# Hackathon Project Phases Template

## Project Title:

CoutureAI: Clothing Image Generator Using Stable Diffusion Pipeline

## Team Name:

Pixel Pioneers

## Team Members:

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## Phase-1: Brainstorming & Ideation

### Objective:

Develop an AI-powered fashion visualization tool that enables users to generate realistic images of clothing based on textual descriptions.

### Key Points:

1. **Problem Statement:**

   - Traditional online shopping platforms lack personalized visual representation of user-defined clothing styles.
   - Customers often struggle to visualize unique clothing designs before making a purchase.

2. **Proposed Solution:**

   ○ An AI-powered application using Diffusers' Stable Diffusion Pipeline to generate realistic clothing images based on user descriptions.
   ○ A user-friendly interface for easy interaction and visualization.

3. **Target Users:**

   ○ Fashion enthusiasts looking to visualize their custom clothing ideas.
   ○ Designers needing AI-generated inspirations for clothing designs.
   ○ Online shoppers seeking personalized outfit previews.

4. **Expected Outcome:**

   ○ A working AI-powered platform that transforms text descriptions into high-quality clothing images.

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# Phase-2: Requirement Analysis

## Objective:

Define the technical and functional requirements for CoutureAI.

## Key Points:

1. **Technical Requirements:**

   ○ Programming Language: **Python**
   ○ Backend: **Stable Diffusion Pipeline with Diffusers**
   ○ Frontend: **HTML,CSS,JavaScript**

2. **Functional Requirements:**

   ○ Users should input detailed text descriptions of clothing items.
   ○ AI should generate high-resolution images based on the input.
   ○ The interface should allow users to refine and regenerate images.

3. **Constraints & Challenges:**

    ○ Ensuring realistic and high-quality image outputs.
    ○ Handling high computational requirements for Stable *Diffusion*.
    ○ Optimizing UI performance for seamless user interaction.

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# Phase-3: Project Design

## Objective:

Develop the system architecture and user flow of the application.

## Key Points:

1. **System Architecture:**

    ○ User inputs a clothing description via the UI.
    ○ The request is processed by the Stable Diffusion model.
    ○ AI generates a realistic clothing image.
    ○ The generated image is displayed in the UI.
2. **User Flow:**

    ○ Step 1: User enters a clothing description (e.g., "a floral summer dress with puff sleeves").
    ○ Step 2: The backend processes the request using the AI model.
    ○ Step 3: The generated clothing image is displayed to the user.
3. **UI/UX Considerations:**

    ○ Simple and interactive UI for smooth navigation.
    ○ Options for image refinement and regeneration.
    ○ Responsive design for both desktop and mobile users.

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# Phase-4: Project Planning (Agile Methodologies)

## Objective:

Break down development tasks for efficient completion.

| Sprint | Task | Priority | Deadline | Dependencies | Expected Outcome |
|---|---|---|---|---|---|
| Sprint 1 | Environment Setup & API Integration | High | End of Day 1 | Python, API Key setup | API connection established |
| Sprint 1 | Frontend UI Development | Medium | End of Day 1 | API response format finalized | Basic UI with input fields |
| Sprint 2 | Image Generation & Optimization | High | Mid-Day 2 | AI model integration | Working AI-generated images |
| Sprint 2 | Error Handling & Debugging | High | Mid-Day 2 | API logs, UI inputs | Improved API stability |
| Sprint 3 | Testing & UI Enhancements | Medium | Mid-Day 2 | API response, UI layout completed | Responsive UI, better user experience |
| Sprint 3 | Final Presentation & Deployment | Low | End of Day 2 | Working prototype | Demo-ready project |

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# Phase-5: Project Development

## Objective:

Implement core features of CoutureAI.

## Key Points:

1. **Technology Stack Used:**

   - **Frontend:** HTML,CSS,JavaScript
   - **Backend:** Diffusers' Stable Diffusion Pipeline
   - **Programming Language:** Python
2. **Development Process:**

   - Implement AI model for text-to-image generation.
   - Develop UI components for user input and image display.

3. **Challenges & Fixes:**

    ○ **Challenge:** Slow image generation time.
      **Fix:** Optimize Stable Diffusion model settings.
    ○ **Challenge:** User inputs with ambiguous descriptions.
      **Fix:** Provide guided input suggestions.

# Phase-6: Functional & Performance Testing

Ensure that CoutureAI works as expected.

| Test Case ID | Category | Test Scenario | Expected Outcome | Status | Tester |
|---|---|---|---|---|---|
| TC-001 | Functional Testing | User enters a clothing description | AI generates a relevant image | ✅ Passed | Tester 1 |
| TC-002 | Performance Testing | Image generation time under 2-5 minutes | Optimized processing speed | ⚠️ Needs Optimization | Tester 2 |
| TC-003 | UI Testing | Ensure UI is responsive across devices | Works on mobile & desktop | ❌ Failed - Needs Fix | Tester 3 |
| TC-004 | Deployment Testing | Host the app using deployment service | App accessible online | 🚀 Deployed | GitHub |

# Final Submission

https://github.com/yuvikasai/CoutureAI