

# StudyBuddy

## Use Case Diagrams

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# **1 Introduction**

This document presents the use case diagrams for the StudyBuddy application. These diagrams illustrate the functional requirements and interactions between actors (students, administrators, and external systems) and the system's various modules. Each diagram corresponds to specific functional requirements outlined in the System Requirements Specification (SRS).

## **2 Overview of Actors**

### **2.1 Student**

The primary user of the StudyBuddy platform. Students interact with all core features including task management, notes, chat, calendar, and gamification systems.

### **2.2 Admin**

System administrator responsible for managing users, maintaining the system, and monitoring overall performance.

### **2.3 Firebase System**

External system actor that handles authentication, real-time data synchronization, push notifications, and cloud messaging services.

## 3 Main Use Case Diagram

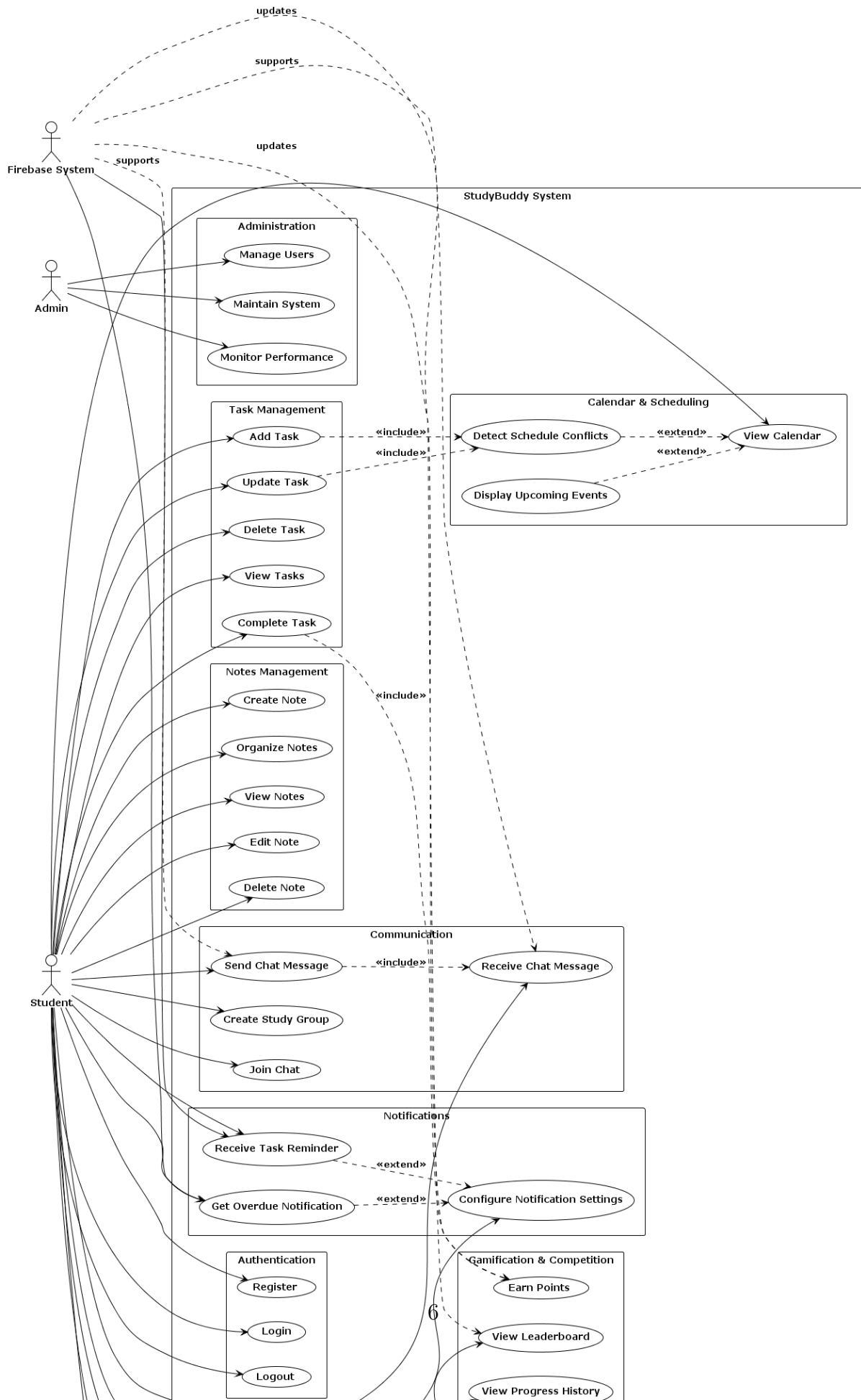
### 3.1 Description

The main use case diagram provides a comprehensive overview of all functionalities available in the StudyBuddy system. It is organized into eight major packages:

- **Authentication:** User registration, login, and logout functionality
- **Task Management:** Creating, updating, deleting, viewing, and completing tasks
- **Calendar & Scheduling:** Calendar view, conflict detection, and event display
- **Notes Management:** Note creation, organization, editing, and deletion
- **Communication:** Real-time chat and study group functionality
- **Notifications:** Task reminders and overdue alerts
- **Gamification & Competition:** Points system, leaderboard, and progress tracking
- **Administration:** User and system management functions



## 3.2 Diagram



### **3.3 Key Relationships**

- Complete Task includes Earn Points (FR8)
- Add/Update Task includes Detect Schedule Conflicts (FR4)
- Send Chat Message includes Receive Chat Message (FR6, FR7)
- Task notifications extend notification configuration settings

## 4 Task Management Module

### 4.1 Description

The Task Management module is central to the StudyBuddy platform, allowing students to organize their academic activities efficiently. This module fulfills functional requirements FR2, FR4, and FR8.

#### Key Features:

- Add new tasks with deadlines
- Update existing tasks
- Delete tasks with confirmation
- View all tasks in various formats
- Mark tasks as complete to earn points
- Automatic categorization options

### 4.2 Diagram

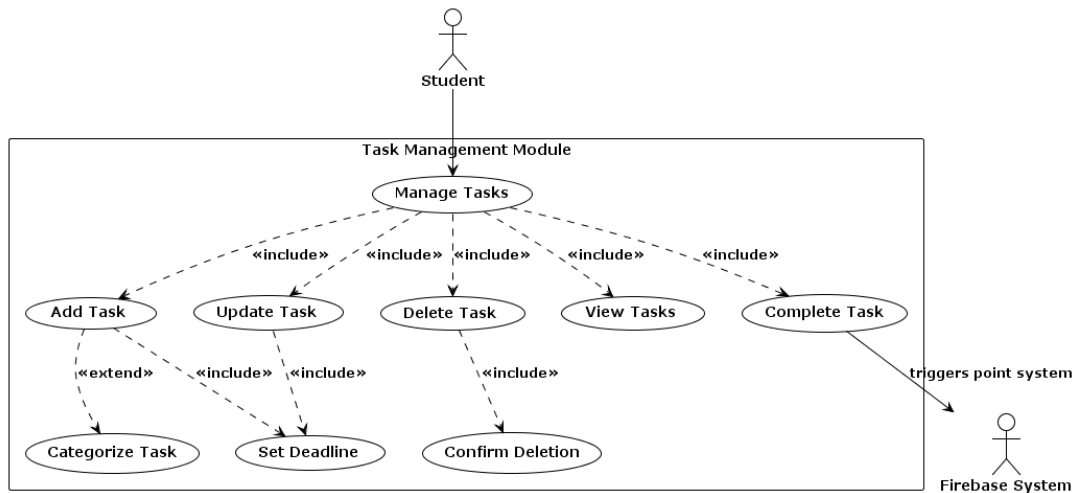


Figure 2: Task Management Module Use Case Diagram

### 4.3 Use Case Details

- **Add Task:** Requires setting a deadline; optional task categorization
- **Update Task:** Allows modification of task details and deadlines
- **Delete Task:** Requires user confirmation before deletion (NFR7)
- **Complete Task:** Triggers the Firebase point system for gamification



## 5 Communication Module

### 5.1 Description

The Communication module enables real-time collaboration among students through instant messaging and study groups. This module implements functional requirements FR6 and FR7, ensuring messages synchronize instantly across all devices.

#### Key Features:

- Real-time chat with instant synchronization
- Study group creation and management
- Group chat functionality
- Chat history access
- Cross-device message delivery

### 5.2 Diagram

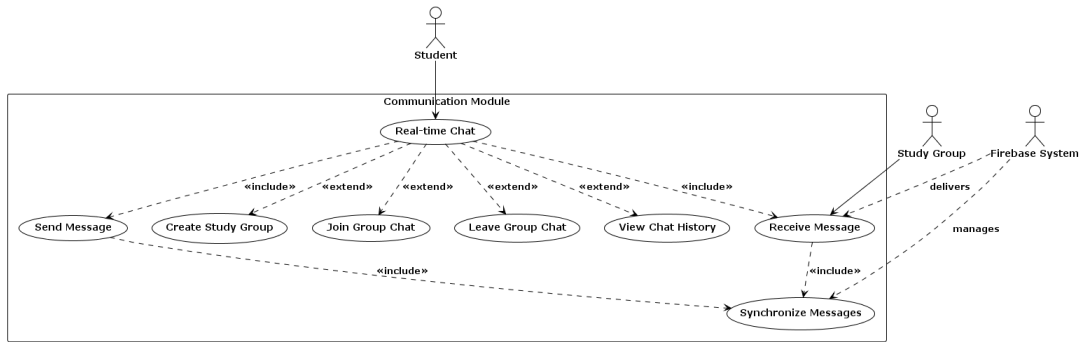


Figure 3: Communication Module Use Case Diagram

### 5.3 Use Case Details

- **Send Message:** Automatically triggers message synchronization via Firebase
- **Receive Message:** Real-time delivery managed by Firebase system
- **Create Study Group:** Allows students to form collaborative groups
- **Join/Leave Group Chat:** Flexible group membership management
- **Synchronize Messages:** Ensures consistency across all user devices (FR7)

## 6 Gamification Module

### 6.1 Description

The Gamification module enhances student motivation through a points and ranking system. This module fulfills functional requirements FR8, FR9, and FR10, creating a competitive yet collaborative learning environment.

#### Key Features:

- Points awarded for task completion
- Dynamic leaderboard updates
- Personal ranking history
- Progress tracking over time
- Comparative performance analysis

### 6.2 Diagram

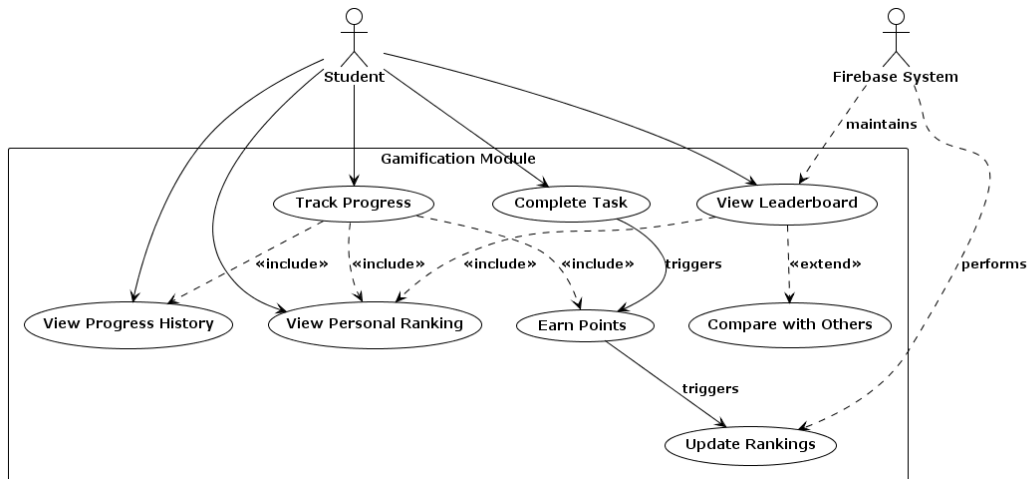


Figure 4: Gamification Module Use Case Diagram

### 6.3 Use Case Details

- **Earn Points:** Triggered automatically when tasks are completed (FR8)
- **View Leaderboard:** Displays dynamic rankings of all users (FR9)
- **View Personal Ranking:** Shows individual performance metrics
- **View Progress History:** Tracks achievement over time (FR10)
- **Update Rankings:** Managed by Firebase in real-time (NFR4)

## 7 Notifications Module

### 7.1 Description

The Notifications module ensures students stay informed about their tasks through timely reminders and alerts. This module implements functional requirement FR3 using Firebase Cloud Messaging (FCM).

#### Key Features:

- Automatic push notifications for upcoming tasks
- Overdue task alerts
- Customizable notification settings
- Enable/disable notification preferences
- Configurable reminder timing

### 7.2 Diagram

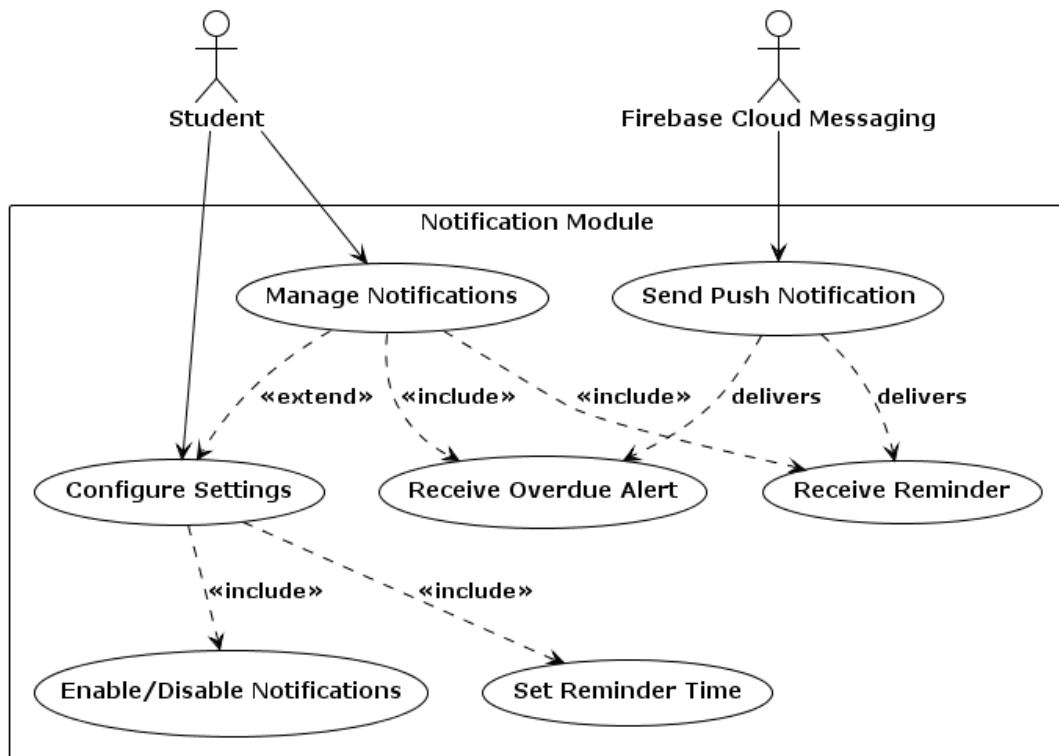


Figure 5: Notifications Module Use Case Diagram

### 7.3 Use Case Details

- **Receive Reminder:** Automatic notifications for upcoming tasks (FR3)
- **Receive Overdue Alert:** Alerts for tasks past their deadline (FR3)

- **Configure Settings:** Students can customize notification preferences
- **Enable/Disable Notifications:** Toggle notifications on/off
- **Set Reminder Time:** Customize when to receive advance notifications
- **Send Push Notification:** Delivered via Firebase Cloud Messaging