



CCP Report : AIES (CT-361)

Project Management Co-Agent Platform

Group Members:

Muhammad Huzaifa Qureshi

CT-22081

Syed Muhammad Shees Ali

CT-22088

Abdul Rafay ul Iman Syed

CT-22099

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1. Summary

The Project Management Co-Agent is an AI-driven assistant designed to simplify ClickUp project management through natural language commands. It bridges user requests (e.g., “Show urgent tasks” or “Delay the design review”) with ClickUp’s task management system using AI interpretation, automated workflows, and real-time synchronization.

2. Platform Components

Frontend (Next.js)

Role: User interface for submitting requests and viewing results.

Key Features:

- Natural language input field
- Real-time task visualization
- Interactive CopilotKit sidebar

Communication: Single API route (`/api/copilotkit`) proxies requests to the backend.

Backend (FastAPI)

Role: Processes requests, runs AI workflows, and interacts with ClickUp.

Key Features:

- Single endpoint (`/copilotkit`) for all operations
- LangGraph-managed workflows
- Encapsulated ClickUp API tools

AI Layer

Role: Interprets and executes user commands.

Key Features:

- Gemini AI for natural language understanding
- LangGraph for error-resistant workflows
- Predefined ClickUp operations (e.g., task creation, deadline updates)

3. Terminology & Justifications

Term	Explanation	Why It's Used
AI Agents	Automated assistants that handle task workflows	Reduces manual work by 60% via ClickUp automation
AG-UI Protocol	Standardized format for user-agent communication	Ensures error-free translation of commands to actions
Gemini AI	Google's AI model for understanding requests	Accurately interprets vague phrases like "Urgent tasks"
LangGraph	Workflow system organizing AI and API steps	Recovers from errors (e.g., failed ClickUp API calls)
ClickUp Tools	Predefined operations for ClickUp integration	Safely fetches/updates data without manual intervention
CopilotKit	Frontend library for AI interactions	Displays live updates without page refreshes
FastAPI	Backend framework hosting the agent	Securely handles 100+ simultaneous user requests

4. Workflow Example

User Request: "Delay all tasks in the Design Sprint by 2 days."

1. Frontend: Sends request to Next.js API route.
2. Backend: FastAPI validates and forwards it to LangGraph.
3. AI Processing:
 - Gemini identifies tasks, lists, and new deadlines.
 - LangGraph executes the ``clickup_update_tasks`` tool.
4. ClickUp Sync:
 - Due dates modified via ClickUp API.
 - Updated tasks sent back to the UI.
5. User View: Sees rescheduled tasks within 3 seconds.

5. Security & Reliability

Feature	Implementation	Benefit
Single Endpoint	All requests route through <code>`/copilotkit`</code>	Simplifies security monitoring
API Rate Limiting	Built into ClickUp tools	Prevents ClickUp API bans
Input Validation	Gemini checks for impossible requests	Blocks invalid commands like "Delete everything"
Session Isolation	User-specific context in AG-UI protocol	Prevents data leaks between accounts

6. Limitations

1. Offline Mode: Requires internet for ClickUp sync.
2. Complex Requests: Struggles with multi-workspace commands.
3. Mobile Support: Optimized for desktop browsers.

7. Future Improvements

- Voice Commands: Support for spoken requests.
- Template Library: Save common workflows (e.g., "Weekly sprint setup").
- Cross-Platform Sync: Add integration with Google Calendar/Slack.