DESIGN ARTIFACTS AND SYSTEM MODELING
DAYRO MORENO GOL O ASISTENCIA

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2025

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1. CRC cards

Our project is microservices oriented, knowing that we are going to create the CRC card per each microservice that we must create for this project.

Class name	ms-users (Microservice users)
Responsibilities	Create, read, update, and delete user accounts according to the entity-relation diagram.
	Generate and issue login tokens (JWT) for secure access by all app microservices.
	Manage user roles (CRUD) and store permissions for each role.
	Validate access tokens and respond with permission status for requesting microservices, ensuring correct authorization.
Collaborators	Frontend
	ms-forum
	ms-notifications
	ms-meeting
	ms-workboard
	ms-chat

Class name	ms-forum (Microservice forum)
Responsibilities	Create and manage discussion posts and themes, allowing comments, upvotes, and

	downvotes.
	Enable navigation by tags, allowing users to assign and use free-form tags for posts.
	Display statistics, such as number of topics and recent activity.
	Validate user sessions by communicating with ms-users.
	Publish events for user interactions to ms-notifications (e.g., when a new comment, upvote, or post occurs).
Collaborators	Frontend
	ms-users
	ms-notifications

Class name	ms-meeting (Microservice meeting)
Responsibilities	The microservice listens for notification events from other services (such as forum, users, chat, and all) and processes the data needed for sending a notification.
	It formats the notification content using templates, localization, and user preferences. This all is in app.
	It records notifications sent (for each user) and their delivery status (sent, failed, read), allowing further querying, analytics, or resend attempts.
Collaborators	Frontend
	ms-forum
	ms-meeting
	ms-workboard
	ms-chat
	ms-users

Class name	ms-meeting (Microservice meeting)
Responsibilities	Establish and manage real-time video/audio meetings, supporting 1:1 calls and group conferences.
	Handle signaling and participant connectivity, including negotiation and management of sessions (via WebRTC SDP).
	Track and report meeting statistics, such as number of participants, call duration, and resource usage.
Collaborators	Frontend
	ms-users
	ms-notifications

Class name	ms-workboard (Microservice Workboard)
Responsibilities	Create and manage workboards and boards, including creation, update, deletion, and retrieval of boards.
	Handle tasks/cards management within boards, supporting CRUD operations on tasks, including assigning users, setting statuses, priorities, and deadlines.
	Support drag-and-drop and status transitions for tasks to move them across different columns or states (e.g., To Do, In Progress, Done).
	Provide real-time collaboration features like notifications on task changes, comments, and updates.
Collaborators	Frontend
	ms-users
	ms-notifications

Class name	ms-chat (Microservice Chat)
Responsibilities	Manage real-time 1:1 and group chat sessions, enabling users to send and receive messages instantly.
	Store and retrieve chat history to support message persistence across user sessions and devices.
	Handle user presence and status updates, such as online, offline, and typing indicators.
	Ensure message delivery guarantees and synchronization, including queuing messages when users are offline and delivering them upon reconnection.
Collaborators	Frontend
	ms-users
	ms-notifications

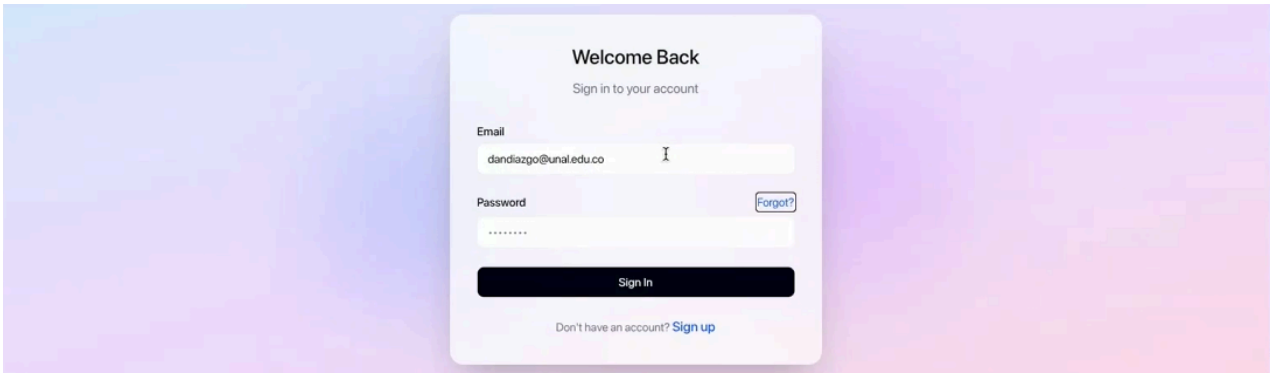
Class name	Frontend
Responsibilities	Provide user interface for all microservices, including forum, chat, workboard, meetings, and notifications.
	Manage user session and authentication state, interacting with ms-users to validate login and maintain session.
	Translate user actions into API calls to the appropriate microservices (ms-forum, ms-chat, ms-workboard, ms-meeting, ms-notifications).
	Render dynamic content and update UI in real-time based on responses and events from backend microservices.
Collaborators	ms-chat
	ms-users

	ms-notifications
	ms-forum
	ms-workboard
	ms-meeting

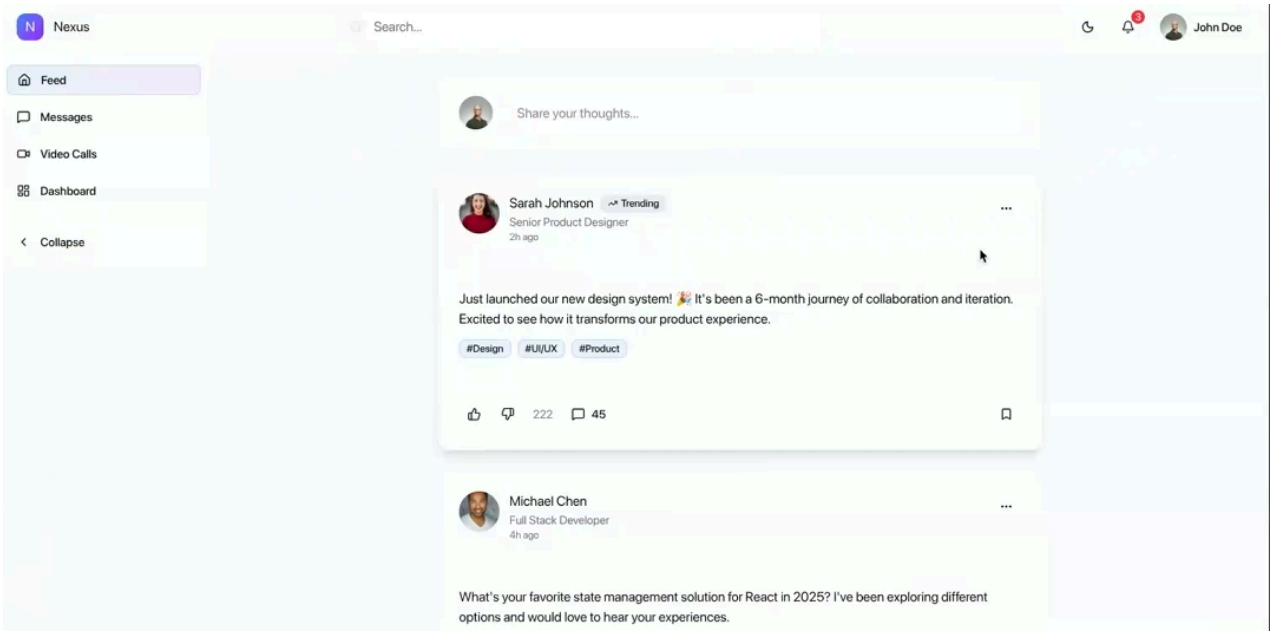
2. Mockups

This time, for the app mockups we have prepared a demonstrative video that can be accessed here: Mock-up.mp4

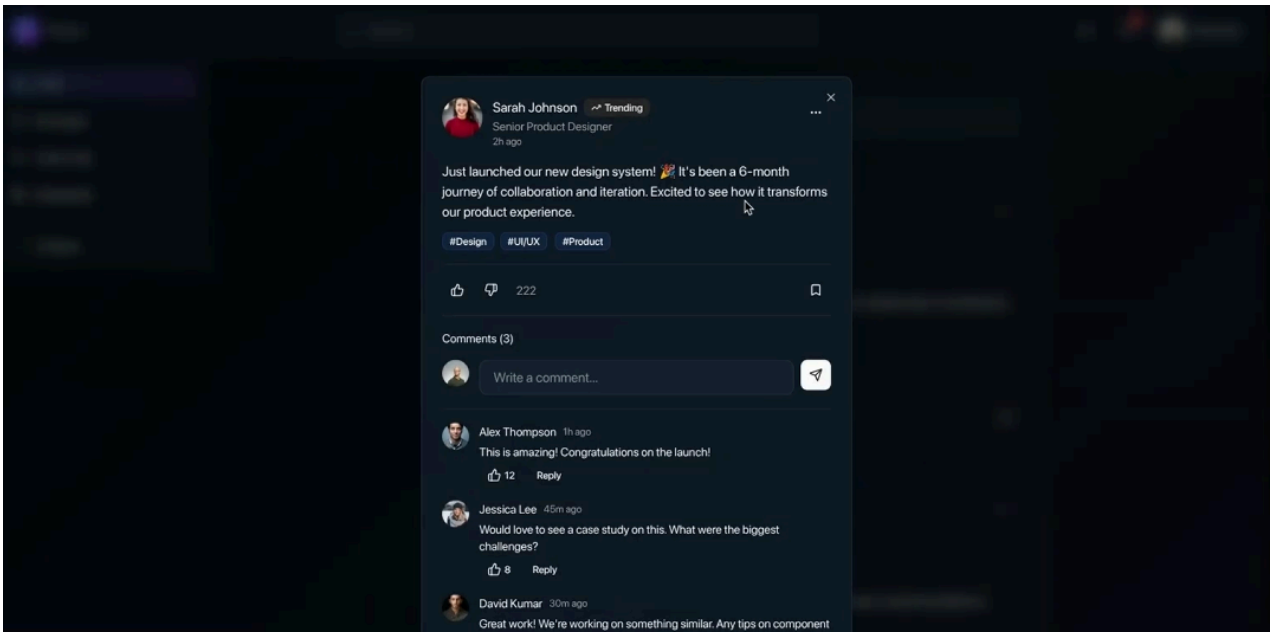
Login:



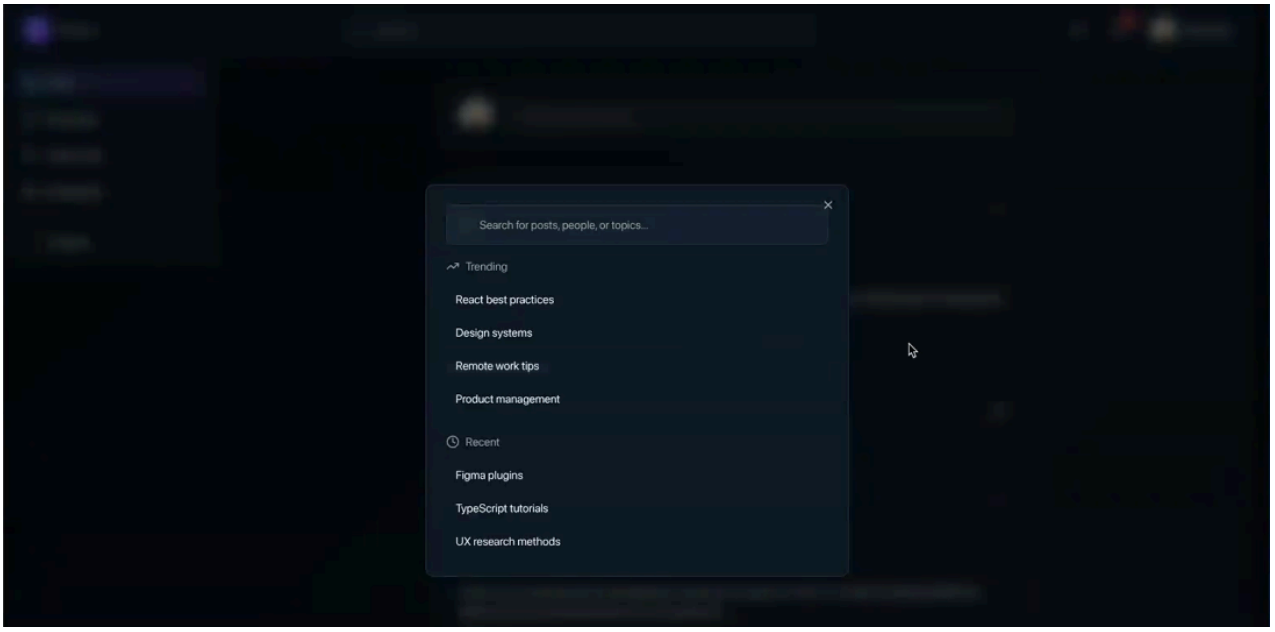
Feed:



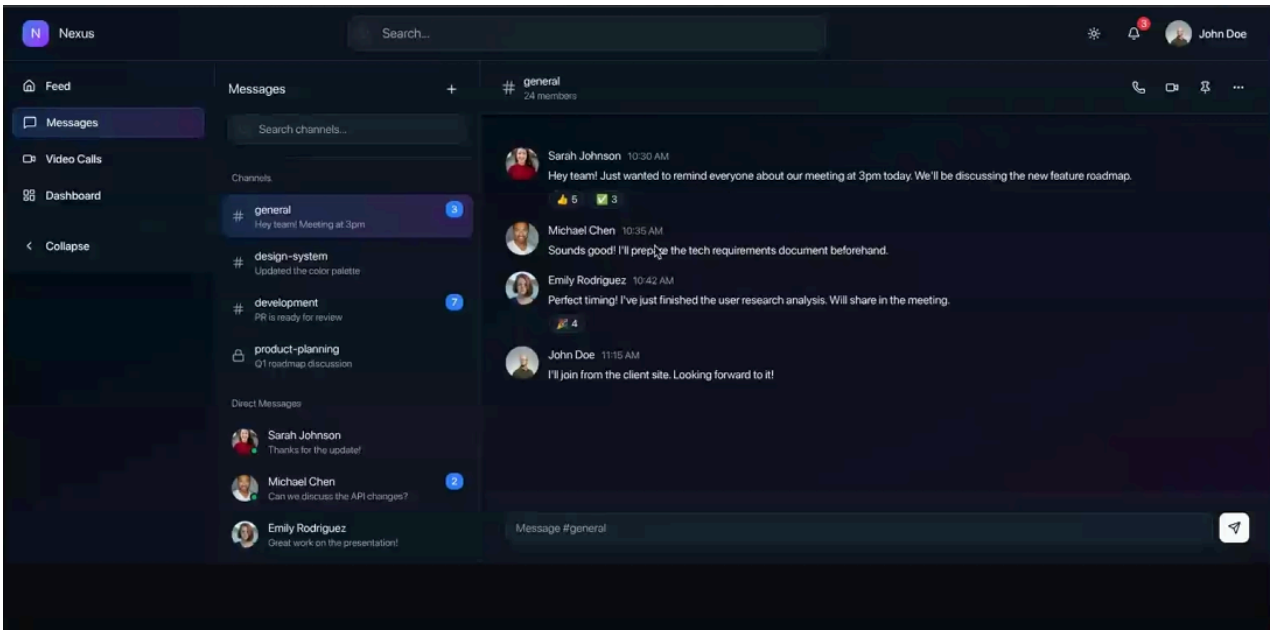
Feed on focus:



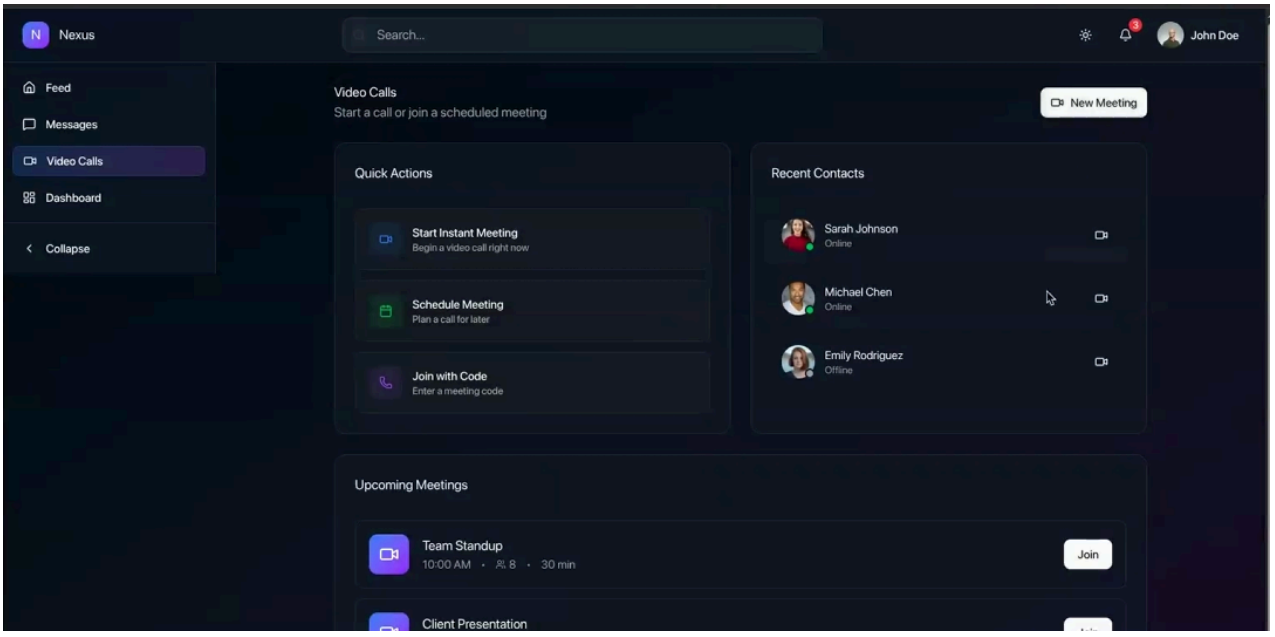
Search bar:



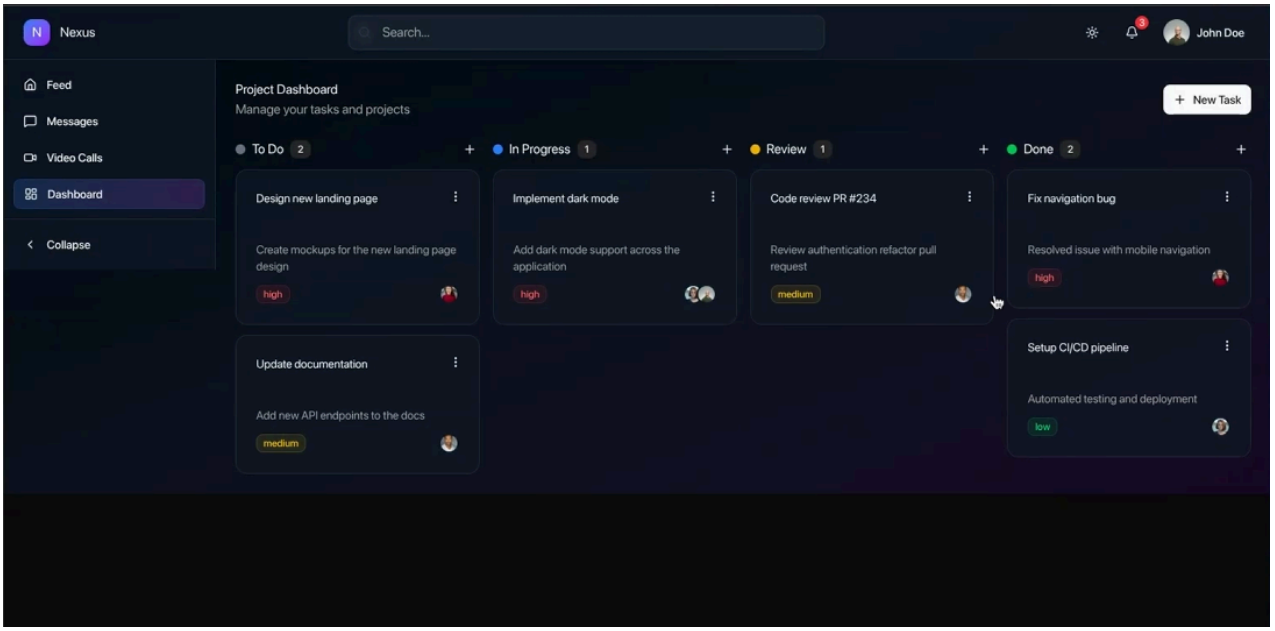
Messages (group chat and direct):



Video calls:



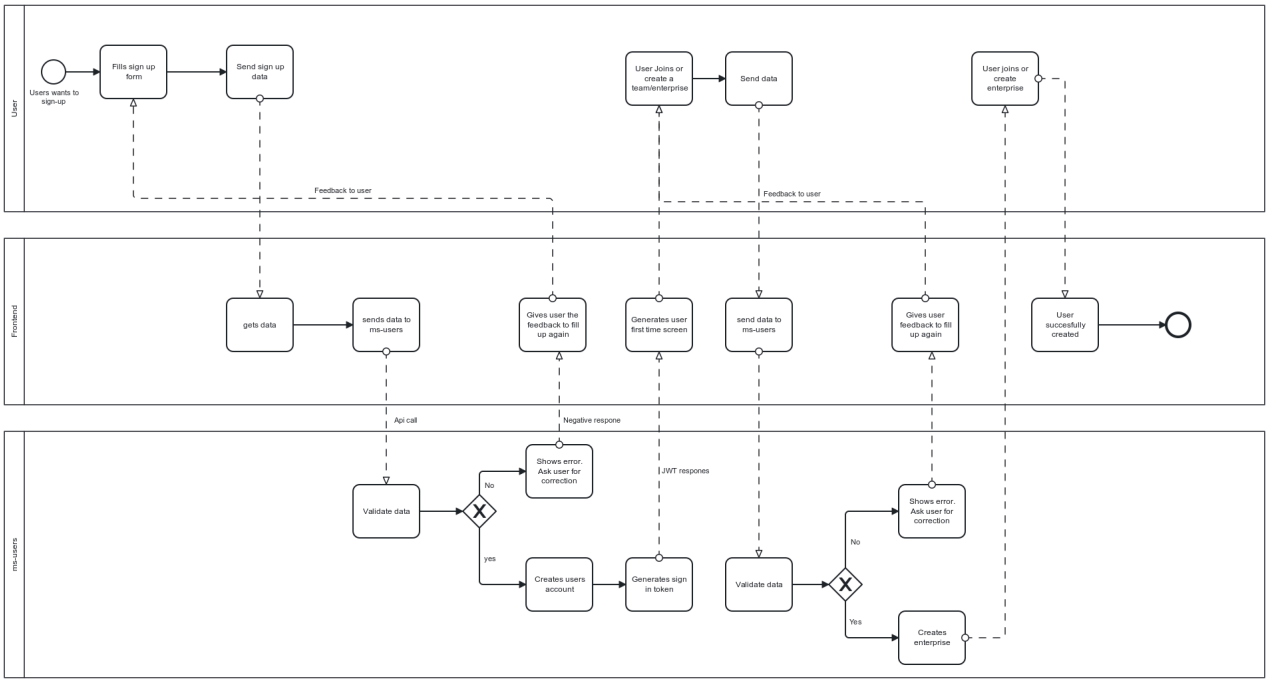
WorkBoards:



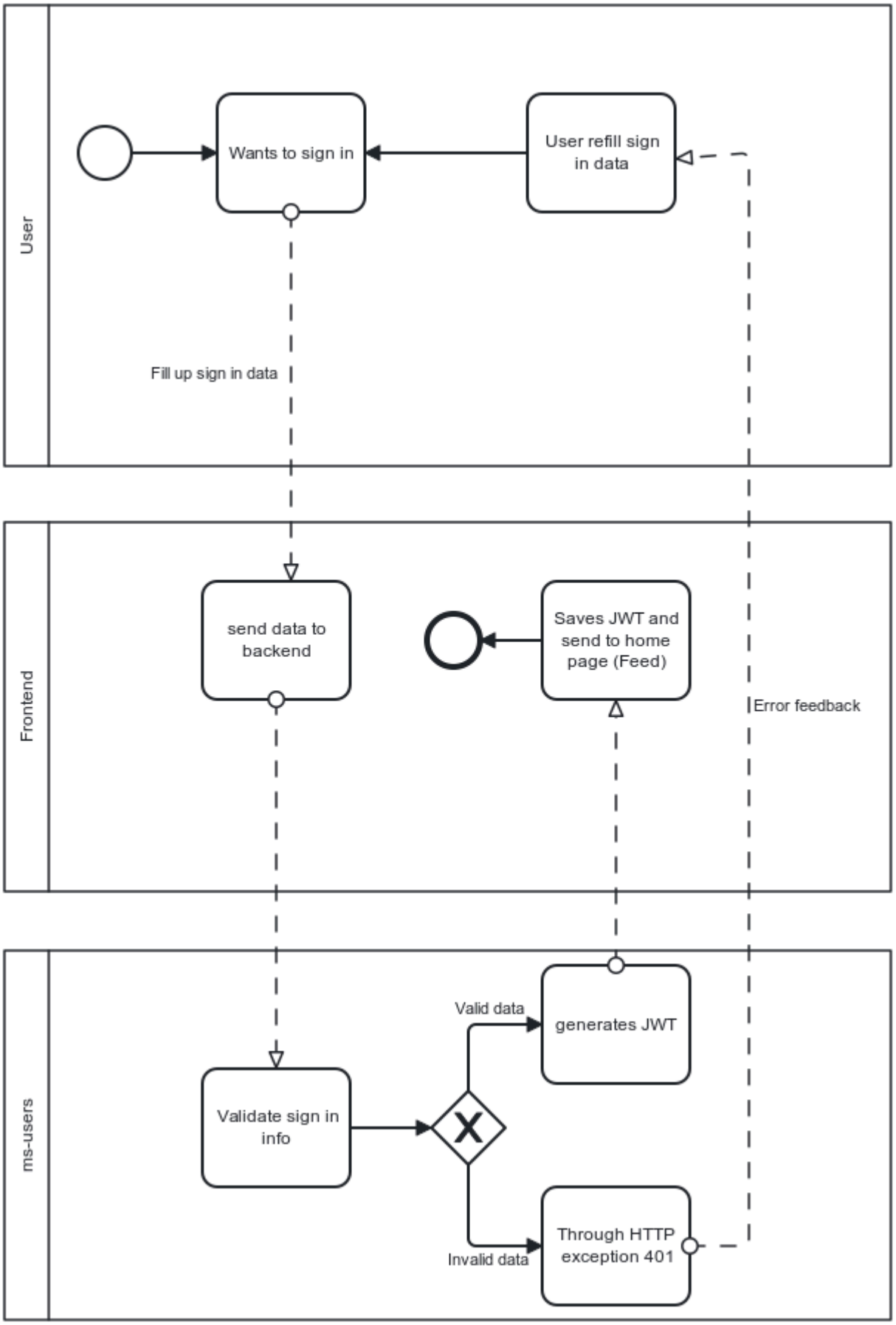
3. Business Model Processes

User Management process

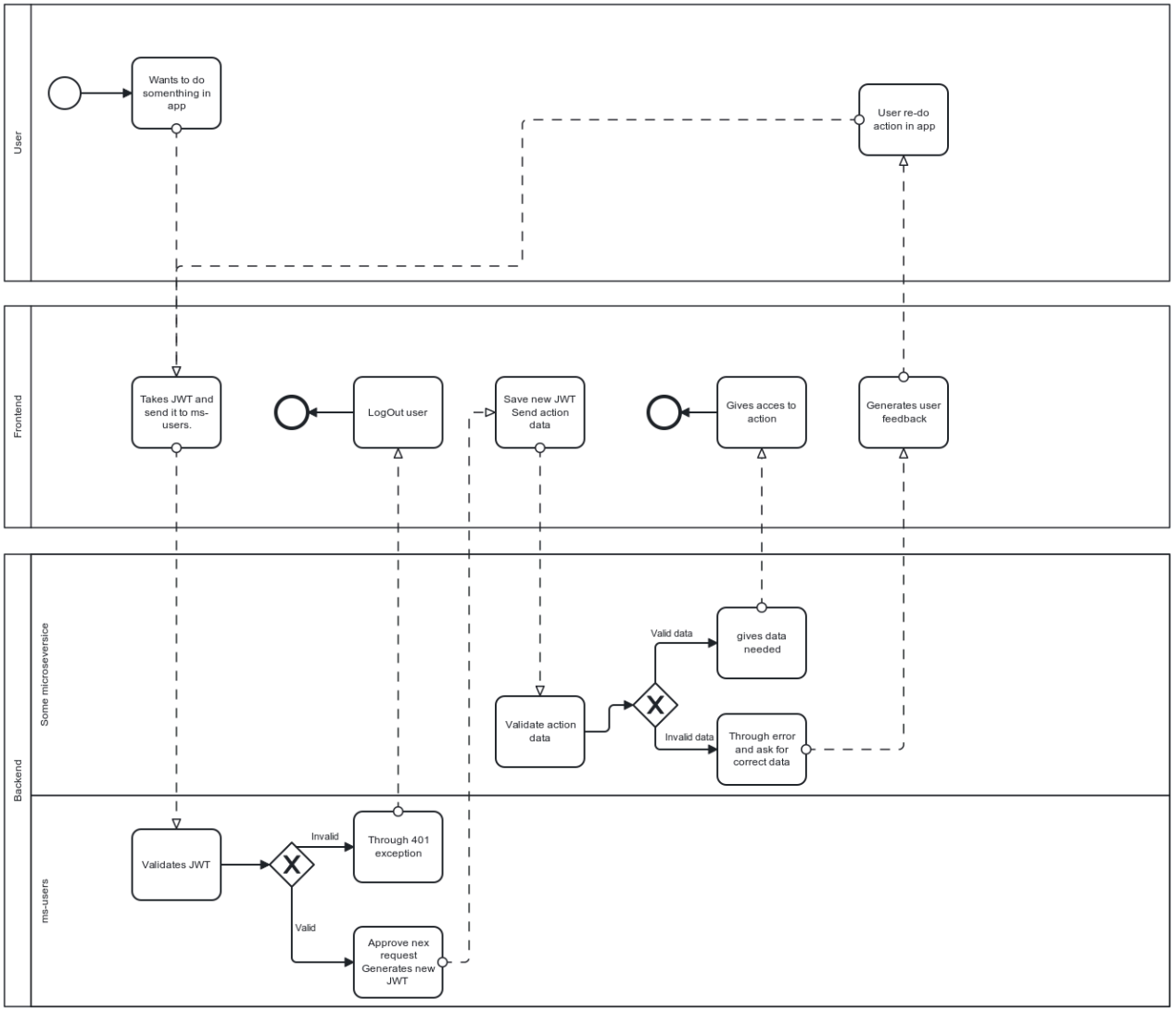
1. Register:



2. Login

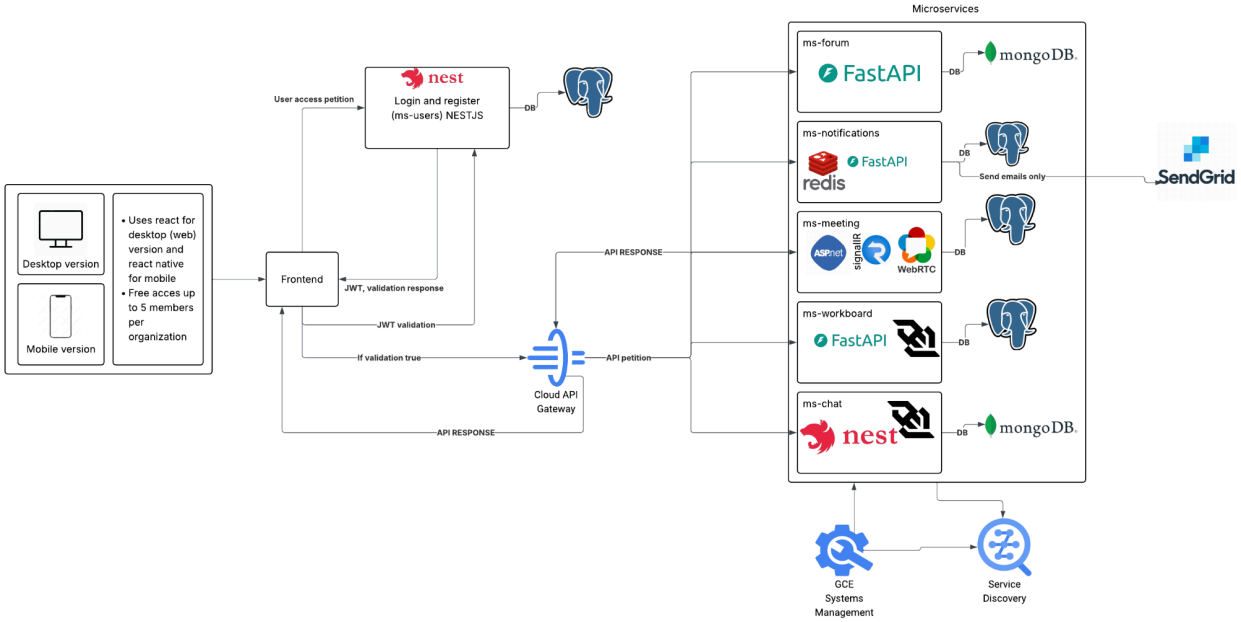

User
Wants to sign in
User refill sign in data
Fill up sign in data
Frontend
send data to backend
Saves JWT and send to home page (Feed)
Error feedback
ms-users
Valid data
generates JWT
Validate sign in info
Through HTTP exception 401
Invalid data

3. JWT validation



4. Architecture Diagram

Full diagram could be seen on: Architecture diagram.png

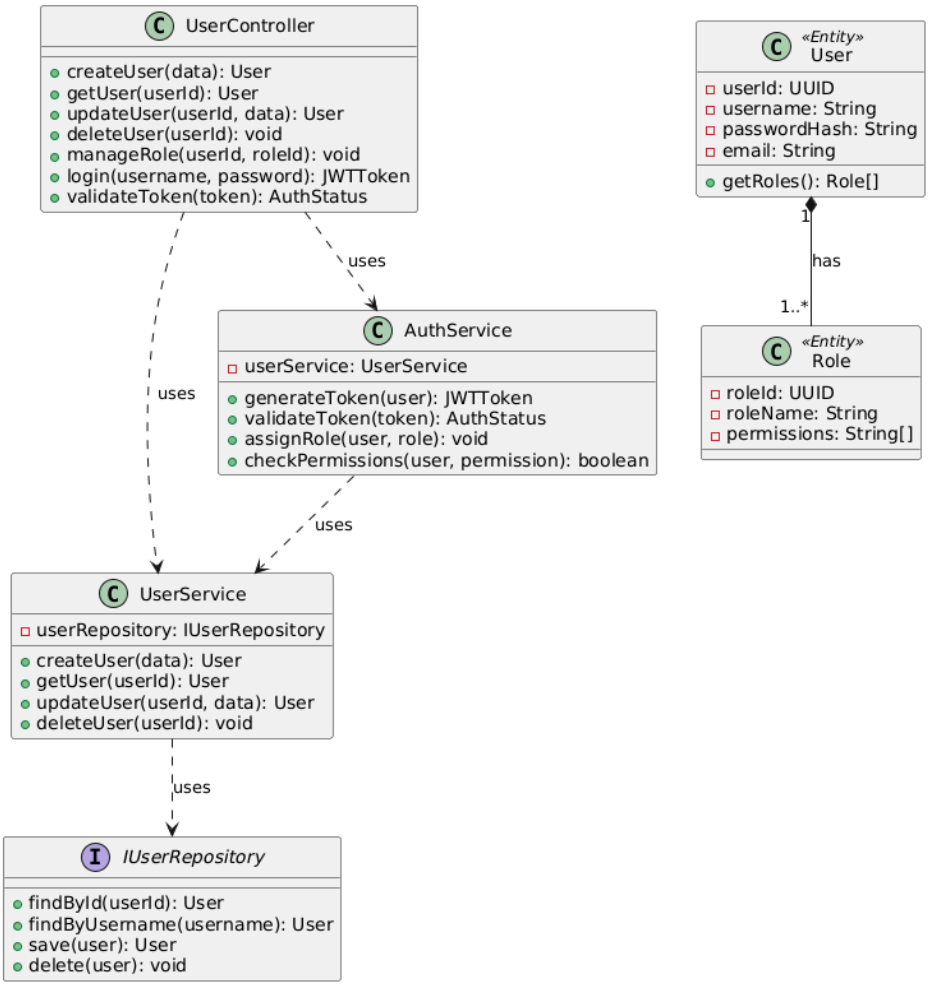


5. Class Diagram

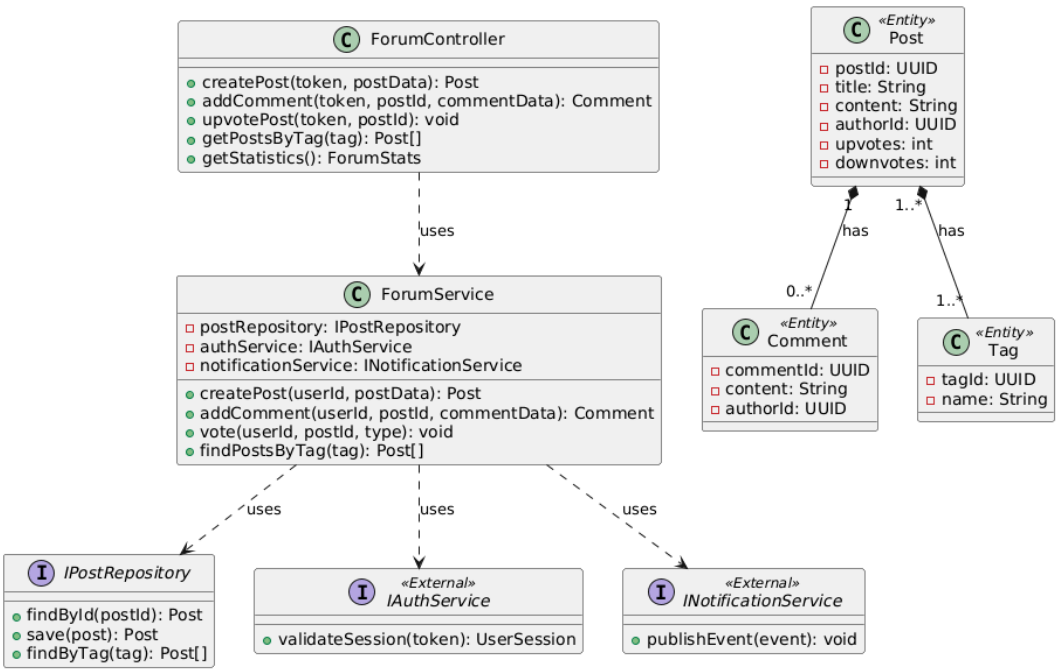
In a microservices-based system, the overall architecture is decomposed into multiple independent services, each responsible for a specific domain or functionality. As a result, class diagrams are not created for the entire system as a whole, but rather one class diagram is developed for each microservice.

Each diagram focuses on the internal structure of a single microservice, detailing its main classes, attributes, methods, and relationships. This modular approach enhances clarity, maintainability, and scalability, allowing developers to understand and evolve each service independently. It also aligns with the principles of encapsulation and bounded context, which are fundamental to microservices design.

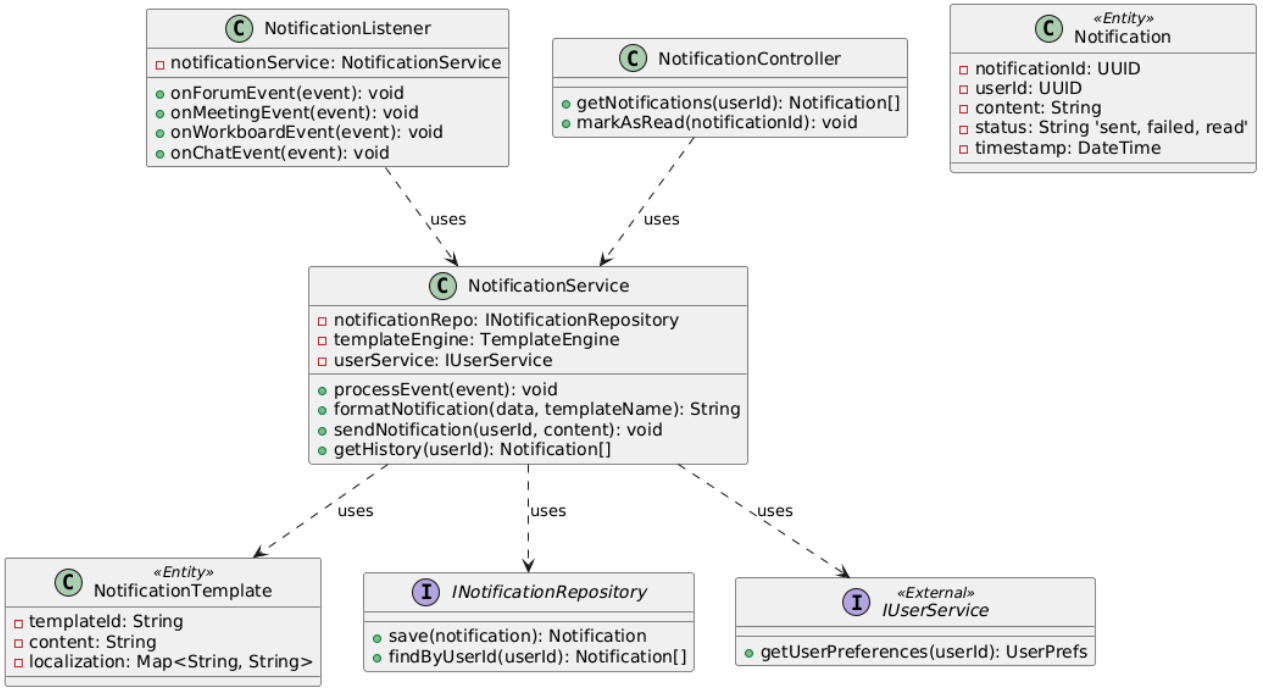
Class Diagram: ms-users



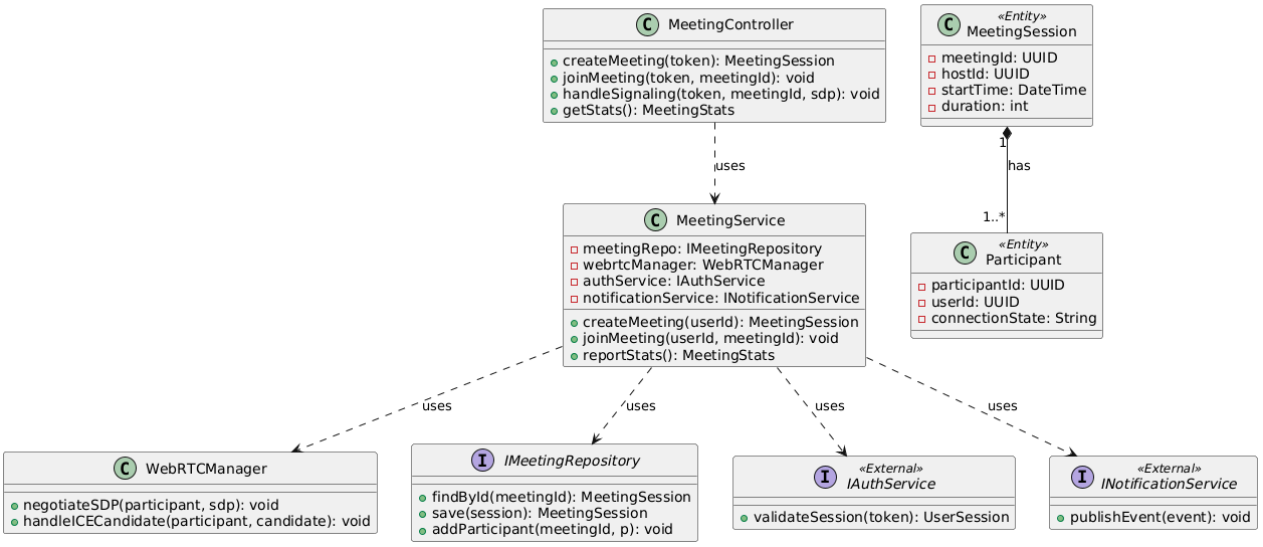
Class Diagram: ms-forum



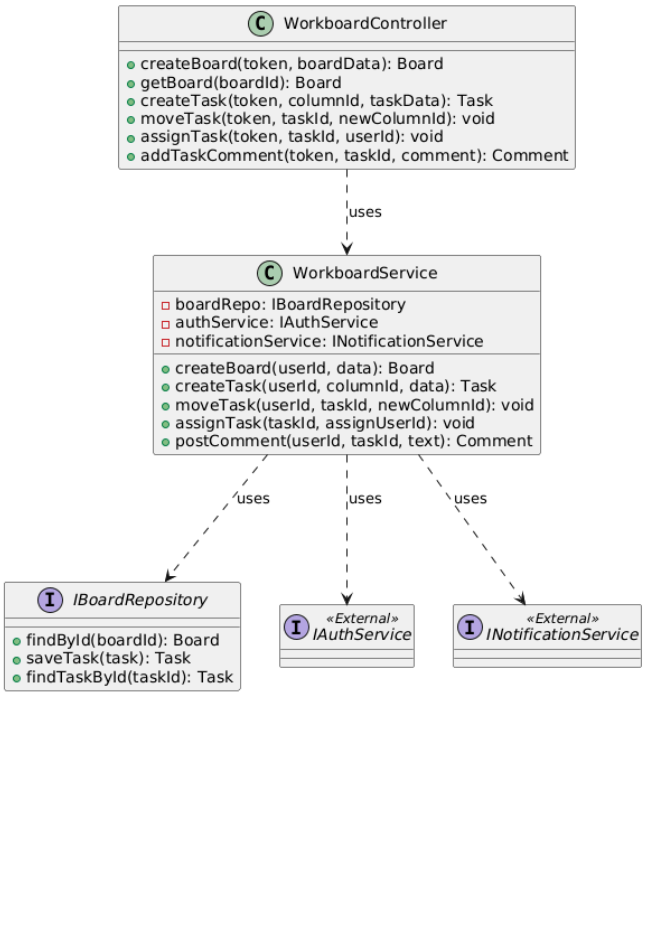
Class Diagram: ms-notifications



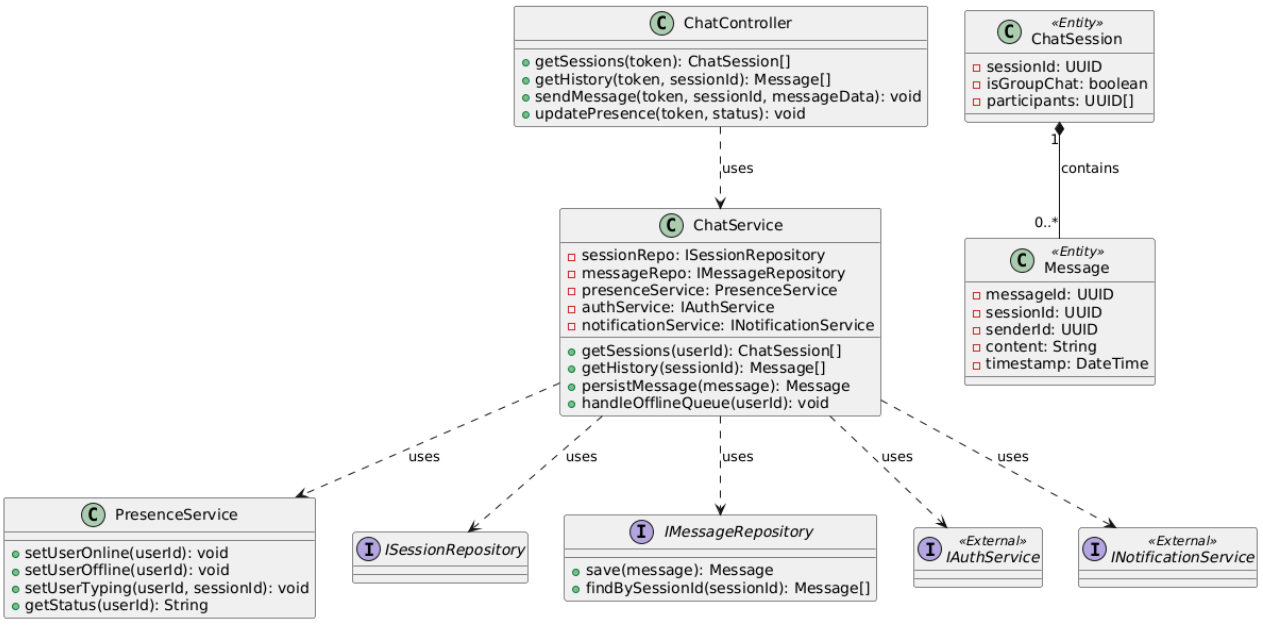
Class Diagram: ms-meeting



Class Diagram: ms-workboard



Class Diagram: ms-chat



6. Relational Database Model

Full diagram could be seen on: [DB diagram]

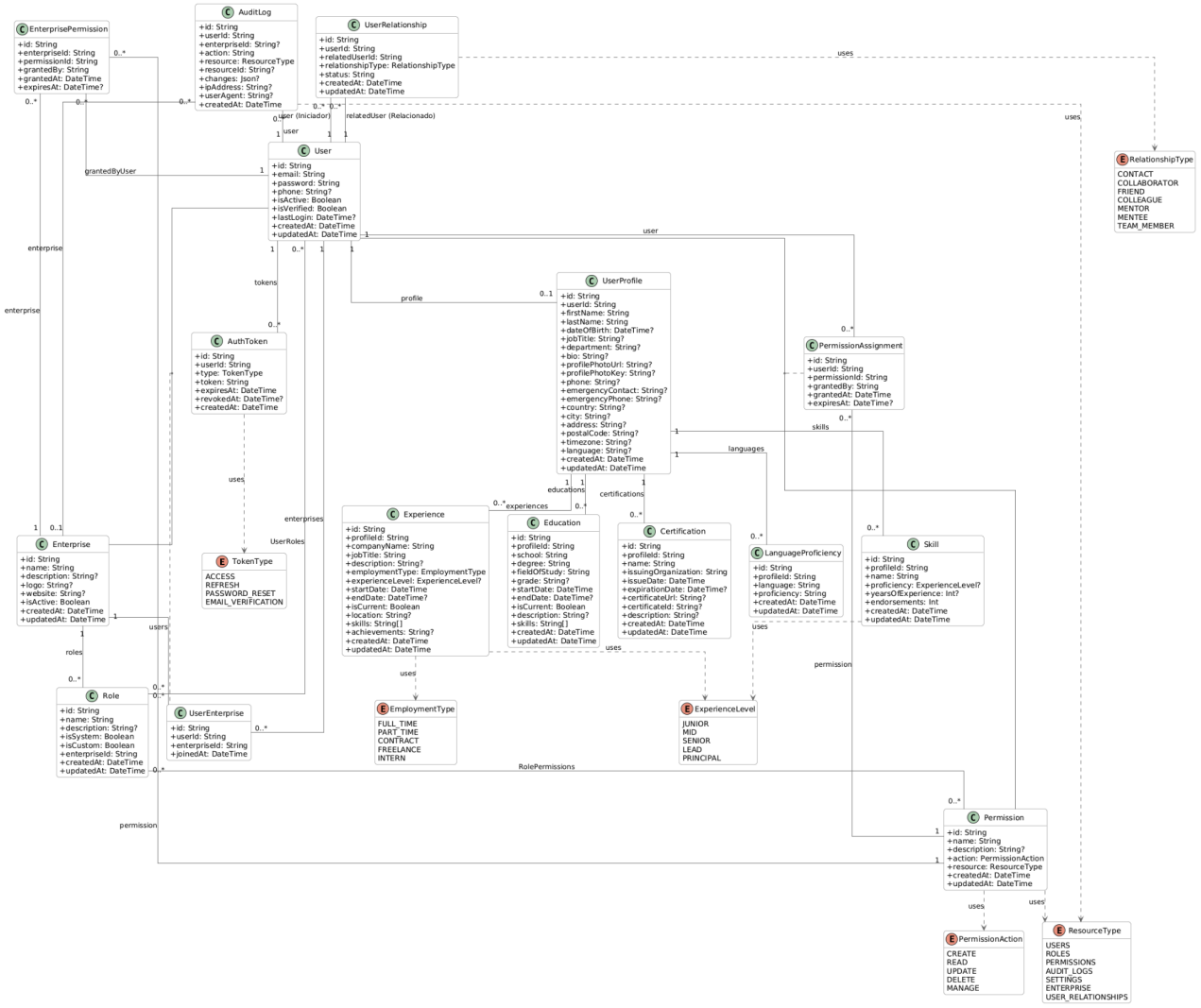


DIAGRAM-NOTIFICATIONS-MicroService

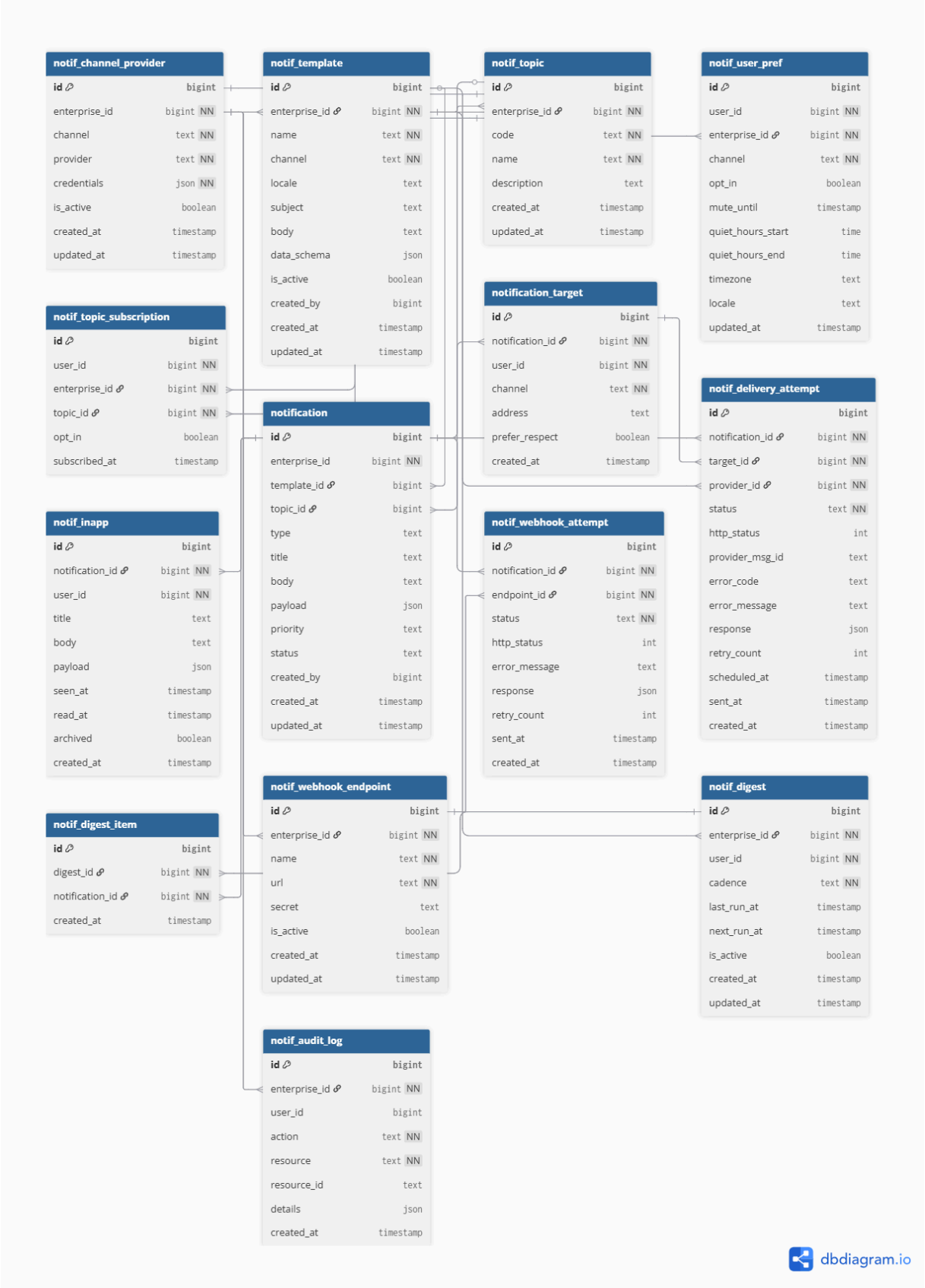


DIAGRAM-WORKBOARD-MicroService

DIAGRAM-USERS-MicroService

7. Delivery Format

Since we are using a microservices-based architecture, all work can be found within the organization https://github.com/IngSoftII-DayroGol-Asistencia in the .git repository, where it can be viewed both in PDF and Markdown formats.