To-Do List Application - Use Case Specification

1. Introduction

This document specifies a comprehensive use case specification for the To-Do List Application, detailing the functional requirements and interactions between users and the system.

2. Use Case Actors

2.1 Primary Actors

User: The primary actor who will interact with the To-Do List application

Administrator: Manages system-level configurations and user accounts (optional)

3. Use Case Diagram Overview

3.1 System Boundary

The application of To-Do List involves the following primary use cases:

Task Management

List Management

User Authentication

Notification Management

4. Extended Use Cases

4.1 Task Creation Use Case

Actor: User

Description: The system allows users to create new tasks

Preconditions:

The user is authenticated

The user has at least one accessible task list

Main Flow:

The user selects "Create New Task"

System displays task creation form

User enters task details (title, description, due date, priority)

System validates task information

System saves the task to the selected list

Alternative Flows:

User can cancel task creation

User can add subtasks to the main task

4.2 Task Management Use Case

Actor: User

Description: Comprehensive task management capabilities

Use Case Scenarios:

Edit Task

Change task details

Change task status

Change priority

Delete Task

Delete individual tasks

Delete multiple tasks

Mark Task Complete

Change task status to completed

Optional archiving of completed tasks

4.3 List Management Use Case

Actor: User

Description: Creates, manages, and organizes task lists

Functional Requirements:

Create new task lists

Rename existing lists

Delete lists

Share lists with other users

Set list-level permissions

4.4 User Authentication Use Case

Actor: User

Description: Secure access to the application for users

Authentication Flows

User Registration

New account

Email and password

Social media authentication is optional

User Login

Enter credentials

Authenticate against system records

Password Management

Forgotten password reset

Change existing password

4.5 Notification Management Use Case

Actor: User

Description: Manage task and system notifications

Notification Types:

Task Due Date Reminders

Overdue Task Alerts

Shared List Updates

System Ann

To-Do List Application - Activity Diagram Specification

1. Introduction

1.1 Purpose

This document describes the activity diagram specification for the To-Do List Application, outlining the workflow and process flows of key system functionalities.

2. Activity Diagram Overview

2.1 Scope

The activity diagram represents the dynamic behavior and workflow of critical processes in the To-Do List application, including:

User Authentication

Task Creation

Task Management

List Management

3. Activity Flows with Detailed Information

3.1 User Authentication Activity Flow

3.1.1 Registration Process

Start → Enter Registration Details

↓

Validate User Information

├─ Invalid Information → Display Error Message

└─ Valid Information → Create User Account

↓

Send Verification Email

↓

Confirm Email Verification

↓

End (User Registered)

3.1.2 Login Process

Start → Navigate to Login Page

↓

Enter Credentials

↓

Authenticate Credentials

├─ Authentication Fails → Display Error Message

└─ Authentication Succeeds → Access User Dashboard

↓

Load User's Task Lists and Pending Tasks

↓

End (User Logged In)

3.2 Task Creation Activity Flow

3.2.1 Create New Task

Start → Select "Create Task"

↓

Select Task List

↓

Input Task Details

- Title
- Description
- Due Date
- Priority

↓

Validate Task Information

├─ Invalid Information → Highlight Errors

└─ Valid Information → Save Task

↓

Update Task List

↓

Send Optional Notification

↓

End (Task Created)

3.3 Task Management Activity Flow

3.3.1 Update Task Status

Start → Select Existing Task

↓

Choose Action

Mark as Complete

Update Task Status

Move to Completed Tasks

Edit Task Details

Modify Task Attributes

Save Changes

Delete Task

Confirm Deletion

Remove Task from List

↓

Sync Changes

↓

End (Task Updated)

To-Do List Application - Class Diagram Specification

1. Introduction

1.1 Purpose

This document is a class diagram specification for the To-Do List Application, describing the system's structural design, class relationships, and major object interactions.

2. Class Overview

2.1 Core Classes

The core classes include:

User

Task

TaskList

Notification

Authentication

Permission

Relationship Descriptions

A User can own multiple TaskLists

A User can be assigned multiple Tasks

A TaskList contains multiple Tasks

A Task can have multiple Subtasks

A User receives multiple Notifications

3. Design Patterns

3.1 Applied Patterns

Singleton: Authentication Service

Factory: Task and Notification Creation

Observer: Notification System

Strategy: Permission Management

To-Do List Application - Component Diagram Specification

Introduction

1.1 Purpose

This report provides an explicit component diagram specification for the To-Do List Application. It defines the architecture components and dependencies of the system, along with descriptions of the interactions.

Component Overview

2.1 High-Level Architecture

The architecture of the To-Do List application features a modular or multi-layer architecture with the following primary components:

Presentation Layer

Business Logic Layer

Data Access Layer

Authentication and Security Layer

Notification Service

Third-party Integrations

To-Do List Application - Sequence Diagram Specification

1. Introduction

1.1 Purpose

This document provides an in-depth specification of a sequence diagram that illustrates dynamic interactions among components of the To-Do List Application under key user scenarios.

2. Sequence Diagram Overview

2.1 Covered Scenarios

Registration and authentication of users

Task creation

Task update and change of status

Sharing lists

Generation of notifications

3. Detailed Sequence Flows

3.1 User Registration Sequence

Participant: User Interface

Participant: Authentication Service

Participant: User Repository

Participant: Notification Service

Process:

User inputs registration information

Client-side validation is done by UI

Registration request is forwarded to Authentication Service

Authentication Service validates details

User account is created in User Repository

Verification token is generated

Verification email is sent through Notification Service

Return registration success

Sequence Steps:

User Interface requests registration

Client-side input validation is performed

Request for registration is sent to Authentication Service

Server-side comprehensive validation

User account creation in database

Generation of verification token

Sending of email notification

Return confirmation of registration

3.2 Task Creation Sequence

Participant: User Interface

Participant: Task Service

Participant: Authorization Service

Participant: Task Repository

Participant: Notification Service

Flow:

User requests task creation

UI prepares task details

Send task creation request

Authorization Service validates user permissions

Task Service processes task

Persist task in Task Repository

Generate task creation notification

Return task creation confirmation

Sequence Steps:

Validate permission before creating the task

Atomic creation and persistence of the task

Auto-notification generation

Instant feedback to the user

3.3 Task Update Sequence

Participant: User Interface

Participant: Task Service

Participant: Authorization Service

Participant: Task Repository

Participant: Notification Service

Flow:

The user chooses a task to update

Modify task information

Make update request

The Authorization Service verifies update permission

Task Service verifies changes for acceptance

Update the task in the Task Repository

Create an update notification

Broadcast update to list owners

3.4 List Sharing Sequence

Participant: User Interface

Participant: List Service

Participant: Authorization Service

Participant: User Repository

Participant: Notification Service

Flow:

User requests list sharing

Input sharing information (email/username)

Verify recipient

Check sharing permissions

Create sharing invitation

Send invitation notification

Update list permissions

Notify list owner

Sequence Steps:

Recipient validation

Permission-based sharing

Invitation mechanism

Collaborative update notifications

To-Do List Application - UML Diagram Specification

1. Introduction

1.1 Purpose

This document details a complete UML diagram specification for the To-Do List Application, covering structural and behavioral modeling of the system across different UML diagram types.

Use Case Diagram

Primary Actors and Use Cases

User Actor

The following actions are available:

Register Account

Login/Logout

Create Task

Update Task

Delete Task

Create Task List

Share Task List

Manage Profile

System Use Cases

Authenticate User

Generate Notifications

Sync Tasks

Manage Permissions

Sequence Diagram Flow

Task Creation Sequence

User -> UI: Create Task

UI -> AuthService: Validate Permissions

AuthService -> TaskService: Process Task

TaskService -> TaskRepository: Save Task

TaskRepository --> TaskService: Confirm Save

TaskService -> NotificationService: Generate Notification

NotificationService -> User: Send Confirmation

To-Do List Application - Data Flow Diagram (DFD) Specification

1. Introduction

1.1 Purpose

This document contains the specification for the To-Do List Application using Data Flow Diagrams that explains data flow through the system, including processes, data stores, and external entities.

2. System Context

2.1 External Entities

The following external entities interact with the system:

User

External Authentication Provider

Email Service

Calendar Integration

Mobile/Web Client

3. Data Flow Diagram Levels

3.1 Level 0 (Context Diagram)

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+------------------+

| To-Do List |

| System |

+------------------+

/ | \

/ | \

User Input --- | --- System Output

Authentication --- | --- Notifications

Task Data ------ | --- Sync Data

3.2 Level 1 (Main Processes)

[User] --> [Authentication Process] --> [Task Management]

| |

v v

[User Management] <-- [List Management]

| |

v v

Notification Service <-- Data Storage

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Task Data Elements:

Task ID

Title

Description

Due Date

Priority

Status

Assigned User