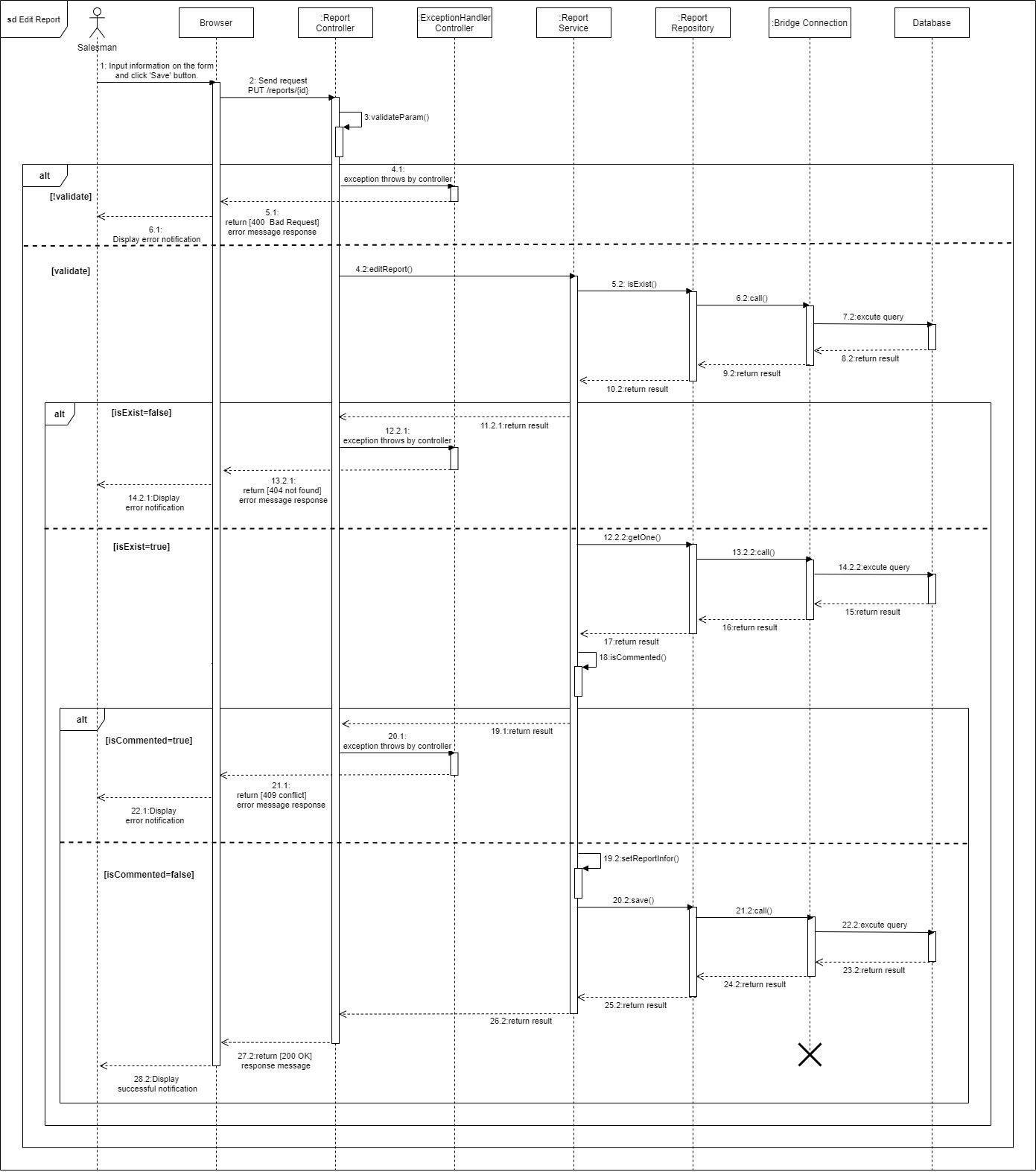


Figure 11. Edit report

### 3.3 Activity Diagram(s)

#### <Sales Manager> Create target school

Summary: This diagram shows the process by which the sales manager creates a target school.

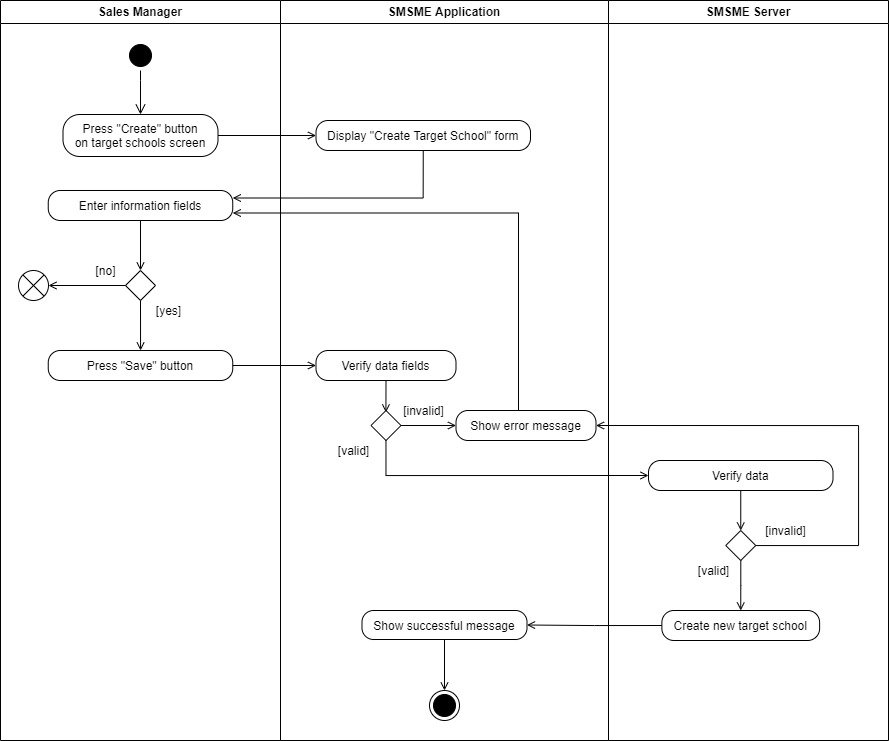


Figure 12. Create target schools

#### <Sales Manager> Assign salesman

Summary: This diagram shows the process by which the sales manager assigns a salesman to a target school.

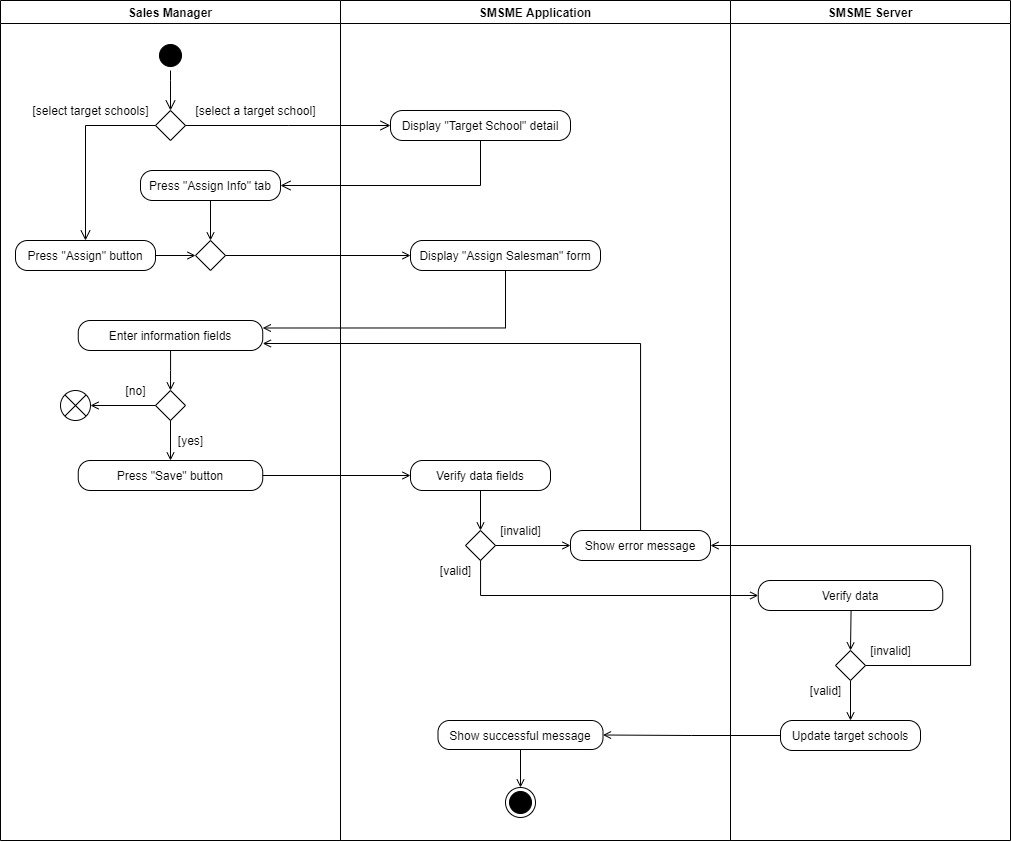


Figure 13. Assign salesmen to target schools

#### <Sales Manager> Update target school

Summary: This diagram shows the process by which the sales manager updates a target school.

Diagram

Description automatically generated

Figure 14. Update target school's details

#### <Sales Manager> Remove target school

Summary: This diagram shows the process by which the sales manager removes a target school.

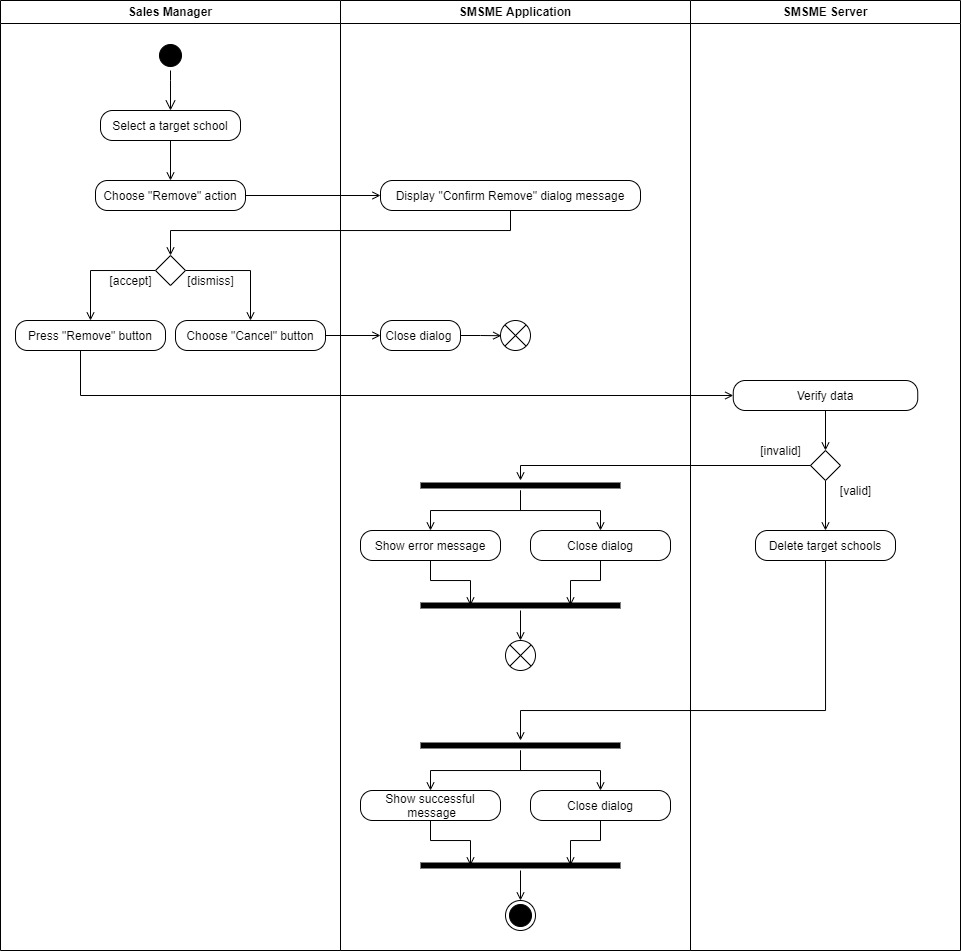


Figure 15. Remove a target school

#### <Sales Manager/ Salesman> Create report

Summary: This diagram shows the process by which the sales manager or salesman create a report.

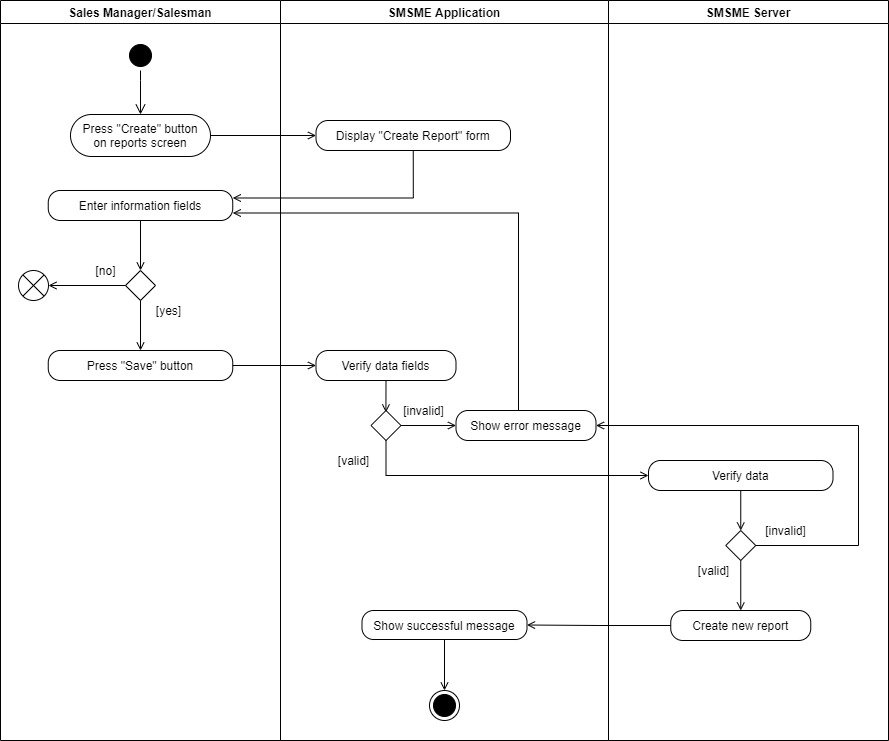


Figure 16. Create reports

#### <Sales Manager/ Salesman> Update report

Summary: This diagram shows the process by which the sales manager or salesman update a report.

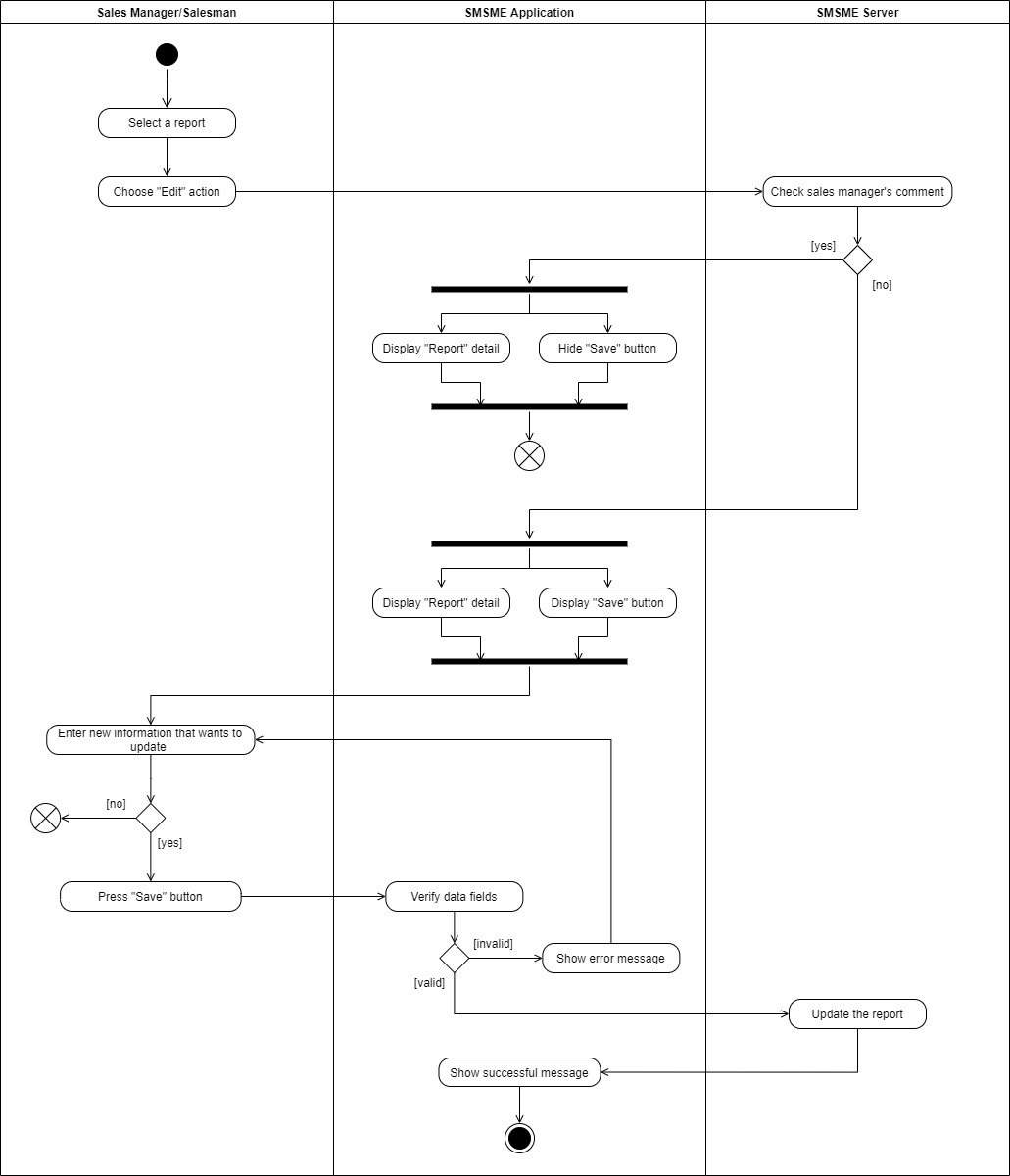


Figure 17. Update report

## 4. Class Specifications

### 4.1 User

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| username | String | private | The unique identifier of a user |
| passwordHash | String | private | The password hash of the user |
| fullName | String | private | The full name of the user |
| address | String | private | The address of the user |
| email | String | private | The email of the user |
| phone | String | private | The phone number of the user |
| isActive | boolean | private | The active status of the user |
| avatar | String | private | The avatar of the user |
| isMale | boolean | private | The gender of the user (true 🡪 male, false 🡪 female) |
| birthDate | Date | private | The birthdate of the user |

Table 3. Class User Specification - Attributes

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Method** | **Visibility** | **Return Type** | **Description** |
| 1 | getter | public | dataType | get attribute value |
| 2 | setter | public | void | set attribute value |

Table 4. Class User Specification - Methods

### 4.2 PersonalActivity

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| id | int | private | The unique identifier of a personal activity |
| title | String | private | The title of the personal activity |
| startTime | Date | private | The start time of the personal activity |
| endTime | Date | private | The end time of the personal activity |
| isCompleted | boolean | private | The completed status of the personal activity |
| remark | String | private | The remark of the personal activity |
| description | String | private | The description of the personal activity |
| location | String | private | The location of the personal activity |
| isAllDay | boolean | private | The duration of the personal activity, if it lasts for whole day or not |
| recurrenceId | int | private | The unique identifier of a recurrence series |
| recurrenceRule | String | private | The rule of the recurrence series |
| recurrenceException | String | private | The exception of the recurrence |

Table 5. Class PersonalActivity Specification - Attributes

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Method** | **Visibility** | **Return Type** | **Description** |
| 1 | getter | public | dataType | get attribute value |
| 2 | setter | public | void | set attribute value |

Table 6. Class PersonalActivity Specification - Methods

### 4.3 Role

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| id | int | private | The unique identifier of a role |
| name | String | private | The name of the role |

Table 7. Class Role Specification - Attributes

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Method** | **Visibility** | **Return Type** | **Description** |
| 1 | getter | public | dataType | get attribute value |
| 2 | setter | public | void | set attribute value |

Table 8. Class Role Specification - Methods

### 4.4 Memorandum

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| id | int | private | The unique identifier of a memorandum |
| duration | String | private | A period of time in which the memorandum is effective/active |
| revenueCriteria | String | private | Criteria of revenue and expenditure |
| service | Date | private | Services/Programs that Major colaborate with their target schools |
| note | String | private |  |
| date | Date | private | The date of the memorandum creation |

Table 9. Class Memorandum Specification - Attributes

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Method** | **Visibility** | **Return Type** | **Description** |
| 1 | getter | public | dataType | get attribute value |
| 2 | setter | public | void | set attribute value |

Table 10. Class Memorandum Specification - Methods

### 4.5 TargetSchool

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| id | int | private | The unique identifier of a target school |
| schoolYear | String | private | The school year of the target school |
| note | String | private | The note of the target school |
| isActive | boolean | private | The active status of the target school (use for soft deleting) |

Table 11. Class TargetSchool Specification - Attributes

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Method** | **Visibility** | **Return Type** | **Description** |
| 1 | getter | public | dataType | get attribute value |
| 2 | setter | public | void | set attribute value |

Table 12. Class TargetSchool Specification - Methods

### 4.6 Report

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| id | int | private | The unique identifier of a report |
| date | Date | private | The date of the memorandum creation |
| result | String | private | The result of the report |
| description | String | private | The description of the report |
| positivity | String | private | The positivity of the report |
| difficulty | String | private | The difficulty of the report |
| futurePlan | String | private | The future plan of the report |
| supervisorComment | String | private | The supervisor comment of the report |

Table 13. Class Report Specification - Attributes

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Method** | **Visibility** | **Return Type** | **Description** |
| 1 | getter | public | dataType | get attribute value |
| 2 | setter | public | void | set attribute value |

Table 14. Class Report Specification - Methods

### 4.7 School

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| id | int | private | The unique identifier of a school |
| name | String | private | The name of the school |
| address | String | private | The address of the school |
| phone | String | private | The phone number of the school |
| type | SchoolType | private | The school type of the school |
| scale | SchoolScale | private | The school scale of the school |
| educationalLevel | EducationalLevel | private | The educational level of the school |
| isActive | boolean | private | The active status of the school |
| reprName | String | private | The name of the representative |
| reprGender | boolean | private | The gender of the representative |
| reprPhone | String | private | The phone number of the representative |
| reprEmail | String | private | The email of the representative |

Table 15. Class School Specification - Attributes

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Method** | **Visibility** | **Return Type** | **Description** |
| 1 | getter | public | dataType | get attribute value |
| 2 | setter | public | void | set attribute value |

Table 16. Class School Specification - Methods

### 4.8 District

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| id | int | private | The unique identifier of a district |
| name | String | private | The name of the district |

Table 17. Class District Specification - Attributes

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Method** | **Visibility** | **Return Type** | **Description** |
| 1 | getter | public | dataType | get attribute value |
| 2 | setter | public | void | set attribute value |

Table 18. Class District Specification - Methods

### 4.9 SchoolStatus

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| id | String | private | The unique identifier of a school status |
| name | String | private | The name of the school status |

Table 19. Class SchoolStatus Specification - Attributes

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Method** | **Visibility** | **Return Type** | **Description** |
| 1 | getter | public | dataType | get attribute value |
| 2 | setter | public | void | set attribute value |

Table 20. Class SchoolStatus Specification - Methods

### 4.10 TargetSchoolPurpose

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Type** | **Visibility** | **Description** |
| id | String | private | The unique identifier of a target school purpose |
| name | String | private | The name of the target school purpose |

Table 21. Class TargetSchoolPurpose Specification - Attributes

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Method** | **Visibility** | **Return Type** | **Description** |
| 1 | getter | public | dataType | get attribute value |
| 2 | setter | public | void | set attribute value |

Table 22. Class TargetSchoolPurpose Specification - Methods

### 4.11 EducationalLevel

|  |  |  |  |
| --- | --- | --- | --- |
| **Value** | **Type** | **Visibility** | **Description** |
| Tiểu học |  |  | Enum constant |
| THCS |  |  | Enum constant |
| THPT |  |  | Enum constant |

Table 23. Enum Class EducationalLevel Specification

### 4.12 SchoolScale

|  |  |  |  |
| --- | --- | --- | --- |
| **Value** | **Type** | **Visibility** | **Description** |
| Lớn |  |  | Enum constant |
| Vừa |  |  | Enum constant |
| Nhỏ |  |  | Enum constant |

Table 24. Enum Class SchoolScale Specification

### 4.13 SchoolType

|  |  |  |  |
| --- | --- | --- | --- |
| **Value** | **Type** | **Visibility** | **Description** |
| Công lập |  |  | Enum constant |
| Ngoài công lập |  |  | Enum constant |
| Bán công |  |  | Enum constant |

Table 25. Enum Class SchoolType Specification

## 5. Data & Database Design

### 5.1 Database diagram

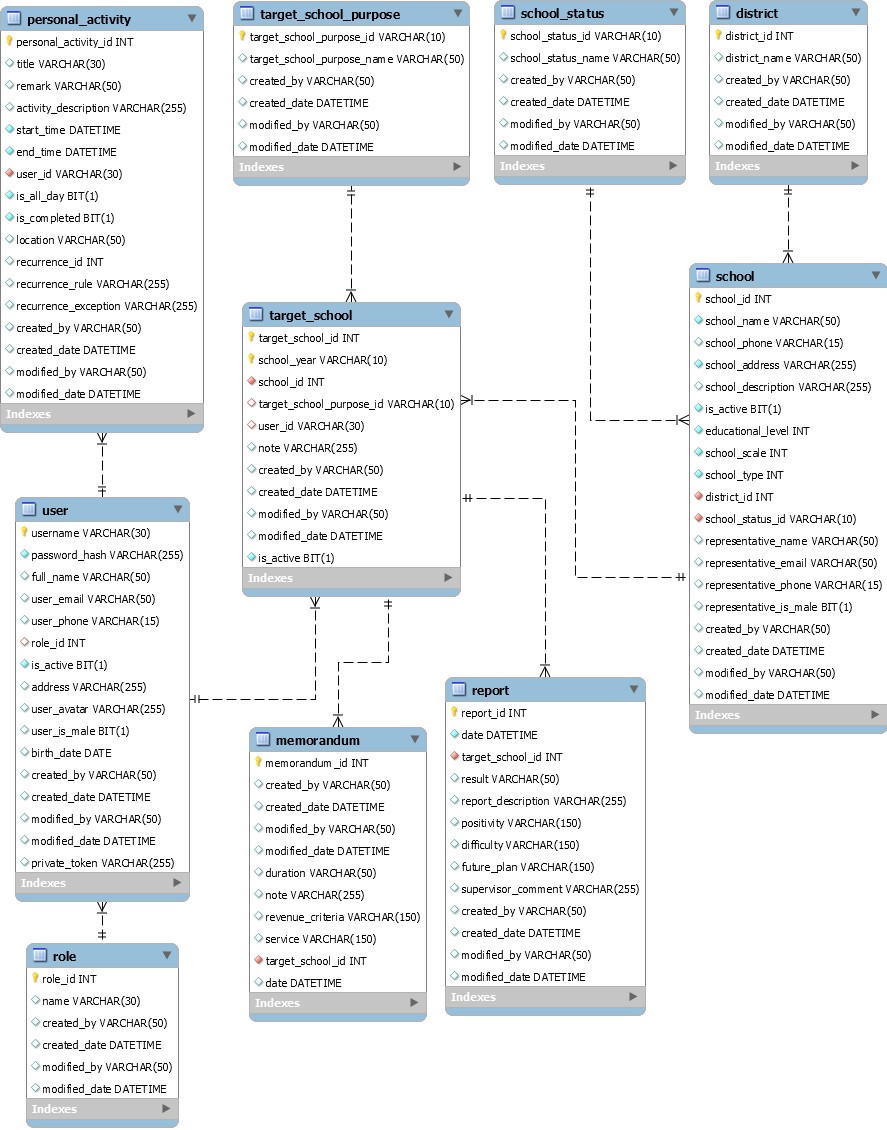


Figure 18. Database Diagram

#### school

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | school\_id | int |  | X | X | X |  |
| 2 | school\_name | varchar | 50 |  | X |  |  |
| 3 | school\_phone | varchar | 15 |  |  |  |  |
| 4 | school\_address | varchar | 255 | X | X |  |  |
| 5 | is\_active | bit | 1 |  | X |  | Use for soft deleting |
| 6 | education\_level | int |  |  | X |  |  |
| 7 | school\_scale | int |  |  | X |  |  |
| 8 | school\_type | int |  |  | X |  |  |
| 9 | district\_id | int |  |  | X | X |  |
| 10 | school\_status\_id | varchar | 10 |  | X | X |  |
| 11 | representative\_name | varchar | 50 |  |  |  |  |
| 12 | representative\_email | varchar | 50 |  |  |  |  |
| 13 | representative\_phone | varchar | 15 |  |  |  |  |
| 14 | representative\_is\_male | bit | 1 |  |  |  |  |
| 15 | created\_by | varchar | 50 |  |  |  | Use for auditing |
| 16 | created\_date | datetime |  |  |  |  | Use for auditing |
| 17 | modified\_by | varchar | 50 |  |  |  | Use for auditing |
| 18 | modified\_date | datetime |  |  |  |  | Use for auditing |

Table 26. Description for table "school"

#### district

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | district\_id | int |  | X | X | X |  |
| 2 | district\_name | varchar | 50 |  | X |  |  |
| 3 | created\_by | varchar | 50 |  |  |  | Use for auditing |
| 4 | created\_date | datetime |  |  |  |  | Use for auditing |
| 5 | modified\_by | varchar | 50 |  |  |  | Use for auditing |
| 6 | modified\_date | datetime |  |  |  |  | Use for auditing |

Table 27. Description for table "district"

#### school\_status

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | school\_status\_id | varchar | 10 | X | X | X |  |
| 2 | school\_status\_name | varchar | 50 |  | X |  |  |
| 3 | created\_by | varchar | 50 |  |  |  | Use for auditing |
| 4 | created\_date | datetime |  |  |  |  | Use for auditing |
| 5 | modified\_by | varchar | 50 |  |  |  | Use for auditing |
| 6 | modified\_date | datetime |  |  |  |  | Use for auditing |

Table 28. Description for table "school\_status"

#### target\_school

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | target\_school\_id | int |  | X | X | X |  |
| 2 | school\_year | varchar | 10 |  | X | X |  |
| 3 | school\_id | int |  |  | X | X |  |
| 4 | target\_school\_purpose\_id | varchar | 10 |  | X | X |  |
| 5 | user\_id | varchar | 30 |  |  | X |  |
| 6 | note | varchar | 255 |  |  |  |  |
| 7 | is\_active | bit | 1 |  | X |  | Use for soft deleting |
| 8 | created\_by | varchar | 50 |  |  |  | Use for auditing |
| 9 | created\_date | datetime |  |  |  |  | Use for auditing |
| 10 | modified\_by | varchar | 50 |  |  |  | Use for auditing |
| 11 | modified\_date | datetime |  |  |  |  | Use for auditing |

Table 29. Description for table "target\_school"

#### report

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | report\_id | int |  | X | X | X |  |
| 2 | date | datetime |  |  | X |  |  |
| 3 | target\_school\_id | int |  |  | X | X |  |
| 4 | result | varchar | 50 |  | X |  |  |
| 5 | report\_description | varchar | 255 |  |  |  |  |
| 6 | positivity | varchar | 150 |  |  |  |  |
| 7 | difficulty | varchar | 150 |  |  |  |  |
| 8 | future\_plan | varchar | 150 |  |  |  |  |
| 9 | supervisor\_comment | varchar | 255 |  |  |  |  |
| 10 | created\_by | varchar | 50 |  |  |  | Use for auditing |
| 11 | created\_date | datetime |  |  |  |  | Use for auditing |
| 12 | modified\_by | varchar | 50 |  |  |  | Use for auditing |
| 13 | modified\_date | datetime |  |  |  |  | Use for auditing |

Table 30. Description for table "report"

#### target\_school\_purpose

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | target\_school\_purpose\_id | varchar | 10 | X | X | X |  |
| 2 | target\_school\_purpose\_name | varchar | 50 |  | X |  |  |
| 3 | created\_by | varchar | 50 |  |  |  | Use for auditing |
| 4 | created\_date | datetime |  |  |  |  | Use for auditing |
| 5 | modified\_by | varchar | 50 |  |  |  | Use for auditing |
| 6 | modified\_date | datetime |  |  |  |  | Use for auditing |

Table 31. Description for table "target\_school\_purpose"

#### user

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | username | varchar | 30 | X | X | X |  |
| 2 | password\_hash | varchar | 255 |  | X |  | Password is hashed by Bcript Hashing Algorithm. |
| 3 | full\_name | varchar | 50 |  |  |  |  |
| 4 | user\_email | varchar | 50 |  |  |  |  |
| 5 | user\_phone | varchar | 15 |  |  |  |  |
| 6 | role\_id | int |  |  | X | X |  |
| 7 | is\_active | bit | 1 |  | X |  | Use for soft deleting or when the users quit job. |
| 8 | address | varchar | 255 |  |  |  |  |
| 9 | user\_avatar | varchar | 255 |  |  |  | Presigned URL for retriving images from Firebase Storage. |
| 10 | user\_is\_male | bit | 1 |  | X |  |  |
| 11 | birth\_date | date |  |  |  |  |  |
| 12 | private\_token | varchar | 255 |  |  |  | This token is used to recovered the forgotten password. |
| 13 | created\_by | varchar | 50 |  |  |  | Use for auditing |
| 14 | created\_date | datetime |  |  |  |  | Use for auditing |
| 15 | modified\_by | varchar | 50 |  |  |  | Use for auditing |
| 16 | modified\_date | datetime |  |  |  |  | Use for auditing |

Table 32. Description for table "user"

#### role

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | role\_id | int |  | X | X | X |  |
| 2 | name | varchar | 30 |  | X |  |  |
| 3 | created\_by | varchar | 50 |  |  |  | Use for auditing |
| 4 | created\_date | datetime |  |  |  |  | Use for auditing |
| 5 | modified\_by | varchar | 50 |  |  |  | Use for auditing |
| 6 | modified\_date | datetime |  |  |  |  | Use for auditing |

Table 33. Description for table "role"

#### personal\_activity

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | personal\_activity\_id | int |  | X | X | X |  |
| 2 | title | varchar | 30 |  | X |  | Title of the to-do activity |
| 3 | remark | varchar | 50 |  |  |  | Result or remark of the activity |
| 4 | activity\_description | varchar | 255 |  |  |  |  |
| 5 | start\_time | datetime |  |  | X |  |  |
| 6 | end\_time | datetime |  |  | X |  |  |
| 7 | user\_id | varchar | 30 |  | X | X |  |
| 8 | is\_all\_day | bit | 1 |  | X |  | The duration of the personal activity, if it lasts for whole day or not |
| 9 | is\_completed | bit | 1 |  | X |  | The status of the activity, whether it is completed or not |
| 10 | location | varchar | 50 |  |  |  | Location where this activity happens/will happen. |
| 11 | recurrence\_id | int |  |  |  |  | An activity can occur one time or multiple time. If it occurs multiple time, this “recurrence\_id” is to specify the series/family of that activity. |
| 12 | recurrence\_rule | varchar | 255 |  |  |  | A series contains multiple same activities with the general rule for repeating after a period. |
| 13 | recurrence \_exception | varchar | 255 |  |  |  | This list is used to store the “personal\_activity\_id” of an exception in the series. |
| 14 | created\_by | varchar | 50 |  |  |  | Use for auditing |
| 15 | created\_date | datetime |  |  |  |  | Use for auditing |
| 16 | modified\_by | varchar | 50 |  |  |  | Use for auditing |
| 17 | modified\_date | datetime |  |  |  |  | Use for auditing |

Table 34. Description for table "personal\_activity"

#### memorandum

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| 1 | memorandum\_id | int |  | X | X | X |  |
| 2 | duration | varchar | 50 |  | X |  | A period of time in which the memorandum is effective/active |
| 3 | note | varchar | 255 |  |  |  |  |
| 4 | revenue\_criteria | varchar | 150 |  |  |  | Criteria of revenue and expenditure |
| 5 | service | varchar | 150 |  | X |  | Services/Programs that Major colaborate with the target schools |
| 6 | target\_school\_id | int |  |  | X | X |  |
| 7 | date | datetime |  |  | X |  |  |
| 8 | created\_by | varchar | 50 |  |  |  | Use for auditing |
| 9 | created\_date | datetime |  |  |  |  | Use for auditing |
| 10 | modified\_by | varchar | 50 |  |  |  | Use for auditing |
| 11 | modified\_date | datetime |  |  |  |  | Use for auditing |

Table 35. Description for table "memorandum"

### 5.2 Data File Design

We use Firebase Storage to store images.

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **File Name** | **Type** | **Notes** |
| 1 | avatars | jpg, jpeg, png | The images are used for user’s avatar. |
| 2 | Import\_Sample.xlsx | xlsx | The sample sheet for user import guidance. |

Table 36. Data File Design