**MINISTRY OF EDUCATION AND TRAINING**

**FPT UNIVERSITY**

Capstone Project Summary Document

**Google Admin and HR System synchronization**

|  |  |
| --- | --- |
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| **Supervisor** | Nguyễn Phan Quang Nhật |
| **Ext. Supervisor** | N/A |
| **Capstone Project code** | GmHRS |

- Ho Chi Minh City, ***20th May 2020*** –

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# Capstone project register



**CAPSTONE PROJECT REGISTER**

Class: Duration time: from ..…….../20…. To ..….…./20…..

(\*) Profession: <Software Engineer> Specialty: <ES> <IS>

x

(\*) Kinds of person make registers: Lecturer Students

x

1. Register information for supervisor (if have)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Full name** | **E-Mail** | **Title** |
| Supervisor 1 | Nguyễn Phan Quang Nhật | NhatNPQ3@fe.edu.vn | Mr. |

2. Register information for students (if have)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Full name** | **Student code** | **E-mail** | **Role in Group** |
| Student 1 | Phan Văn Thành | SE62274 | Thanhpvse62274@fpt.edu.vn | Leader |
| Student 2 | Nguyễn Đình Thông | SE61790 | Thongndse61790@fpt.edu.vn | Member |
| Student 3 | Nguyễn Công Sơn | SE62729 | Sonncse62729@fpt.edu.vn | Member |
| Student 4 | Đặng Phạm Thế Nguyên | SE62666 | Nguyendptse62666@fpt.edu.vn | Member |

3. Register content of Capstone Project

(\*) 3.1. Capstone Project name:

English: Google Admin and HR System Synchronization

Vietnamese: Đồng bộ hoá dữ liệu nhân sự với hệ thống Gmail doanh nghiệp.

Abbreviation: GmHRS

- **Context**:

G Suite (or Gmail for business) is one of preferable choices for business mail system for organizations and businesses from startups to large enterprises.

In most of organization, the G Suite is managed independently from the HRMS (human resource management system) of the organization since G Suite admin programming interface has just been release in recent years. It means that every time a company gets a new employee, after entering his or her profile into the HRMS, the IT has to manually create an email account for him or her accordingly. Similar process is also needed when an employee leaves the company.

The aim of this project is to provide an independent tool which not only synchronizes employees accounts in HRMS but also helps to enforce some mail-related company policies.

The target users of this project are not normal users but usually IT management teams.

- **Building an application which provides following features (minimum requirement):**

1. Register and self-profile management for each organization.
2. Account management for admin.
3. Setup input (how HRMS provide data for GmHRS, the format is defined by GmHRS)
   * Through direct database access.
   * API endpoints
4. Synchronize employees list in HRMS with account in their G Suite (one-way only)
5. Synchronize email groups in G Suite with (one-way only):
   * Teams
   * Departments
6. Build a simple HRMS for the demo purpose
   * Employees management
   * Teams management
   * Department management
   * Provide API endpoints for GmHRS.

***Depending on team capacity, these following points can be extended to fit with it:***

1. Extend feature (1) with 2 factor authentication support.
2. Enforce email signatures for all employees Gmail account.
   * This implies a signature editor
3. Enforce auto response mail for employees during their leaves/vacations based on data from the leave management of HRMS if available.
4. Support large organization with multiple domains for multiple subsidiaries.

(\*) 3.2. Main proposal content (including result and product)

1. Theory and practice (document):

* Student should apply the software development process and the UML.
* Software artifacts include User Requirement, Software Requirement Specification,
* Architecture Design, Detail Design, System Implementation and Testing Document,
* Installation Guide, sources code, and deployable software packages.
* 3 tiers or MVC or any architectural design pattern should be applied.
* Server-side technique:
  + Database design, OOA, OOD, OOP, NodeJS or any server-side programming language, …
* Client-side technique:
  + HTML5, CSS, JavaScript, jQuery, Ajax, ReactJS, React Native, Android, Swift, Flutter, ...
* Communication technique:
  + Exchange information and transfer data in effective in networks, communicating protocol between mobile devices...
* Research
  + Algorithms for feature (4), (5), (7).

1. Program:

* Web application for both admin and users.
* Web application for demo HRMS.

1. Other products:

N/A

4. Other comment (propose all relative thing if have)

N/A

|  |  |
| --- | --- |
| **Supervisor (If have)**    *Nguyễn Phan Quang Nhật* | HCM City, date …… ………. /20 …..  **On behalf of Registers** |

# Report 1

## Project Information

* + - * **Project name**: Google Admin and HR System synchronization
      * **Project code**: GmHRS
      * **Product type**: Web page system
      * **Start date:** 16-05-2020
      * **End date**: 30-08-2020

## Introduction

In this document, we introduce a system that help Human Resource (HR) to synchronize data of employees, teams, departments from the HRMS (human resource management system) of the organization up to G-Suite. The aim of this project, we also help to enforce some mail-related company policies. For example: Support design format company’s signature and design auto reply mail template.

## Current Situation

In most of organization, the G-Suite is managed independently from the HRMS (human resource management system). It means that every time a company gets a new employee, after entering his or her profile into the HRMS, the IT has manually creating an email account for him or her accordingly. Similar process is also needed when an employee leaves the company.

Otherwise, the most company have some mail-related policy but the company can’t handle at all of their employees that they have follow the policies of the company or not.

## Problem Definition

Analyze above situation, we noticed that current system is good at organizing data, the information is arranged quite clearly and comprehensible. But it leaves below problems:

IT manually create email Google on G-Suite after HR create new employees in HRMS, with a large organization so take more time to do this

Handling about mail-related policies from GmHRS.

## Proposed Solution

### Featured

The values and challenges of the proposed solutions

Web application:

* + - * Register for new account: user must register an account for use web application
      * Setting connection: User must provide API end point or DB connection for synchronization.
      * Set up scheduler jobs: User can set time for synchronize is automatically
      * Execute synchronize manually: When execute synchronize user can preview data after process comparing between HRMS and G Suite at First sync. At Second sync user preview any changed from HRMS for confirming and executing synchronize data.
      * View data logs of synchronizing: User can view any creating, updating and deleting of employees, teams, departments.
      * Manage signature template: User can design signature templates with dynamic and assign template by specific for departments, teams and positions
      * Manage rules of signature: User can define rules of signature by min length, max length, required and not required using dynamic content
      * Manage vacation auto reply mail template: User can design template for auto vacation auto reply mail and assign by specific for departments, teams and positions.
      * Manage smart OTP with GmHRS OTP: User can active and de active option for signing in with smart OTP (no internet) or approving by pass OTP (internet). User can use any app OTP to get smart OTP. For example: Authy, Google Authentication, Authenticator of Microsoft and GmHRS OTP mobile application…

### Advantages and disadvantages

**Advantages**:

* + - * We support company to update employees on G-Suite automation.

Reduce much of effort of staff in create employees Google account processing

* + - * Supporting manage Gmail signatures for employees in the company according to the law set by the company. Supporting check and updating signatures for employees who are incorrectly signed under the company's law for signature.
      * Helping manage an employee's Gmail auto replies while they're on vacation.

**Disadvantages**:

* + - * Users need to be trained to use mapping component and create formula function.
      * Users need set rule polices to check content email is valid
      * Only IT can handle and for using GmHRS web application.
      * Only support Gmail

## Functions requirements

Functional requirements of the system are listed as below:

* + 1. Unauthorized User
       - Unauthorized user can register
       - Unauthorized user can reset password
       - Unauthorized user can sign in
    2. System Admin
       - System admin can sign in (optional 2FA)
       - System admin can sign out
       - System admin can create user
       - System admin can update user
       - System admin can delete user
       - System admin can view detail user
    3. Company Admin
       - Company admin can sign in (optional 2FA)
       - Company admin can sign out
       - Company admin can change password
       - Company admin can update profile information
       - Company admin can settings connection (API endpoint and DB Connection)
       - Company admin can set up time and turn on/off schedule jobs for synchronization
       - Company admin can execute synchronization manually (Gmail business and personal information of employees, email group and information of teams and departments)
       - Company admin can view list and detail of employees, teams, departments
       - Company admin can preview data of employees, teams and departments when synchronization
       - Company admin view logs of synchronization
       - Company admin can CRUD signature template with dynamic content
       - Company admin can assign signature template by specific for department, team, position of employee and order and apply by priorities.
       - Company admin can create rules for signature template (min length, max length, dynamic contents)
       - Company admin can update employee’s signature on Gmail
       - Company admin can check and update employee’s signature do not follow rules of signature
       - Company admin can send mail to remind employees who having signature did not following rules of signature
       - Company admin can send mail to notify all of employees when rules of signature changed.
       - Company admin can CRUD vacation auto reply mail template
       - Company admin can assign vacation auto reply mail template by specific for department, team, position of employee and order and apply by priorities.
       - Company admin can active and de active sign in with smart OTP
       - Company can sign in by smart OTP, approve by pass OTP on GmHRS OTP mobile application.
    4. System handler
       - System handler can execute schedule jobs for synchronization

## Role and responsibility

|  |  |  |  |
| --- | --- | --- | --- |
| No | Full Name | Position | Contact |
| 1 | Nguyễn Phan Quang Nhật | Supervisor | nhatnpq3@fu.edu.vn |
| 2 | Phan Văn Thành | Leader | thanhpvse62274@fpt.edu.vn |
| 3 | Nguyễn Đình Thông | Member | thongndse61790@fpt.edu.vn |
| 4 | Nguyễn Công Sơn | Member | sonncse62729@fpt.edu.vn |
| 5 | Đặng Phạm Thế Nguyên | Member | nguyendptse62666@fpt.edu.vn |

Table 1 - Role & Responsibility

# Software process model

As the project problem which we mention above, we choose Scrum Model to manage project development with each sprint is 5 working days. This model will help us:

- Scrum team always work together to reach the project goal. Team member working progress is daily updated.

- Minimize risks when changing requirement.

- The working cycle “Learn - Revise – Apply” is done concurrently and continuously, a team member can apply new research and get the result quickly.

- Product coding is focused rather than document to deliver higher product value.

More information: <https://www.scrum.org/>

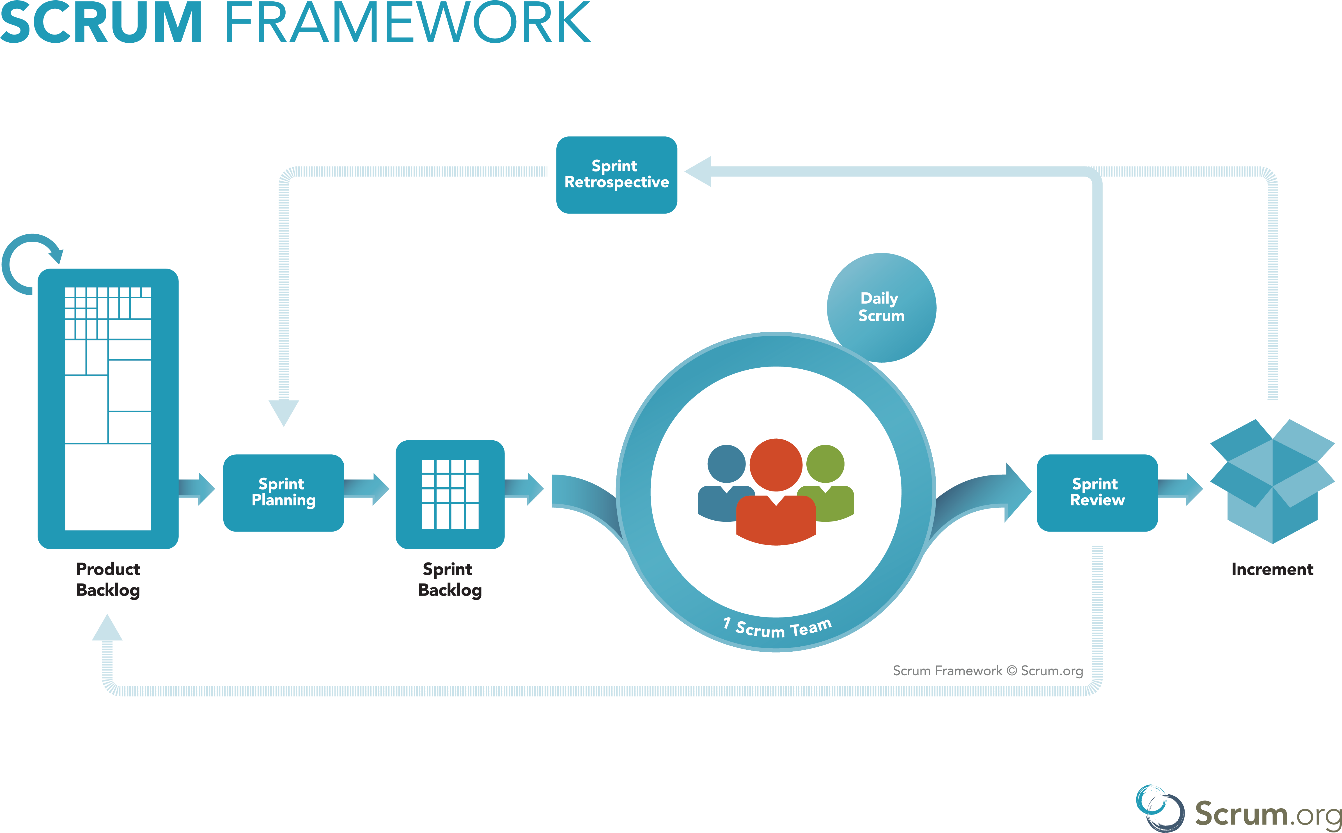


Figure 1 Scrum model

*Reference*: <https://www.scrumviet.org/uploads/1/1/9/1/119155464/published/scrumframework-2000.png?1556106427>

# Conceptual diagram

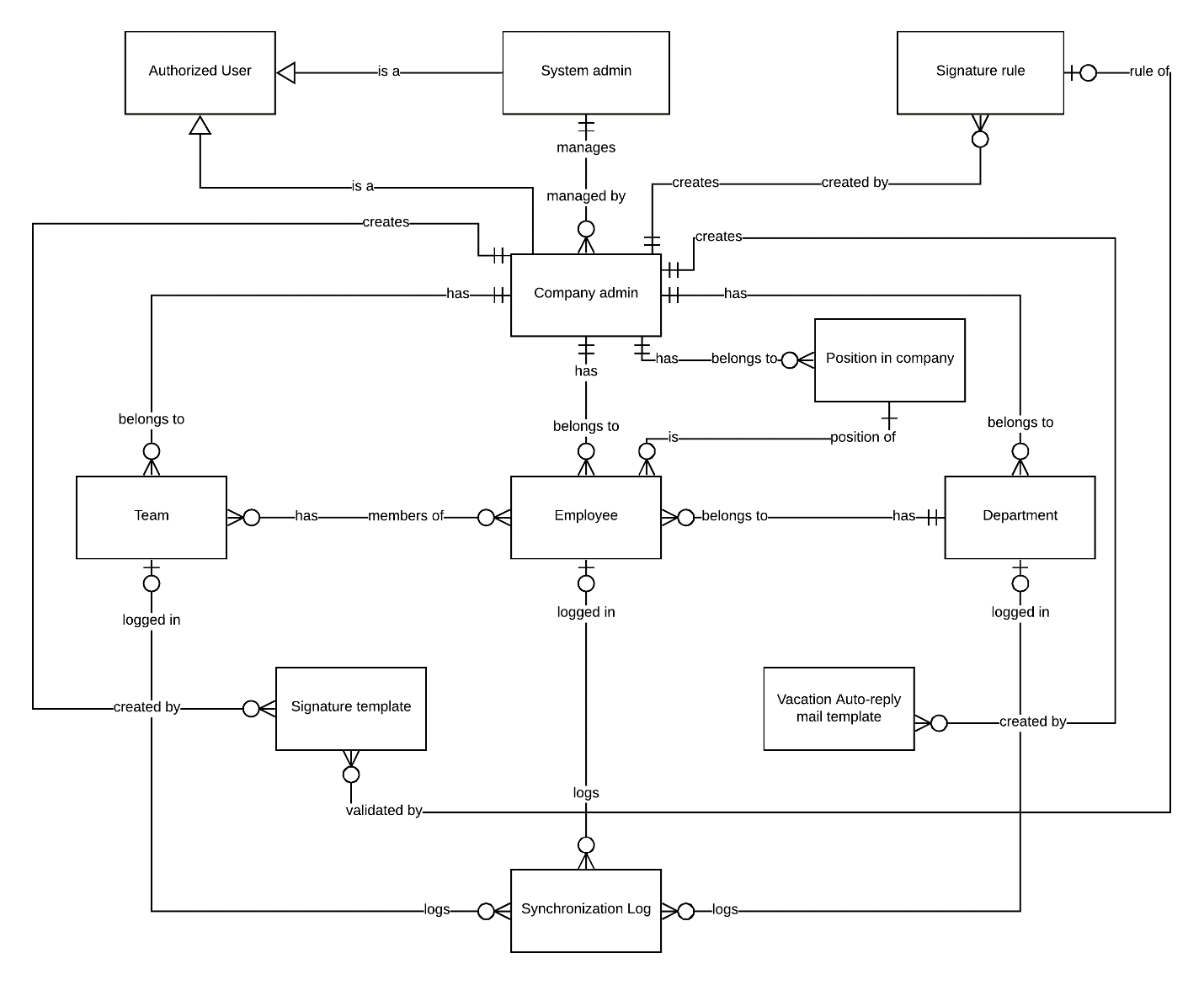


Figure 2 Conceptual Diagram

# Use Case Diagram

## Use Case Overview

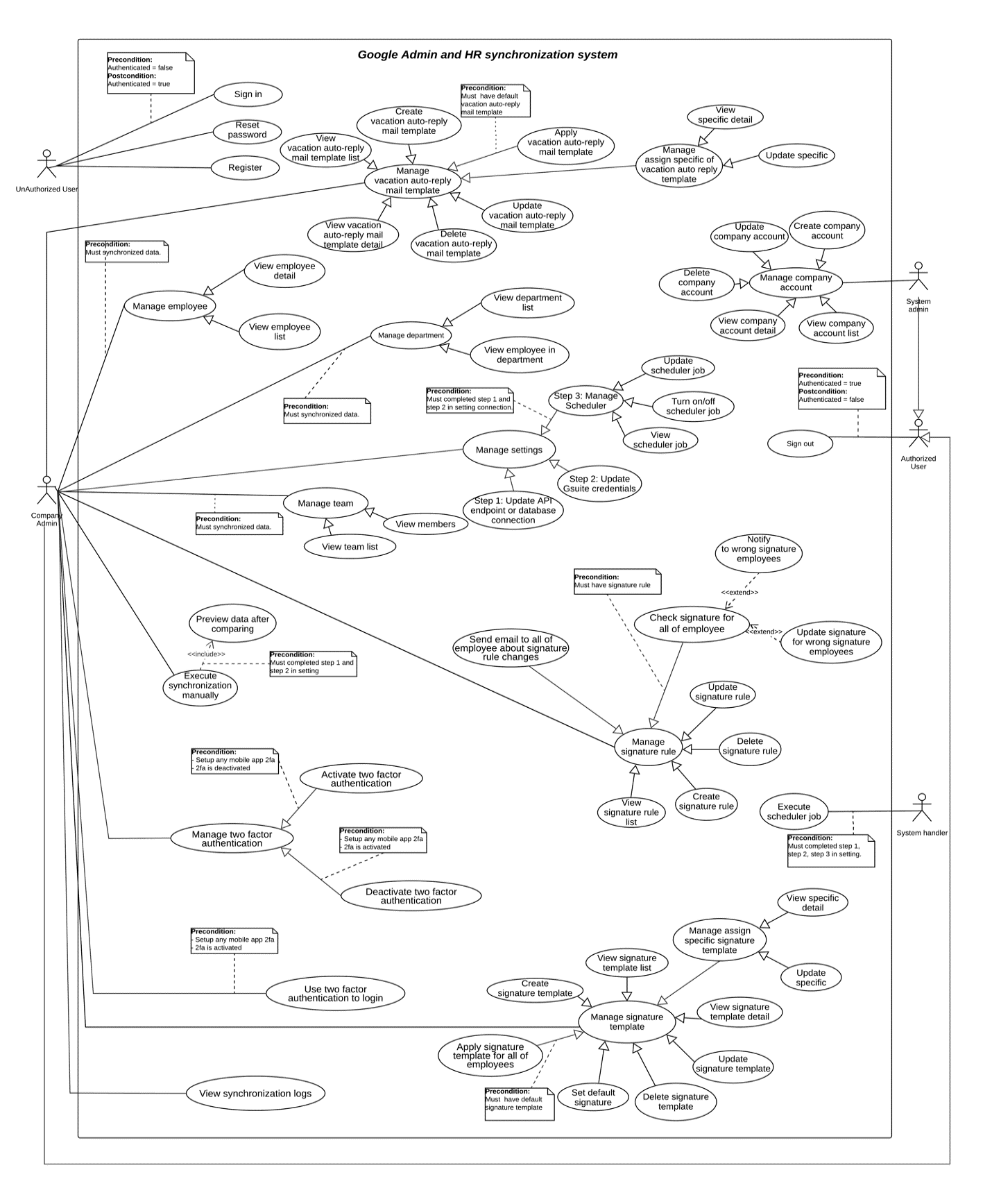


Figure 3 Overview Use Case

## Use Case Specification

### <Unauthorized User> Overview Use Case

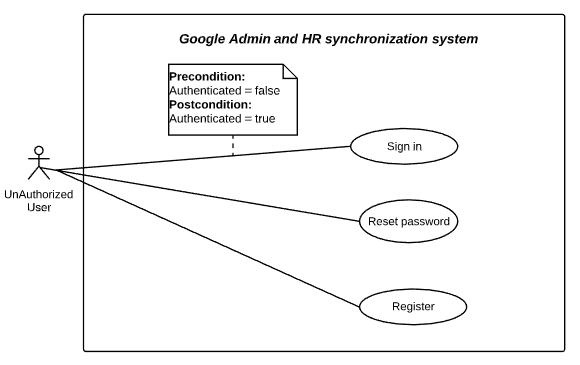


Figure 4 <Unauthorized User> Overview Use Case

#### <Unauthorized User> Sign in

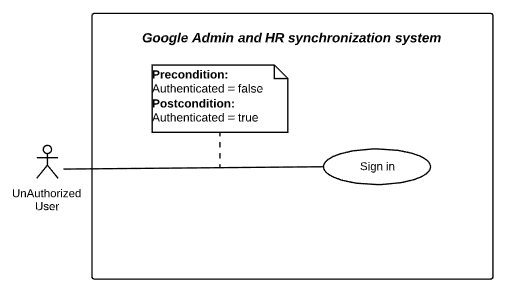


Figure 5 <Unauthorized User> Sign in

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – GmHRS\_U\_01** | | | |
| **Use Case No.** | GmHRS\_U\_01 | **Use Case Version** | 2.0 |
| **Use Case Name** | Sign in | | |
| **Author** | ThongND | | |
| **Date** | 24/06/2020 | **Priority** | Normal |
| **Actor:**   * Unauthorized User   **Summary:**   * This use case allows unauthorized user to sign in into the system   **Goal:**   * Unauthorized user can sign in into the system   **Trigger:**   * Unauthorized user clicks “Login” button in login page   **Precondition:**   * Unauthorized user is not authenticated   **Post condition:**   * Unauthorized user is authenticated   **Success**: Unauthorized user login with the specific role in the system  **Fail**: System show error message  **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | **Step** | **Actor Action** | **System Response** | | 1 | Unauthorized user goes to login view. | System requires identity information from Unauthorized user:  -Username: blank text input.  -Password: blank text input. | | 2 | Unauthorized user inputs information. |  | | 3 | Unauthorized user clicks “Login” button to login to the system | User is authenticated and redirected to specific pages depending on his/her role. [Exception 1, 2] |   **Alternative Scenario: N/A**  **Exceptions:**   |  |  |  | | --- | --- | --- | | **No** | **Actor Action** | **System Response** | | 1 | Unauthorized user enters wrong username or password | System shows error message “Username or password invalid” | | 2 | Unauthorized user enters username and password of an account that is deactivated by administrator | System shows error message “Your account has been locked. Please contact the administrator” |   **Relationships:** **N/A**  **Business Rules:**   * After login to system, guest will be redirected to specific view based on their role on the system: user, administrator or system administrator * If role is “Company Admin”, the system will display company admin page * If role is “System Admin”, the system will display system admin page | | | |

Table 2 <Unauthorized User> Sign in use case specification

#### <Unauthorized User> Reset password

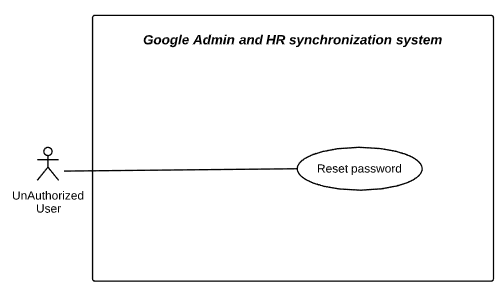


Figure 6 <Unauthorized User> Reset password use case specification

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – GmHRS\_U\_02** | | | |
| **Use Case No.** | GmHRS\_U\_02 | **Use Case Version** | 2.0 |
| **Use Case Name** | Reset password | | |
| **Author** | ThanhPV | | |
| **Date** | 24/06/2020 | **Priority** | Normal |
| **Actor:**   * Unauthorized User   **Summary:**   * This use case allows unauthorized to reset password   **Goal:**   * Unauthorized user can reset password   **Trigger:**   * Unauthorized user clicks “Forgot Password” button in login page   **Precondition:**   * Unauthorized user is not authenticated   **Post condition:**   * Unauthorized user can change password.   **Success**: Unauthorized user change password successfully.  **Fail**: System show error message  **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | **Step** | **Actor Action** | **System Response** | | 1 | Unauthorized user clicks “Forgot Password” button | System redirect to Reset password view: | | 2 | Unauthorized user input information | System requires identity information from Unauthorized user:  -User Name: blank text input  -Phone: blank text input  -Your email: blank text input | | 3 | Unauthorized user clicks “Reset” | System show message “Password reset successfully”, send code to use reset password and redirect to change password view | | 4 | Unauthorized user input information | System show:  -Your new password: blank text input  -Confirm Your new password: blank text input  -Code: blank text input | | 5 | Unauthorized user click button “Change password” | System show success message and redirect to login page. [Exception:1,2,3] |   **Alternative Scenario: N/A**  **Exceptions:**   |  |  |  | | --- | --- | --- | | **No** | **Actor Action** | **System Response** | | 1 | Unauthorized user input wrong username, email or phone | System show error message: “Input information again”. | | 2 | Unauthorized user input new password less than 6 characters | System show error message: “Password must be more than 6 characters” | | 3 | Unauthorized user input confirms password mismatch | System show error message: “Password mismatch” |   **Relationships:** **N/A**  **Business Rules:**   * Unauthorized user can reset password any time * After system show message “Password reset successfully”. Check your email to get code”. Use the code to change password * In change password page, you must input new password less than 6 characters * In change password page, you must to input match new password and confirm password | | | |

Table 3 <Unauthorized User> Reset password use case specification

#### <Unauthorized User> Register

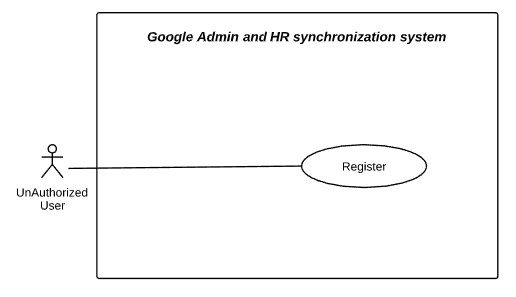


Figure 7 <Unauthorized User> Register use case specification

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – GmHRS\_U\_03** | | | |
| **Use Case No.** | GmHRS\_U\_03 | **Use Case Version** | 2.0 |
| **Use Case Name** | Register | | |
| **Author** | ThanhPV | | |
| **Date** | 24/06/2020 | **Priority** | Normal |
| **Actor:**   * Unauthorized user   **Summary:**   * This use case allows Unauthorized user register account into the system   **Goal:**   * Unauthorized user can register into the system   **Trigger:**   * Guest click “Register” link in login page   **Precondition:**   * Unauthorized user not logged in the system   **Post condition:**   * Unauthorized user registers successfully and the system redirect guest to the login page   **Success**: Unauthorized user success to register account.  **Fail**: System show error message.  **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | **Step** | **Actor Action** | **System Response** | | 1 | Unauthorized user goes to login view. |  | | 2 | Unauthorized user clicks “Register Account” on login page. | System redirect Unauthorized user to register view | | 3 |  | System requires identity information from Unauthorized user:  -User name: blank text input  -Your email: blank text input  -Password: blank text input  -Confirm Password: blank text input  -Phone: blank text input  -Address: blank text input | | 4 | Unauthorized user inputs information. |  | | 5 | Guest click “Register” button to register to system. | Unauthorized user registers into system with his/her specific role and redirect guest to login page [Exception 1,2,3,4,5,6,7] |   **Alternative Scenario: N/A**  **Exceptions:**   |  |  |  | | --- | --- | --- | | **No** | **Actor Action** | **System Response** | | 1 | Guest does not enter, enter blank or enter username not be between 6 and 20 characters. | System shows error message “Username must be between 6 and 20 characters” | | 2 | Guest does not enter, enter blank email | System shows error message “Email is required” | | 3 | Guest does not enter, enter blank or enter password less than 6 characters. | System shows error message “Password must be more than 6 characters” | | 4 | Guest does not enter, enter blank confirm password or do not match with password | System shows error message “Password mismatch” | | 5 | Guest enters email is not validated with email standard form | System shows error message “Invalid email address” | | 6 | Guest enters a username used by another account | System shows error message” Your user name or email already exists!” | | 7 | Guest enters an email used by another account | System shows error message” Your user name or email already exists!” |   **Relationships:** **N/A**  **Business Rules:**   * Username must be between 6 and 20 characters. * A username is only used to register for one person. * Email must be validated email standard. * Email must not be blank. * An email is only used to register for one person. * Password must be more than 6 characters. | | | |

Table 4 <Unauthorized User> Register use case specification

### <System Admin> Overview Use Case

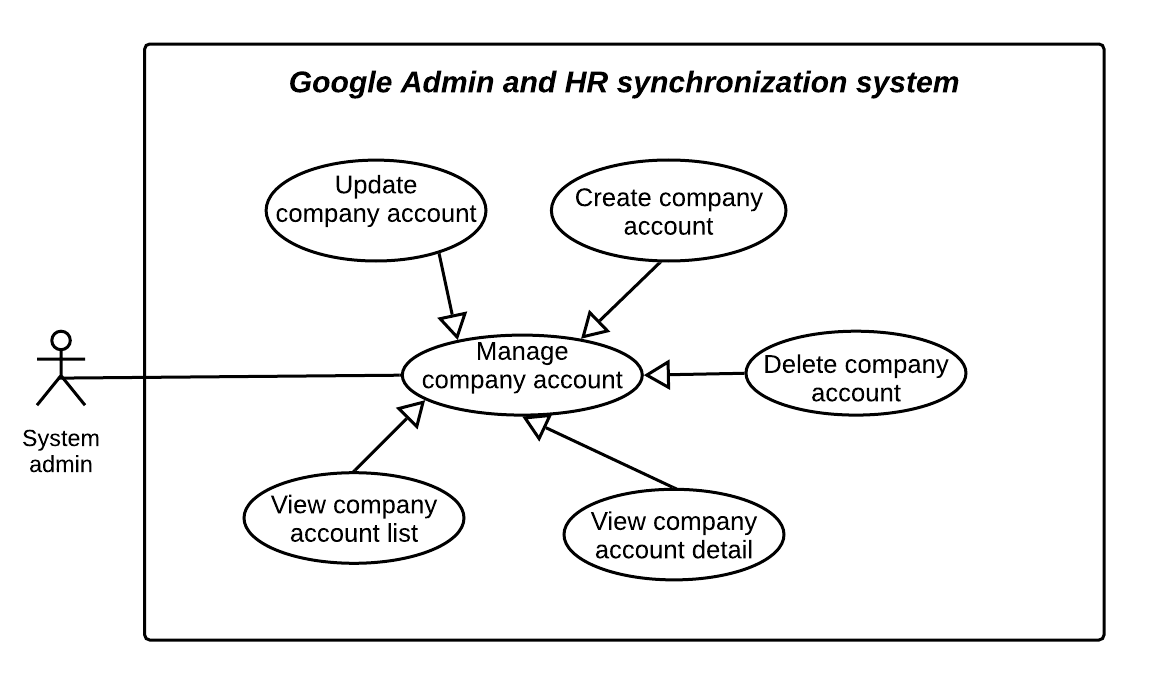


Figure 8 <System admin> Overview Use Case

#### <System admin> View account company list

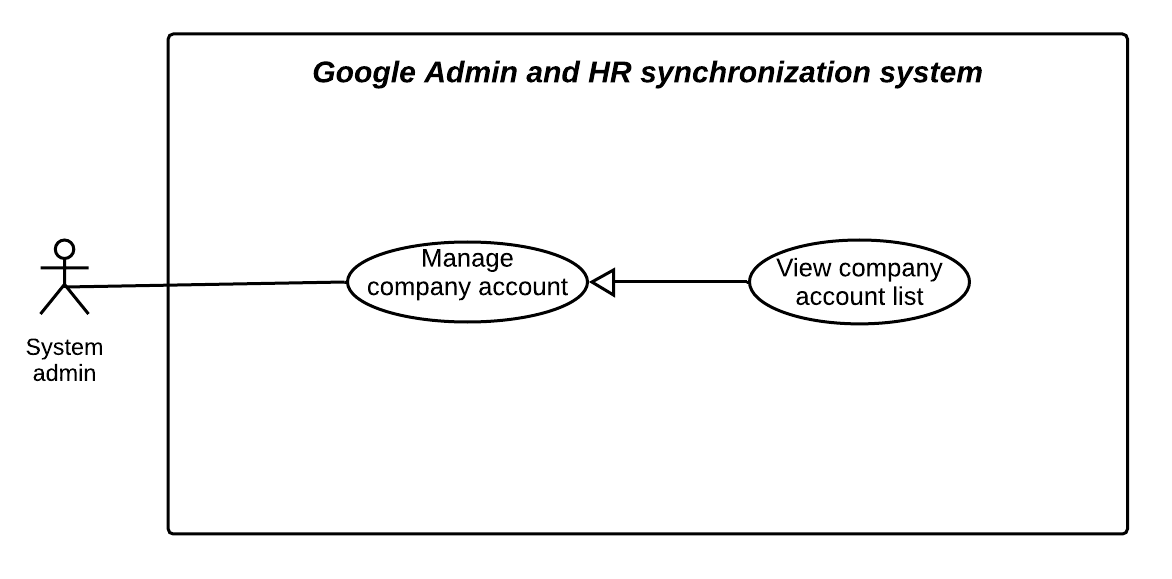


Figure 9 <System Admin> View account company list

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – GmHRS\_S\_01** | | | |
| **Use Case No.** | GmHRS\_S\_01 | **Use Case Version** | 2.0 |
| **Use Case Name** | View account company list | | |
| **Author** | ThanhPV | | |
| **Date** | 24/06/2020 | **Priority** | Normal |
| **Actor:**   * System Admin.   **Summary:**   * This use case allows System admin view account company list.   **Goal:**   * System admin view account company list.   **Trigger:**   * System admin goes to manage company admin page.   **Precondition:**   * Unauthorized user is logged into the system with role “System Admin”.   **Post condition:**   * Success: System show account company list. * Fail: System show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | **Step** | **Actor Action** | **System Response** | | 1 | System admin goes to manage company page | System shown account company list. [Exception 1] |   **Alternative Scenario: N/A**  **Exceptions:**   |  |  |  | | --- | --- | --- | | **No** | **Actor Action** | **System Response** | | 1 | Lost internet connection. | System fail to load list account company |   **Relationships:** **N/A**  **Business Rules:**   * System will show account company list with status active and de active | | | |

Table 5 - <System Admin> View account company list use case specification

#### <System admin> Create account company

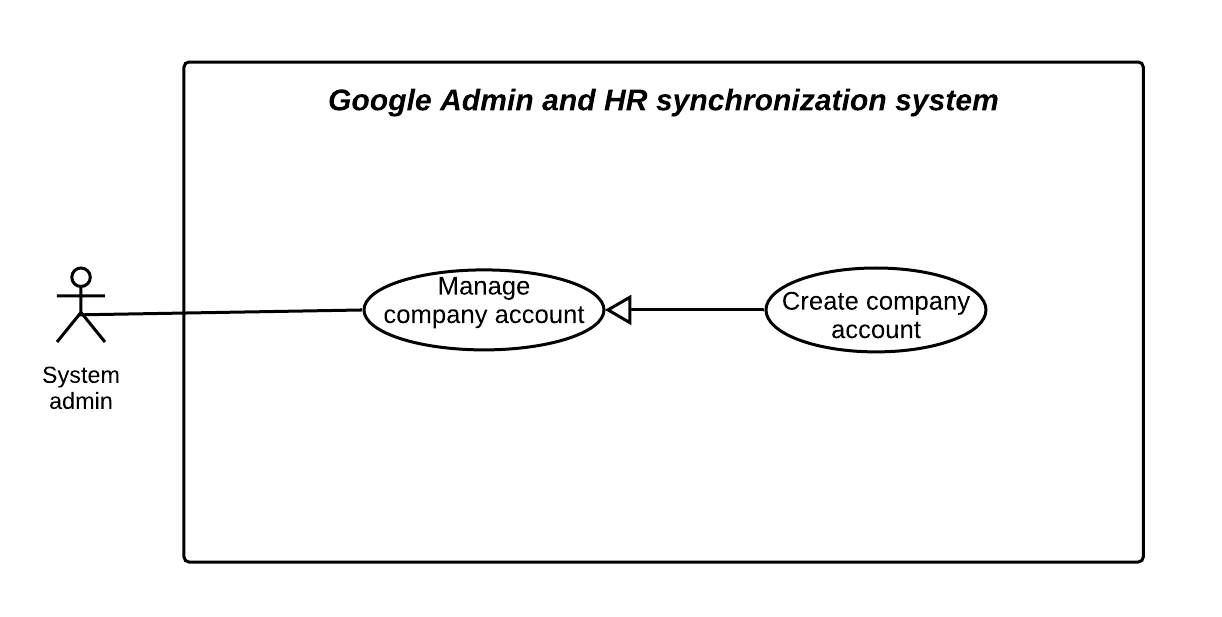


Figure 10 - <System Admin> Create account company

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – GmHRS\_S\_02** | | | |
| **Use Case No.** | GmHRS\_S\_02 | **Use Case Version** | 2.0 |
| **Use Case Name** | Create account company | | |
| **Author** | ThanhPV | | |
| **Date** | 24/06/2020 | **Priority** | Normal |
| **Actor:**   * System Admin.   **Summary:**   * This use case allows System admin to add Account Company into the system.   **Goal:**   * System admin add Account Company into the system.   **Trigger:**   * System admin clicks Create Account Company button in the manage company page.   **Precondition:**   * System admin goes to the manage company page.   **Post condition:**   * Success: Created account row added in list accounts table. * Fail: System show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | **Step** | **Actor Action** | **System Response** | | 1 | System admin clicks “Create Account Company” button in manage company page. | System shows popup:  -Email: blank text input  -Username: blank text input  -Password: blank text input  -Phone: blank text input | |  | System admin inputs information |  | |  | System admin click “Submit” button to add account to system | System closes popup and shows account updated in table |   **Alternative Scenario: N/A**  **Exceptions:**   |  |  |  | | --- | --- | --- | | **No** | **Actor Action** | **System Response** | | 1 | Guest does not enter, enter blank or enter username not be between 6 and 20 characters. | System shows error message “Username must be between 6 and 20 characters” load list account company | | 2 | Guest does not enter, enter blank or enter password less than 6 characters. | System shows error message “System shows error message “Password must be more than 6 characters” | | 3 | Guest does not enter, enter blank email | System shows error message “Email is required” | | 4 | Guest enters email is not validated with email standard form | System shows error message “Invalid email address” | | 5 | Guest enters a username used by another account | System shows error message” This username is already registered” | | 6 | Guest enters an email used by another account | System shows error message “This email is already registered” |   **Relationships:** **N/A**  **Business Rules:**   * Username must be between 6 and 20 characters. * A username is only used to register for one person. * Email must be validated email standard. * Email must not be blank. * Username or email is unique. * Password must be more than 6 characters. | | | |

Table 5 <System Admin> Create account company use case specification

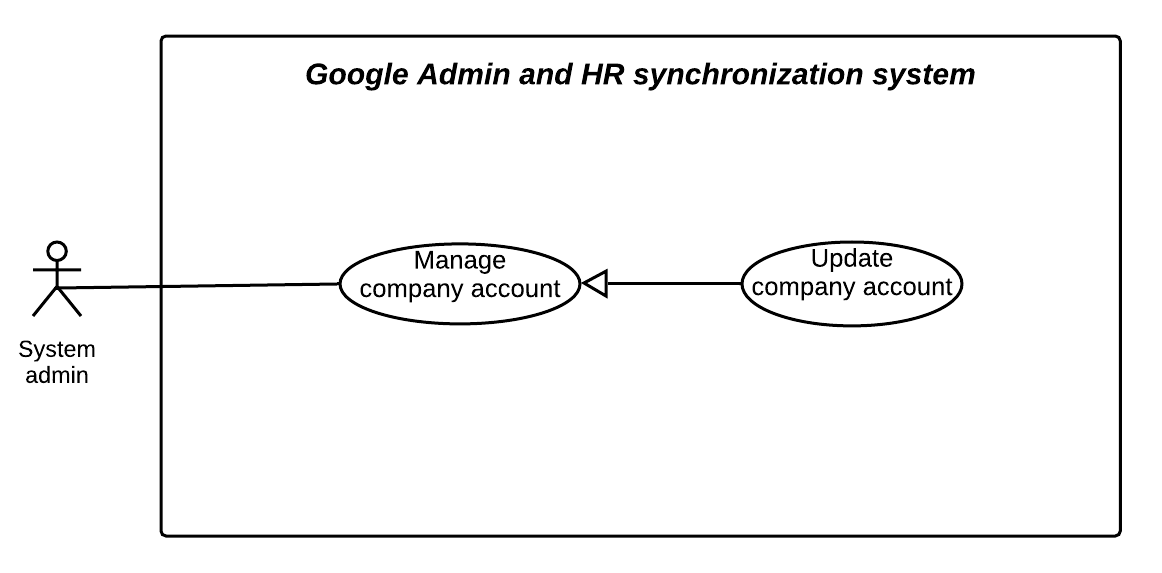


Figure 11 - <System Admin>Update account company

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – GmHRS\_S\_03** | | | |
| **Use Case No.** | GmHRS\_S\_03 | **Use Case Version** | 2.0 |
| **Use Case Name** | Update account company | | |
| **Author** | ThanhPV | | |
| **Date** | 24/06/2020 | **Priority** | Normal |
| **Actor:**   * System Admin.   **Summary:**   * This use case allows System admin update specified company account.   **Goal:**   * System admin update specified company account.   **Trigger:**   * System admin click “Update” button   **Precondition:**   * Unauthorized user is logged into the system with role “System Admin”.   **Post condition:**   * Success: Account must be updated. * Fail: System show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | **Step** | **Actor Action** | **System Response** | | 1 | System admin click “View” button | System show modal:  -Email: read only text  -username: read only text  -Address: read only text  -Phone: read only text  -Created Date: read only text  -Modified Date: read only text  -API endpoint: text  -Database connection: read only text  -Close: button  -Update: button | | 2 | System admin click “Close” button | Close modal, nothing changes | | 3 | System admin input information |  | | 4 | System admin click “Update” button | System closes modal and shows account updated in table. [Exception 1]. |   **Alternative Scenario: N/A**  **Exceptions:**   |  |  |  | | --- | --- | --- | | **No** | **Actor Action** | **System Response** | | 1 | Lost connection | System time out |   **Relationships:** **N/A**  **Business Rules:**   * System admin can update specified account company * System admin just update API endpoint for company admin | | | |

Table 6 <System Admin> Update account company use case specification

#### <System admin> Delete account company

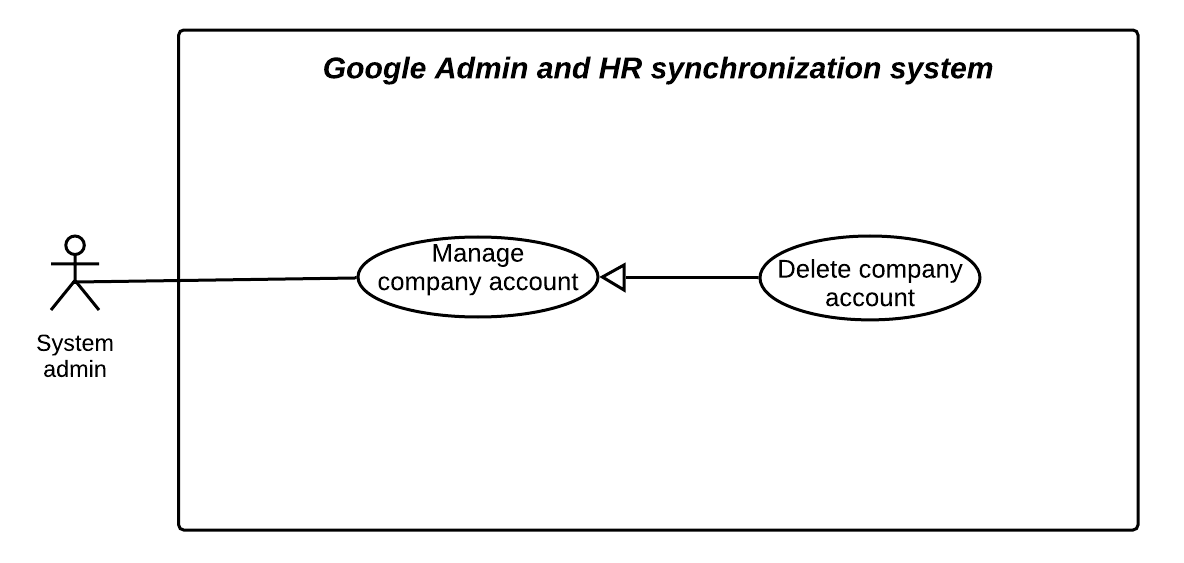


Figure 12 - <System Admin> Delete account company

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – GmHRS\_S\_04** | | | |
| **Use Case No.** | GmHRS\_S\_04 | **Use Case Version** | 2.0 |
| **Use Case Name** | Delete account company | | |
| **Author** | ThanhPV | | |
| **Date** | 24/06/2020 | **Priority** | Normal |
| **Actor:**   * System Admin.   **Summary:**   * This use case allows System admin activate/deactivate specified company account.   **Goal:**   * System admin activate/deactivate specified company account.   **Trigger:**   * System admin slide toggle status “On/Off”   **Precondition:**   * Unauthorized user is logged into the system with role “System Admin”.   **Post condition:**   * Success: Account must be activate/deactivate. * Fail: System show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | **Step** | **Actor Action** | **System Response** | | 1 | System admin slide toggle “On/Off” | System show confirm dialog:  -Change: button.  -Cancel: button. | | 2 | System admin click “Cancel” button | Close dialog, nothing changes. | | 3 | System admin click “Change” button | System activate/deactivate account company and send status [Exception 1] |   **Alternative Scenario: N/A**  **Exceptions:**   |  |  |  | | --- | --- | --- | | **No** | **Actor Action** | **System Response** | | 1 | Lost connection | System fail to activate/deactivate account company |   **Relationships:** **N/A**  **Business Rules:**   * System admin can activate/deactivate specified account company | | | |

Table 7 <System Admin> Delete account company use case specification

### <Company admin> Overview Use Case

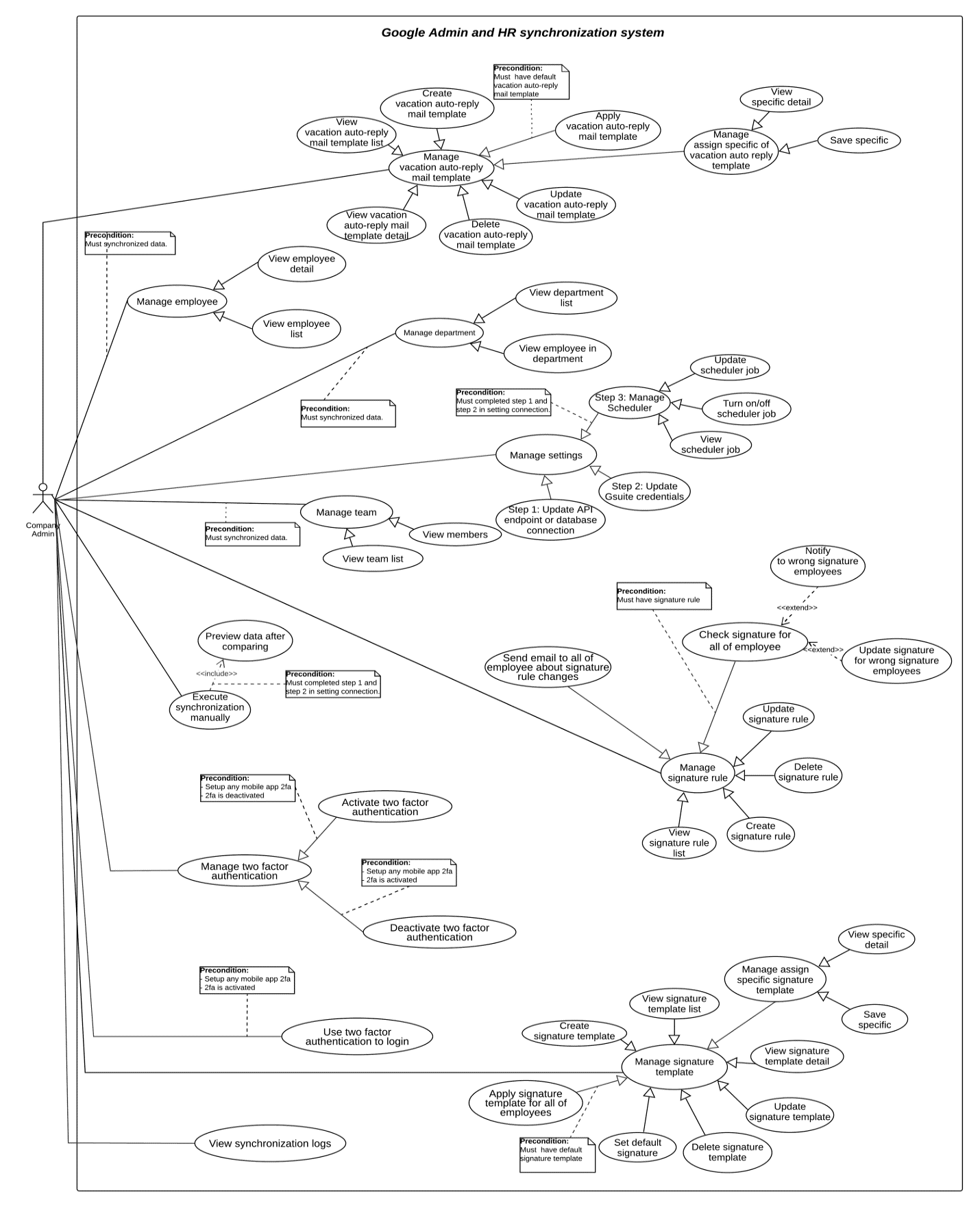


Figure 13 <Company admin> Overview Use Case

#### <Company admin> Update database connection or API endpoint

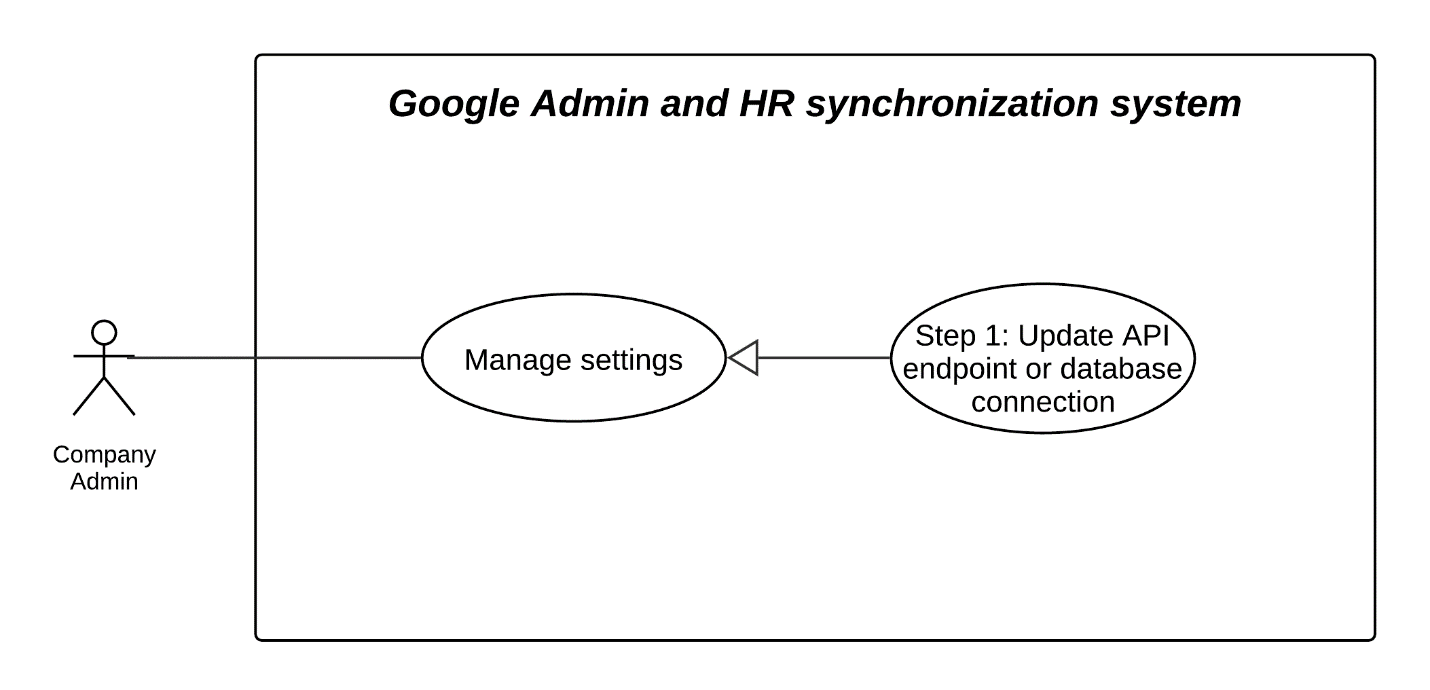


Figure 14 - Update database connection or API endpoint

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – GmHRS\_C\_01** | | | |
| **Use Case No.** | GmHRS\_C\_01 | **Use Case Version** | 2.0 |
| **Use Case Name** | Step 1: Update API endpoint or database connection | | |
| **Author** | ThanhPV | | |
| **Date** | 24/06/2020 | **Priority** | Normal |
| **Actor:**   * Company admin.   **Summary:**   * This use case allows Company update API endpoint or database connection.   **Goal:**   * Company admin update API endpoint or database connection.   **Trigger:**   * Company admin goes to setting page   **Precondition:**   * Unauthorized user is logged into the system with role “Company Admin”.   **Post condition:**   * Success: System update API endpoint or database connection success. * Fail: System show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | **Step** | **Actor Action** | **System Response** | | 1 | Company admin goes to setting page, in step 1 | System show:  -Connection Name: blank text input  -Host name: blank text input  -port: blank text input  -Username: blank text input  -Password: blank text input  -Database type: select  -Next: button  -Test Connection: button  -Database connection: radio button  -API endpoint: radio button | | 2 | In database connection, company admin input information. [ Alternative] |  | | 3 | Company admin click “Test Connection” button | System show modal result | | 4 | Company admin click “Save” | System will save connection string and close modal | | 5 | Company admin click “Next” button | System show the next step |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | **Step** | **Actor Action** | **System Response** | | 1 | Company admin goes to setting page, in step 1 and select API endpoint | System show:  -URL: blank text input  -Database connection: radio button  -API endpoint: radio button  -Next: button  -Test: button | | 2 | Company admin input information |  | | 3 | Company admin click “Test” button | System show modal result | | 4 | Company admin click “Save” button | System will save API endpoint and close modal | | 5 | Company admin click “Next” button | System show the next step |   **Exceptions:**   |  |  |  | | --- | --- | --- | | **No** | **Actor Action** | **System Response** | | 1 | Lost internet connection. | System fail to Test/Test Connection, Save step 1. |   **Relationships:** **N/A**  **Business Rules:**   * Company admin must input all of field to enable button “Test Connection” * Database connection must pass all of field in modal result to save * API endpoint must pass all of field in modal result to save | | | |

Table 8 <Company Admin> Update database connection or API endpoint use case specification

#### <Company admin> Update G-Suite credentials

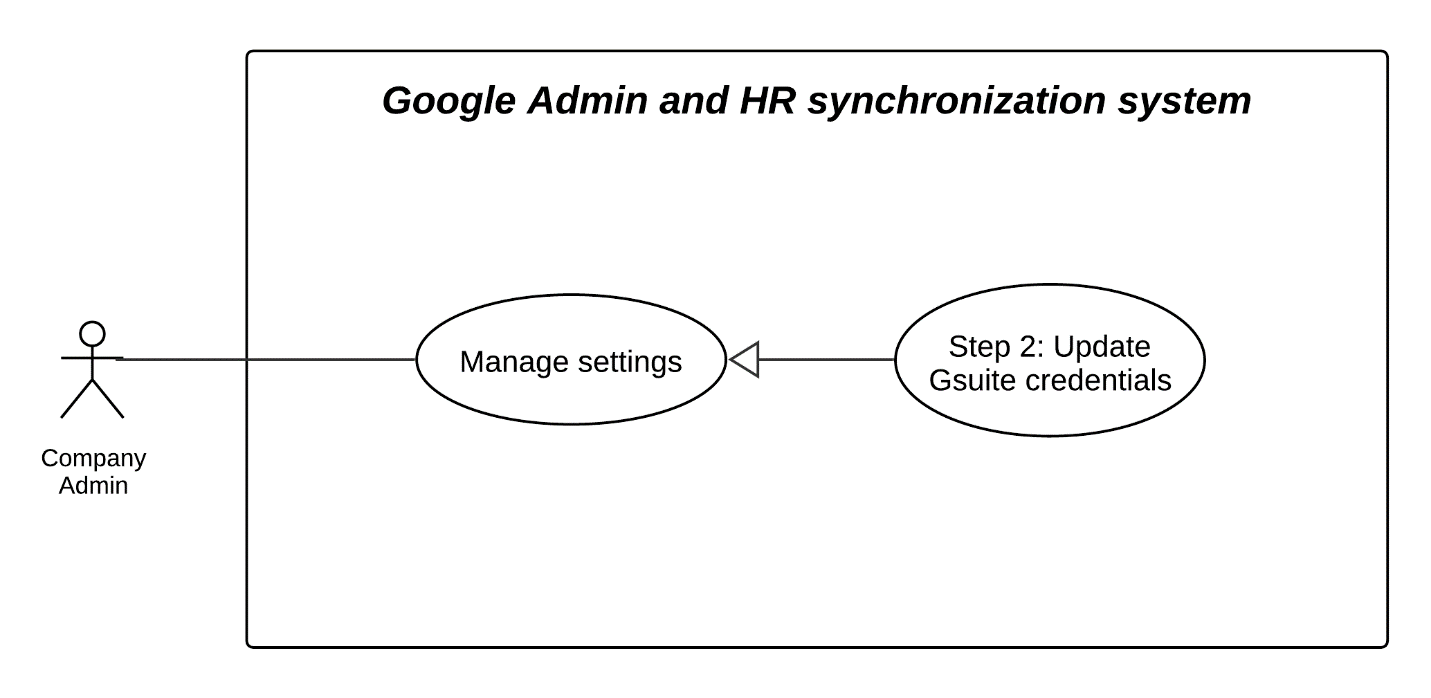


Figure 15 - Update G-Suite credential

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – GmHRS\_C\_02** | | | |
| **Use Case No.** | GmHRS\_C\_02 | **Use Case Version** | 2.0 |
| **Use Case Name** | Step 2: Update S-Suite credentials | | |
| **Author** | ThanhPV | | |
| **Date** | 24/06/2020 | **Priority** | Normal |
| **Actor:**   * Company admin.   **Summary:**   * This use case allows Company update G-Suite credentials.   **Goal:**   * Company admin update G-Suite credentials.   **Trigger:**   * Company admin click “Next” button in step 1   **Precondition:**   * Company admin update step 1 successfully   **Post condition:**   * Success: System update G-Suite credentials success. * Fail: System show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | **Step** | **Actor Action** | **System Response** | | 1 | Company admin goes to step 2 | System show:  -Admin company email: blank text input  -File JSON of key authenticated G-Suite: file input  -Next: button  -Test: button  -Back: button | | 2 | Company admin input information |  | | 3 | Company admin click “Test” button | System show modal result | | 4 | Company admin click “Save” | System will save G-Suite credential and close modal | | 5 | Company admin click “Next” button | System show the next step |   **Alternative Scenario: N/A**  **Exceptions:**   |  |  |  | | --- | --- | --- | | **No** | **Actor Action** | **System Response** | | 1 | Lost internet connection. | System fail to Test, Save step 2 |   **Relationships:** **N/A**  **Business Rules:**   * Company admin email must have role admin on G-Suite * File JSON of key authenticated G-Suite must be JSON file * Test G-Suite credential must valid 5 scope in modal result to save step 2 | | | |

Table 9 <Company Admin> Update G-Suite credential use case specification

#### <Company admin> Turn on/off schedule job

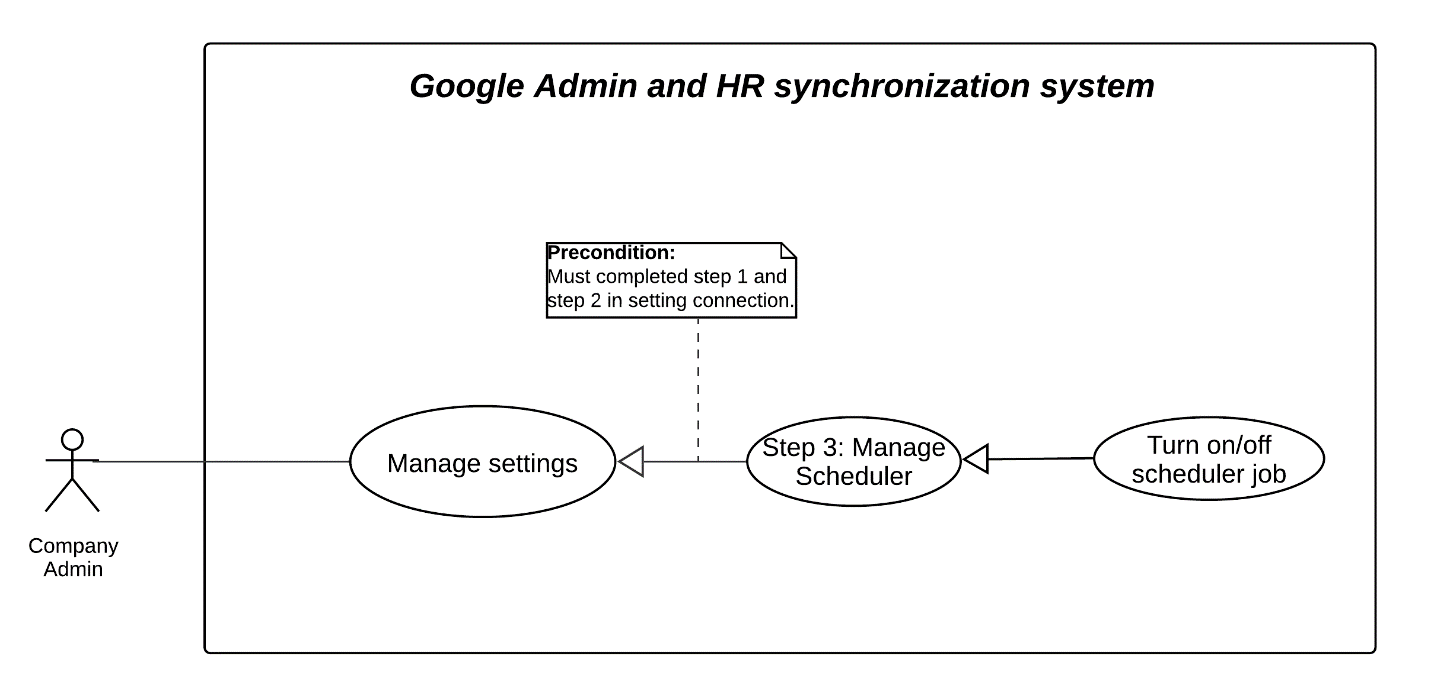


Figure 16 - Turn on/off schedule job

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – GmHRS\_C\_04** | | | |
| **Use Case No.** | GmHRS\_C\_04 | **Use Case Version** | 2.0 |
| **Use Case Name** | Turn on/off schedule job | | |
| **Author** | ThongND | | |
| **Date** | 24/06/2020 | **Priority** | Normal |
| **Actor:**   * Company admin.   **Summary:**   * This use case allows Company Turn on/off schedule job.   **Goal:**   * Company admin can Turn on/off schedule job.   **Trigger:**   * Company admin slide toggle “On/Off” in step 3   **Precondition:**   * Company admin update step 1 and step 2 successfully   **Post condition:**   * Success: System turn on/off schedule job success. * Fail: System show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | **Step** | **Actor Action** | **System Response** | | 1 | In step 3 on setting page Company admin slide toggle “On/Off” | System show confirm dialog:  -Change: button  -Cancel: button | | 2 | Company admin click “Cancel” button | Nothing changes, close dialog | | 3 | Company admin click “Change” button | System change on / off schedule time and show message |   **Alternative Scenario: N/A**  **Exceptions:**   |  |  |  | | --- | --- | --- | | **No** | **Actor Action** | **System Response** | | 1 | Lost internet connection. | System fail to turn on/off schedule job |   **Relationships:** **N/A**  **Business Rules:**   * Company admin must complete successfully in step 1 ,2 * Company admin must set time for schedule in step 3 successfully * Company admin must synchronize data manually in the first synchronize before turn on/off schedule job | | | |

Table 10 <Company Admin> Turn on/off schedule job schedule job use case specification

#### <Company admin> Create signature template

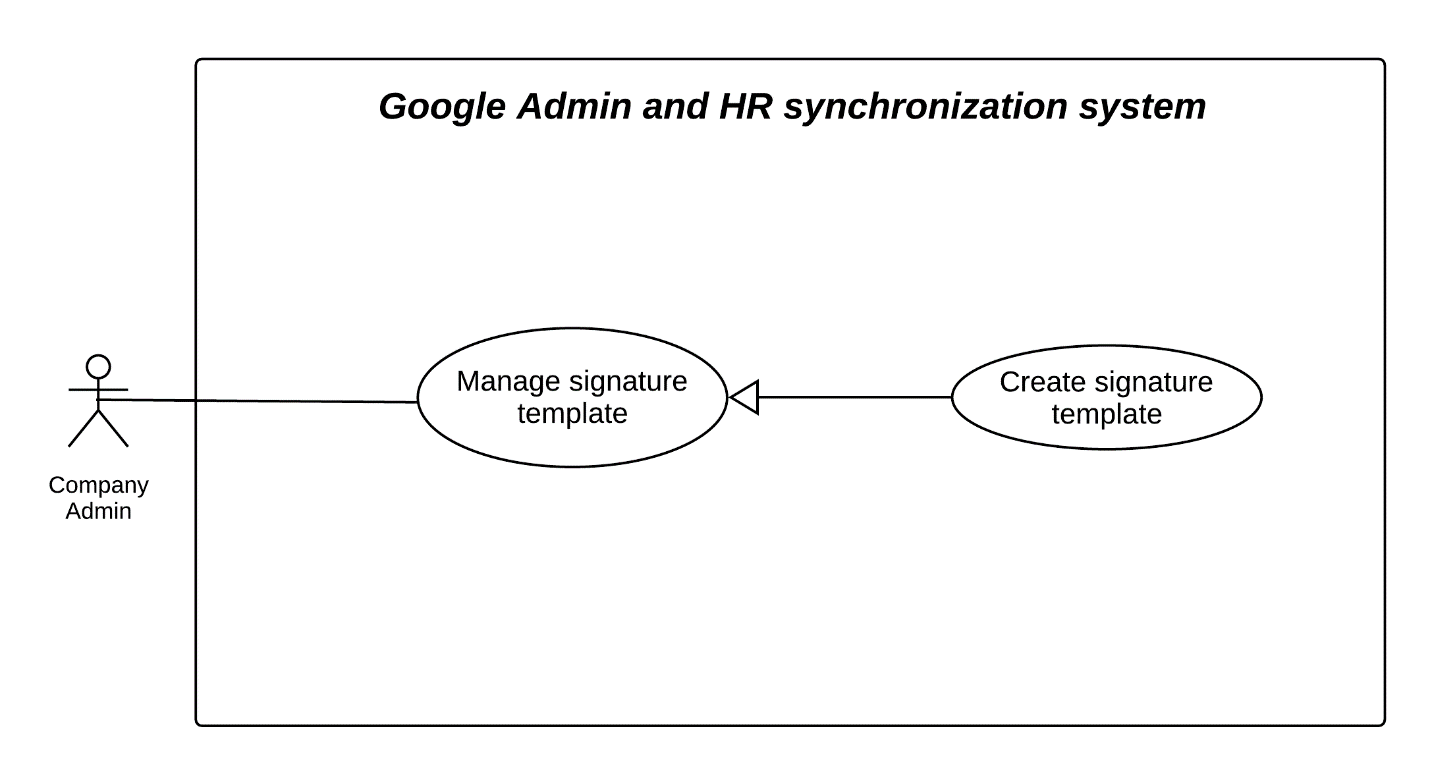


Figure 17 - <Company admin> Create signature template

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – GmHRS\_C\_19** | | | |
| **Use Case No.** | GmHRS\_C\_19 | **Use Case Version** | 2.0 |
| **Use Case Name** | Create signature template | | |
| **Author** | NguyenDPT | | |
| **Date** | 24/06/2020 | **Priority** | High |
| **Actor:**   * Company admin.   **Summary:**   * This use case allows Company admin create signature template.   **Goal:**   * Company admin create signature template.   **Trigger:**   * Company admin click” New” button.   **Precondition:**   * Unauthorized user is logged into the system with role “Company Admin”.   **Post condition:**   * Success: Signature template must be created. * Fail: System show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | **Step** | **Actor Action** | **System Response** | | 1 | Company admin click “New” button | System clear all contain in create signature template view. System show:  -Signature name: blank text input  -Content: editor  -Load review: button  -Review content: Editor (Read only) | | 2 | Company admin input information |  | | 3 | Company admin click “Save” | System show confirm dialog:  -Cancel: button  -Ok, do it: button | | 4 | Company admin click “Ok, do it” button | System will save signature template and show message. [Exception 1,2,3] |   **Alternative Scenario: N/A**  **Exceptions:**   |  |  |  | | --- | --- | --- | | **No** | **Actor Action** | **System Response** | | 1 | Company admin does not enter, enter blank “Signature name” | System shows error message “Input signature name” | | 2 | Company admin does not enter or enter blank “Content” | System shows error message “Input signature template content!” | | 3 | Company admin input “Signature name” existed | System shows error message “Signature name already existed!” |   **Relationships:** **N/A**  **Business Rules:**   * Signature name must have at least 1 character. * Signature content must have at least 1 character and maximum 10000 characters. * If company admin has signature rule, all template created will follow the rule. The template that not valid rule cannot create. * Signature name not allow duplication. | | | |

Table 11 <Company admin> Create signature template use case specification

#### <Company admin> Create signature rule

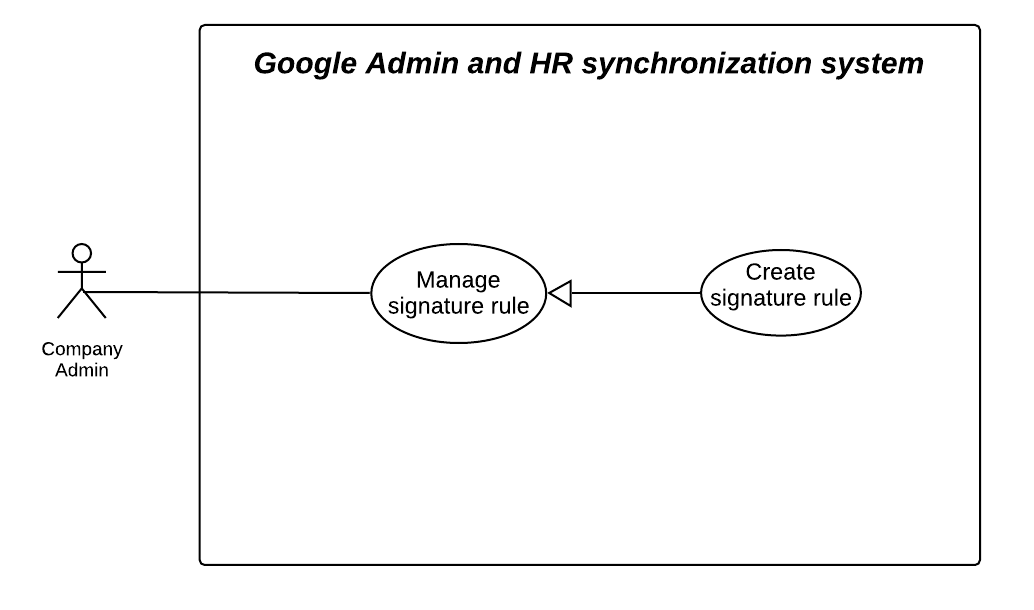


Figure 18 - <Company admin> Create signature rule

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – GmHRS\_C\_11** | | | |
| **Use Case No.** | GmHRS\_C\_11 | **Use Case Version** | 2.0 |
| **Use Case Name** | Create signature rule | | |
| **Author** | NguyenDPT | | |
| **Date** | 24/06/2020 | **Priority** | High |
| **Actor:**   * Company admin.   **Summary:**   * This use case allows Company admin create signature rule.   **Goal:**   * Company admin can create signature rule.   **Trigger:**   * Company admin click “New” button.   **Precondition:**   * Unauthorized user is logged into the system with role “Company Admin”.   **Post condition:**   * Success: Signature rule must be created. * Fail: System show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | **Step** | **Actor Action** | **System Response** | | 1 | Company admin click “Clear data” button | System clear all ten tent in the signature template view. System show:  -Signature rule name: blank text input  - Minimum signature length: blank text input  - Maximum signature length: blank text input  -Table contain/not contain rule  -Add row: button | | 2 | Company admin click “Add row” button | System add a row in table:  -Column Rule: Select  -Column Content: blank text input  -Column Delete: Delete button | | 3 | Company admin input rule |  | | 4 | Company admin click “New” button to create signature rule | System show confirm dialog:  -Cancel: button  -Ok, do it: button | | 5 | Company admin click “Ok, do it” button | System will create signature rule and show message. [Exception 1,2,3,4,5] |   **Alternative Scenario: N/A**  **Exceptions:**   |  |  |  | | --- | --- | --- | | **No** | **Actor Action** | **System Response** | | 1 | Lost internet connection. | System fails to load items in “Contain”, “Not Contain”, “Value”. | | 2 | Company Admin enter blank or not enter signature rule name | System show error message: “Please input rule name and rule content!” | | 3 | Company Admin enter blank or not enter min and max signature length | System show error message: “Please check maximum and minimum length!” | | 4 | Company Admin not add rule in table rule | System show error message: “Please input rule data table!” | | 5 | Company Admin not enter or enter blank content of rule | System show error message: “Content of rule cannot blank! |   **Relationships:** **N/A**  **Business Rules:**   * If company admin selects Contain this text in table rule, signature of employee must have the text of “content” in their signature * If company admin selects Not contain this text in table rule, signature of employee must not have the text of “content” in their signature | | | |

Table 12 <Company admin> Create signature rule use case specification

#### <Company admin> Send email to all of employee about signature rule changes

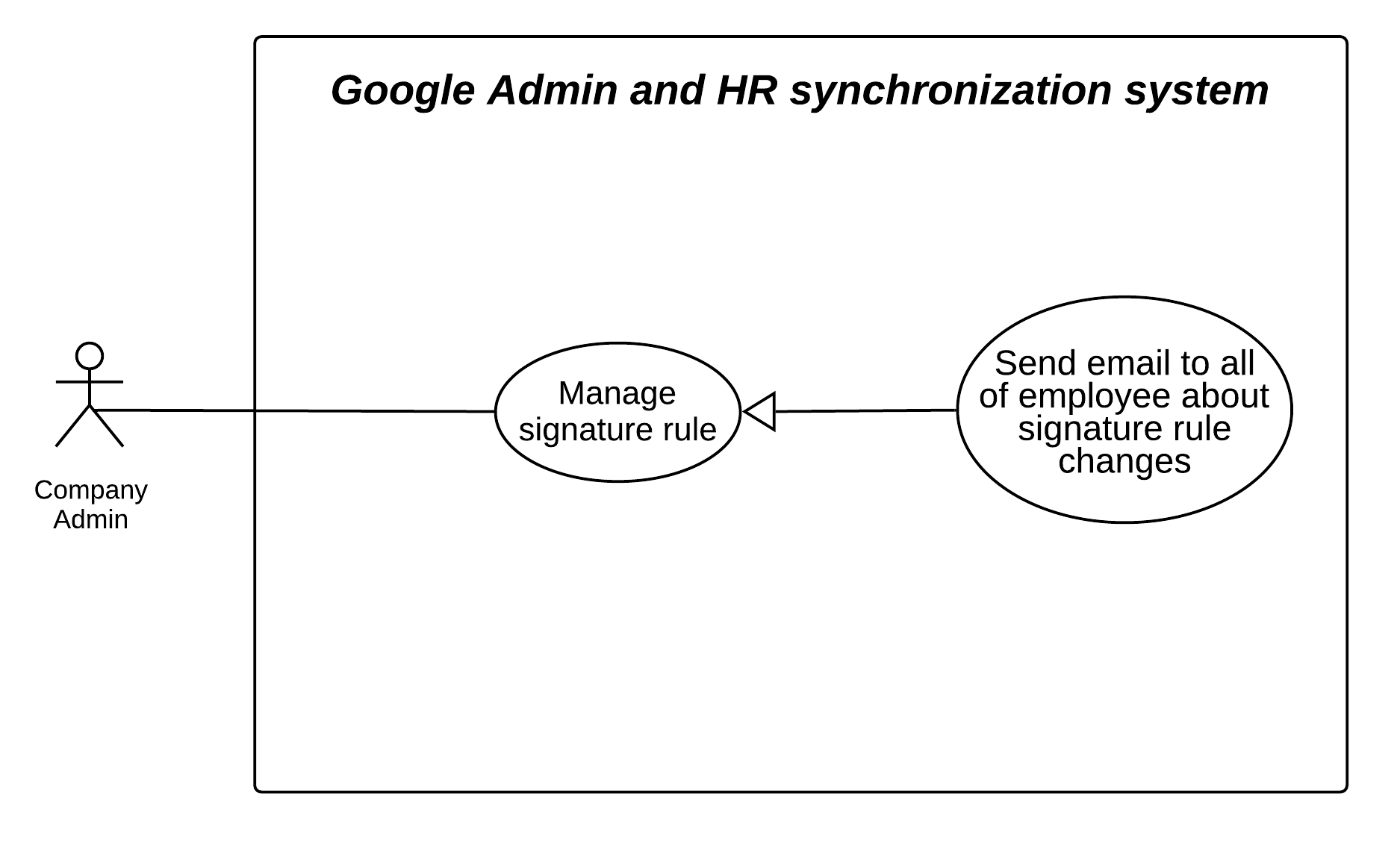


Figure 19 - <Company Admin> Send email to all of employee about signature rule changes

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – GmHRS\_C\_14** | | | |
| **Use Case No.** | GmHRS\_C\_14 | **Use Case Version** | 2.0 |
| **Use Case Name** | Send email to all of employee about signature rule changes | | |
| **Author** | NguyenDPT | | |
| **Date** | 24/06/2020 | **Priority** | Normal |
| **Actor:**   * Company Admin.   **Summary:**   * This use case allows Company admin Send email to all of employee about signature rule changes.   **Goal:**   * Employee receive email of company about rule changed   **Trigger:**   * Company admin click “send” button   **Precondition:**   * . Company Admin has a rule for signature   **Post condition:**   * Success: System show success message “Email was sent” * Fail: System show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | **Step** | **Actor Action** | **System Response** | | 1 | Company admin click “send” button | System show a success message. [Exception 1] |   **Alternative Scenario: N/A**  **Exceptions:**   |  |  |  | | --- | --- | --- | | **No** | **Actor Action** | **System Response** | | 1 | Lost internet connection. | System fails to send email to all of employee about signature rule changes |   **Relationships:** **N/A**  **Business Rules:**   * User must click button notify to employees | | | |

Table 13 <Company Admin> Send email to all of employee about signature rule changes use case specification

#### <Company admin> Apply signature template for all employees

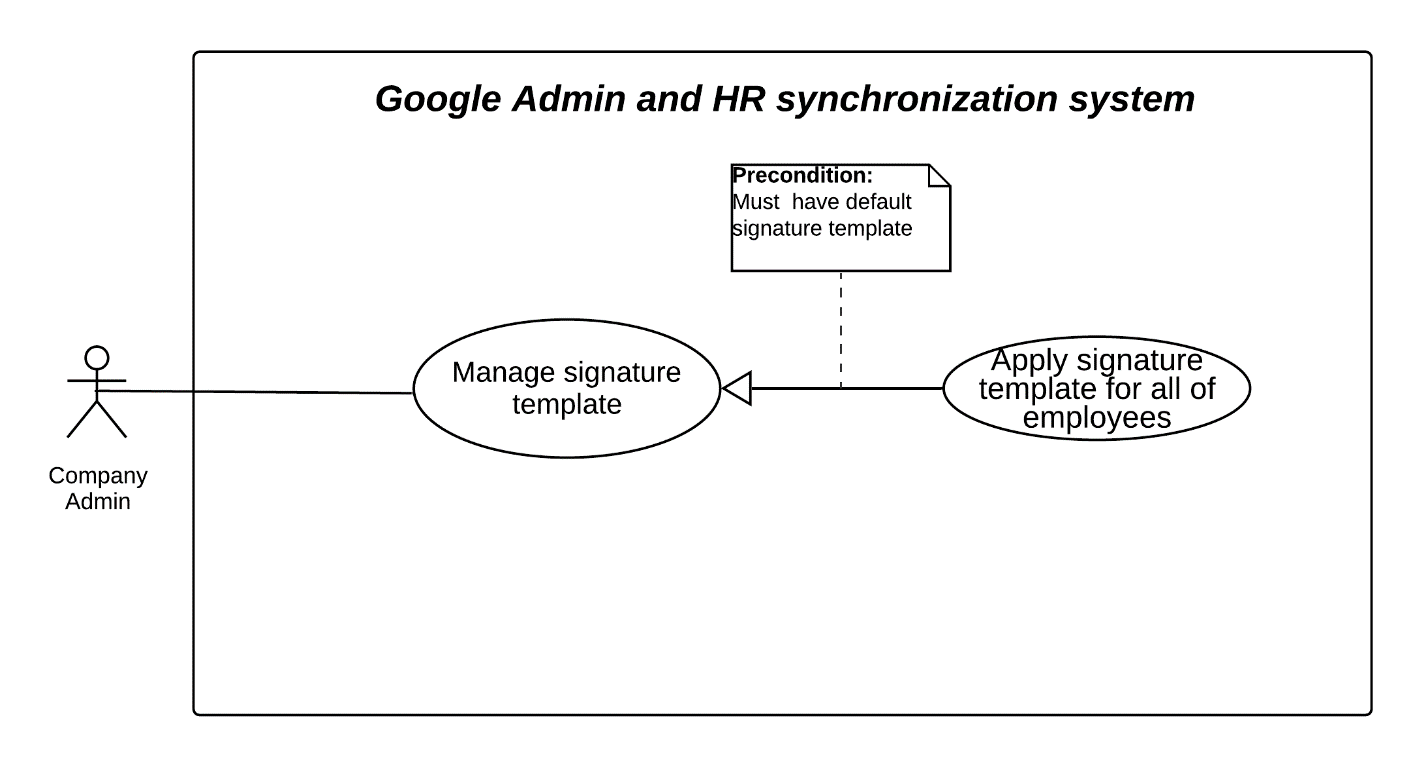


Figure 20 - Apply signature template for all employees

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – GmHRS\_C\_24** | | | |
| **Use Case No.** | GmHRS\_C\_24 | **Use Case Version** | 2.0 |
| **Use Case Name** | Apply signature template for all employees | | |
| **Author** | NguyenDPT | | |
| **Date** | 24/06/2020 | **Priority** | Normal |
| **Actor:**   * Company Admin.   **Summary:**   * This use case allows Company admin apply signature template for all employees.   **Goal:**   * Company admin can apply signature template for all employees.   **Trigger:**   * Company admin click “Apply all employee” button   **Precondition:**   * Set default signature template.   **Post condition:**   * Success: System set default signature template for all employee. * Fail: System show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | **Step** | **Actor Action** | **System Response** | | 1 | Company admin click “Apply all employee” button | System show confirm dialog:  -Cancel: button  -Ok, do it: button | | 3 | Company admin click “Ok, do it” button | Close dialog, System will set default the signature template and show message [Exception 1]. |   **Alternative Scenario: N/A**  **Exceptions:**   |  |  |  | | --- | --- | --- | | **No** | **Actor Action** | **System Response** | | 1 | Lost internet connection. | System fails to set default signature template | | 2 | Invalid signature rule | System shows error message “signature template not follow the rule, please check notification” |   **Relationships:** **N/A**  **Business Rules:**   * Company admin must set default signature template before * Company admin can apply when default signature valid default signature rule | | | |

Table 14 <Company admin> Apply signature template for all employees

#### <Company admin> Save specific assign signature template

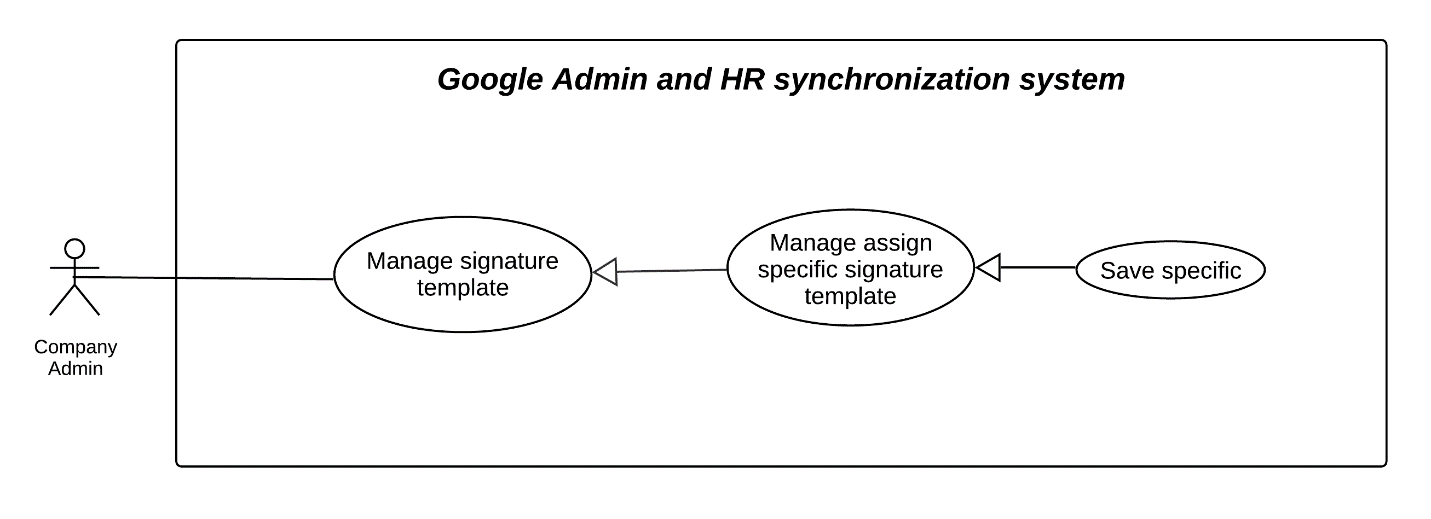


Figure 21 - <Company Admin> Save specific assign signature template

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – GmHRS\_C\_25** | | | |
| **Use Case No.** | GmHRS\_C\_25 | **Use Case Version** | 2.0 |
| **Use Case Name** | Save specific assign signature template | | |
| **Author** | NguyenDPT | | |
| **Date** | 24/06/2020 | **Priority** | Normal |
| **Actor:**   * Company Admin   **Summary:**   * This use case allows company admin save specific assign signature template into the system   **Goal:**   * Company admin user can save specific assign rule into the system   **Trigger:**   * Company admin clicks “Save” button in specific assign modal   **Precondition:**   * Company admin is authenticated * The company has signature template   **Post condition:**   * The Specific assign for signature template is saved   **Success**: The Specific assign for signature is save successfully  **Fail**: System show error message  **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | **Step** | **Actor Action** | **System Response** | | 1 | Company admin goes to specific assign modal. | System requires identity information from Unauthorized user:  -Specific by: select option.  - Value: select option  - Template: select option | | 2 | Company admin select information. |  | | 3 | Company admin click “Save” button to Save | System close modal and show message. [Exception 1] |   **Alternative Scenario: N/A**  **Exceptions:**   |  |  |  | | --- | --- | --- | | **No** | **Actor Action** | **System Response** | | 1 | Company admin do not choose the other field | System shows error message “Please input information” |   **Relationships:** **N/A**  **Business Rules:**   * Company admin can delete specific signature template. * When delete template finish, the data cannot be reverting * When the template is assigning specific, the template cannot be deleting * When apply signature template, apply specific will be priority | | | |

Table 15 <Company Admin> Save specific assign signature template use case specification

#### <Company admin> Create vacation auto-reply mail template

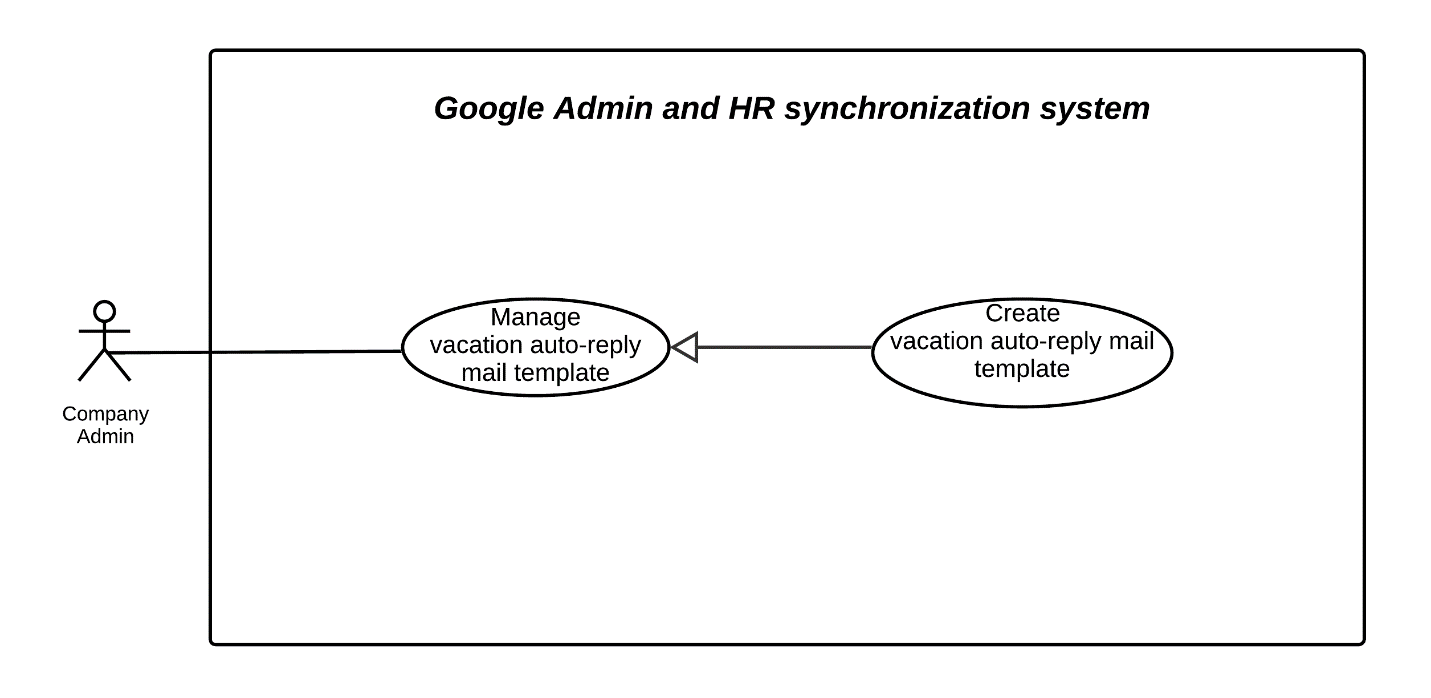


Figure 22- <Company admin> Create vacation auto-reply mail template

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – GmHRS\_C\_26** | | | |
| **Use Case No.** | GmHRS\_C\_26 | **Use Case Version** | 2.0 |
| **Use Case Name** | Create vacation auto-reply mail template | | |
| **Author** | ThanhPV | | |
| **Date** | 24/06/2020 | **Priority** | High |
| **Actor:**   * Company admin.   **Summary:**   * This use case allows Company admin create vacation auto-reply mail template.   **Goal:**   * Company admin create vacation auto-reply mail template.   **Trigger:**   * Company admin click “Create Template” button.   **Precondition:**   * Unauthorized user is logged into the system with role “Company Admin”.   **Post condition:**   * Success: Vacation auto-reply mail template must be created. * Fail: System show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | **Step** | **Actor Action** | **System Response** | | 1 | Company admin click “Create Template” button | System redirect to create template view:  -Template Name: blank text input  -Subject: blank text input.  -Content: Editor  -Close: button  -Create template: button | | 2 | Company admin click “Close” button | Nothing changes, system redirect to manage vacation auto-reply mail template view | | 3 | Company input information |  | | 4 | Company admin click “Create Template” button to create vacation auto-reply mail template | System redirect to manage vacation auto-reply mail template view and shows table of vacation auto-reply mail template that has created vacation auto-reply mail template row. [Exception 1, 2, 3]. |   **Alternative Scenario: N/A**  **Exceptions:**   |  |  |  | | --- | --- | --- | | **No** | **Actor Action** | **System Response** | | 1 | Company admin does not enter or enter blank “Template Name”. | System shows error message “Template name is required”. | | 2 | Company admin does not enter or enter blank “Subject”. | System shows error message “Subject is required”. | | 2 | Company admin enters a “Template Name” used by another. | System shows error message” Template Name already exist! Please input another again !”. |   **Relationships:** **N/A**  **Business Rules:**   * A Template name not allow duplicate. * Template name must have at least 1 character * Subject must have at least 1 character | | | |

Table 16 <Company admin> Create auto-reply mail template use case specification



#### <Company admin> Apply vacation auto-reply mail template

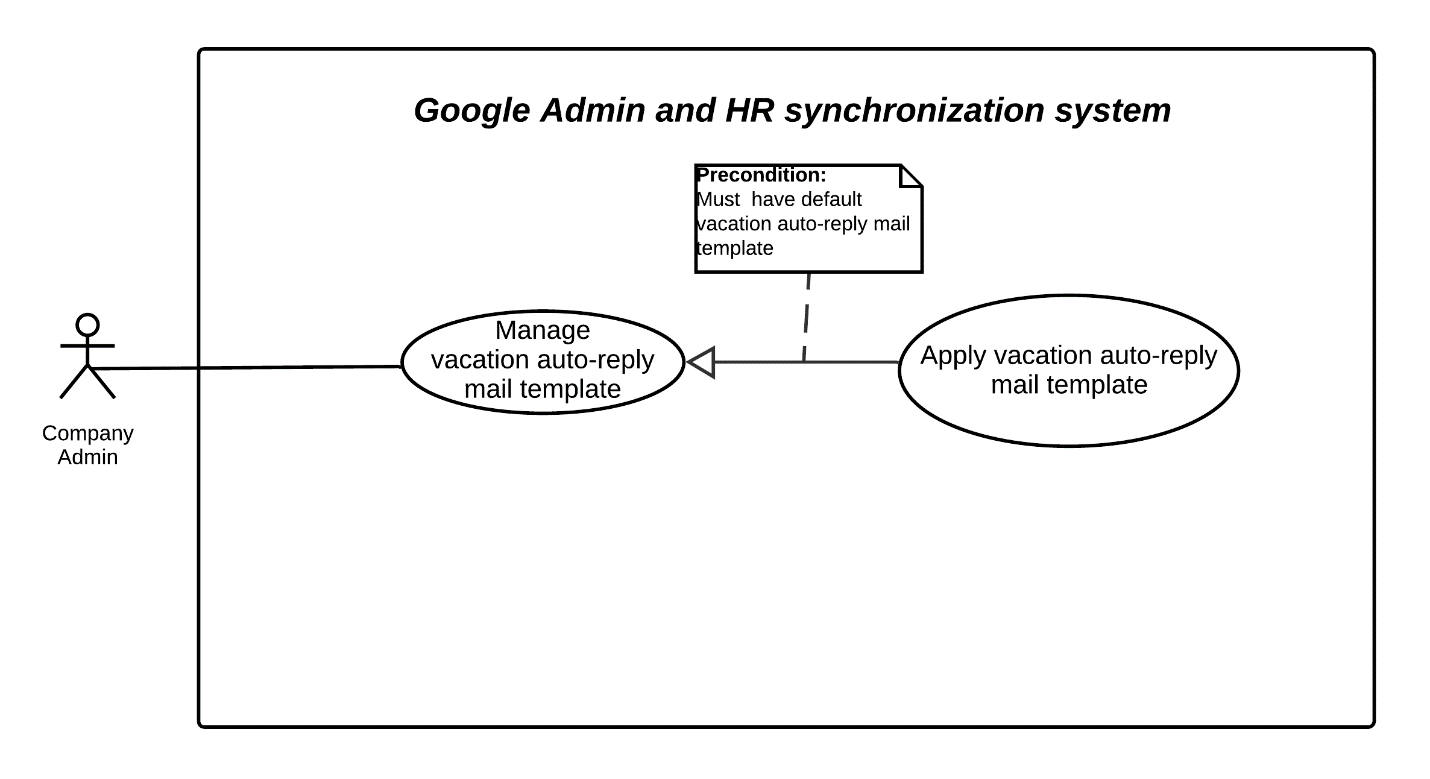


Figure 23 - Apply vacation auto-reply mail template

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – GmHRS\_C\_30** | | | |
| **Use Case No.** | GmHRS\_C\_30 | **Use Case Version** | 2.0 |
| **Use Case Name** | Apply vacation signature template | | |
| **Author** | ThanhPV, ThongND | | |
| **Date** | 24/06/2020 | **Priority** | Normal |
| **Actor:**   * Company Admin.   **Summary:**   * This use case allows Company admin apply vacation auto-reply mail template.   **Goal:**   * System admin can apply vacation auto-reply mail template.   **Trigger:**   * Company admin click “Apply” button   **Precondition:**   * Must have default vacation auto-reply mail template.   **Post condition:**   * Success: System apply vacation auto-reply mail template success. * Fail: System show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | **Step** | **Actor Action** | **System Response** | | 1 | Company admin click “Apply” button on specific row | System show a dialog confirm:  -Apply: button  -Cancel: button | | 2 | Company admin click “Cancel” button | Close dialog, nothing changes | | 3 | Company admin click “Delete” button | Close dialog, System remove vacation auto-reply mail template deleted in vacation auto-reply mail template list. [Exception 1,2]. |   **Alternative Scenario: N/A**  **Exceptions:**   |  |  |  | | --- | --- | --- | | **No** | **Actor Action** | **System Response** | | 1 | Lost internet connection. | System fails to delete auto-reply mail | | 2 | Company admin delete template is assigning | System show dialog with message “This template is assigning specific. Please delete specific assign before” |   **Relationships:** **N/A**  **Business Rules:**   * Company admin can delete specific signature auto-reply mail template. * When delete template finish, the data cannot be reverting * When the template is assigning specific, the template cannot be deleting * When apply vacation auto-reply mail template, apply specific will be order by priorities | | | |

Table 17 <Company Admin> Apply vacation auto-reply mail template specification

#### <Company admin> Save specific of vacation auto-reply mail template

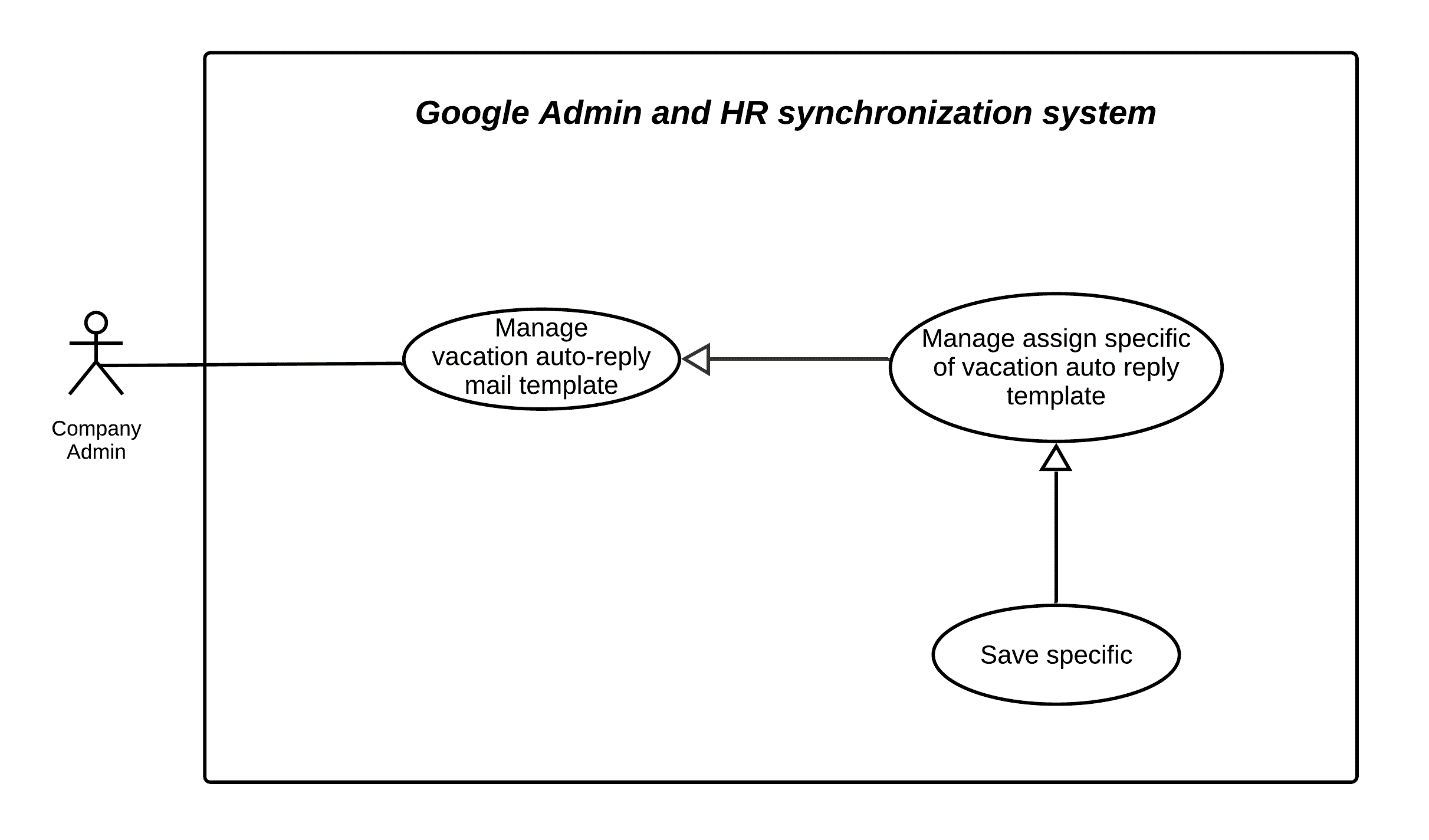


Figure 24 - Update specific of vacation auto-reply mail template

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – GmHRS\_C\_31** | | | |
| **Use Case No.** | GmHRS\_C\_31 | **Use Case Version** | 2.0 |
| **Use Case Name** | Update specific of vacation auto-reply mail template | | |
| **Author** | ThanhPV, ThongND | | |
| **Date** | 24/06/2020 | **Priority** | Normal |
| **Actor:**   * Company Admin.   **Summary:**   * This use case allows Company admin Update specific of vacation auto-reply mail template.   **Goal:**   * System admin can update specific of vacation auto-reply mail template.   **Trigger:**   * Company admin click “Save” button   **Precondition:**   * Company has data about team, department, employee and vacation auto-reply mail template   **Post condition:**   * Success: System update specific of vacation auto-reply mail template success. * Fail: System show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | **Step** | **Actor Action** | **System Response** | | 1 | Company admin click “Add row” button | System add a row in table and show:  -Specific by: select  -Value: multiple select  -Template: select  -View: button  -Delete: button | | 2 | Company admin choose information |  | | 3 | Company admin click “View” button | System show modal contain list employee of value that company admin selected | | 4 | Company admin click “Save” button | System will update specific apply and show message. [Exception 1] |   **Alternative Scenario: N/A**  **Exceptions:**   |  |  |  | | --- | --- | --- | | **No** | **Actor Action** | **System Response** | | 1 | Lost internet connection. | System fails to update |   **Relationships:** **N/A**  **Business Rules:**   * If company admin specific apply for employee with more than 1 template, system will consider the priority based on the table to apply * If the employee is not applying specific, the default template will be applied to that employee * Data deleted and saved will not be reverted | | | |

Table 18 <Company Admin> Update specific of vacation auto-reply mail template specification

#### <Company admin> Execute synchronization manually

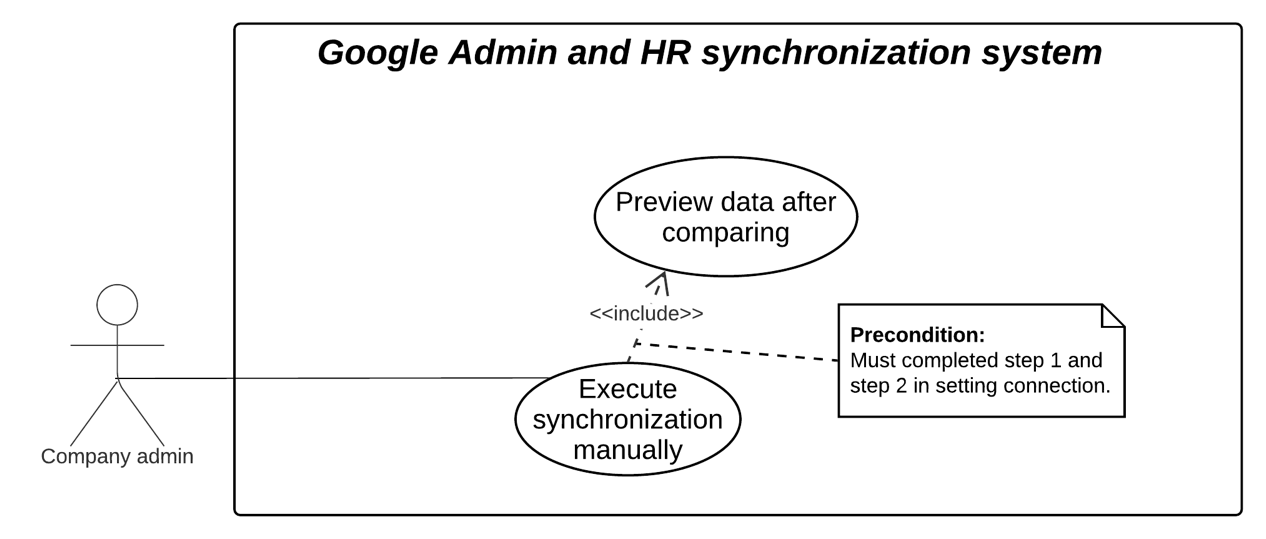


Figure 25 - <Company admin> Execute synchronization manually

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – GmHRS\_C\_36** | | | |
| **Use Case No.** | GmHRS\_C\_36 | **Use Case Version** | 2.0 |
| **Use Case Name** | Execute synchronization manually | | |
| **Author** | SonNC, ThongND | | |
| **Date** | 24/06/2020 | **Priority** | High |
| **Actor:**   * Company admin.   **Summary:**   * This use case allows Company admin Execute synchronization manually.   **Goal:**   * Company admin Execute synchronization manually.   **Trigger:**   * Company admin click button “Synchronize” in modal preview.   **Precondition:**   * Validate “database connection” or “API Endpoint” (Setting step 1) successfully. * Validate “G-suite credential” (Setting step 2) successfully.   **Post condition:**   * Success Execute synchronization manually successfully. * Fail: System show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | **Step** | **Actor Action** | **System Response** | | 1 | Company admin click icon synchronize at top right page. | System show modal show time at last synchronize and button “Synchronize” | | 2 | Company Admin click button “Synchronize” | System show modal for preview after comparing data, includes button “Synchronize now” and button “Close” | | 3 | Company Admin selects item that want to synchronize (selected all is default). Then clicks “Synchronize now” | Modal for preview close when synchronize completed. | | 4 | Company click button “Close” | Modal for preview data close |   **Alternative Scenario: N/A**  **Exceptions:**   |  |  |  | | --- | --- | --- | | **No** | **Actor Action** | **System Response** | | 1 | Lost internet connection. | System fail to Execute Synchronization manually and show message “Connection time out” | | 2 | G Suite API or HRMS API have error occurring | System fail to Execute Synchronization manually and show message “Synchronize failed”. |   **Relationships:** **N/A**  **Business Rules:**   * Company admin can Execute synchronization manually * In the first synchronize, company admin must synchronize manually * At first synchronize, after Admin Company click “Execute Synchronization”, system will show the data after comparing between HRMS and G-suite to Admin Company confirm. * At second synchronize, after Admin Company click “Execute Synchronization”, system will show the data after comparing between HRMS and GmHRS to Admin Company confirm. * After Admin Company confirm the data after comparing, synchronize manually officially implemented * After synchronize successfully. Information of team, department and employee can view in the system | | | |

Table 19 <Company admin> Execute synchronization manually use case specification

#### <Company admin> Use two factor authentication to login

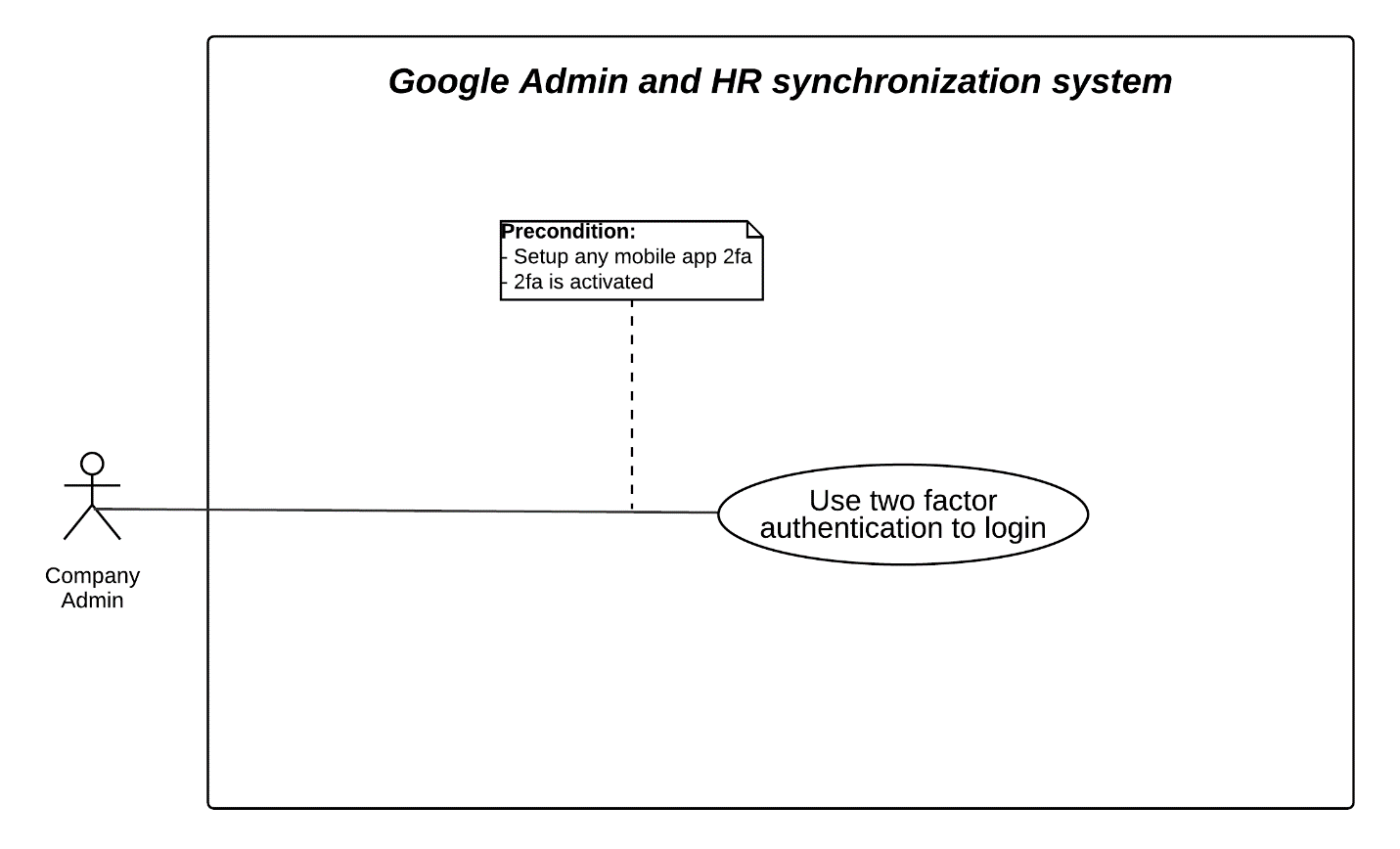


Figure 26 <Company admin> Use two factor authentication to login

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – GmHRS\_C\_39** | | | |
| **Use Case No.** | GmHRS\_C\_39 | **Use Case Version** | 2.0 |
| **Use Case Name** | Use two factor authentications to login | | |
| **Author** | NguyenDPT | | |
| **Date** | 24/06/2020 | **Priority** | High |
| **Actor:**   * Company admin.   **Summary:**   * This use case allows Company admin use two factor authentication to login.   **Goal:**   * Company admin can use two factor authentications to login.   **Trigger:**   * Enter valid OTP   **Precondition:**   * Set up any app 2 factor authentication. * 2 factor authentications is deactivated.   **Post condition:**   * Success Company admin use two factor authentications to login success. * Fail: System show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | **Step** | **Actor Action** | **System Response** | | 1 | Company admin sign in with username and password successfully | System show 2FA page:  -OTP: blank text input  -Submit: button | | 2 | Company admin click “Submit” button | System show message and redirect to home page. [Exception 1] |   **Alternative Scenario: N/A**  **Exceptions:**   |  |  |  | | --- | --- | --- | | **No** | **Actor Action** | **System Response** | | 1 | Company admin enter invalid OTP | System show error message |   **Relationships:** **N/A**  **Business Rules:**   * If company admin scans another QR code from another app that support 2FA, so company admin cannot sign in to the system * If company admin deletes data of application on mobile, so company admin cannot sign in to the system | | | |

Table 20 <Company Admin> Use two factor authentications to login

### <System handler> Overview Use Case

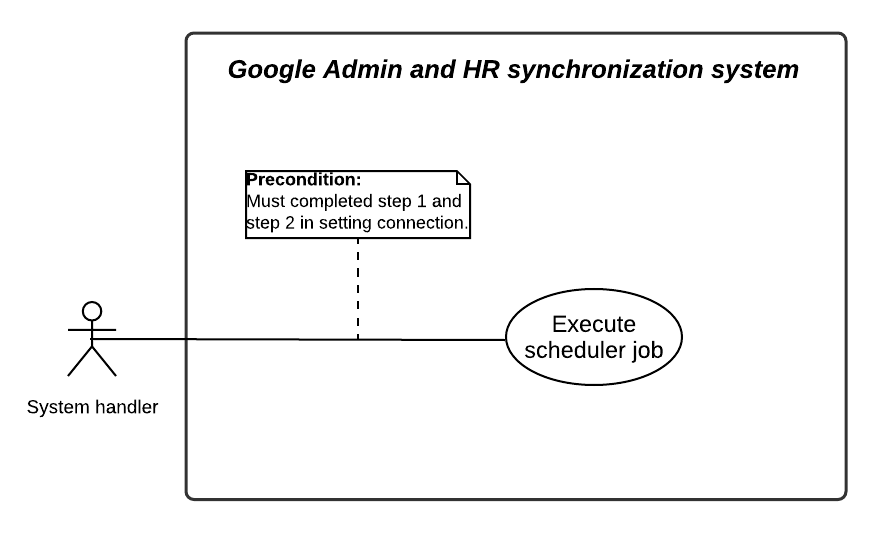


Figure 27 - <System handler> Overview Use Case

#### <System handler > Execute schedule job

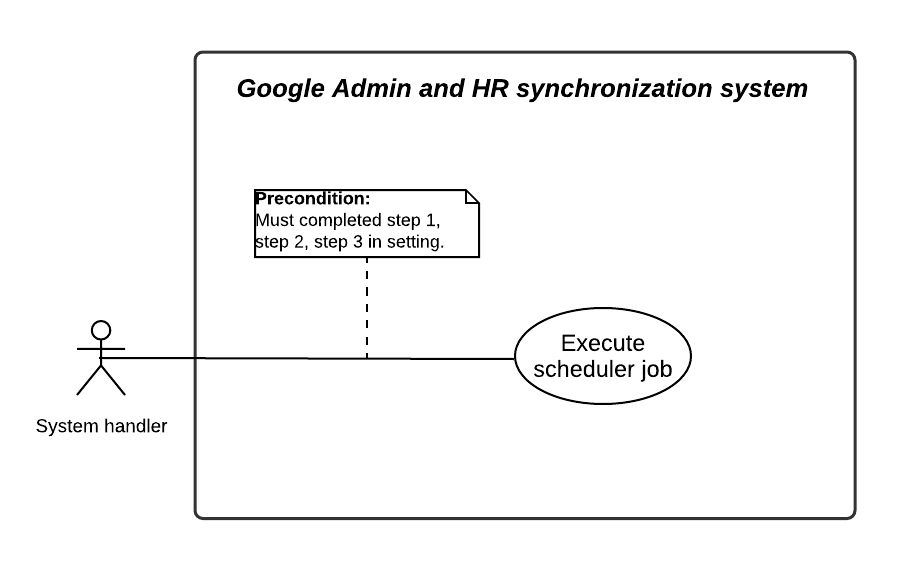


Figure 28 - <System handler> Execute schedule job

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – GmHRS\_H\_1** | | | |
| **Use Case No.** | GmHRS\_H\_1 | **Use Case Version** | 2.0 |
| **Use Case Name** | Execute synchronization job | | |
| **Author** | SonNC | | |
| **Date** | 24/06/2020 | **Priority** | High |
| **Actor:**   * System handler.   **Summary:**   * This use case allows System handler can execute schedule job.   **Goal:**   * System handler can execute schedule job.   **Trigger:**   * On time action execute job.   **Precondition:**   * Setting step 1, step 2 and step 3 successfully * Turn on auto synchronize in step 3   **Post condition:**   * Success: System handler must synchronize data successfully. * Fail: System show error message.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | **Step** | **Actor Action** | **System Response** | | 1 | On time in setting schedule, system handler executes schedule job | System update synchronize log on dash board |   **Alternative Scenario: N/A**  **Exceptions:**   |  |  |  | | --- | --- | --- | | **No** | **Actor Action** | **System Response** | | 1 | Lost connection | Execute schedule job fail |   **Relationships:** **N/A**  **Business Rules:**   * Must to be synchronize manually before in the first time * System handler execute schedule job from the second synchronize | | | |

Table 21 <System handler> Execute schedule job use case specification

# System Architecture Diagram

## 6.1 System Architecture

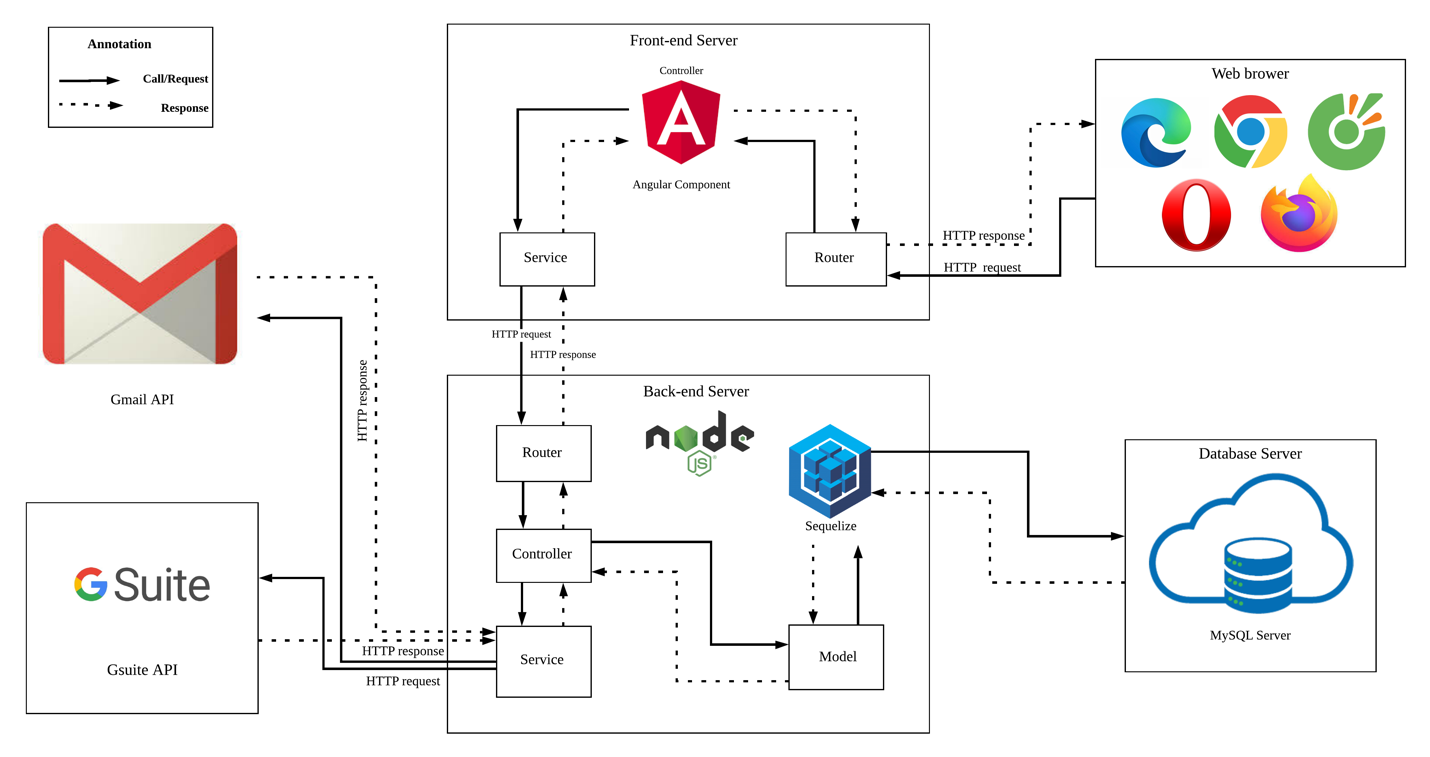


Figure 29 System Architecture Diagram

## 6.2 Flow chart

### 6.2.1. <Core flow > Setting connection

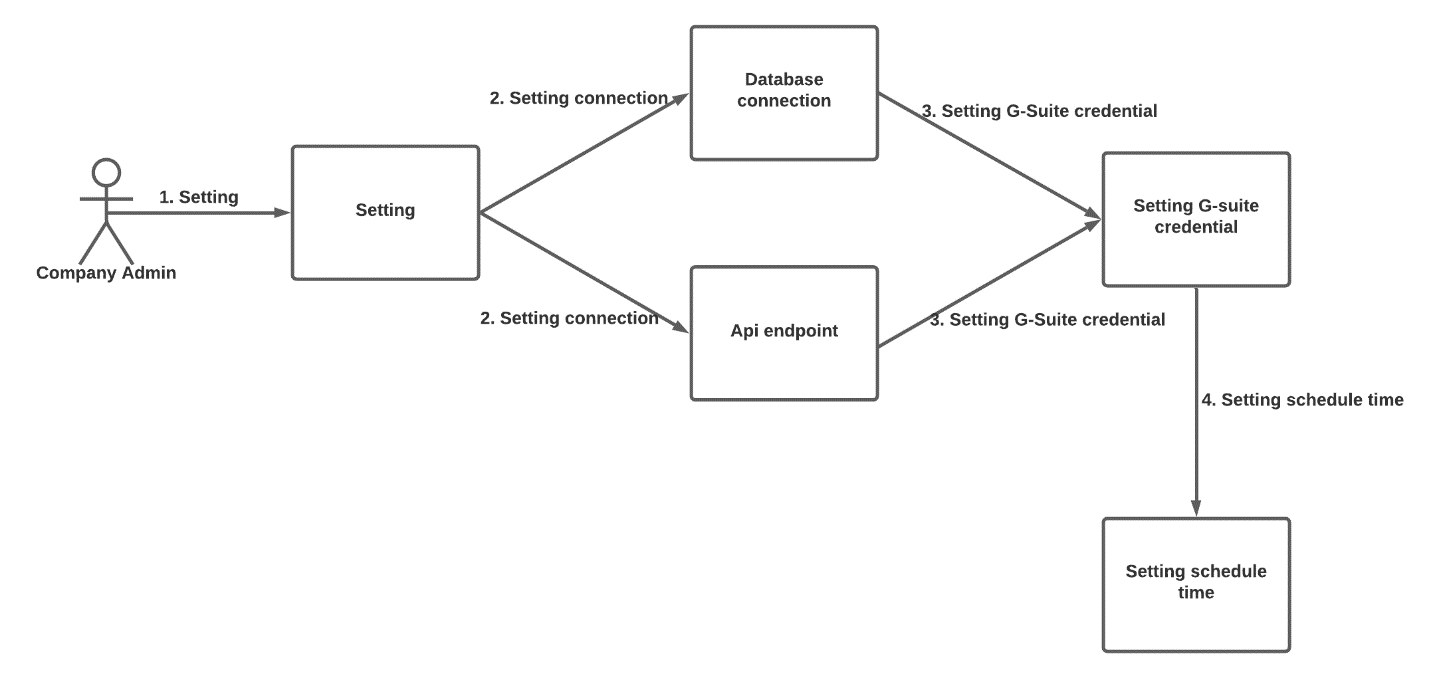


Table 22 <Core flow> Setting Connection

### 6.2.2. <Core flow> Execute synchronize manually

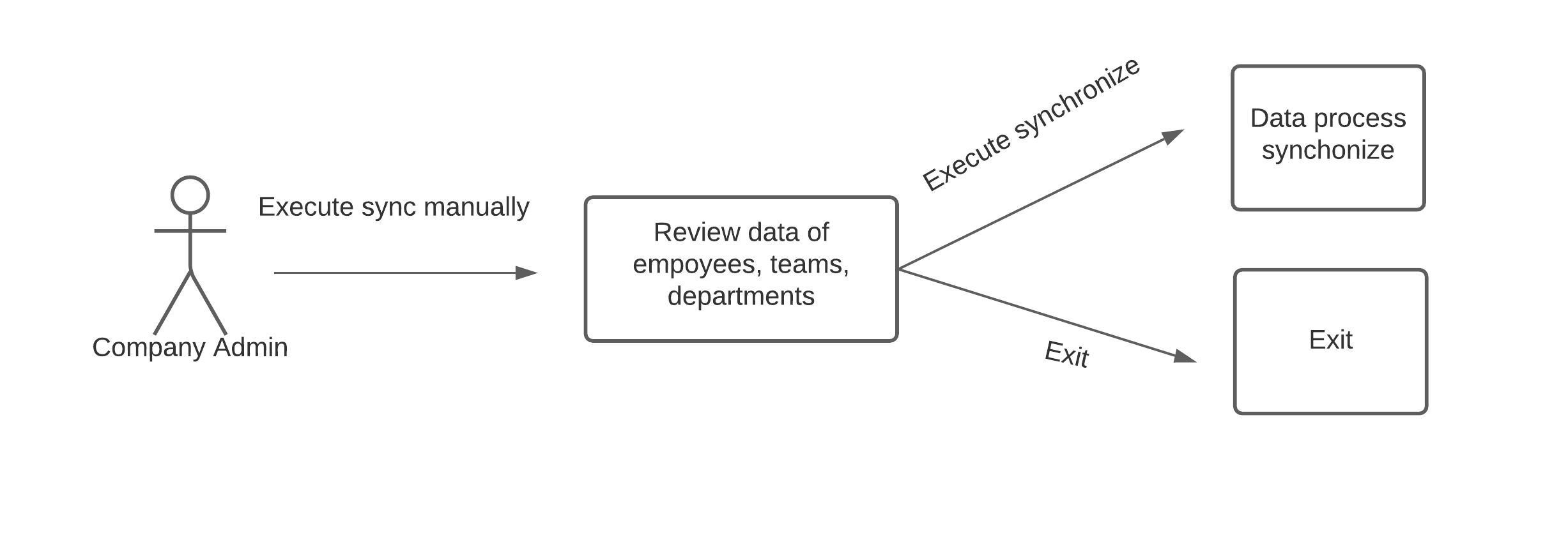


Table 23 <Core flow> Execute synchronize manually

### 6.2.3. <Core flow> Signature template

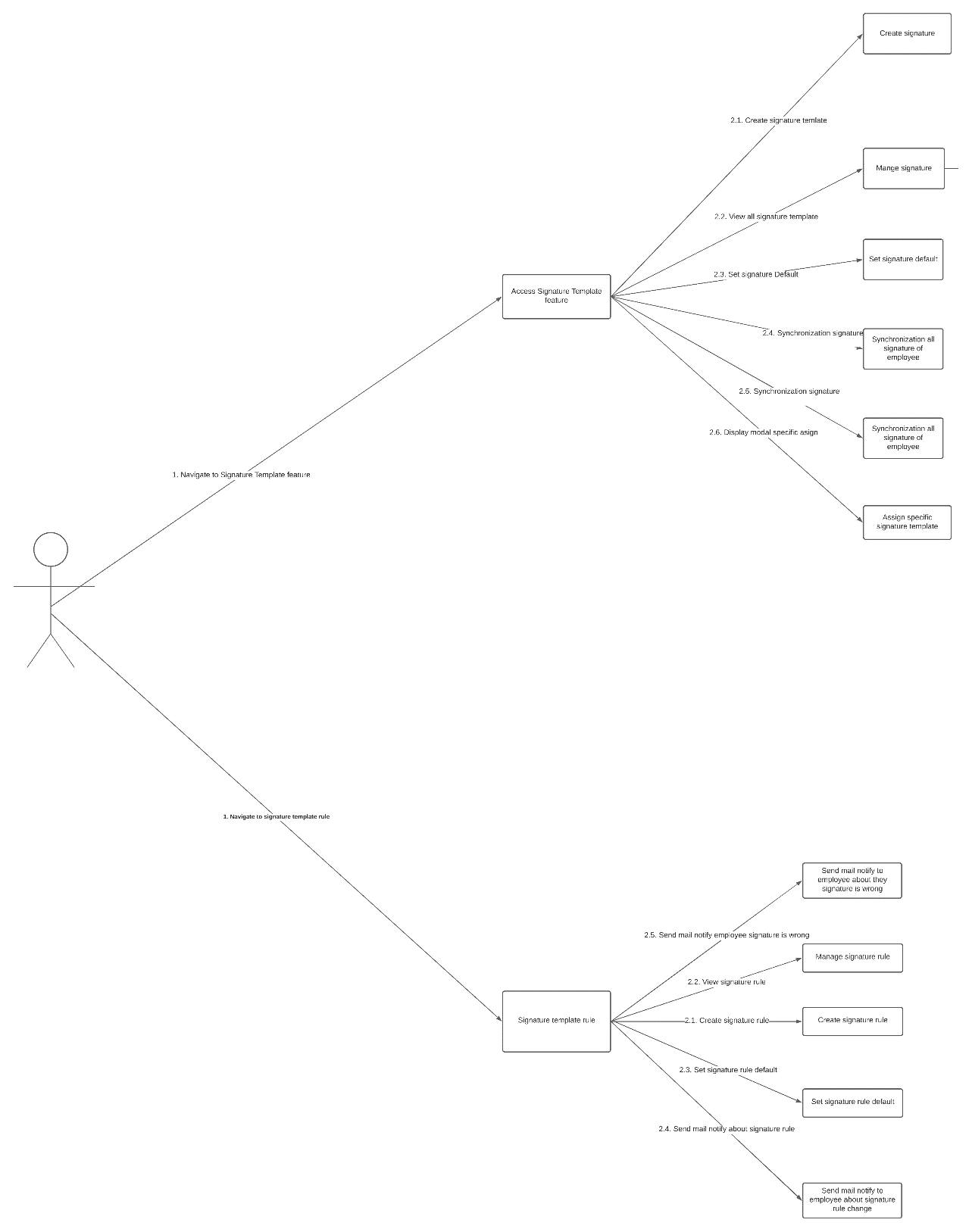


Table 24 <Company Admin> Signature template

### 6.2.4. <Core flow> Two factor authentication

,

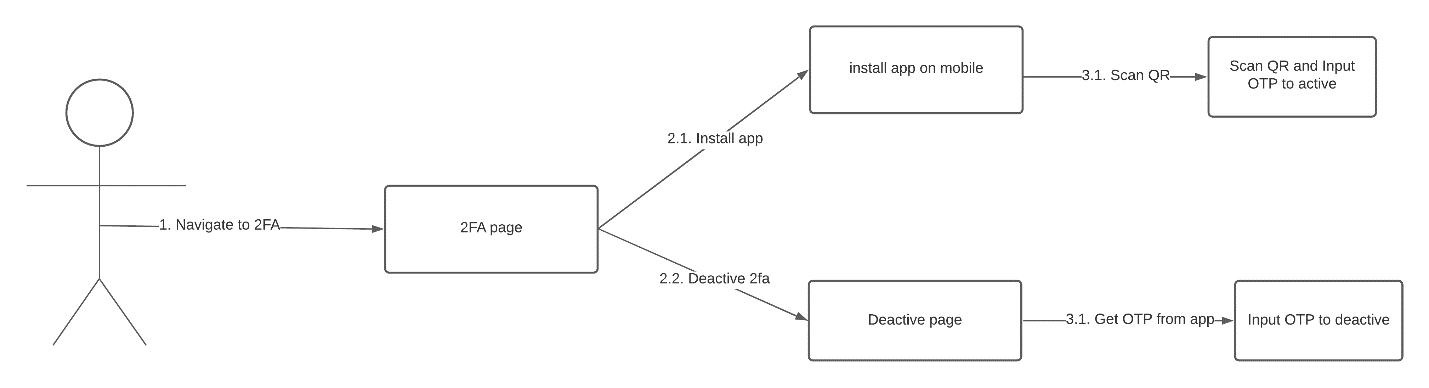


Table 25 <Core flow> Two factor authentication

### 6.2.5. <Core flow> Execute synchronize Gmail business

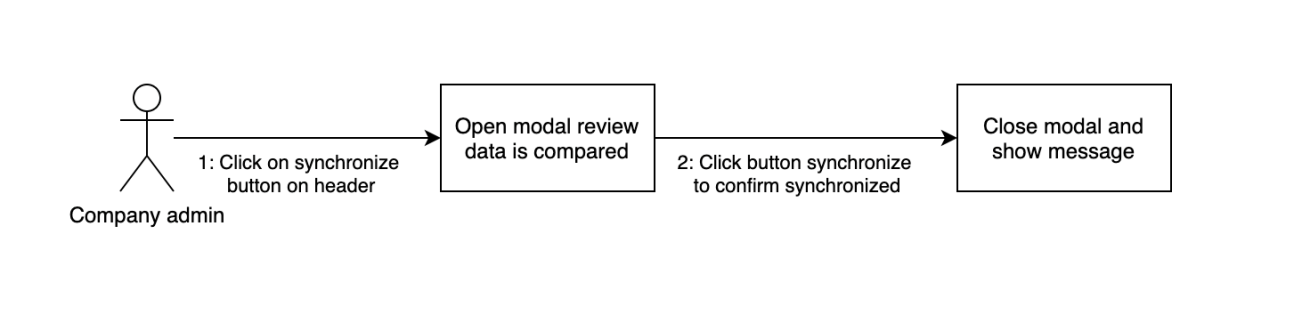


Table 26 <Core flow> Execute synchronize Gmail business

### 6.2.6. <Core flow> Manage vacation auto reply mail template

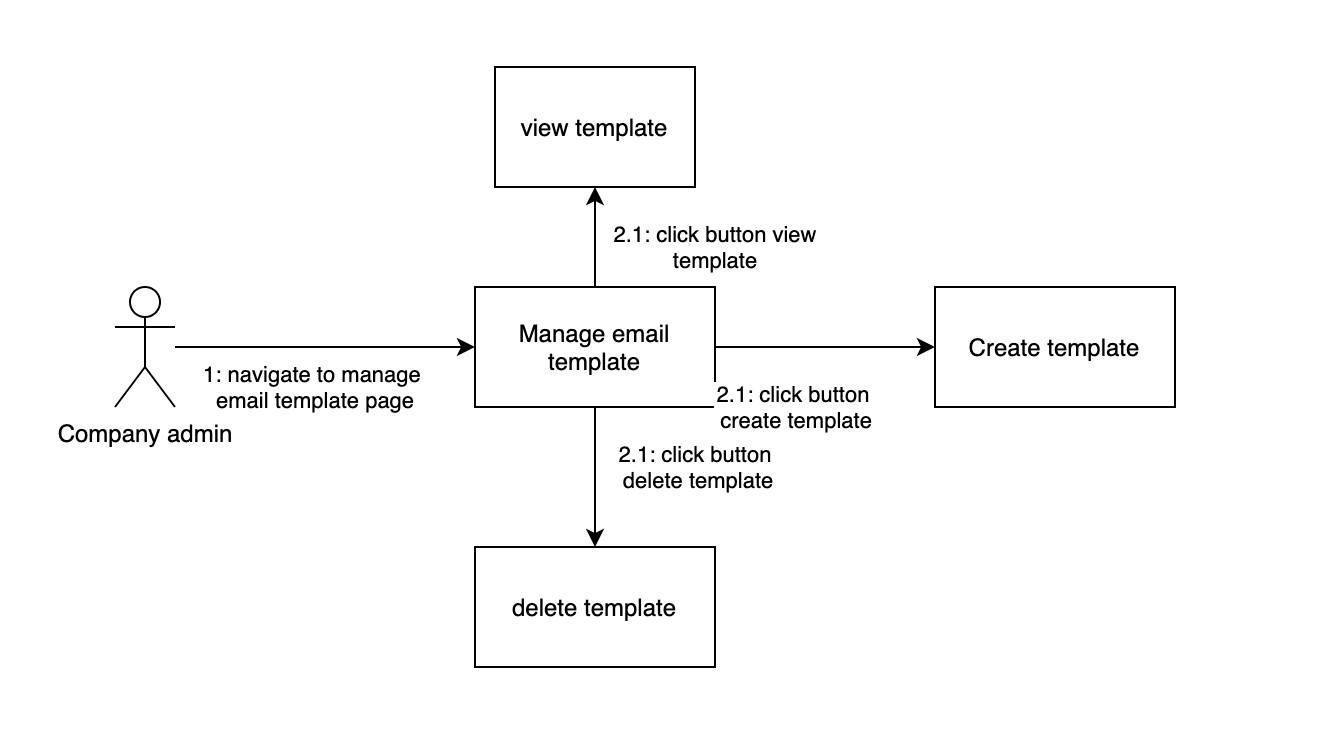


Table 27 <Core flow> Manage vacation auto reply mail template

### 6.2.7. <Core flow> Assign vacation auto reply mail template

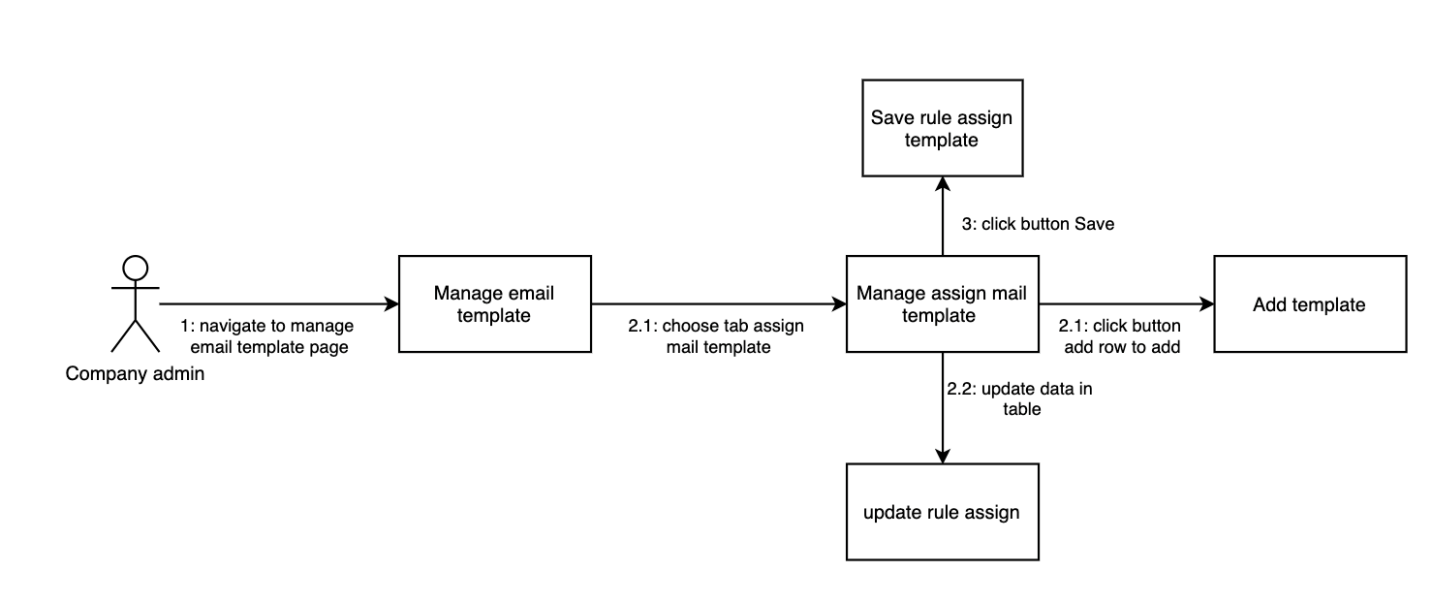


Table 28 <Core flow> Assign vacation auto reply mail template

# Framework

### Web Application Architecture Diagram

In the client side, we choose Angular because:

* Improve the productivity of the programmers
* Clear development structure
* Angular is easy to maintain isolated components

In the server side, we choose NodeJS because

* Receive and process multiple connections with a single thread. This helps the system consume the least amount of RAM and run fastest when not having to create new threads for each query
* Non-blocking, I/O helps make the most of server resources without creating latency

# Component Diagram

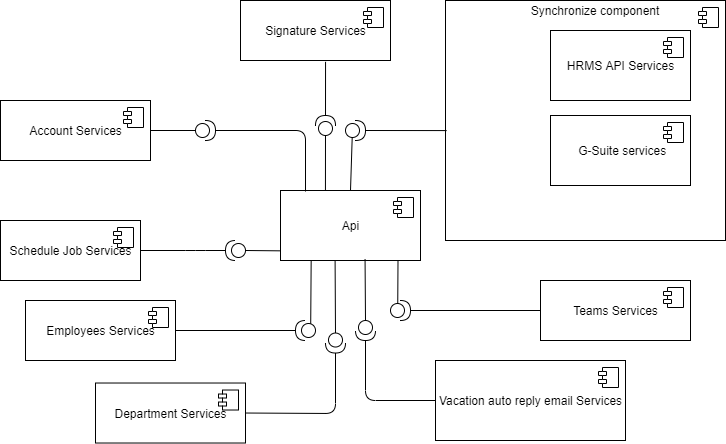


Figure 30 Component Diagram

|  |  |
| --- | --- |
| COMPONENT DICTIONARY: DESCRIBES COMPONENTS | |
| Account Services | Provide API for manage account company manager. |
| Synchronize Component | Provide API for synchronize data between Company and G-Suite. |
| HRMS API Services | Connect to database of company and create API endpoint for synchronize process |
| G-Suite Services | Provide function for get data from G-Suite by using G-Suite API. |
| Schedule Job Service | Provide API for manage schedule job like on/off and change time synchronize. |
| Employees Services | Provide API for manage employees by work directly with GmHRS Database. |
| Teams Services | Provide API for manage teams by work directly with GmHRS Database. |
| Departments Services | Provide API for manage department by work directly with GmHRS Database. |
| Vacation auto reply mail Services | Provide API for manage vacation auto reply mail template by work directly with GmHRS Database, Synchronize to Gmail. |
| Signature Services | Provide API for manage signature template by work directly with GmHRS Database, Synchronize to Gmail. |

Table 29 Component Diagram dictionary

# Class Diagram

## Class Diagram

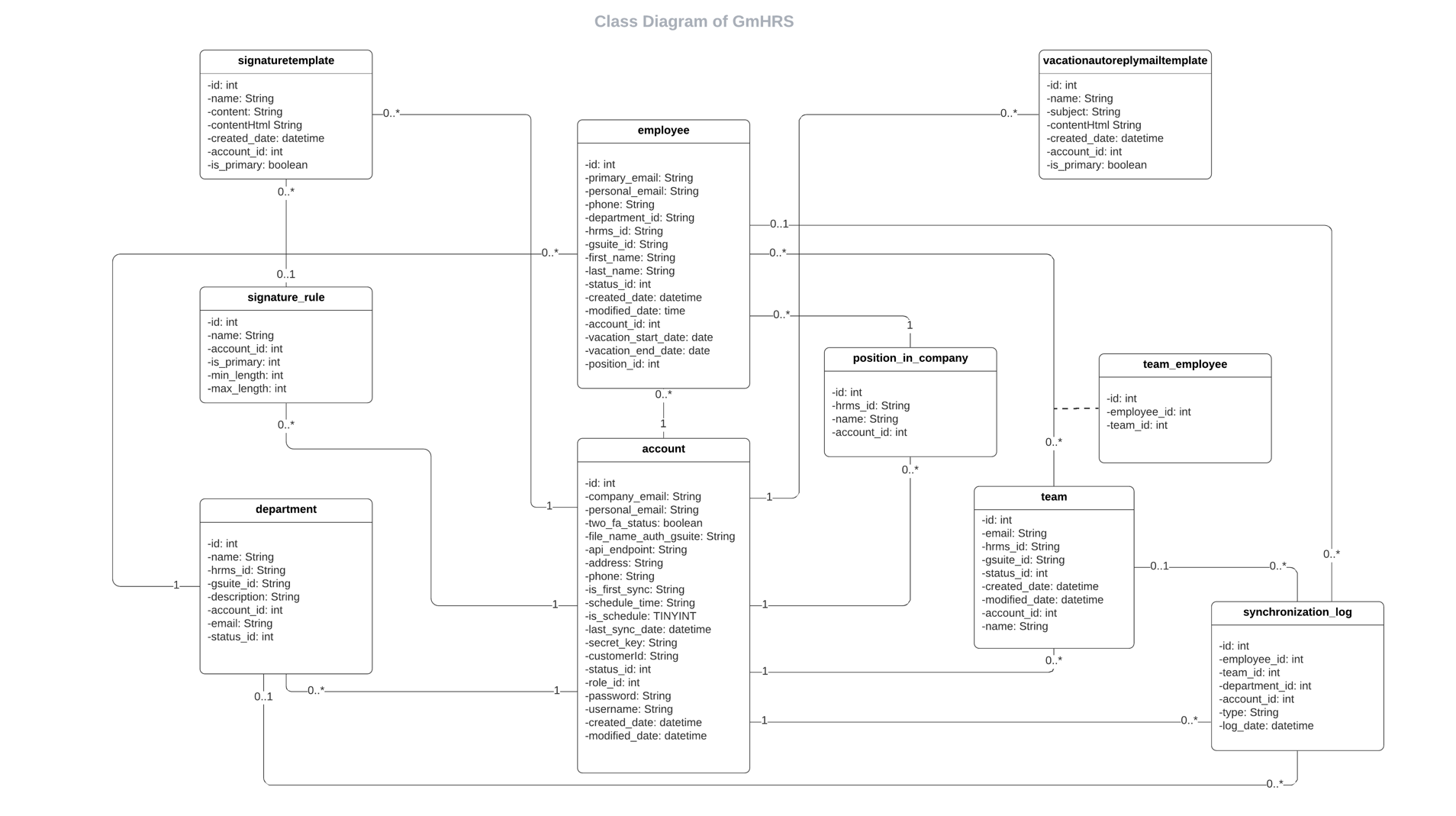


Figure 31 Class Diagram

## Class Dictionary

|  |  |  |
| --- | --- | --- |
| Class dictionary: describe Class | | |
| Class Name | Mapping column with Conceptual diagram | Description |
| account | Account | Contain the Account Information |
| employee | Employee | Contain the Employee Information |
| team | Team | Contain the Team Information |
| department | Department | Contain the Department Information |
| signaturetemplate | Signature Template | Contain the Signature Template Information |
| signature\_rule | Signature rule | Contain the Rule of Signature Information |
| autoreplymailtemplate | Auto Reply Mail Template | Contain the Vacation Auto Replay Mail Template Information |
| team\_employee | N/A | Contain Team and Employee Information |
| synchronization\_log | Synchronization Log | Contain Synchronization Log of Employees, Teams, Departments Information |
| position\_in\_company | Position | Contain Position in company Information |

Table 30 Class Dictionary

# Entity Relationship Diagram

## Entity Relationship Diagram

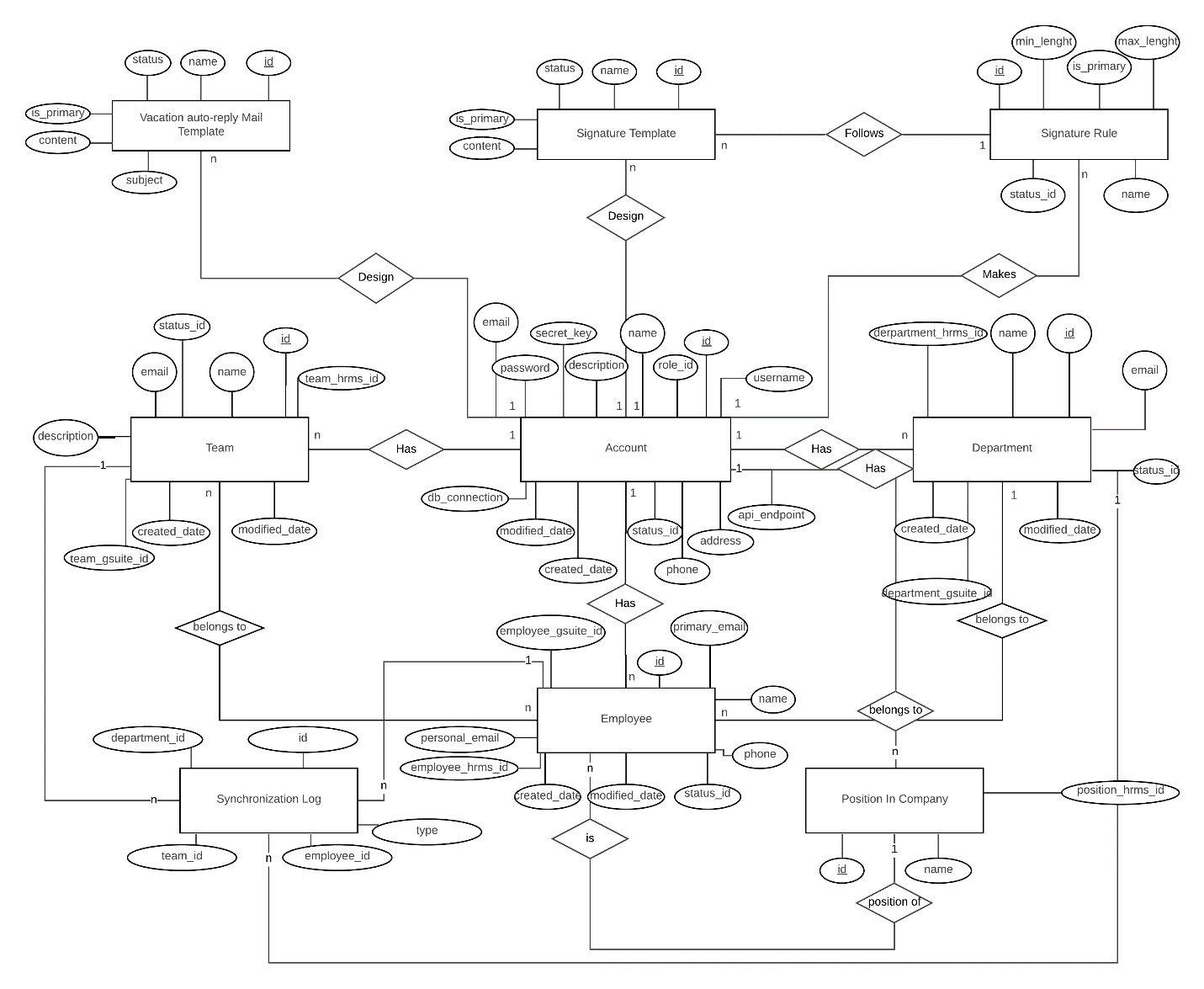


Figure 32 Entity Relationship Diagram

## Entity Data Dictionary

|  |  |  |
| --- | --- | --- |
| Entity dictionary: describe Entity | | |
| Entity Name | Mapping column with Conceptual diagram | Description |
| Account | Account | Contain the Account information. |
| Employee | Employee | Contain the Employee information |
| Department | Department | Contain the Department information |
| Team | Team | Contain the Team information |
| Signature Rule | Signature Rule | Contain the Rule of signature template |
| Signature Template | Signature Template | Contain the Signature Template information |
| Vacation Auto-reply Mail Template | Vacation Auto-reply Mail Template | Contain the Auto-reply Mail Template information |
| Position in Company | Position in Company | Contain the Position of Company |
| Synchronization Log | Synchronization Log | Contain logs of data changed of employees, teams and departments |

Table 31 Entity relationship diagram dictionary

# Interactive Diagram

## Save API endpoint

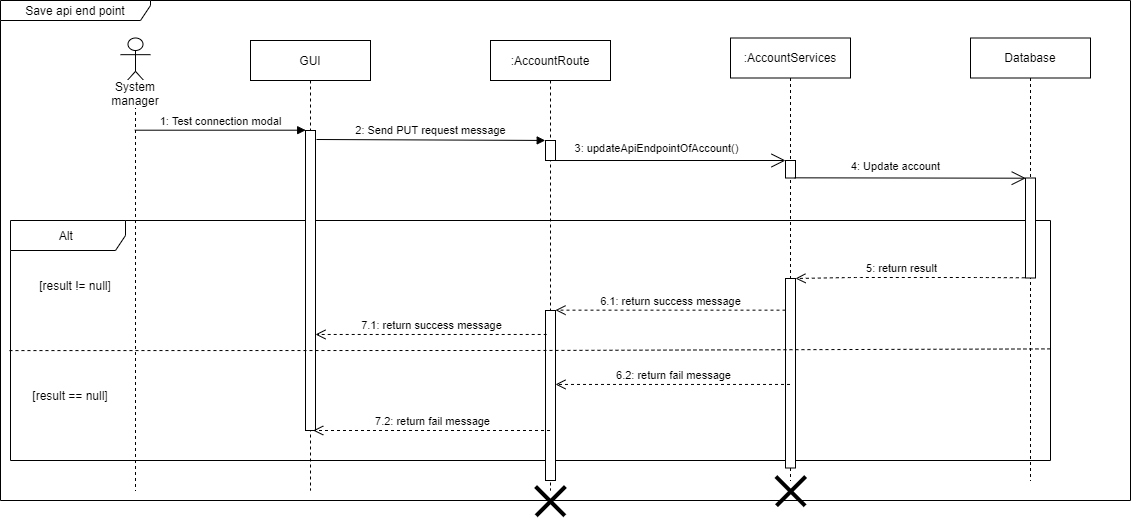


Figure 33 - < Sequence Diagram> Save API endpoint

## Check file g-suite authentication

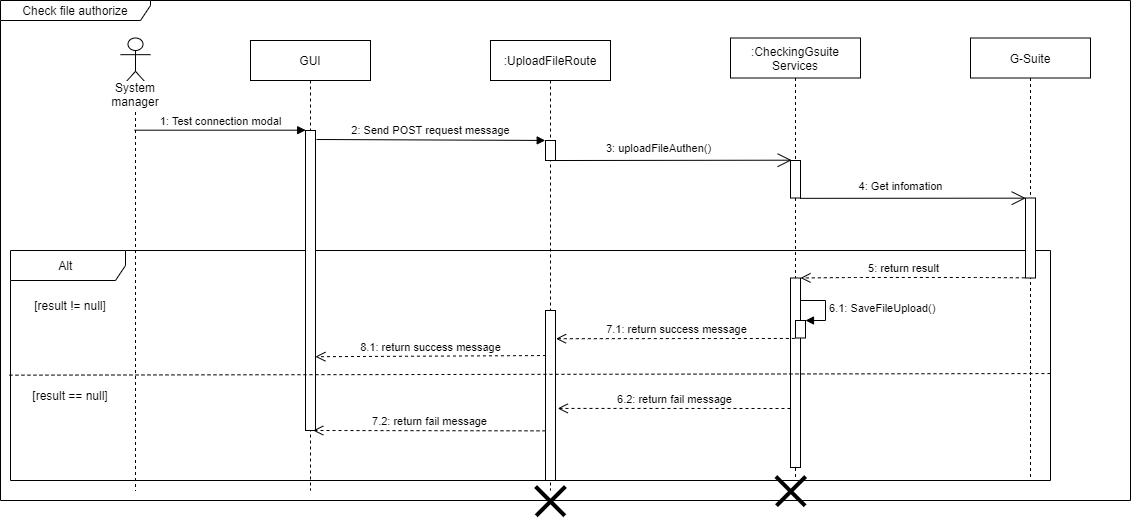


Figure 34 - < Sequence Diagram> Check file g-suite authentication

## Create signature rule

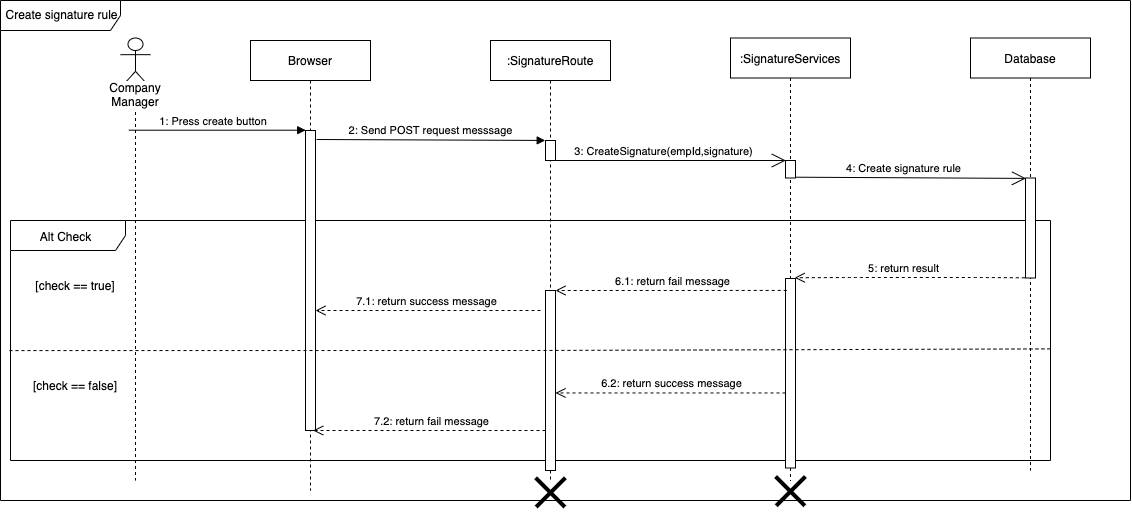


Figure 35 - < Sequence Diagram> Create signature rule

## Start schedule job

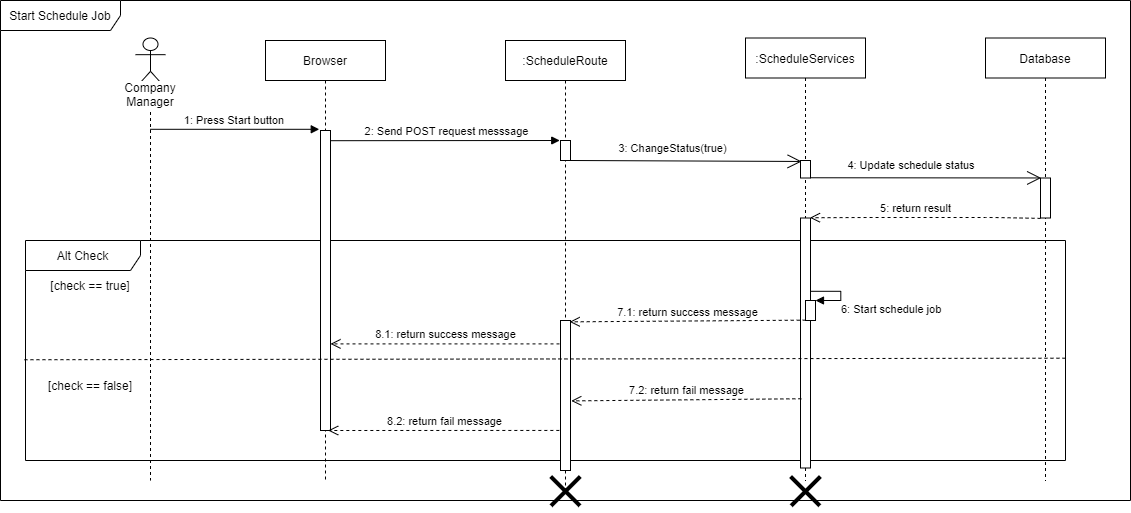


Figure 36 - < Sequence Diagram> Start schedule job

## 11.5. Review at First synchronization

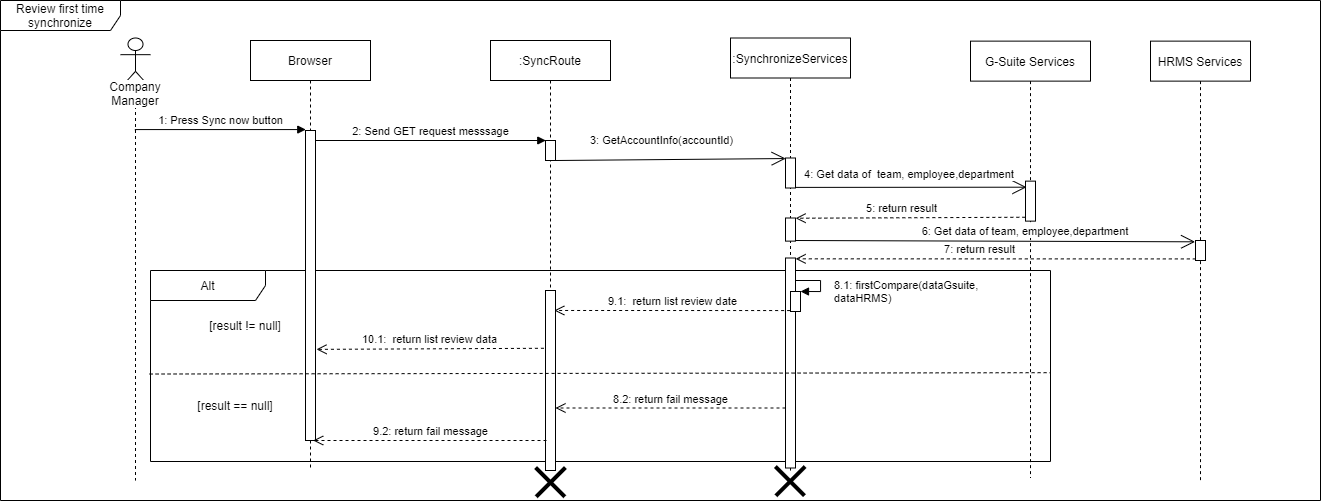


Figure 37 Review data at First Synchronize

## 11.6. Review at Second synchronization

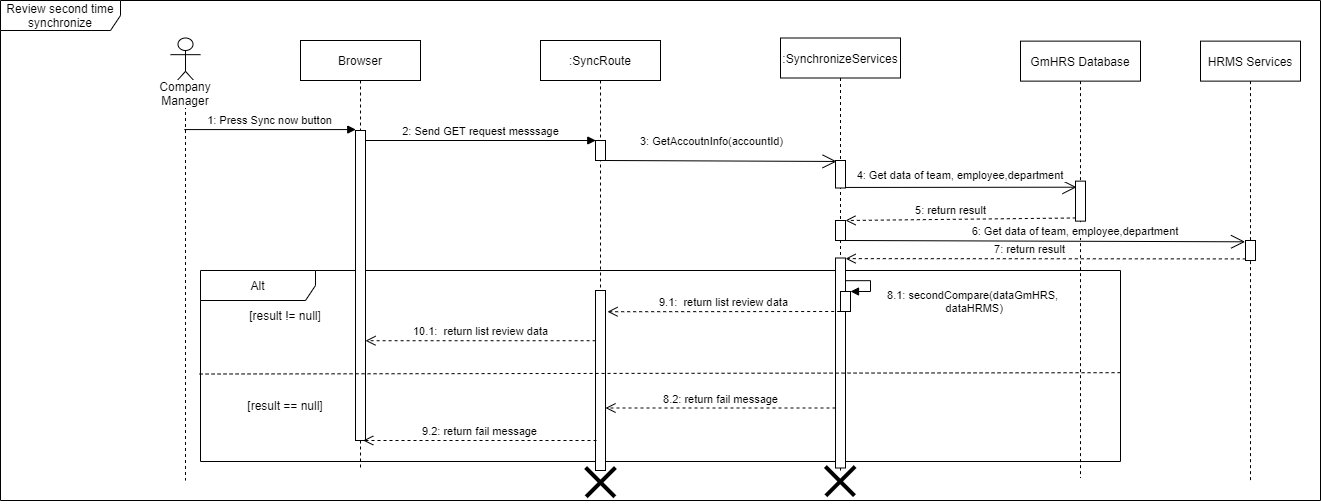


Figure 38 Review data at Second Synchronization

## 11.7. Execute synchronization manually

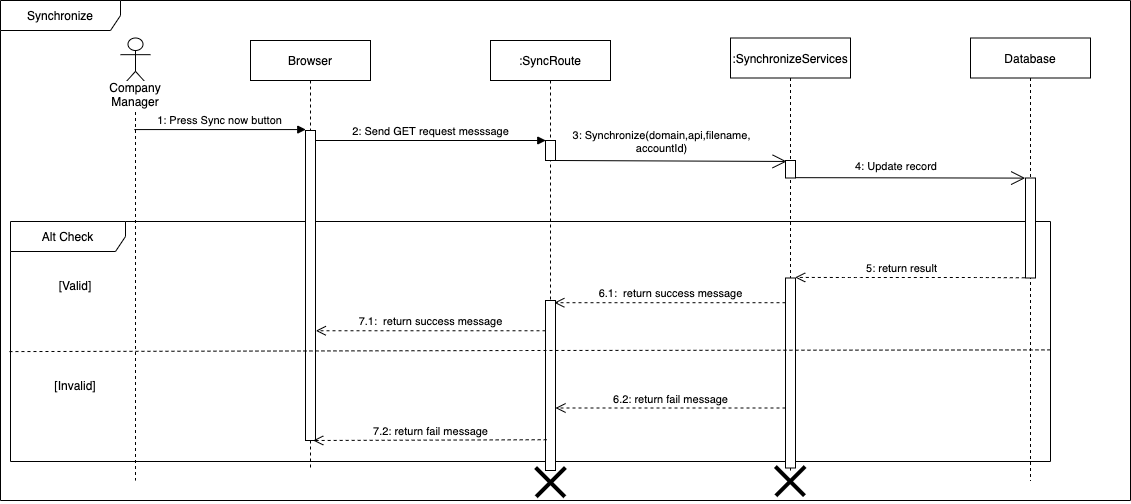


Figure 39 - <Sequence Diagram>Execute synchronization manually

## 11.8. Get wrong signature employee

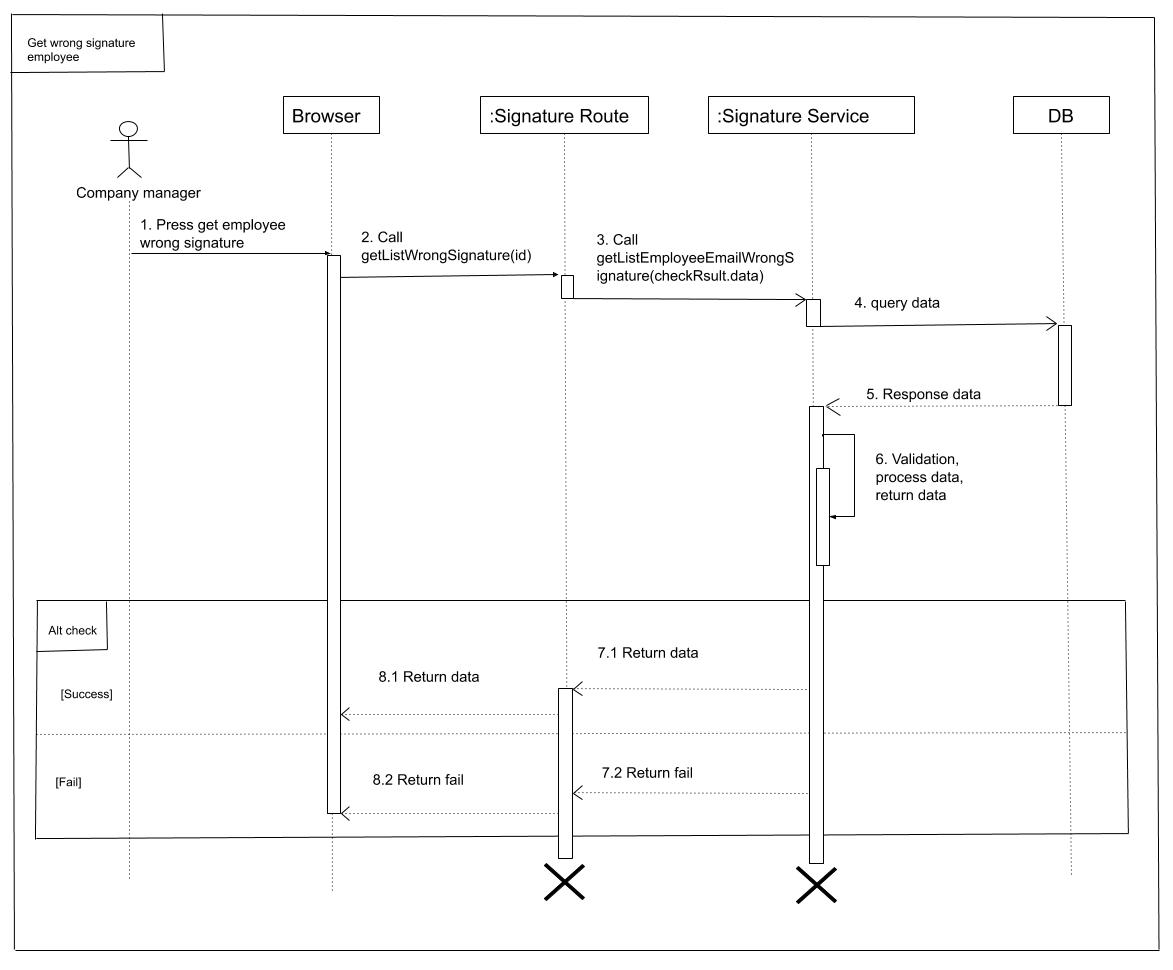


Figure 40 - <Sequence Diagram> Get wrong signature employee

## 11.9. New signature rule

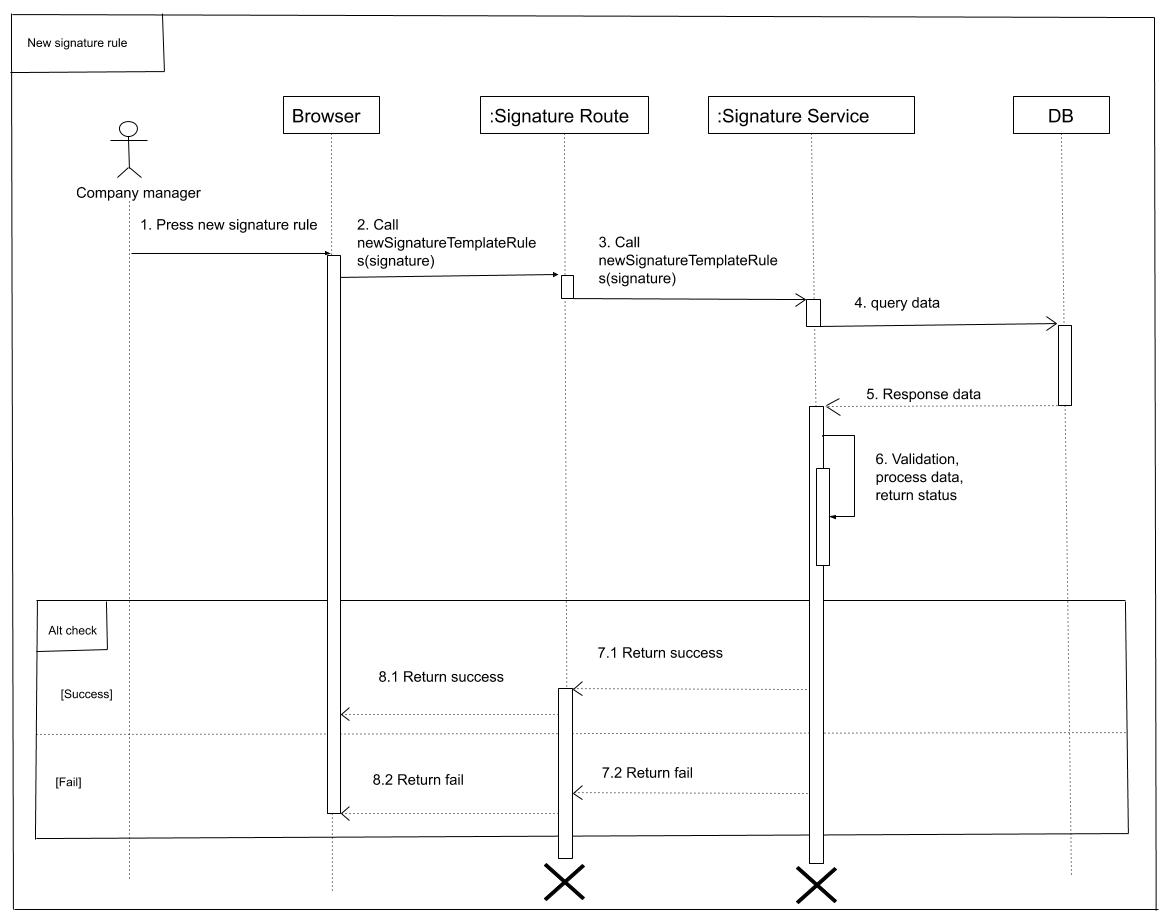


Figure 41 - <Sequence Diagram> New signature rule

## 11.10. Create signature template

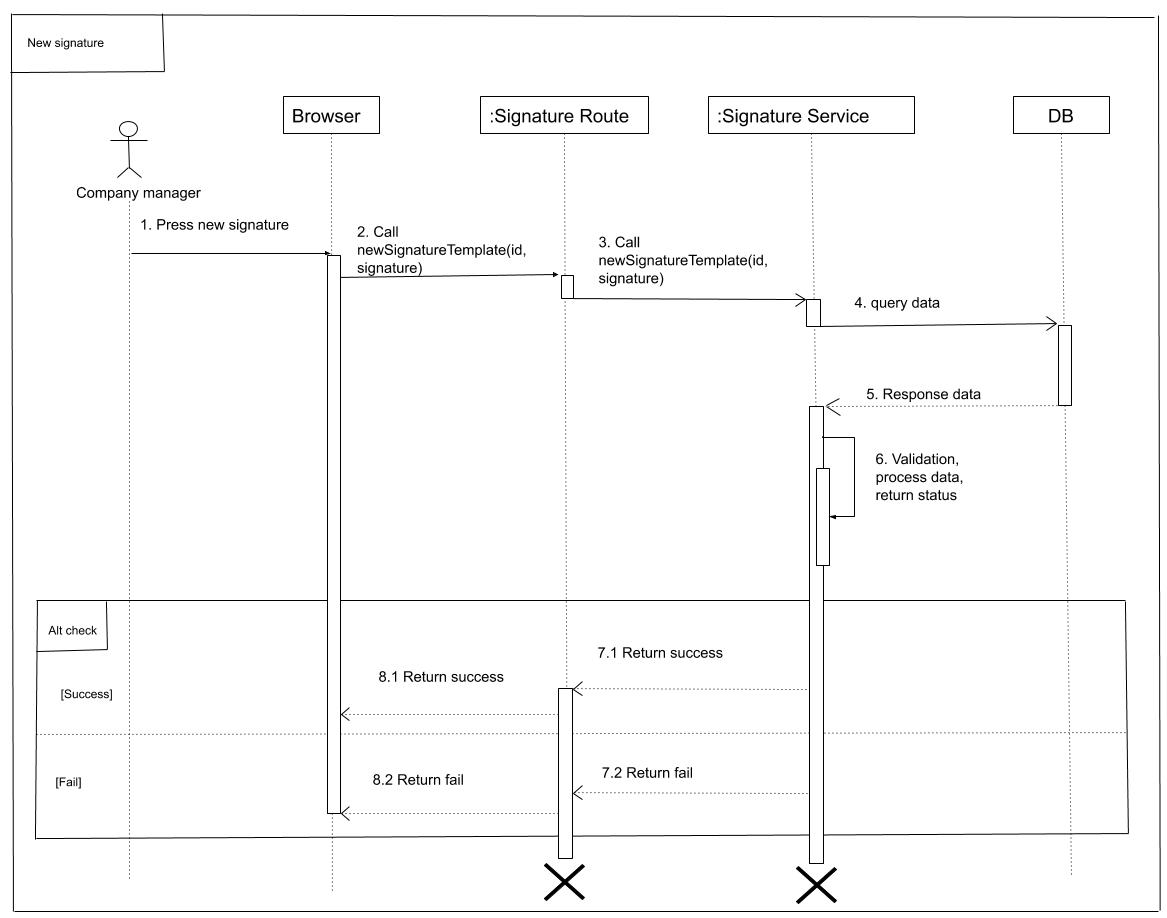


Figure 42 - <Sequence Diagram> Create signature template

## 11.11. Send notify about rule to employee

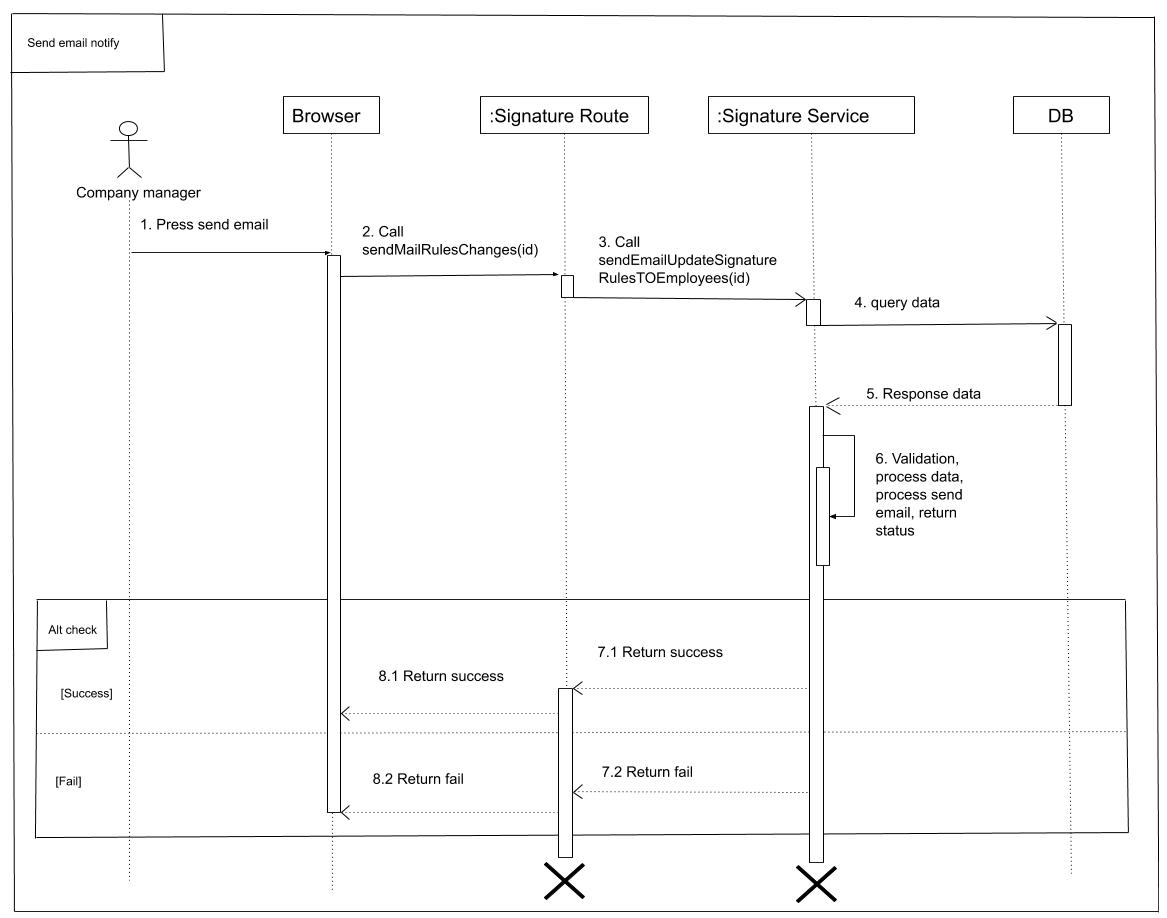


Figure 43- <Sequence Diagram> Send notify about rule to employee

## 11.12. Send mail to wrong signature employee

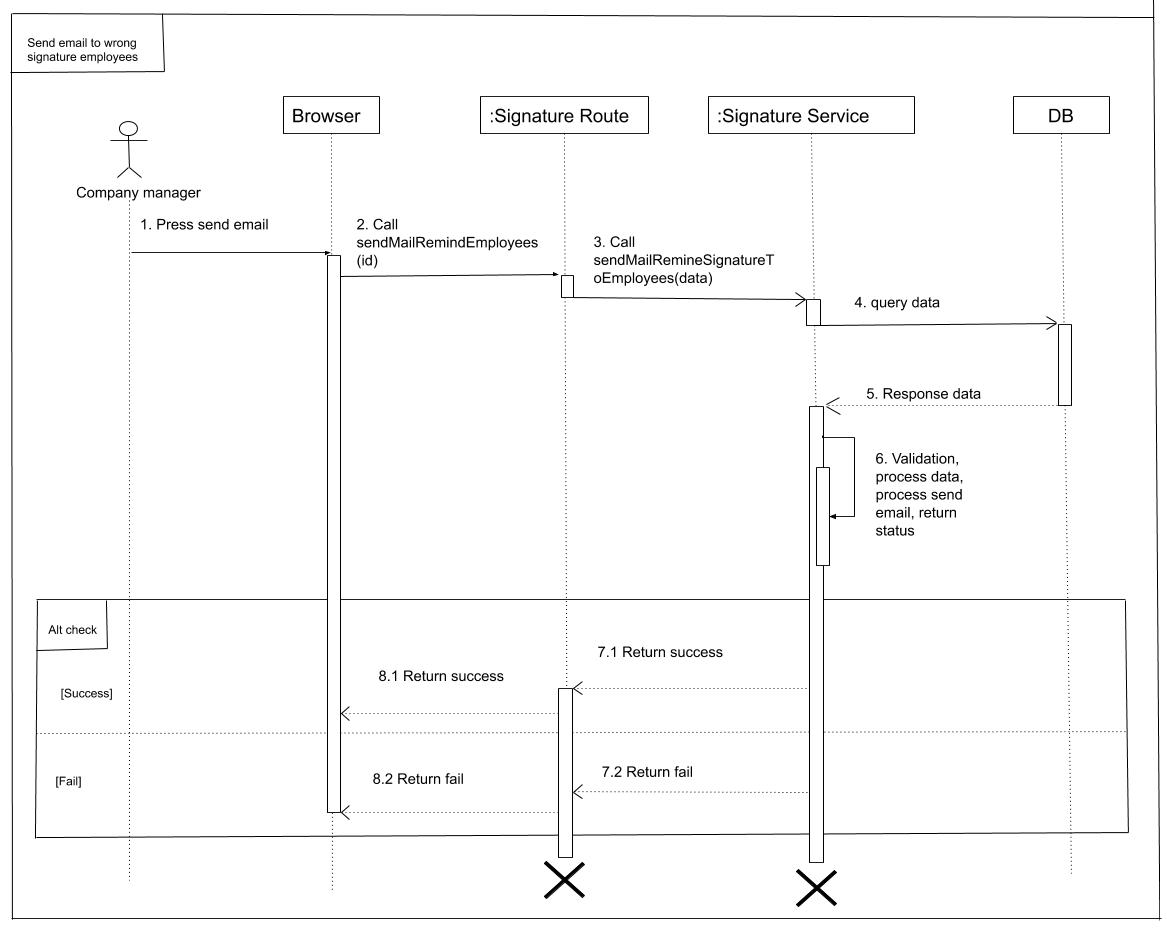


Figure 44 - <Sequence Diagram> Send mail to wrong signature employee

## 11.13. Specific apply signature

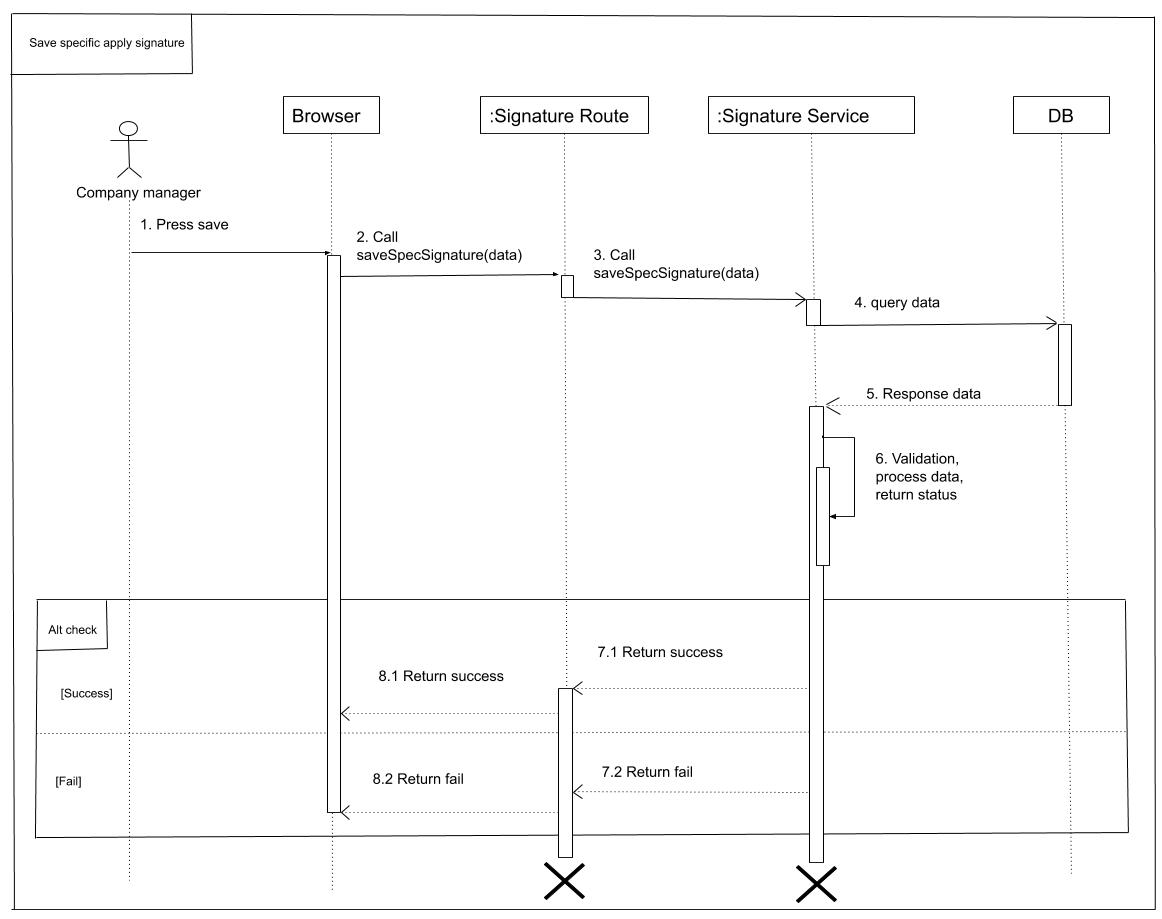


Figure 45 - <Sequence Diagram> Specific apply signature

## 11.14. Update signature for only wrong signature employee

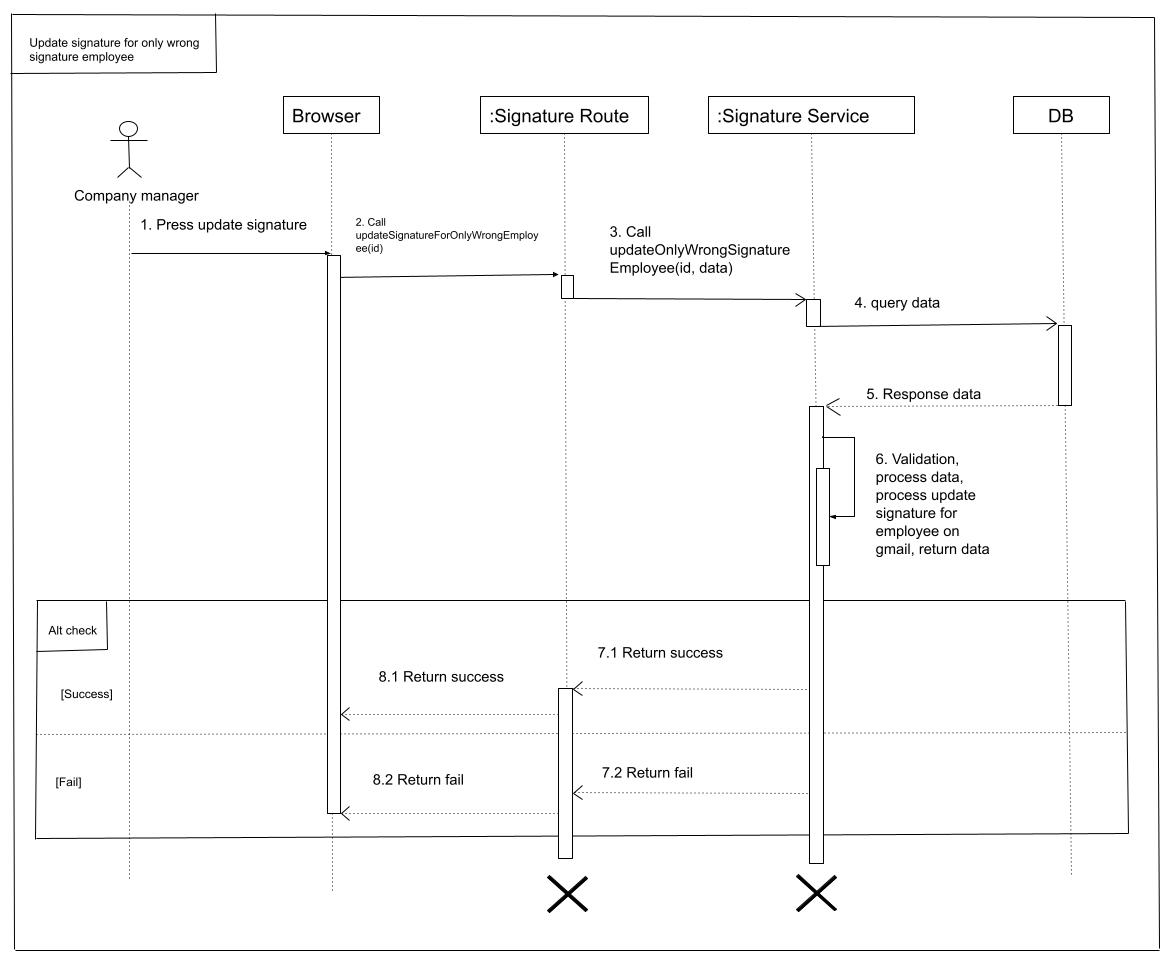


Figure 46 - <Sequence Diagram>Update signature for only wrong signature employee

# Physical diagram

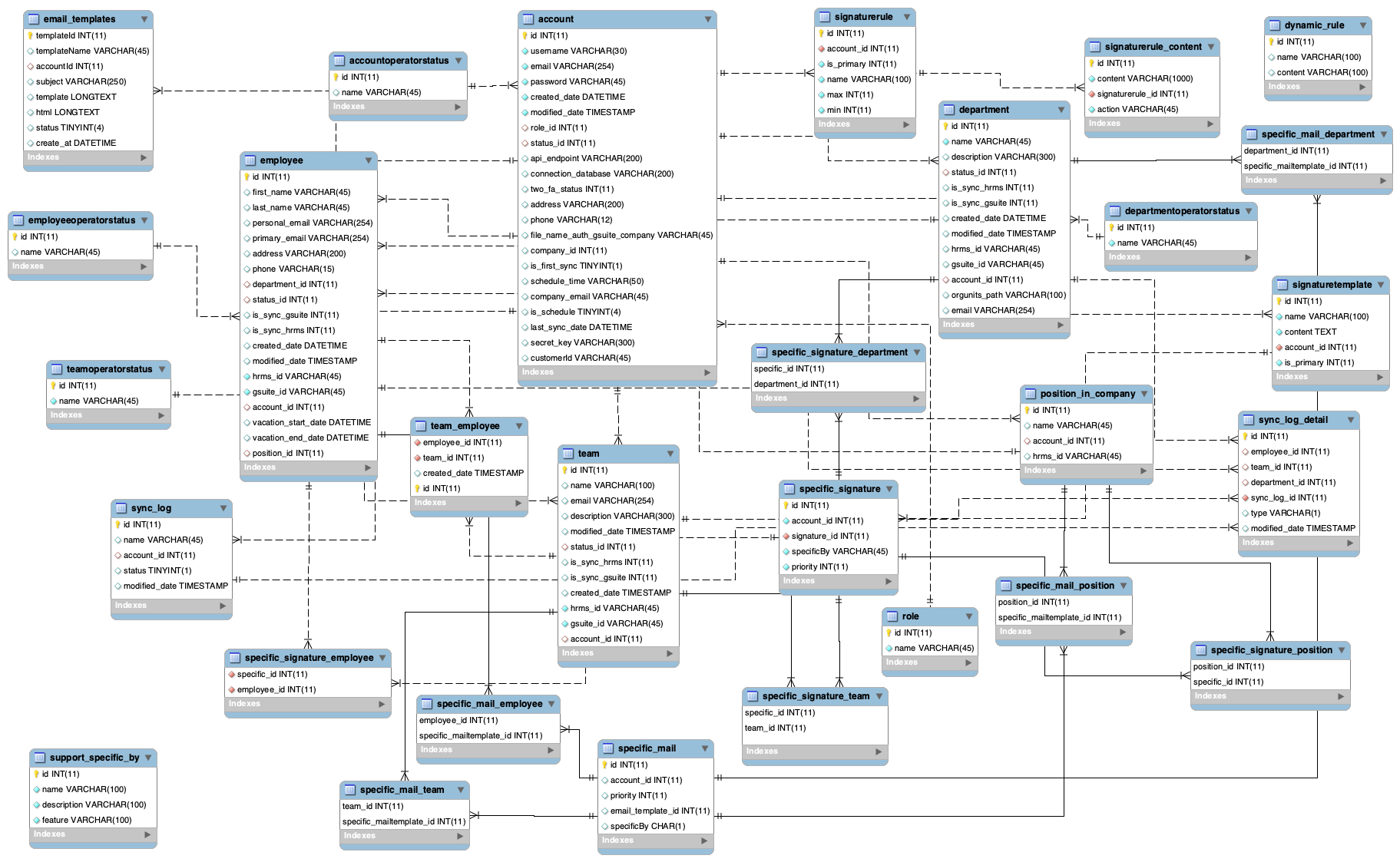


Figure 47 - Physical Diagram

|  |  |
| --- | --- |
| DATA DICTIONARY: DESCRIBE CONTENT OF ALL TABLES | |
| Table name | Description |
| account | Account of IT admin company to login GmHRS |
| employee | Employee with personal information includes email business |
| department | Department of company |
| team | Team includes members |
| team\_employee | Team contains members |
| accountoperatorstatus | Account is active or deactive |
| depart,emtoperatorstatus | Contains the department status information |
| teamoperatorstatus | Contains the team status information |
| position\_in\_company | Company must have positions. |
| email\_templates | Email template for vacation auto reply mail. |
| specific\_mail | Contains the information assign specific auto reply mail template |
| specific\_mail\_department | Employees of the department will be assigning a mail template for vacation auto reply mail by specific |
| specific\_mail\_position | Employees with the position will be assign a mail template for vacation auto reply mail by specific |
| specific\_mail\_team | Members in the team will be assign a mail template for vacation auto reply mail by specific |
| role | Role of account for logging in to GmHRS. |
| signaturetemplate | Contains the signature template information |
| signaturerule | Company make rules of signatures |
| signaturerule\_content | Content for rules of signature. For example: required or not required |
| specific\_signature | Define signature template for team, department and position order by priorities. |
| specific\_signature\_department | Signature template for department by specific |
| specific\_signature\_team | Signature template for team by specific |
| specific\_signature\_position | Signature template for position by specific |
| support\_specific\_by | Contains the support specific by what |
| dynamic\_rule | Content of rules is dynamic content like phone, name, email. |
| sync\_log | Logging information of employees, teams, departments |
| sync\_log\_detail | Logging detail of employees, teams, departments shad synchronized at GmHRS with 3 types (New, Update, Delete) |

Table 32 Physical diagram dictionary

# Algorithm

## 12.1. Time base OTP

### 12.1.1. Definition

This algorithm is used to create one time password based on real time and secret key. To increase the security for user accounts

### 12.1.2. Define problem

We need an algorithm that can create OTP on clients and servers without an internet connection. This algorithm must ensure that each time OTP is created, it must ensure the number of digits generated is 6

### 12.1.3. Solution

Time based One time password (TOTP) guarantees to solve the problems mentioned above. This algorithm helps generate 6-digit otp, exactly on each creation with a combination of real-time and secret keys.

**Dictionary:**

* Base32: Include A-Z and 2-7: ABCDEFGHIJKLMNOPQRSTUVWXYZ234567

**To create OTP:**

**Conditional**: A secret key in base32 must shared between server and client.

**Step 1**: Secret\_Hex: Convert secret key from base32 to Hexadecimal.

**Step 2**: Current\_Time: Get current time in second divides the integer by 30.

**Step 3**: Time\_in\_hex: time convert to Hexadecimal.

**Step 4**: Hmac\_SHA1: use Hmac SHA1 algorithm to hash Secret\_key and Time\_in\_hex.

**Step 5**: Offset: get the last char of Hmac\_SHA1 convert to Decimal.

**Step 6**: Big\_Int: Convert 7FFFFFFF from hexadecimal to decimal.

**Step 7**: Otp\_temp: Perform calculations on bits Offset in step 5 ‘AND’ Big\_Int in step 6.

**Step 8**: Get last 6 digits from Otp\_temp of step 7. If it less than 6 digits then add ‘0’ to font until it reaches 6 numbers.

### 12.1.4. Complexity

The complexity of this algorithm is: O(n)2

### 12.1.5. Example

**Example 1:**

Secret Key: R2ZTEFMCAUSFTAZDRFF6KEU3P62EZB52UXZ7MCBSYLMULWAXXJYA

Time: Fri Jul 03 2020 01:41:36 convert to second is 1593715296411 seconds.

OTP: 692 075.

**Example 2:**

Secret Key: R2ZTEFMCAUSFTAZDRFF6KEU3P62EZB52UXZ7MCBSYLMULWAXXJYA

Time: Fri Jul 03 2020 01:44:06 convert to second is 1593715446136 seconds.

OTP: 819 292.

**Example 3:**

Secret Key: R2ZTEFMCAUSFTAZDRFF6KEU3P62EZB52UXZ7MCBSYLMULWAXXJYA

Time: Fri Jul 03 2020 01:46:10 convert to second is 1593715570670 seconds.

OTP: 843 492.)

## 13.1. Comparing with idea from merge sort

### 13.1.1. Definition

This algorithm is used to compare employee, team and department lists between HRMS and G-suite systems of company.

List must be comparing:

* + Employee
  + Team
  + Department

For set up data on GmHRS for synchronizing on G-Suite, the system must be defining three lists of employee, team and department:

* + Creating new list
    - The system is filter out lists belongs to HRMS but not existed on G-Suite
  + Updating list
    - The system is filter out list existed both HRMS system and G-Suite system.
  + Out of HRMS system list
    - The system is filter out list is not belonging to HRMS system but existed on G-Suite.

A close up of a map

Description automatically generated

Figure 48 - Comparing employees of G Suite and HRMS

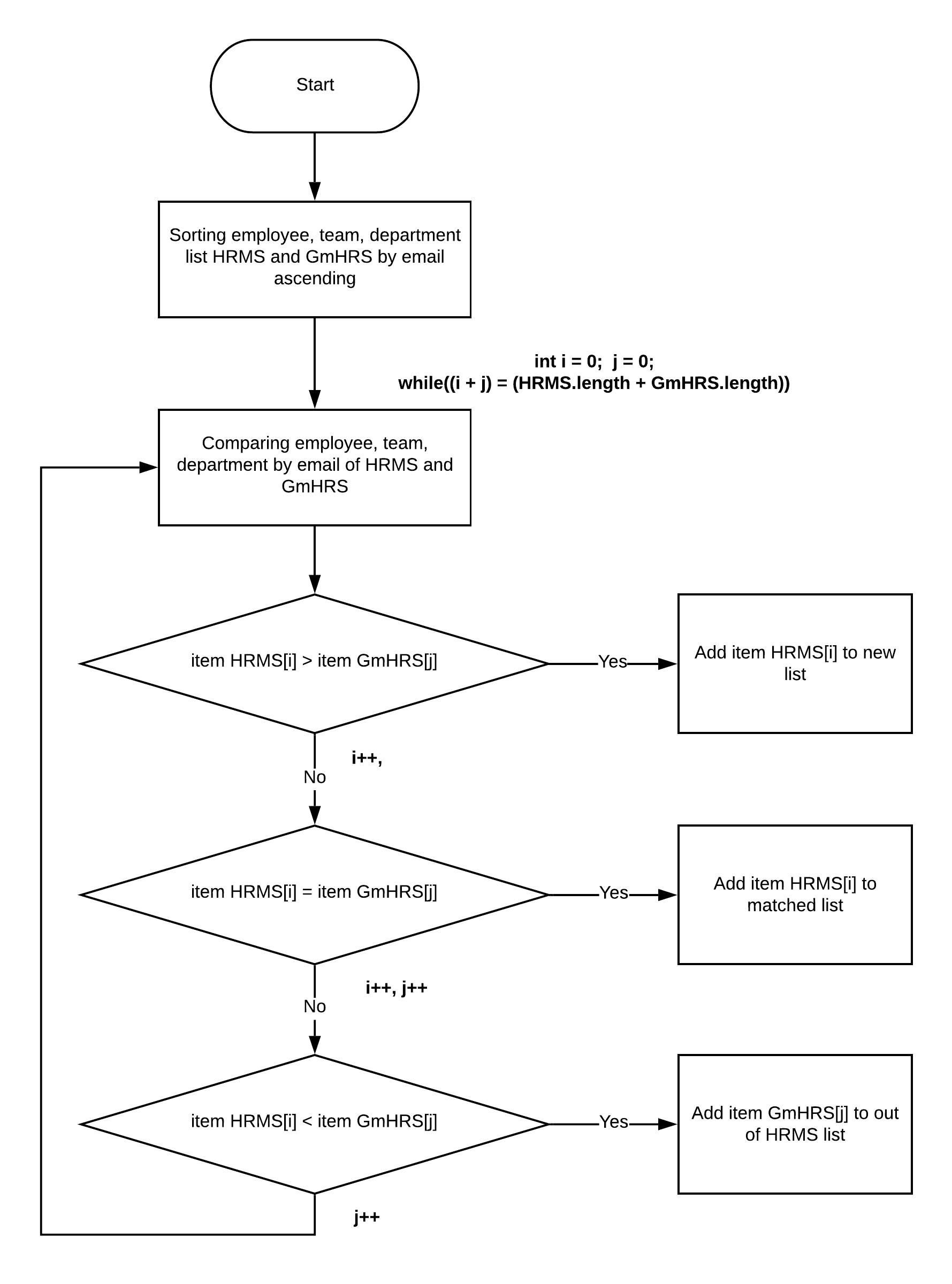


Figure 49 <Flowchart> Comparing with idea from merge sort

### 13.1.2. Complexity

The complexity of this algorithm is: O (n + m) + O(nlnn) + O(mlnm).

# Future Plans

* The current system only supports 2 connection methods (API endpoints or access direct database, we will upgrade so that users can provide the database by selecting the table in the user interface.
* Support synchronize another mail server. For example: Outlook.
* Upgrade to extension application to be compatible with HRMS on cloud server.

# Appendix

1. **The Unified Modeling Language** *[Online]*Available: <https://www.omg.org/spec/UML/2.0/About-UML/>
2. **Muletier Architecture** *[Online]* Available: <https://www.ibm.com/support/knowledgecenter/en/SSAW57_8.5.5/com.ibm.websphere.nd.multiplatform.doc/ae/covr_3-tier.html>
3. **MySQL** *[Online]* Avalable : <https://dev.mysql.com/doc/>
4. **ExpressJS**[Online] Available: <https://expressjs.com/>
5. **AngularJS**[Online] Available: <https://angular.io/>
6. **G-suite** **Admin SDK Developers**[Online] Avalable : [https://developers.google.com/admin-sdk](https://developers.shopify.com/)