# Project Plan: Fae Quality Intelligence Platform

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Project Lead: (User's Name/Fae Intelligence)

Core Goal: To develop an interactive, step-by-step platform where users can engage with specialized AI "Quality Experts" to analyze problems, generate documentation drafts, and gain insights into quality processes (both manufacturing and business).

## Phase 1: Foundation & Detailed Planning (Current Phase)

**Objective:** To establish a clear project scope, define initial expert modules, design the user experience, and finalize the technology stack.

**Timeline:** Estimated 2-4 Weeks

**Key Tasks & Deliverables:**

1. **Define Core Quality Expert Personas/Modules (Target: 2-3 Initial Modules):**
   * **Task 1.1: Finalize "CAPA Expert" Module Definition.**
     + **Description:** Review and confirm the existing detailed prompt for the "Senior Quality Engineer and CAPA expert." This includes AI Persona, Task Instructions, Input Variables, Output Format, Constraints.
     + **Status:** Definition largely complete from previous discussion.
   * **Task 1.2: Define "Root Cause Analysis (RCA) Facilitator" Module.**
     + **Description:** This expert will guide users in identifying potential root causes for a stated problem, potentially using techniques like a guided 5 Whys or Fishbone diagram construction. It might be more interactive than the CAPA expert's preliminary drafts.
     + **Inputs:** Problem Statement, relevant context (e.g., process steps, known conditions).
     + **Outputs:** Structured 5 Whys analysis, populated Fishbone diagram categories, list of potential root causes, questions to guide further investigation.
     + **Deliverable:** Detailed AI Persona Configuration document for RCA Facilitator.
     + **Status:** To Be Defined.
   * **Task 1.3: Define "Process Improvement Suggester" Module.**
     + **Description:** This expert analyzes a described business or manufacturing process and suggests areas for improvement based on quality principles (e.g., waste reduction, error-proofing, efficiency gains).
     + **Inputs:** Detailed Process Description (steps, inputs, outputs, known pain points), Quality Goals.
     + **Outputs:** List of identified weaknesses/bottlenecks, prioritized improvement suggestions with rationale, potential metrics to track.
     + **Deliverable:** Detailed AI Persona Configuration document for Process Improvement Suggester.
     + **Status:** To Be Defined.
2. **System Architecture & Technology Stack Confirmation:**
   * **Task 2.1: Define High-Level System Architecture.**
     + **Frontend:** React (Next.js, using App Router). UI Components: shadcn/ui, Icons: lucide-react, Notifications: use-toast.
     + **Backend:** Next.js API Routes (for initial simplicity, can scale to dedicated backend later if needed).
     + **LLM Integration:** API calls to a chosen LLM provider (e.g., OpenAI, Google Gemini, Anthropic Claude). Model selection TBD based on task complexity and cost.
     + **Deliverable:** Architecture Diagram & Tech Stack Specification.
     + **Status:** Partially Defined.
   * **Task 2.2: Data Management Strategy (Initial).**
     + **User Inputs:** Primarily session-based (React state). Longer-term storage for saved sessions/drafts is a Phase 5 consideration.
     + **Expert Module Definitions (Prompts, etc.):** Store as structured JSON or TypeScript objects within the codebase for V1. Can be moved to a configuration file or database later.
     + **Privacy:** Emphasize that no sensitive user data is stored persistently in V1 without explicit save actions (future feature).
     + **Deliverable:** Data Management Approach Document.
     + **Status:** To Be Defined.
3. **User Experience (UX) & User Interface (UI) Design:**
   * **Task 3.1: Design User Flow.**
     + **Steps:**
       1. Platform Landing/Welcome.
       2. Selection of "Quality Expert" module (e.g., CAPA, RCA, Process Improvement).
       3. Step-by-step information input sequence tailored to the selected expert.
       4. AI processing / "Expert at Work" indication.
       5. Display of structured AI-generated output.
       6. Options for user (e.g., copy output, start new session).
     + **Deliverable:** User Flow Diagram.
     + **Status:** To Be Defined.
   * **Task 3.2: Create Wireframes/Mockups for Key Screens.**
     + Expert Selection Screen.
     + Generic Sequential Input Screen Layout.
     + Output Display Screen Layout (catering to Markdown and structured data).
     + **Deliverable:** Set of Wireframes/Mockups.
     + **Status:** To Be Defined.
4. **Project Management & Documentation:**
   * **Task 4.1: Refine and Maintain this Project Plan Document.**
     + **Description:** Regularly update with progress, decisions, and changes.
     + **Status:** Ongoing.
   * **Task 4.2: Set up Version Control (Git).**
     + **Status:** Assumed (standard practice).

## Phase 2: Core Platform Development (Frontend & Backend Shell)

**Objective:** To build the foundational application structure that can host and run different "Quality Expert" modules.

**Timeline:** Estimated 3-5 Weeks (after Phase 1 completion)

**Key Tasks & Deliverables:**

1. **Develop Frontend Shell:**
   * Basic Next.js application setup.
   * Main navigation and page routing (for Home, Expert Selection, Expert Interaction Area).
   * Reusable layout components.
   * State management for user journey (e.g., selected expert, current input step).
   * Generic UI components for:
     + Displaying lists of experts.
     + Rendering dynamic forms for sequential input.
     + Displaying Markdown-based AI outputs.
   * **Deliverable:** Functional frontend shell capable of navigating between core areas.
2. **Develop Backend Shell (Next.js API Routes):**
   * API endpoint to receive:
     + Identifier for the selected "Quality Expert" module.
     + User-provided inputs for that module.
   * Logic to dynamically load/select the appropriate "Expert Module Definition" (persona, prompt, output structure).
   * Basic LLM API integration:
     + Function to construct the prompt to the LLM using the module definition and user inputs.
     + Function to make the API call to the LLM.
     + Function to receive and pass back the LLM's response.
   * Error handling for API calls.
   * **Deliverable:** Functional backend API capable of processing a request for a generic expert module and interacting with an LLM.

## Phase 3: First Expert Module Implementation ("CAPA Expert")

**Objective:** To integrate and test the first end-to-end "Quality Expert" module.

**Timeline:** Estimated 2-3 Weeks (after Phase 2 completion)

**Key Tasks & Deliverables:**

1. **Frontend Implementation for CAPA Expert:**
   * Specific form sequence for Company\_Context and Problem\_Statement.
   * UI rendering for the 9-section Markdown output.
   * **Deliverable:** Fully interactive CAPA Expert user interface.
2. **Backend Logic for CAPA Expert:**
   * Integration of the finalized CAPA Expert prompt definition.
   * Any specific input validation or transformation logic for CAPA inputs.
   * **Deliverable:** Backend logic supporting the CAPA Expert module.
3. **End-to-End Testing & Refinement:**
   * Test with various sample CAPA scenarios.
   * Refine prompts, UI, and backend logic based on test results.
   * Ensure output adheres to the defined Markdown structure.
   * **Deliverable:** Tested and refined CAPA Expert module.

## Phase 4: Subsequent Expert Module Implementation

**Objective:** To implement the additional "Quality Expert" modules defined in Phase 1.

**Timeline:** Estimated 1-2 Weeks per module (after Phase 3 completion)

**Key Tasks & Deliverables (repeated for each module, e.g., RCA Facilitator, Process Improvement Suggester):**

1. **Frontend Implementation for [Module Name].**
2. **Backend Logic for [Module Name].**
3. **End-to-End Testing & Refinement for [Module Name].**
   * **Deliverable:** Tested and refined [Module Name] module.

## Phase 5: Advanced Features & Enhancements (Future Considerations)

* User Accounts & Authentication
* Saving, Loading, and Managing User Sessions/Drafts
* Output Editing & Exporting (PDF, DOCX)
* Interactive Output (e.g., clicking on a 5 Why step to get more details or suggest alternatives)
* Feedback Mechanism on AI Output Quality
* Admin Interface for Managing Expert Module Definitions
* Usage Analytics

## Phase 6: Deployment & Maintenance (Future Considerations)

* Deployment Strategy (e.g., Vercel, Netlify, AWS Amplify)
* Continuous Integration/Continuous Deployment (CI/CD) Pipeline
* Monitoring, Logging, and Alerting
* Regular Review and Update of LLM Prompts & Expert Modules
* User Support Documentation/FAQs

**Next Immediate Steps (Executing Phase 1):**

1. **Collaboratively Define Task 1.2 (RCA Facilitator) and Task 1.3 (Process Improvement Suggester) in detail.** This involves drafting their AI Persona Configurations, Input Variables, Output Formats, etc.
2. **Begin work on Task 3.1 (User Flow Diagram) and Task 3.2 (Wireframes).**
3. **Start fleshing out Task 2.1 (Architecture Diagram & Tech Stack Specification) and Task 2.2 (Data Management Approach).**

This document will serve as our roadmap. We can update statuses and add more detail to tasks as we proceed.

What would you like to tackle first from the "Next Immediate Steps"? Shall we start by trying to define the "RCA Facilitator" module in more detail?