

Assignment #1 - Test Plan

Part I: Description of Overall Test Plan

Our testing strategy follows a two-phase approach to ensure comprehensive validation of "**CleverCollab - Autonomous AI Agents for Project Management Automation**" project.

1. **Component-Level Testing:**

Each module, such as automated task allocation, real-time tracking, predictive analytics, and chatbot query handling, will be tested independently. Simulated data will be used to validate normal, abnormal, and boundary conditions, ensuring robustness. Testing scripts will be used to automate test scenarios for consistency.

2. **System Integration Testing:**

The entire system will be deployed and tested in an integrated environment. This phase will validate interactions between modules (e.g., the backend's predictive models and the frontend's visualization). Stress testing will simulate real-world conditions by handling large datasets retrieved via the Jira API and ensuring the AI agents' predictions and task allocations perform efficiently.

Part II: Test Case Descriptions

TC1.1 Task Allocation Test

TC1.2 This test ensures that the AI agents allocate tasks based on team members' skills and availability.

TC1.3 For this test, simulated skill profiles and availability schedules of team members will be used as inputs. The system will match tasks to the most appropriate team members.

TC1.4 Inputs: Skill profiles of team members and task descriptions.

TC1.5 Outputs: Tasks are allocated optimally to team members based on their expertise and availability.

TC1.6 Normal

TC1.7 Blackbox

TC1.8 Functional

TC1.9 Unit Test

TC2.1 Predictive Analytics Test

TC2.2 This test ensures that the predictive model identifies tasks likely to miss deadlines.

TC2.3 Simulated task progress data with varying completion percentages will be used. The model will analyze this data to predict delays.

TC2.4 Inputs: Task progress data with delays simulated in 20% of tasks.

TC2.5 Outputs: The system accurately identifies delayed tasks.

TC2.6 Normal

TC2.7 Blackbox

TC2.8 Functional

TC2.9 Unit Test

TC3.1 Task Status Update Test

TC3.2 This test ensures that the system reflects real-time updates of task progress.

TC3.3 The backend will send simulated updates via the API, which will be reflected in the frontend dashboard.

TC3.4 Inputs: Task completion updates on Jira (sent via API).

TC3.5 Outputs: Updates are reflected instantly in the dashboard.

TC3.6 Boundary

TC3.7 Blackbox

TC3.8 Functional

TC3.9 Integration Test

TC4.1 Chatbot Query Test

TC4.2 This test ensures that the chatbot responds accurately to project manager queries.

TC4.3 Various natural language queries, such as "Who is working on Task X?" and "Which tasks are overdue?" will be tested.

TC4.4 Inputs: Predefined natural language queries.

TC4.5 Outputs: Correct responses with task and team member data.

TC4.6 Normal

TC4.7 Blackbox

TC4.8 Functional

TC4.9 Unit Test

TC5.1 System Stress Test

TC5.2 This test validates the system's performance under heavy loads.

TC5.3 A large number of tasks will be retrieved via the Jira API and processed by the system.

TC5.4 Inputs: 100+ tasks retrieved via Jira API.

TC5.5 Outputs: The system processes all tasks without degradation in performance.

TC5.6 Normal

TC5.7 Blackbox

TC5.8 Performance

TC5.9 Integration Test

TC6.1 Task Duplication Detection Test

TC6.2 This test ensures that duplicate tasks are identified and flagged.

TC6.3 A dataset containing duplicate tasks will be uploaded to the system.

TC6.4 Inputs: Duplicate tasks with identical descriptions and deadlines.

TC6.5 Outputs: Duplicate tasks are flagged by the system.

TC6.6 Abnormal

TC6.7 Whitebox

TC6.8 Functional

TC6.9 Unit Test

TC7.1 User Authentication Test

TC7.2 This test validates that only authorized users can log in.

TC7.3 Valid and invalid credentials will be tested to ensure proper authentication.

TC7.4 Inputs: A combination of valid and invalid user credentials.

TC7.5 Outputs: Valid credentials allow access to the chatbot interface; invalid credentials are rejected.

TC7.6 Normal/Abnormal

TC7.7 Blackbox

TC7.8 Functional

TC7.9 Unit Test

TC8.1 Real-Time Notifications Test

TC8.2 This test ensures that notifications are sent for overdue tasks.

TC8.3 Tasks will be marked overdue, and the system will verify notification delivery.

TC8.4 Inputs: Tasks with overdue status.

TC8.5 Outputs: Notifications are sent to assigned team members.

TC8.6 Boundary

TC8.7 Blackbox

TC8.8 Functional

TC8.9 Integration Test

TC9.1 API Data Consistency Test

TC9.2 This test ensures that data retrieved via the Jira API matches the database.

TC9.3 Task data retrieved from the API will be compared with database records.

TC9.4 Inputs: Task data from Jira API.

TC9.5 Outputs: Data matches database records exactly.

TC9.6 Normal

TC9.7 Whitebox

TC9.8 Functional

TC9.9 Integration Test

TC10.1 Frontend Responsiveness Test

TC10.2 This test ensures the dashboard remains responsive during heavy interactions.

TC10.3 Simulated user interactions will be performed during live updates.

TC10.4 Inputs: Multiple user actions on the dashboard.

TC10.5 Outputs: No UI lag during updates.

TC10.6 Normal

TC10.7 Blackbox

TC10.8 Performance

TC10.9 Integration Test

TC11.1 Task Prioritization Test

TC11.2 This test ensures that tasks are prioritized correctly based on deadlines and dependencies.

TC11.3 Tasks with varying deadlines and dependencies will be inputted.

TC11.4 Inputs: Task data with deadlines and dependencies.

TC11.5 Outputs: Tasks are prioritized correctly.

TC11.6 Normal

TC11.7 Blackbox

TC11.8 Functional

TC11.9 Unit Test

TC12.1 Chatbot Error Handling Test

TC12.2 This test ensures that the chatbot handles invalid or unclear queries gracefully.

TC12.3 Invalid or ambiguous queries will be sent to the chatbot.

TC12.4 Inputs: Queries like "task?" or "???".

TC12.5 Outputs: Error messages or clarification requests from the chatbot.

TC12.6 Abnormal

TC12.7 Blackbox

TC12.8 Functional

TC12.9 Unit Test

TC13.1 Role-Based Access Test

TC13.2 This test ensures different roles (managers, team members) have appropriate access levels.

TC13.3 Simulated logins for different roles will be tested.

TC13.4 Inputs: Role-based credentials.

TC13.5 Outputs: Managers access advanced features; team members access personal tasks.

TC13.6 Normal

TC13.7 Blackbox

TC13.8 Functional

TC13.9 Unit Test

TC14.1 Resource Forecasting Test

TC14.2 This test ensures the system correctly forecasts resource needs.

TC14.3 Task data with varying resource requirements will be analyzed.

TC14.4 Inputs: Task data with estimated hours and resources.

TC14.5 Outputs: Accurate resource forecasts for upcoming tasks.

TC14.6 Normal

TC14.7 Blackbox

TC14.8 Functional

TC14.9 Unit Test

TC15.1 Predictive Analytics Accuracy Test

TC15.2 This test ensures the predictive model's accuracy for forecasting task completion times.

TC15.3 Historical task data with known outcomes will be analyzed by the model.

TC15.4 Inputs: Historical task data.

TC15.5 Outputs: Predictions match actual outcomes within an acceptable margin.

TC15.6 Normal

TC15.7 Whitebox

TC15.8 Functional

TC15.9 Unit Test

Part III: Test Case Matrix

	Normal/ Abnormal/ Boundary	Blackbox/ Whitebox	Functional/ Performance	Unit/ Integration
TC1	Normal	Blackbox	Functional	Unit
TC2	Normal	Blackbox	Functional	Unit
TC3	Boundary	Blackbox	Functional	Integration
TC4	Normal	Blackbox	Functional	Unit
TC5	Normal	Blackbox	Functional	Integration
TC6	Abnormal	Whitebox	Functional	Unit
TC7	Both	Blackbox	Functional	Unit
TC8	Boundary	Blackbox	Functional	Integration
TC9	Normal	Whitebox	Functional	Integration
TC10	Normal	Blackbox	Performance	Integration
TC11	Normal	Blackbox	Functional	Unit
TC12	Abnormal	Blackbox	Functional	Unit
TC13	Normal	Blackbox	Functional	Unit
TC14	Normal	Blackbox	Functional	Unit
TC15	Normal	Blackbox	Functional	Unit