

# AI Agent and AI Agent UI Development Plan - Task Breakdown

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## Phase 1: Infrastructure and Environment Setup

### Task 1: Docker and Docker Compose Configuration

- **Skillset Required:** DevOps, Docker, Docker Compose
- **Task Description:** Update the existing `docker-compose.yml` file to include the AI Agent and AI Agent UI services, configure environment variables, and link services like QuestDB, Grafana, and VS Code.
- **Deliverables:**
  - Updated `docker-compose.yml` file
  - Working Docker setup with all services correctly linked
- **Estimated Time:** 5-8 hours

### Task 2: Dockerfile Creation

- **Skillset Required:** Docker, Python
- **Task Description:** Create Dockerfiles for both the AI Agent (with Python dependencies like `langchain`, `psycpg2`) and the AI Agent UI (Flask setup).
- **Deliverables:**
  - Two working Dockerfiles
- **Estimated Time:** 4-6 hours

### Task 3: Local Development Setup

- **Skillset Required:** Python, Virtual Environment
- **Task Description:** Set up a local Python environment with virtual environments (optional) for testing and development.
- **Deliverables:**
  - Document outlining the local development setup
- **Estimated Time:** 2-3 hours

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## Phase 2: AI Agent Development

### Task 4: Input Processing

- **Skillset Required:** Python, Data Validation, NLP
- **Task Description:** Implement logic to handle user inputs from the AI Agent UI, including validation, sanitization, and parsing for user intent and actions.
- **Deliverables:**
  - Input validation and processing module
- **Estimated Time:** 6-8 hours

## Task 5: Interaction with OpenAI API

- **Skillset Required:** Python, OpenAI API, Natural Language Processing (NLP)
- **Task Description:** Implement integration with the OpenAI API to process user inputs and generate natural language responses.
- **Deliverables:**
  - OpenAI API integration with retry/error handling
- **Estimated Time:** 10-15 hours

## Task 6: Database Interaction with QuestDB

- **Skillset Required:** Python, QuestDB, PostgreSQL, REST APIs
- **Task Description:** Implement SQL and REST API interactions with QuestDB, including handling query optimization, database inserts, and data retrieval.
- **Deliverables:**
  - Database interaction module for QuestDB
- **Estimated Time:** 12-18 hours

## Task 7: Integration with Grafana

- **Skillset Required:** Grafana API, Python, API integration
- **Task Description:** Set up interaction between the AI Agent and Grafana's API to fetch/update dashboards.
- **Deliverables:**
  - API module for Grafana interaction
- **Estimated Time:** 6-8 hours

## Task 8: Integration with VS Code

- **Skillset Required:** VSCode API (or custom integration), Python
  - **Task Description:** Implement integration with VSCode to handle code-related queries or tasks. This includes code execution, file editing, and more, leveraging the VSCode API.
  - **Deliverables:**
    - VSCode integration module that handles code execution and file management via API.
    - Ensure API authentication using `VSCODE_API_KEY`.
  - **Estimated Time:** 10-12 hours
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# Phase 3: AI Agent UI Development

## Task 9: UI Design and Setup

- **Skillset Required:** Web Design, Python (Flask)
- **Task Description:** Design the UI layout, create wireframes, and set up the basic Flask project structure, including templates and static files.
- **Deliverables:**
  - UI wireframes and project setup
- **Estimated Time:** 6-8 hours

## Task 10: Front-End Development

- **Skillset Required:** HTML, CSS (Bootstrap/Tailwind CSS), JavaScript, React (optional)
- **Task Description:** Design and implement the chatbot interface using HTML, CSS, and JavaScript. Optionally integrate React for dynamic features.
- **Deliverables:**
  - Fully functioning front-end for the AI Agent UI
- **Estimated Time:** 12-20 hours

## Task 11: Flask Back-End Development

- **Skillset Required:** Python, Flask, Web API Development
- **Task Description:** Set up Flask routes to handle user inputs and communicate with the AI Agent, including error handling and session management.
- **Deliverables:**
  - Flask back-end with working API endpoints
- **Estimated Time:** 12-18 hours

## Task 12: AI Agent Integration with UI

- **Skillset Required:** API Development, Python, Flask
  - **Task Description:** Connect the AI Agent UI to the AI Agent via REST APIs and handle different response types (e.g., text, images, links).
  - **Deliverables:**
    - API integration between AI Agent and UI
  - **Estimated Time:** 10-12 hours
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# Phase 4: Performance and Optimization

## Task 13: API Efficiency

- **Skillset Required:** Python, API Development, Performance Optimization
- **Task Description:** Optimize API calls between the AI Agent and external services. Implement request batching, caching mechanisms, and rate limiting.
- **Deliverables:**
  - Optimized API interactions
- **Estimated Time:** 5-7 hours

## Task 14: Database Query Optimization

- **Skillset Required:** QuestDB, PostgreSQL, Python
- **Task Description:** Optimize database interactions to ensure fast response times. Implement indexing, query optimization, and query caching where applicable.
- **Deliverables:**
  - Optimized database queries and indexes
- **Estimated Time:** 5-7 hours

## Task 15: Background Task Processing (Optional)

- **Skillset Required:** Python, Celery (or other task queues)
  - **Task Description:** Implement background task processing for long-running tasks using a task queue like Celery. Handle task execution asynchronously and communicate results back to the UI.
  - **Deliverables:**
    - Working background task system
  - **Estimated Time:** 8-10 hours
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## Phase 5: Testing, Performance, and Deployment

### Task 16: Final Testing and Debugging

- **Skillset Required:** QA Testing, Python, Web Development
- **Task Description:** Test both the AI Agent and UI for functionality, usability, and cross-browser compatibility.
- **Deliverables:**
  - Test reports
  - Debugging documentation
- **Estimated Time:** 10-12 hours

### Task 17: Deployment and Performance Monitoring

- **Skillset Required:** DevOps, Docker, Performance Testing
  - **Task Description:** Deploy the AI Agent and AI Agent UI to production, optimize API calls, and ensure performance under expected load.
  - **Deliverables:**
    - Deployed services
    - Performance monitoring dashboard (using Grafana/Prometheus)
  - **Estimated Time:** 12-15 hours
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## Phase 6: Documentation

### Task 18: Code and API Documentation

- **Skillset Required:** Technical Writing, Python, API Documentation Tools
- **Task Description:** Document the codebase, API endpoints, and provide setup instructions for both the AI Agent and UI.
- **Deliverables:**
  - Complete code and API documentation
  - README file for setup and usage
- **Estimated Time:** 5-7 hours

## Phase 7: Project Management and Communication

### Task 19: Regular Status Updates

- **Skillset Required:** Project Management, Communication

- **Task Description:** Provide regular status updates to the project team and stakeholders, highlighting progress, challenges, and next steps.
- **Deliverables:**
  - Weekly status reports
  - Project timeline updates
- **Estimated Time:** Ongoing throughout the project

## Task 20: Team Meetings

- **Skillset Required:** Project Management, Communication
- **Task Description:** Organize and facilitate regular team meetings to discuss project progress, address any issues, and ensure alignment among team members.
- **Deliverables:**
  - Meeting agendas and minutes
  - Action items and follow-ups
- **Estimated Time:** Ongoing throughout the project

## Task 21: Stakeholder Communication

- **Skillset Required:** Project Management, Communication
- **Task Description:** Maintain open communication with project stakeholders, providing them with updates, seeking their input, and addressing their concerns.
- **Deliverables:**
  - Stakeholder communication plan
  - Stakeholder meeting notes and action items
- **Estimated Time:** Ongoing throughout the project