**📌 Unified Task Collaboration System — Specification**

**📁 Core Task Management**

* ✅ **Flexible Task Creation**: Create tasks via detailed form or quick-add modal.
* ✍️ **Subtask Support**: Each subtask can have its own status, assignee, and due date.
* 🧷 **Attachments**: Add files or external links to tasks.
* 🏷️ **Tags & Labels**: Fully customizable with color coding.
* 🔄 **Recurring Tasks**: Automate repeated tasks (e.g., weekly, monthly).
* ☑️ **Completion Options**:
  + Check to mark complete
  + Drag into a “Completed” zone with optional confetti animation
* 🧠 **Smart Suggestions**:
  + Detect missing workflow phases (e.g., QA, testing)
  + Recommend assignees based on workload or history

**💼 Assignment & Collaboration**

* 🔍 **Intelligent Assignee Suggestions**: Based on past behavior and workload.
* 👥 **Multi-Assignee Support**: Toggle on for collaborative tasks.
* 📊 **Workload Visibility**: View potential conflicts and task distribution per user.
* 👤 **Guest Collaborators**: Invite external users with permission-limited access.

**🧰 Templates System**

* 📂 **Reusable Templates**: Create templates with predefined tasks, roles, and deadlines.
* 📦 **Template Library**:
  + Team-wide access
  + Public gallery for sharing (in Notion-style)
  + One-click cloning

**🛡️ Environment & Configuration**

* 🧾 **Project Environment Settings**:
  + Toggle visibility (public/private)
  + Store secrets, API keys securely
  + Role-based access (e.g., PM-only)

**🧭 Views & Visualization**

* 📊 **Storyboard View**:
  + Group by milestone, epic, or team
  + Zoomable columns, drag-and-drop tasks
* 📅 **Calendar View**:
  + Daily, weekly, and monthly task timelines
  + Drag tasks across dates
* 📌 **Sprint Planning Board**:
  + Backlog management
  + Assign story points, calculate sprint velocity
* 📈 **Gantt Chart / Timeline View**:
  + Define dependencies
  + Adjust durations visually
  + Arrows to indicate task flow
* 📖 **Document/Story Mode**:
  + Generate structured project documentation
  + Export to PDF or share via public link

**🔁 Real-Time Collaboration**

* 🔄 **Live Sync (WebSocket)**:
  + Real-time task movement and editing indicators
* 🧑‍🤝‍🧑 **Presence Indicators**:
  + User avatars for viewers/editors
  + “Typing...” status and shared cursor support (Google Docs-style)

**🧾 Search & Filtering**

* 🔍 **Universal Search**: Across tasks, comments, and files.
* 📂 **Advanced Filtering**:
  + Filter by tag, priority, assignee, status, due date
  + Save and share custom views (e.g., “High Priority UX”)

**📊 Analytics & Dashboard**

* ⏱️ **Time Tracking**: Estimated vs actual effort.
* 🧪 **Task & Sprint Statistics**: Completion rates, velocity charts.
* 🔝 **Team Leaderboards**: Based on activity, collaboration, and helpfulness.

**🧩 Gamification (Optional)**

* 🎯 **Points System**: Earn points for completing tasks, helping, reviewing.
* 🎖️ **Badges & Achievements**: Recognize contributions and milestones.
* 📊 **Gamified Leaderboard**: Boost motivation via friendly competition.

**🔔 Notification System**

* 🛎️ **Multi-Channel Alerts**:
  + In-app badges for unread activity
  + Optional email and toast alerts
* ⚡ **Trigger Events**: Task assigned, deadline reached, comment added

**🧠 Focus Mode**

* 🍅 **Pomodoro Timers**
* 🎧 **Ambient Noise or Music** Integration
* 👁️ **Focus Filter**: View only your tasks

**🧑‍💼 Role & Permission System**

| **Role** | **Permissions** |
| --- | --- |
| **Admin** | Full access: users, settings, projects |
| **Project Manager** | Assign tasks, manage members and deadlines |
| **Member** | View, comment, and complete assigned tasks |
| **Guest** | View/comment only (read-only access) |

* 🔐 **Custom Role Matrix**: Per-project permission toggles (e.g., allow members to change due date but not delete tasks)

**🛠️ Logs & Audit Trails**

* 📜 **Activity Feed**: Per project or per user
* 📆 **Audit Timeline**: GitHub Pulse-style changelog
* 🕵️ **Action History**: Who moved what and when

**🌓 Theme & Accessibility**

* 🌗 **Dark/Light Mode**: Auto-detect based on system time or manual toggle
* ✍️ **Canvas-Based Whiteboard**: Visual planning with real-time sharing
* 🌐 **Shareable Playground URLs**: Create sharable, collaborative sessions

**🔄 Flowchart: Collaborative Task Lifecycle**

flowchart TD

A[User Creates Project] --> B[Assign Roles & Access]

B --> C[Configure Project Environment & Secrets]

C --> D[Create New Task or Use Template]

D --> E[Add Subtasks, Assignees, Tags, Files]

E --> F{Real-Time Collaboration}

F --> G[Others Join / Edit / Comment]

G --> H[Tasks Populate Views (Kanban, Calendar, Gantt)]

H --> I[Update Tasks: Drag, Comment, Mark Complete]

I --> J[Trigger Automations (e.g. feedback request)]

J --> K[Gamify / Notify / Log Activities]

K --> L[Data Feeds into Analytics & Dashboard]