# PJ - Microservice - Save and Resume SRMS

Solution Design for Feature Backlog

**IN PROGRESS**



## Introduction

This is a detail design for a Save & Resume Microservice (SRMS).

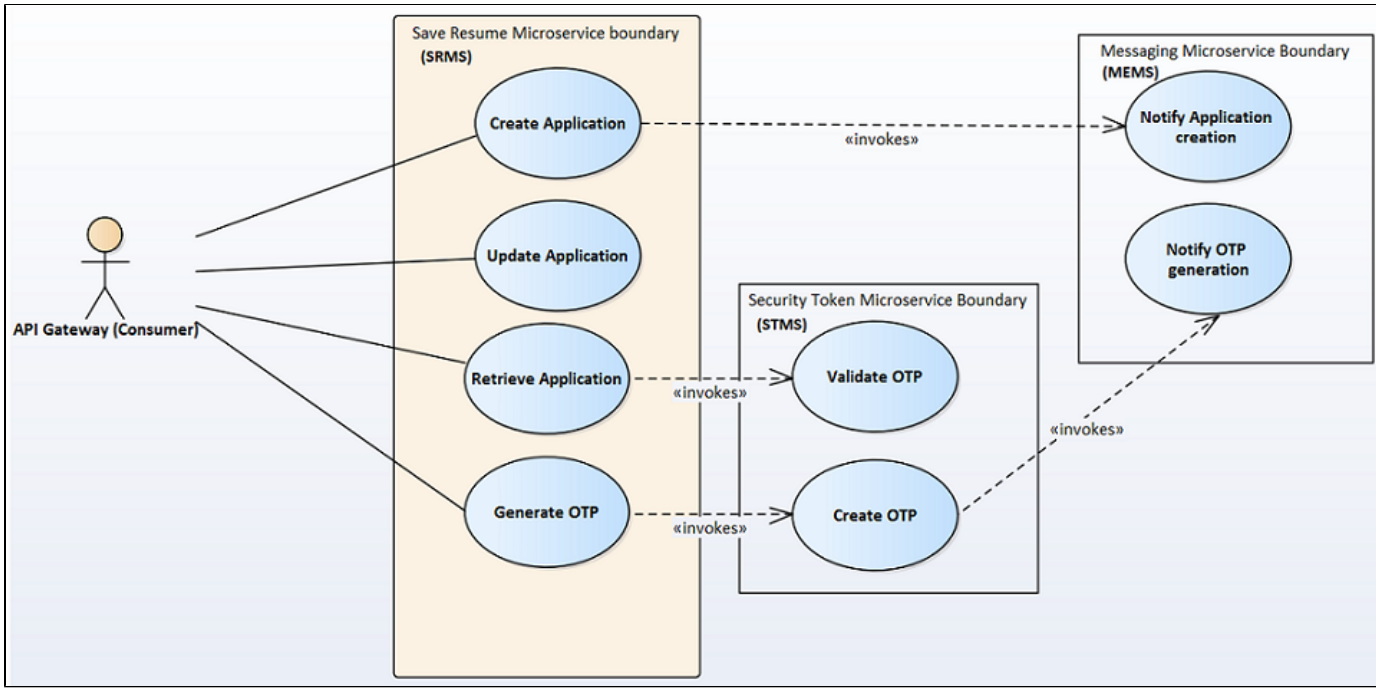
## Dependencies

- [x] Security Token (Mock-able)
- [x] Messaging API (Mock-able)

## Inputs

- The Main Consumer for the SRMS is the  Storage-Manager API.
- Incoming request has to have a valid JWT in order to consume SRMS.

## Use case diagram




## Microservice Definition

Following table represents SRMS highlights

**SAVE AND RESUME service definition**
**BASE URL** : **srms/v1**

| S.No | HTTP verb | Method Name | URL | Type | Request | Response | Request Headers | Response Headers | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 1 | POST | CreateApplicationForm | /forms/{form_name} | Inbound | Body:<br>{<br><br>"sendnotification": "boolean", "given_name": "string",<br><br>"surname": "string", "date_of_birth": "YYYY-MM-DD", "email_address": "string", "mobile_phone": "string", "data": {}<br>} | • Success HTTP code: 201<br>• Success body data Model:<br>{ "application_number": "string", "expires_at": "YYYY-MM-DD"<br>} | • End-User-Claim<br>• Authorization<br>• X-correlation-Id | • X-correlation-Id | To Create new unique application number and mapped to given data. |
| 2 | POST | CreateApplication | / | Inbound | Body:<br>{ "given_name": "string",<br><br>"surname": "string", "date_of_birth": "YYYY-MM-DD", "email_address": "string", "mobile_phone": "string", "data": {}<br>} | • Success HTTP code: 201<br>• Success body data Model:<br>{ "application_number": "string", "expires_at": "YYYY-MM-DD"<br>} | • End-User-Claim<br>• Authorization<br>• X-correlation-Id | • X-correlation-Id | To Create new unique application number and mapped to given data. |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2 | PUT | UpdateApplication | /{application_number} | Inbound | Body:<br>{<br>"given_name": "string",<br>"surname": "string",<br>"date_of_birth": "YYYY-MM-DD",<br>"email_address": "string",<br>"mobile_phone": "string",<br>"data": {}<br>} | • Success HTTP code: 204<br>• Success body data Model:<br>No content | • End-User-Claim<br>• Authorization<br>• X-correlation-Id | • X-correlation-Id | To Update existing application data for the given data for the matching application number. |
| 3 | GET | RetrieveApplication | /{application_number} | Inbound | QueryParams:<br>dateOfBirth = YYYY-MM-DD<br>Header:<br>X-Storage-Manager-OTP = string | • Success HTTP code: 200<br>• Success body data Model:<br><br>{<br>"data": {}<br>} | • End-User-Claim<br>• Authorization<br>• X-correlation-Id | • X-correlation-Id | To Retrieve existing application data for the matching application number, data of birth & OTP. |
| 4 | POST | GenerateOTP | /{application_number}/otp | Inbound | Body:<br>{<br>"date_of_birth": "YYYY-MM-DD"<br>} | • Success HTTP code: 202<br>• Success body data Model:<br>No content | • End-User-Claim<br>• Authorization<br>• X-correlation-Id | • X-correlation-Id | To Generate one Time Password for the given application number and also notifies user by email/Phone. |
| 5 | HEAD | HealthCheck | /healthcheck | Inbound | No Inputs | • Success HTTP code: 204<br>• Success body data Model:<br>No content | • End-User-Claim<br>• Authorization<br>• X-correlation-Id | • X-correlation-Id | To check SRMS health status |

**Please Note:**

Upon error, all request will return following response with body:

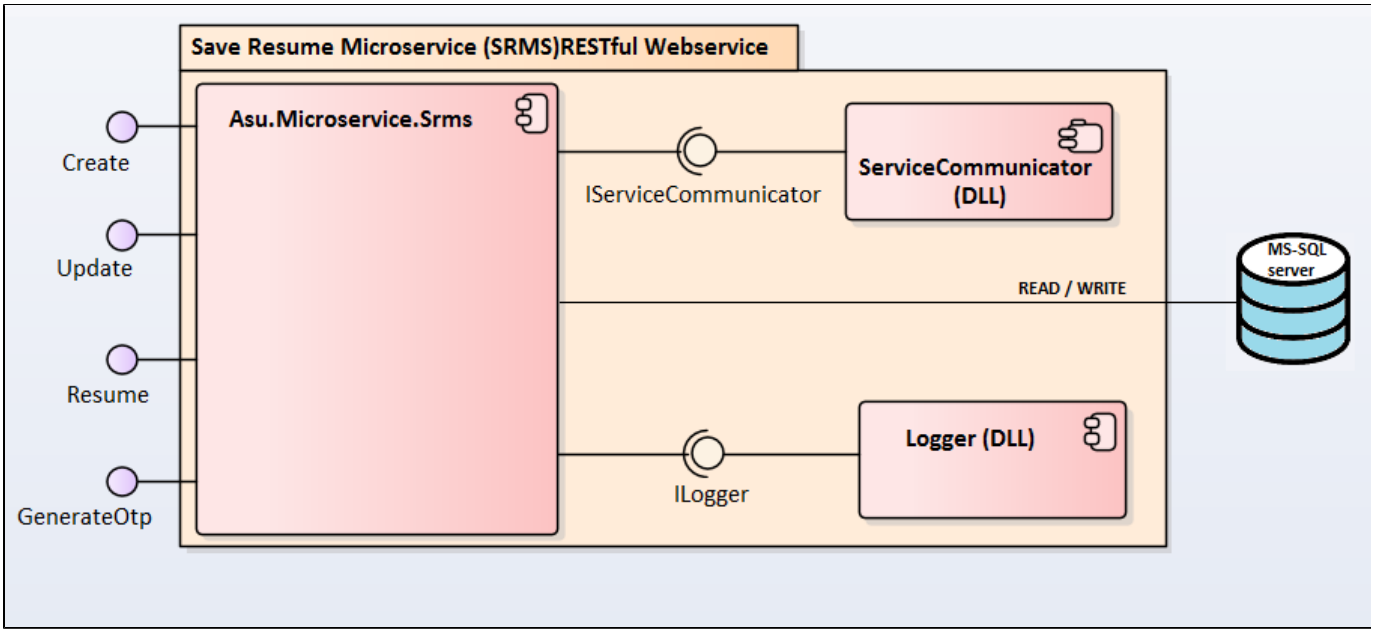
{
"status": "string",
"error_code": "string",
"description": "string"
}
where
status - HTTP error code;
error_code - Error code specific to SRMS;
description - Error description specific to SRMS.
Please refer below SRMS error codes for all handled errors by SRMS.

## Microservice error codes

| Microservice Short Name | Microservice Name | Method name | HTTP Status Code | |
|---|---|---|---|---|
| Srms | Save and Resume | Create; Update | 400 | InvalidGivenName |
| Srms | Save and Resume | Create; Update | 400 | InvalidSurName |
| Srms | Save and Resume | Create; Update | 400 | InvalidPhoneNumber |
| Srms | Save and Resume | Create; Update | 400 | InvalidEmailAddress |

| | | | | |
|---|---|---|---|---|
| Srms | Save and Resume | Update; Retrieve | 400 | InvalidApplicationNo |
| Srms | Save and Resume | Update; Retrieve | 400 | ApplicationExpired |
| Srms | Save and Resume | Create; Update | 400 | InvalidDate |
| Srms | Save and Resume | Retrieve | 400 | InvalidOtpFormat |
| Srms | Save and Resume | common | 500 | SrmsUnKnownError |
| Srms | Save and Resume | common | 503 | SrmsNotAvailable |
| Srms | Save and Resume | common | 404 | ResourceNotAvailabl |
| Srms | Save and Resume | common | 500 | DatabaseReadWriteE |
| Srms | Save and Resume | Create ( both) | 400 | CreateAppInputMode |
| Srms | Save and Resume | Create( both) | 401 | CreateAppUnAuthoriz |
| Srms | Save and Resume | Create( both) | 403 | CreateAppForbidden |
| Srms | Save and Resume | Create( both) | 408 | CreateAppTimeout |
| Srms | Save and Resume | Create( both) | 500 | CreateAppInternalErr |
| Srms | Save and Resume | Create( both) | 501 | CreateAppNotImplem |
| Srms | Save and Resume | CreateApplicationForm only | 400 | FormTypeInvalid |
| Srms | Save and Resume | update | 400 | UpdateAppInputMode |
| Srms | Save and Resume | update | 401 | UpdateAppUnAuthori |
| Srms | Save and Resume | update | 403 | UpdateAppForbidden |
| Srms | Save and Resume | update | 408 | UpdateAppTimeout |
| Srms | Save and Resume | update | 500 | UpdateAppInternalEr |
| Srms | Save and Resume | update | 501 | UpdateNotImplement |
| Srms | Save and Resume | Retrieve | 400 | RetrieveAppInputMod |
| Srms | Save and Resume | Retrieve | 401 | RetrieveAppUnAutho |
| Srms | Save and Resume | Retrieve | 403 | RetrieveAppForbidde |
| Srms | Save and Resume | Retrieve | 408 | RetrieveAppTimeout |
| Srms | Save and Resume | Retrieve | 500 | RetrieveAppInternalE |
| Srms | Save and Resume | Retrieve | 501 | RetrieveAppNotImple |
| Srms | Save and Resume | GenerateOTP | 400 | GenerateOTPInputM |
| Srms | Save and Resume | GenerateOTP | 401 | GenerateOTPUnAuth |
| Srms | Save and Resume | GenerateOTP | 403 | GenerateOTPForbidd |
| Srms | Save and Resume | GenerateOTP | 408 | GenerateOTPTimeou |
| Srms | Save and Resume | GenerateOTP | 500 | GenerateOTPInterna |
| Srms | Save and Resume | GenerateOTP | 501 | GenerateOTPNotImp |

## Components diagram




## Application ID generation algorithim

In both Member join & pension project, application ID will be generated by following microservices

- Member Join Microservice (MJMS)
- Save & Resume Microservice (SRMS) of Member Join
- Save & Resume Microservice (SRMS) of Pension Join

Both Microservice follows below mentioned same algorithm to generate application ID.

These generated Application ID will be having 12 total digits as follows

| Application ID Digits Index( from left to right) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Application ID (12 digits) | | | | | | | | | | | | |

**Algorithm:**

12 digits application ID is divided into following 3 groups.

- Prefix
- Days Left
- Current Time stamp

Following picture depicts application ID groups

| Application ID Digits Index( from left to right) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Application ID ( grouping) | Prefix characters | | | Days Left in base 36 with right aligned and padded with zeros | | | Current Time stamp ( HHmmssfff) in Base 36 with right aligned and padded with zeros | | | | | |

*Prefix:*
This 3 digits ASCII characters. Following characters are reserved for service which generates application ID.

MJM – Member join Microservice
MJS – Member Join Save & Resume Microservice
PJS - Pension join Save & Resume Microservice

*Day Left:*

This is 3 digits base 36 characters.
This is calculated from number of days left since 1st Nov 2017 to today. This integer value is then converted into base 36 to save space. These characters are then right aligned in 3 digits and padded left with zeros.

*Current Time stamp:*

This is 6 digits base 36 characters. This is calculated by converting current time stamp of format “HHmmssfff”. This long integer value is then converted into base 36 to save space. These characters are then right aligned within 6 digits and padded left with zeros.

**Example from MJMS:**

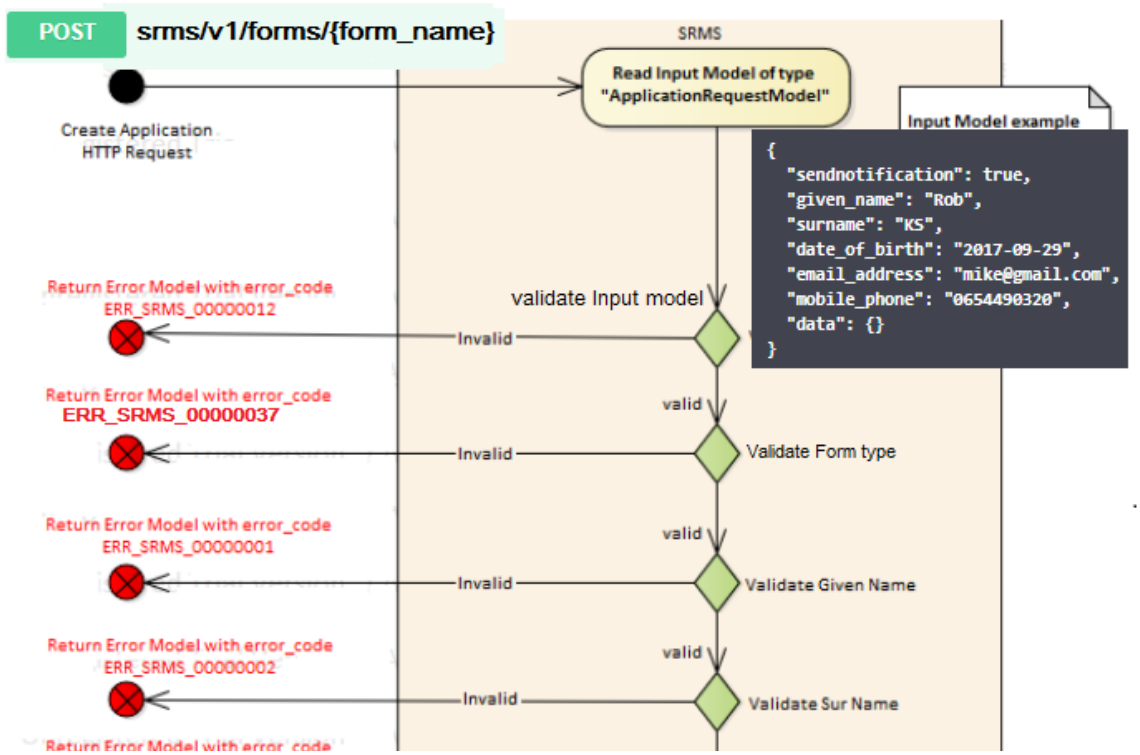
| Application ID Digits Index( from left to right) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Example FROM MJMS | M | J | M | 0 | A | 6 | 1 | Q | V | E | S | 5 |

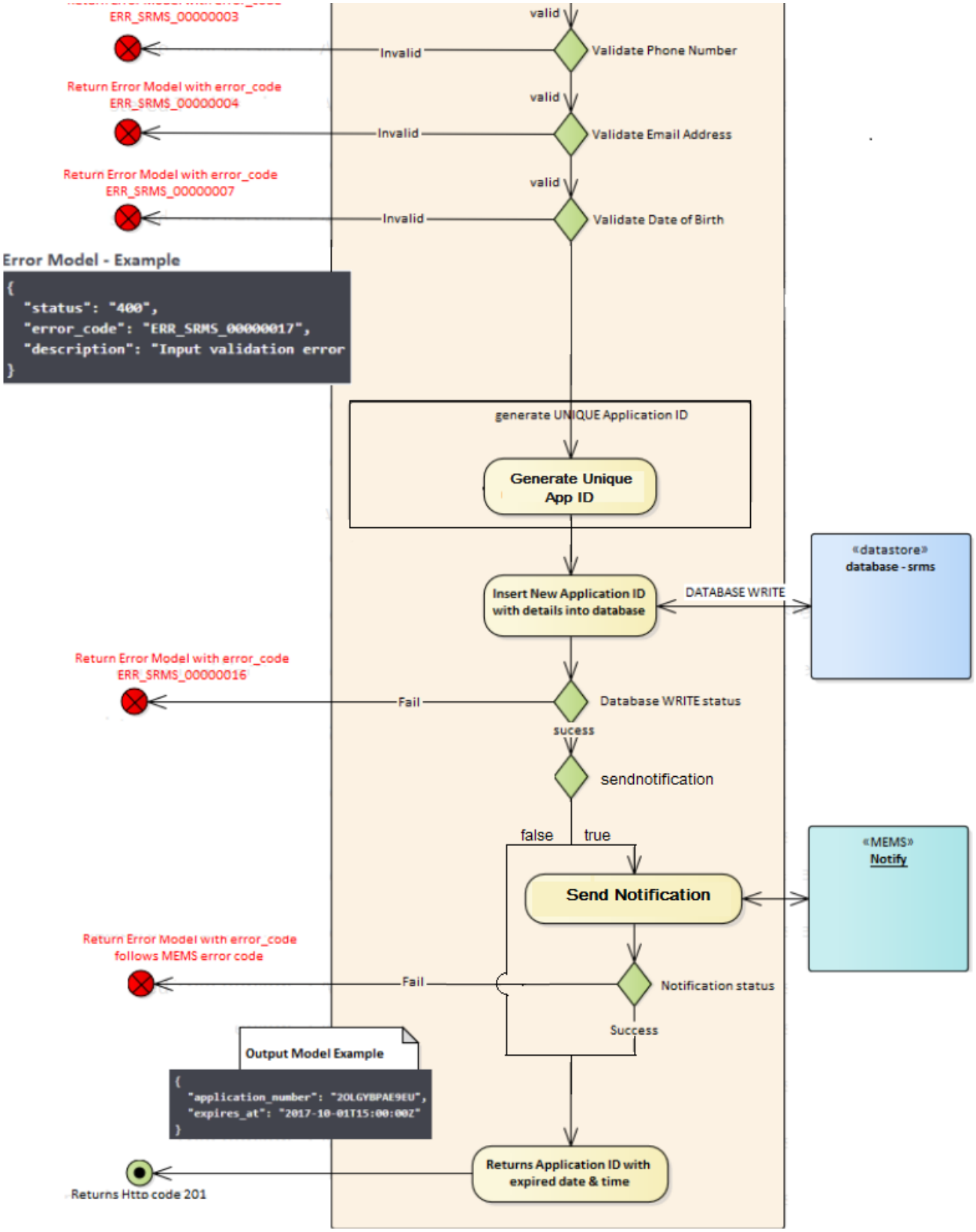
**Example from SRMS**

| Application ID Digits Index( from left to right) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Example FROM SRMS | M | J | S | 0 | A | 6 | 1 | Q | C | A | 7 | Y |

## Activity diagrams

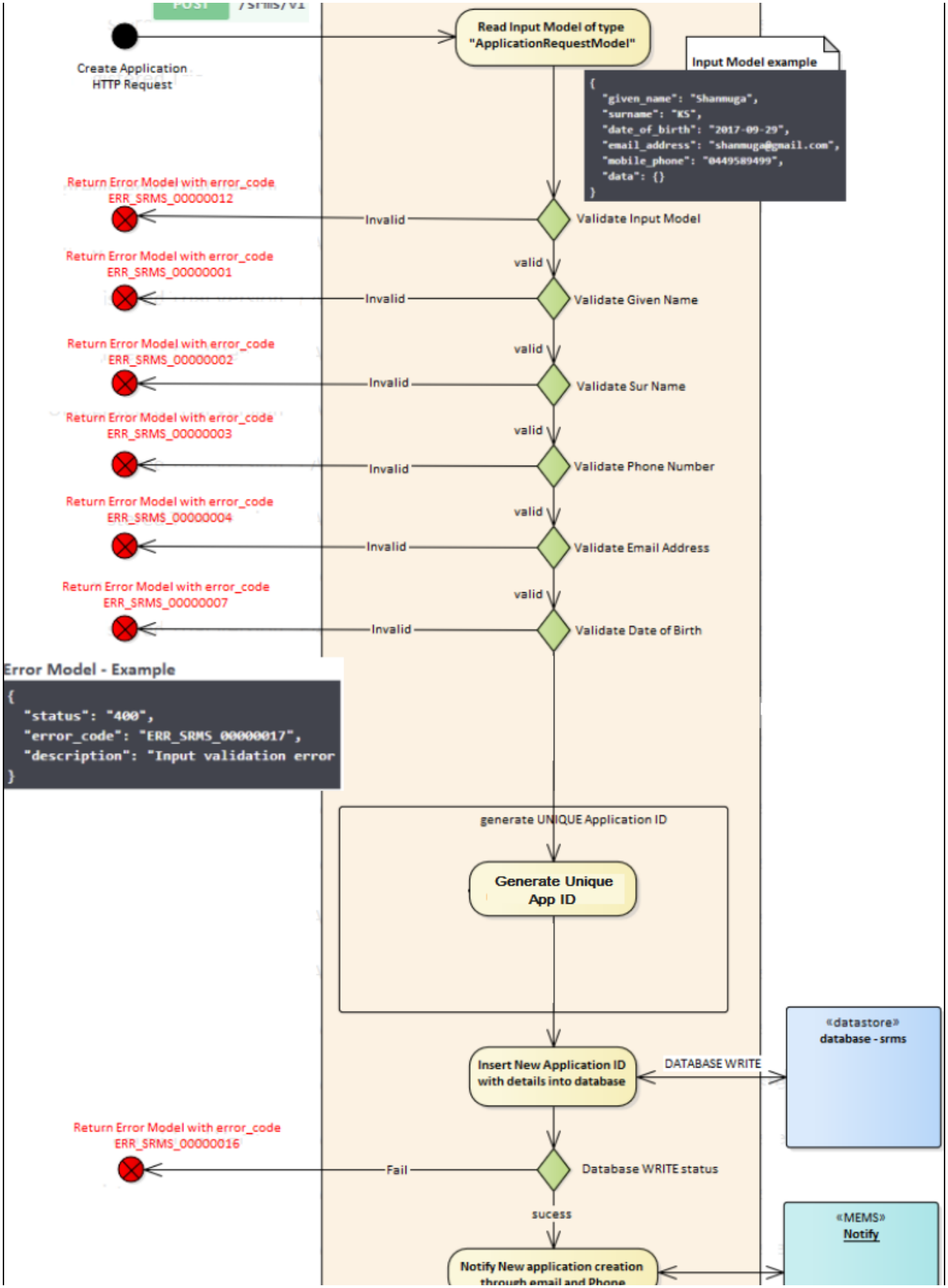
### CreateApplicationForm

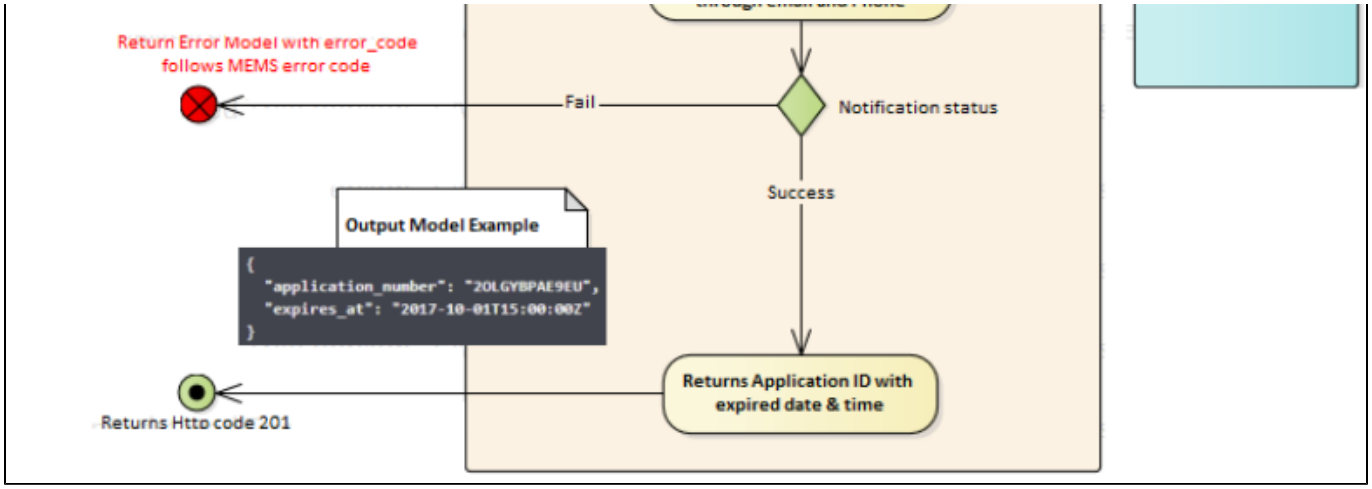




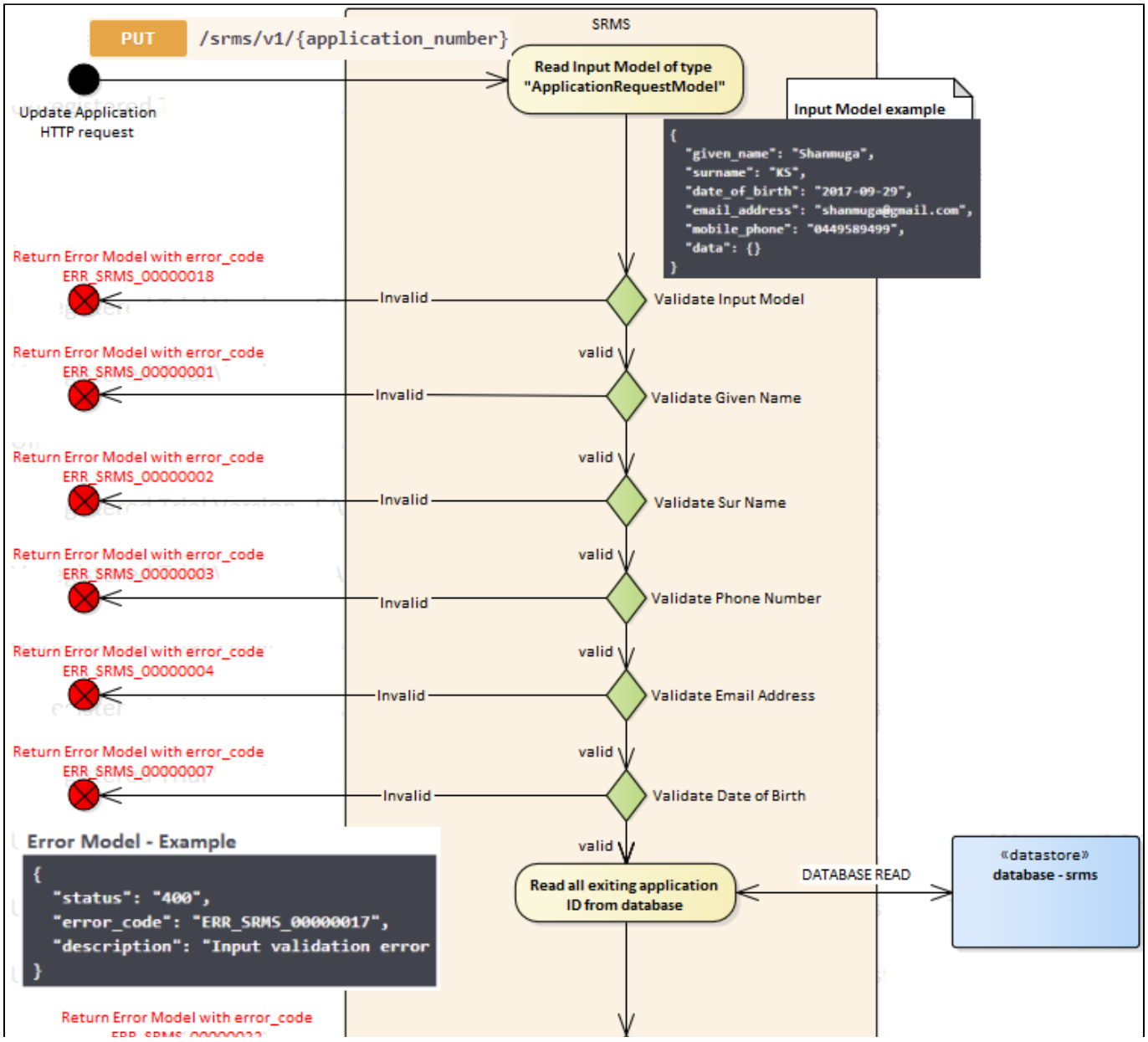

## Create Application

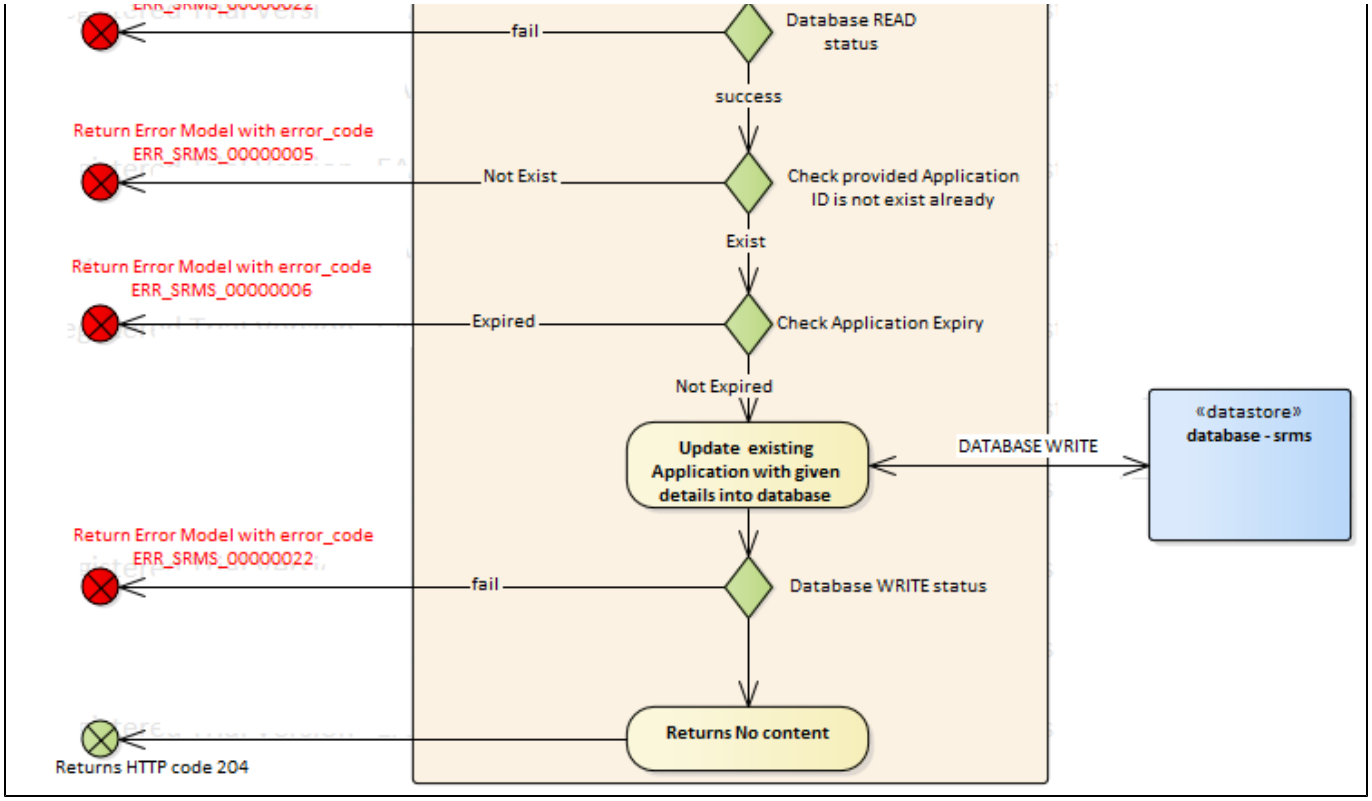
| | SRMS | |
|---|---|---|


POST /srms/v1
Create Application HTTP Request
Read Input Model of type "ApplicationRequestModel"
Input Model example
{
"given_name": "Shanmuga",
"surname": "KS",
"date_of_birth": "2017-09-29",
"email_address": "shanmuga@gmail.com",
"mobile_phone": "0449589499",
"data": {}
}
Validate Input Model
Invalid
Return Error Model with error_code ERR_SRMS_00000012
valid
Validate Given Name
Invalid
Return Error Model with error_code ERR_SRMS_00000001
valid
Validate Sur Name
Invalid
Return Error Model with error_code ERR_SRMS_00000002
valid
Validate Phone Number
Invalid
Return Error Model with error_code ERR_SRMS_00000003
valid
Validate Email Address
Invalid
Return Error Model with error_code ERR_SRMS_00000004
valid
Validate Date of Birth
Invalid
Return Error Model with error_code ERR_SRMS_00000007
Error Model - Example
{
"status": "400",
"error_code": "ERR_SRMS_00000017",
"description": "Input validation error
}
generate UNIQUE Application ID
Generate Unique App ID
Insert New Application ID with details into database
DATABASE WRITE
«datastore» database - srms
Database WRITE status
Fail
Return Error Model with error_code ERR_SRMS_00000016
sucess
Notify New application creation through email and Phone
«MEMS» Notify

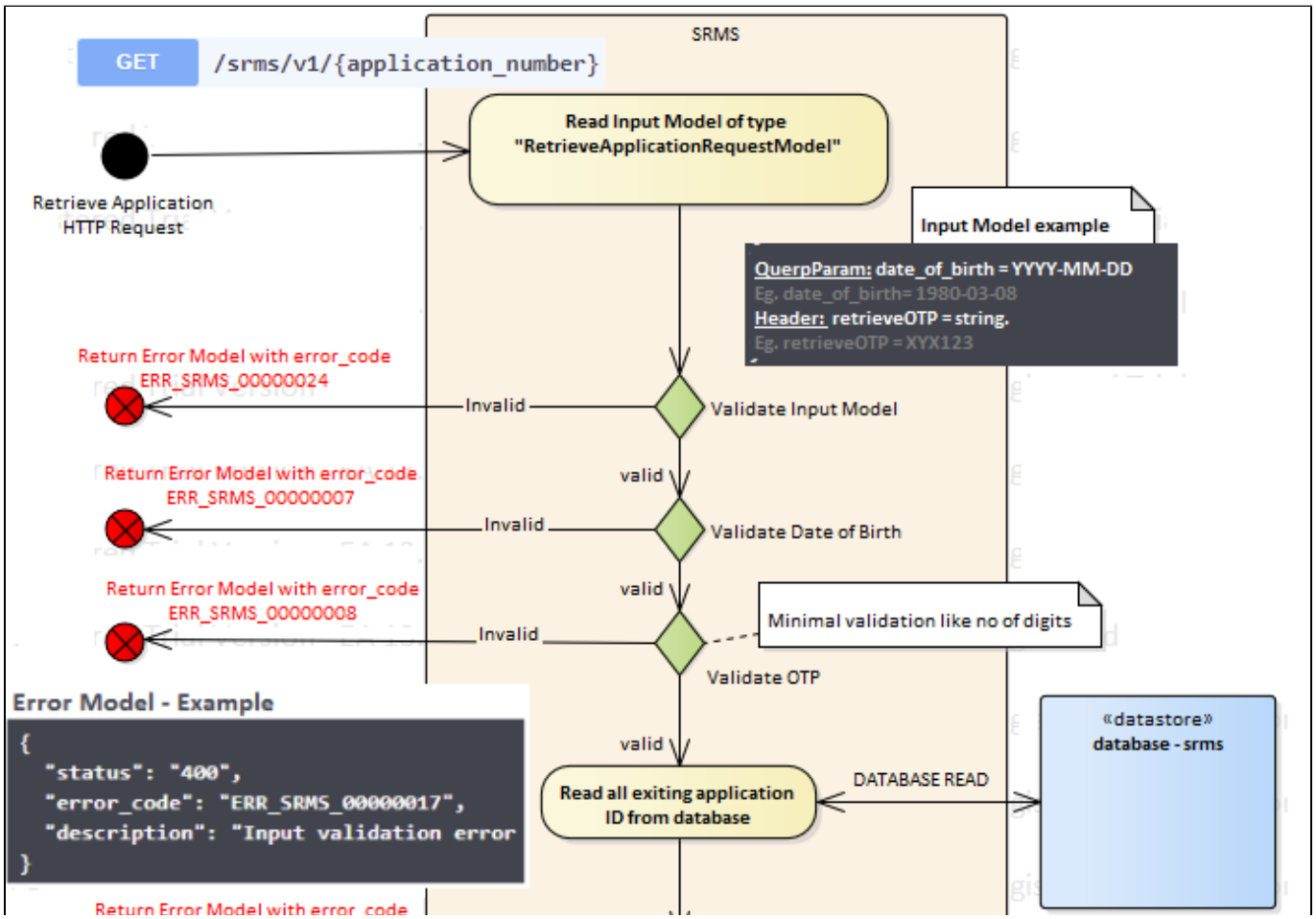


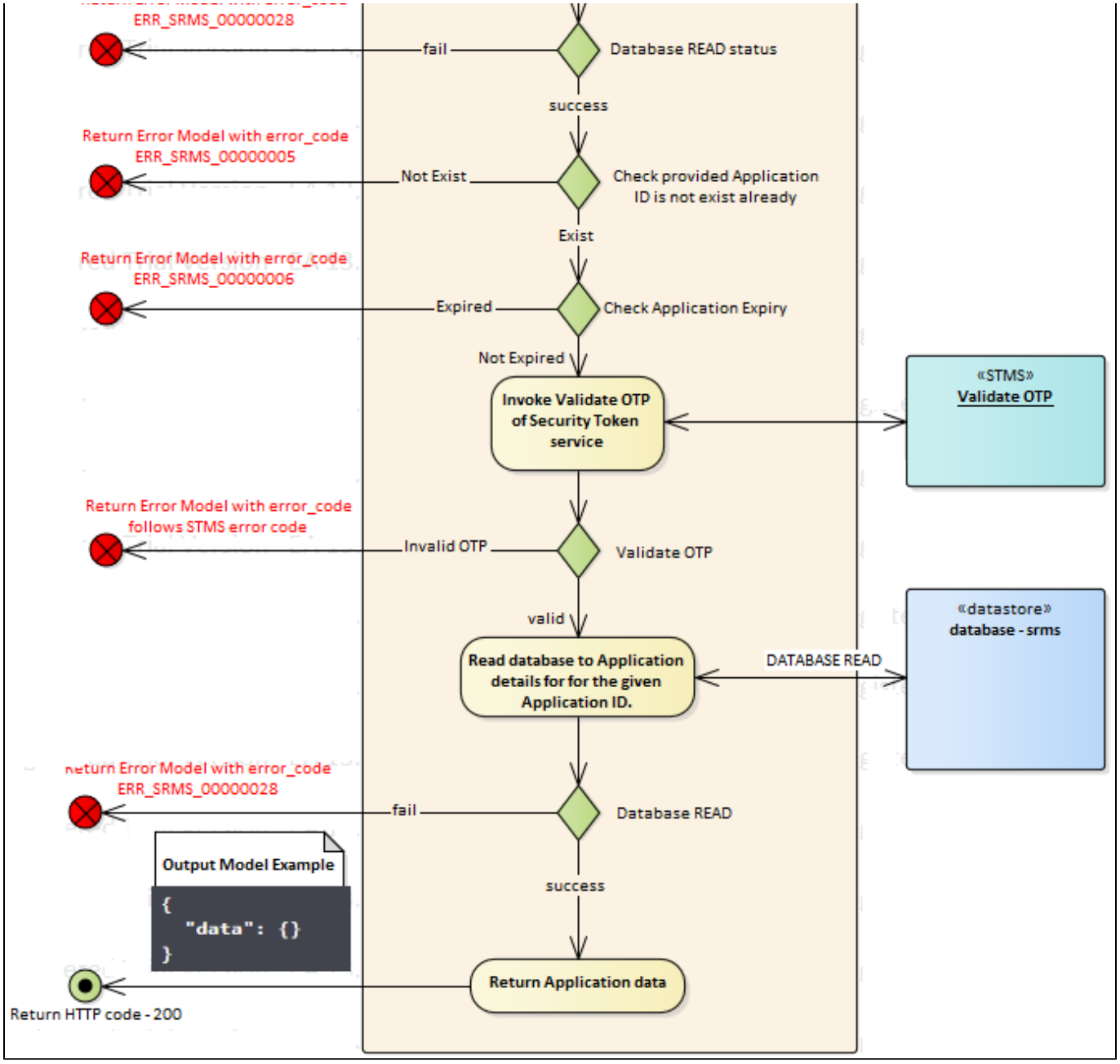

## Update Application



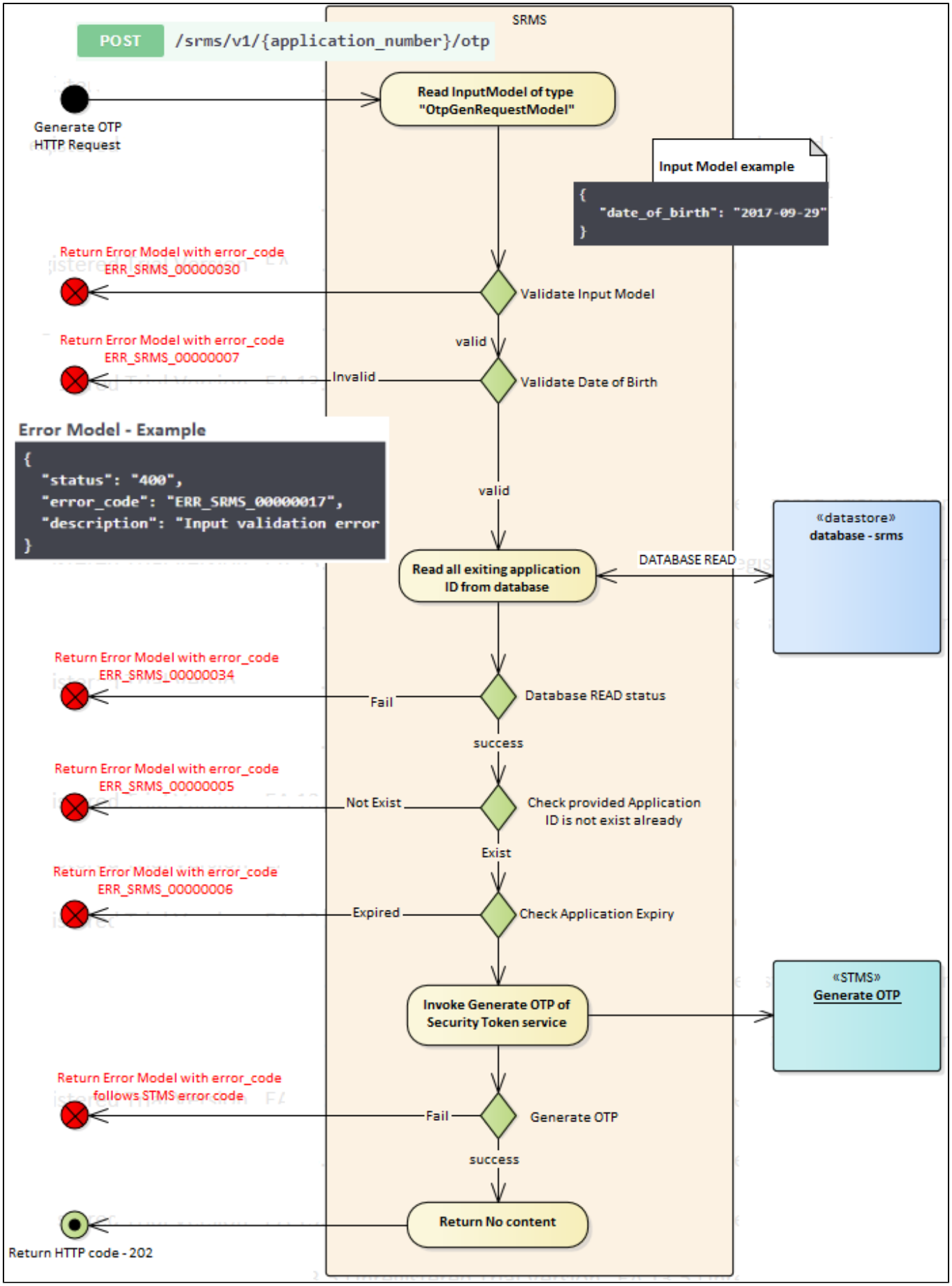



## Retrieve Application



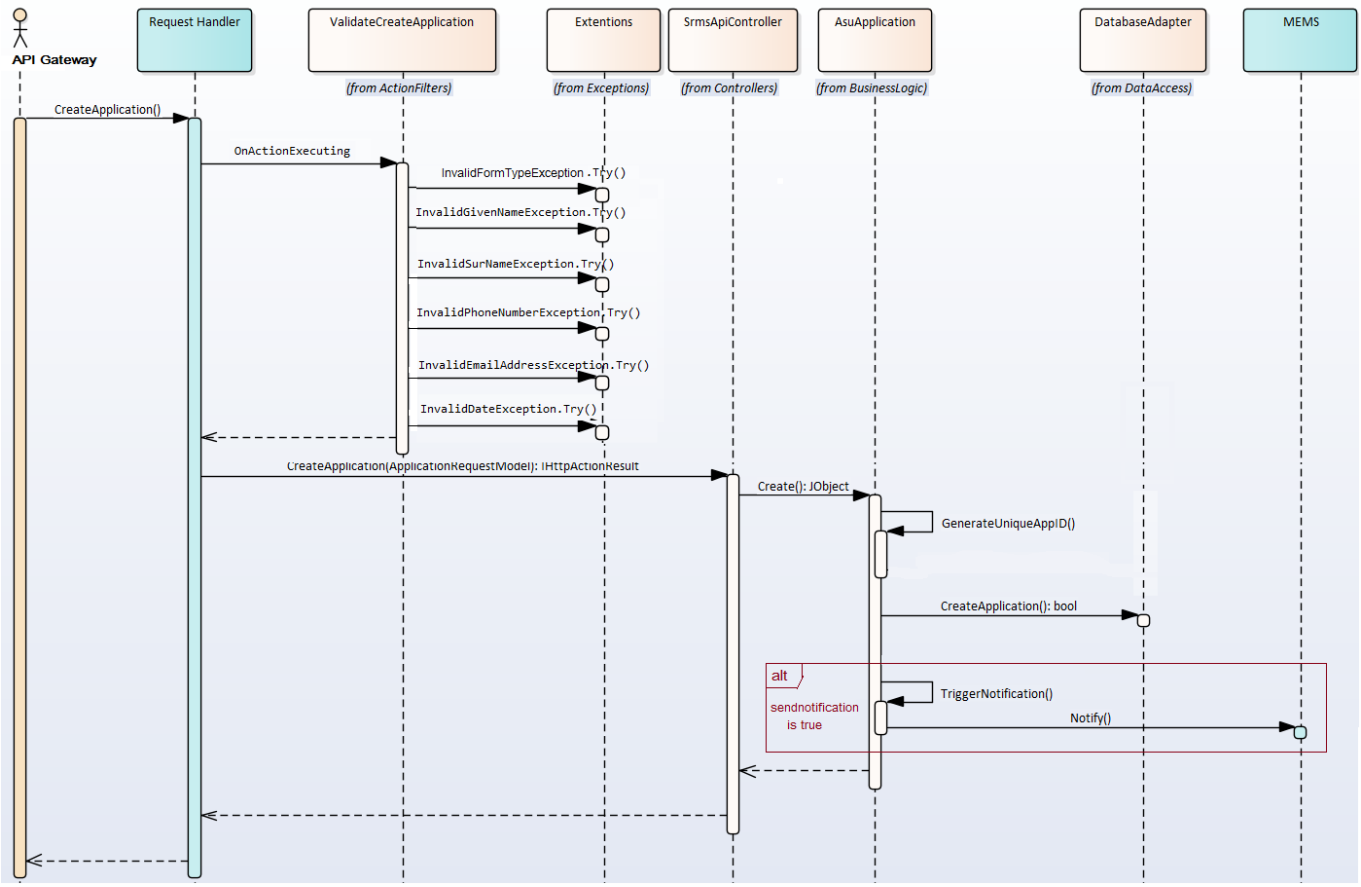



## Generate OTP

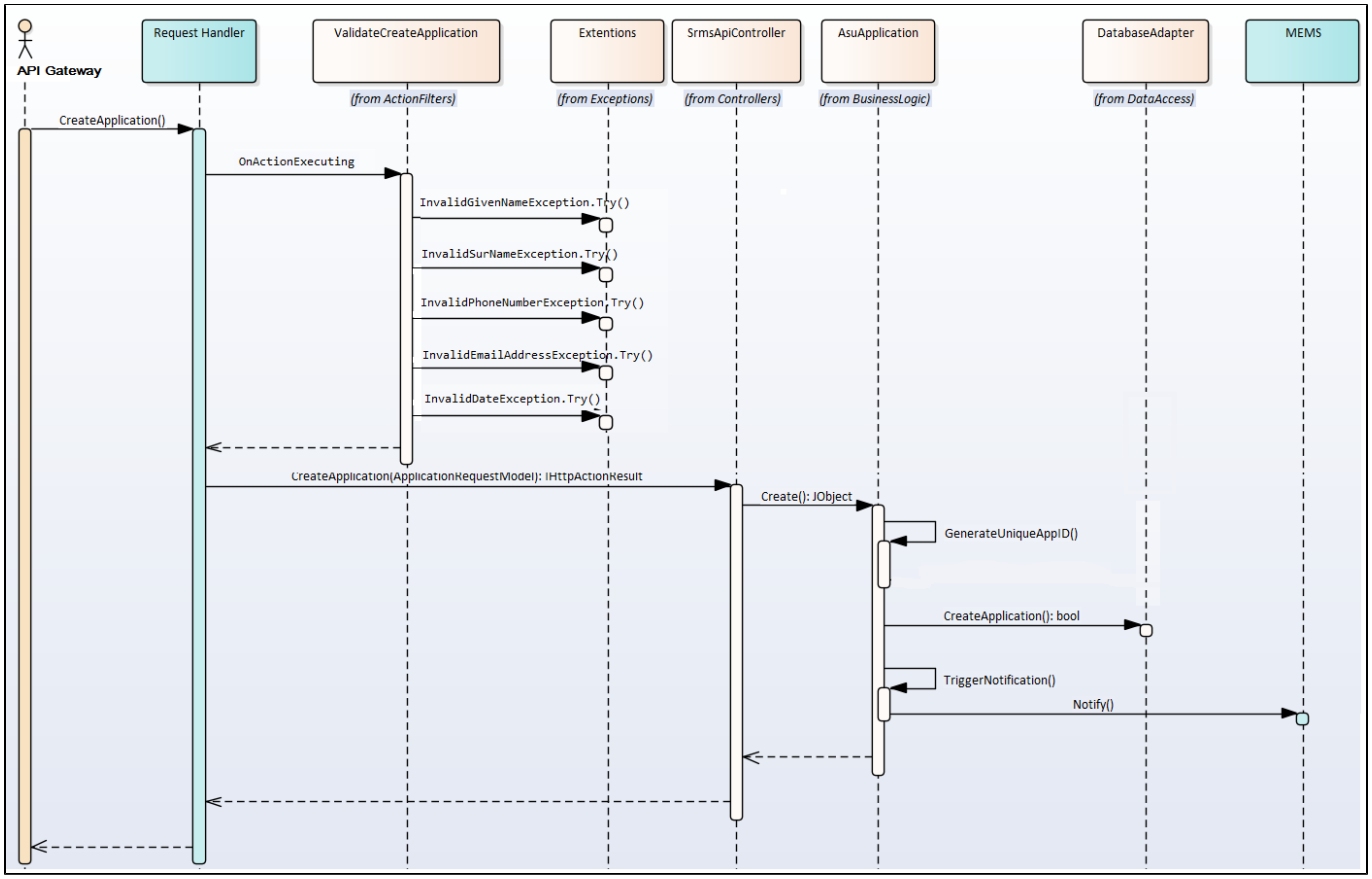

SRMS
POST /srms/v1/{application_number}/otp
Generate OTP HTTP Request
Read InputModel of type "OtpGenRequestModel"
Input Model example
{
"date_of_birth": "2017-09-29"
}
Return Error Model with error_code ERR_SRMS_00000030
Validate Input Model
valid
Return Error Model with error_code ERR_SRMS_00000007
Invalid
Validate Date of Birth
Error Model - Example
{
"status": "400",
"error_code": "ERR_SRMS_00000017",
"description": "Input validation error
}
valid
«datastore» database - srms
Read all exiting application ID from database
DATABASE READ
Return Error Model with error_code ERR_SRMS_00000034
Fail
Database READ status
success
Return Error Model with error_code ERR_SRMS_00000005
Not Exist
Check provided Application ID is not exist already
Exist
Return Error Model with error_code ERR_SRMS_00000006
Expired
Check Application Expiry
«STMS» Generate OTP
Invoke Generate OTP of Security Token service
Return Error Model with error_code follows STMS error code
Fail
Generate OTP
success
Return No content
Return HTTP code - 202

## Sequence diagrams

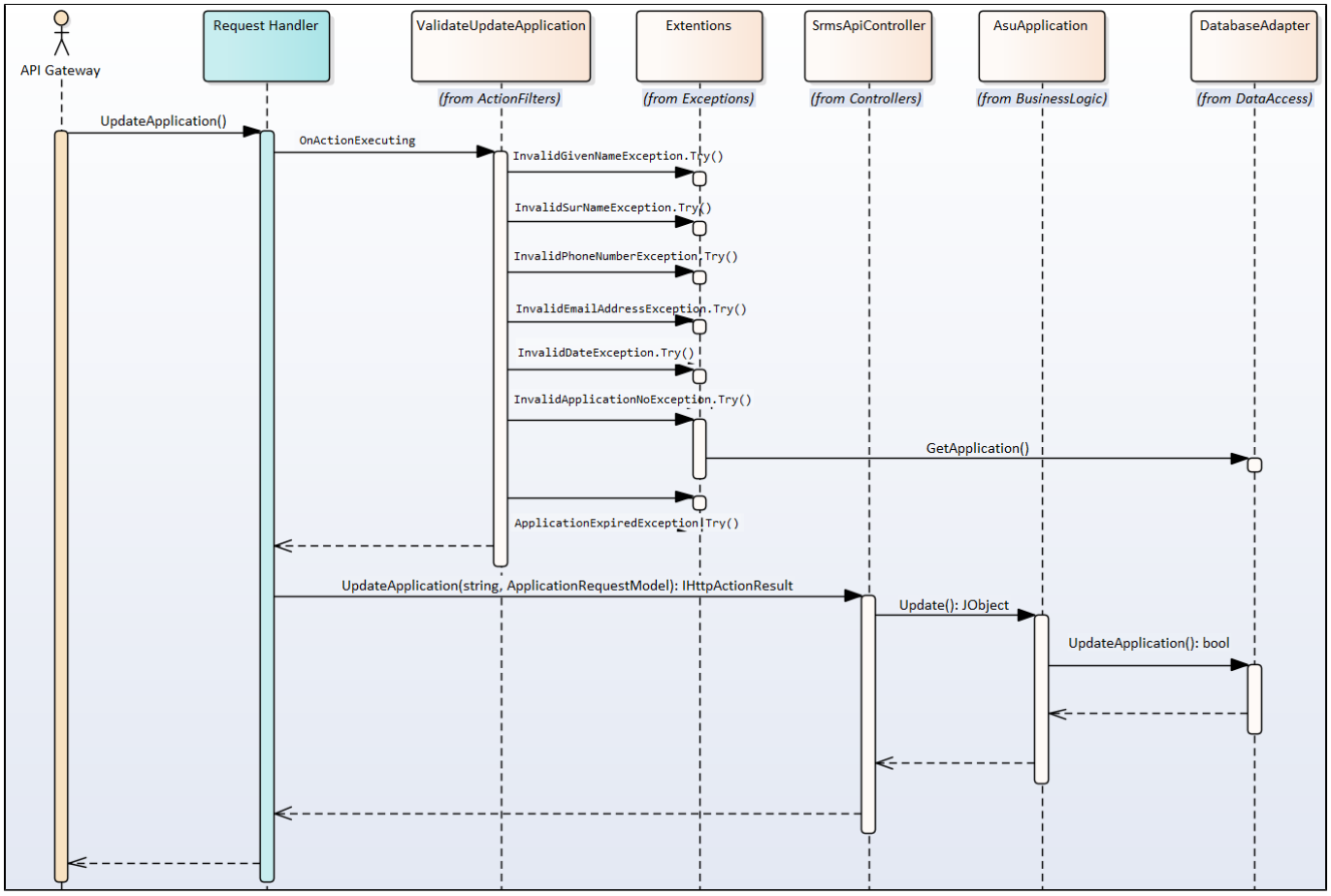
### CreateApplicationForm



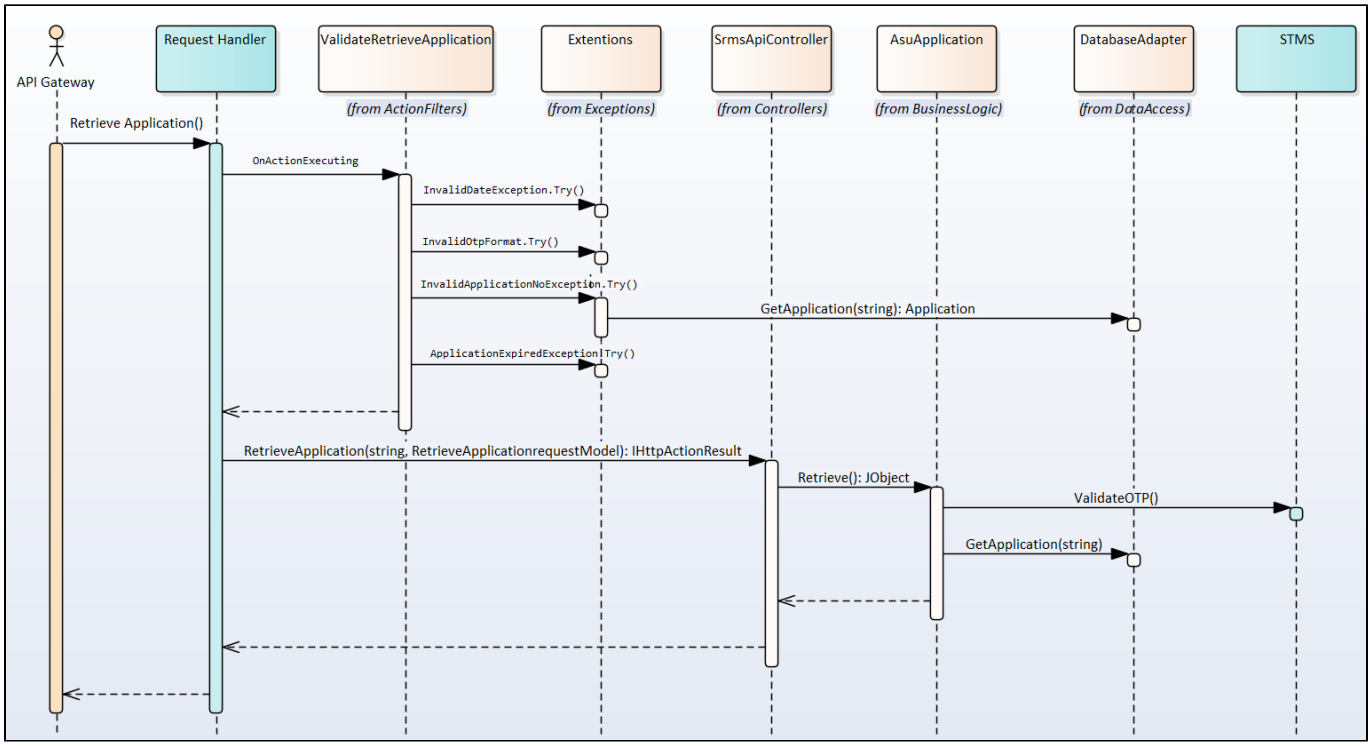

**Create Application**



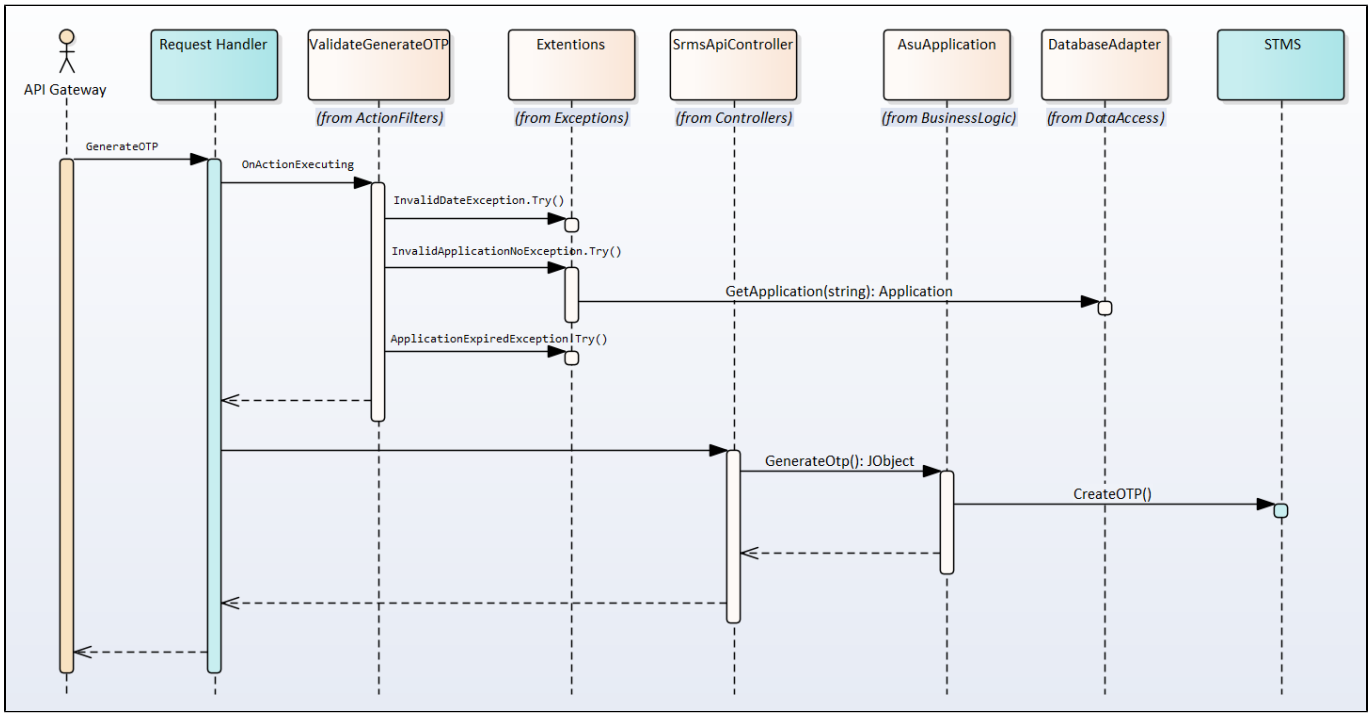

## Update Application




## Retrieve Application



## Generate OTP




## Database design

**Database Name:** srms

### Table Schema

**Table Name: Application**

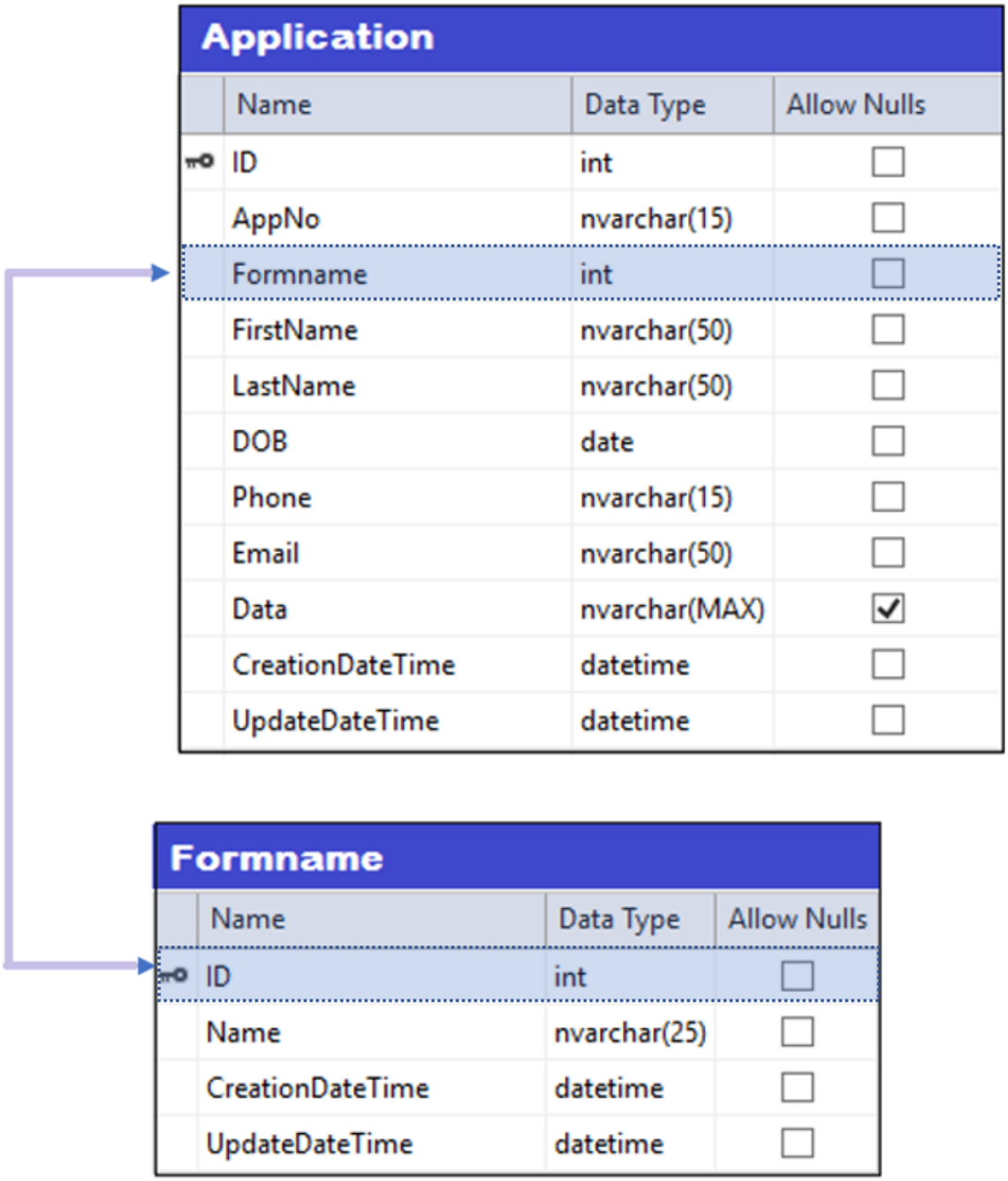
| Column | Type | Allow NULLS | Unique | Comment |
|---|---|---|---|---|
| ID | int (auto-number) | No | Yes | Primary key |
| Formname | int | No | No | |
| AppNo | nvarchar(15) | No | Yes | Application Number |
| FirstName | nvarchar(50) | No | No | |
| LastName | nvarchar(50) | No | No | |
| DOB | date | No | No | |
| Phone | nvarchar(15) | No | No | |
| Email | nvarchar(50) | No | No | |
| Data | nvarchar(MAX) | No | No | |
| CreationDateTime | datetime | No | No | |
| UpdateDateTime | datetime | No | No | |

**Table Name: Formname**

| Column | Type | Allow NULLS | Unique | Comment |
|---|---|---|---|---|
| ID | int (auto-number) | No | Yes | Primary key |
| Name | nvarchar(25) | No | Yes | Form type in single word ( possible values member, pension) |

| | | | | |
|---|---|---|---|---|
| CreationDateTime | datetime | No | No | |
| UpdateDateTime | datatime | No | No | |

## Entity Relationship diagram:




## Data Retenstion and house Keeping

**Action: HS**

**Attachments**

- **SRMS 2.7**
- SRMS 2.7 JSON
- **UniqueAppIdGenerator.pdf**