**Hackathon Project Phases Template** for the **Clothing Image Generator** project.

# **Hackathon Project Phases Template**

## **Project Title:**

CoutureAI: Clothing Image Generator Using Stable Diffusion Pipeline

## **Team Name:**

Neural nexus

## **Team Members:**

* Alle Srija
* Alugu Nandu priya
* Bakkaru Haripriya
* Allakonda Shivani
* Boddu Susmitha

## **Phase-1: Brainstorming & Ideation**

* **Objective:**
* Develop an AI-powered tool that generates realistic clothing images using the Stable Diffusion pipeline, helping designers, retailers, and consumers visualize unique fashion designs.
* **Key Points:**
* **Problem Statement:**
* Fashion designers and retailers struggle to generate realistic previews of clothing before production.
* Custom clothing visualization is expensive and time-consuming.
* Existing solutions lack customization and AI-generated uniqueness.
* **Proposed Solution:**
* An AI-powered system utilizing **Stable Diffusion** to generate realistic **clothing images** based on textual descriptions and style preferences.
* The system will allow users to **customize designs, textures, and styles** without manual effort.
* It can help designers **visualize new collections,** assisting in marketing and prototyping.
* **Target Users:**
* **Fashion Designers** – Quick concept visualization.
* **Retailers & E-commerce Platforms** – Generate product images before production.
* **Consumers & Custom Clothing Brands** – AI-assisted personalization for outfits.
* **Expected Outcome:**
* A functional AI-powered clothing generator that produces realistic fashion images from text descriptions.
* A user-friendly GUI to allow seamless interaction with the model.

## **Phase-2: Requirement Analysis**

**Objective:**

Define the technical and functional requirements for **CoutureAI**.

**Key Points:**

**Technical Requirements:**

* **Programming Language:** Python
* **Backend:** Stable Diffusion Model
* **Frontend:** Tkinter GUI / Web Framework (Streamlit or Flask)
* **Database:** Local storage for generated images (Optional: Cloud storage for future use)

**Functional Requirements:**

* Accept text-based clothing descriptions as input.
* Generate high-quality clothing images using the Stable Diffusion model.
* Allow customization of fabrics, colors, and styles.
* Provide an interactive UI to preview and save generated designs.

**Constraints & Challenges:**

* Ensuring fast image generation without heavy GPU requirements.
* Handling high-resolution image outputs efficiently.
* Fine-tuning the model for fashion-specific details like texture and lighting.

## **Phase-3: Project Design**

**Objective:**

Develop the architecture and user flow for **CoutureAI**.

**Key Points:**

**System Architecture:**

1. User inputs a text description of the desired clothing style.
2. The Stable Diffusion Model processes the input and generates an image.
3. The frontend GUI displays the generated image.
4. The user can refine or download the generated fashion designs.

**User Flow:**

1. User enters a prompt (e.g., "A red velvet evening gown with floral embroidery").
2. AI processes the input and generates a realistic image.
3. User previews the output and makes refinements if needed.
4. Final design is saved for further use or modifications.

**UI/UX Considerations:**

* Simple and intuitive UI for non-technical users.
* Customization sliders for color, fabric, and style.
* Light & Dark Mode for better usability.

## **Phase-4: Project Planning (Agile Methodologies)**

**Objective:**

Break down development tasks for efficient completion.

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| --- | --- | --- | --- | --- | --- | --- | --- |
| Sprint | Task | Priority | Duration | Deadline | Assigned To | Dependencies | Expected Outcome |
| Sprint 1 | Environment Setup & Model Integration | 🔴 High | 6 hours (Day 1) | End of Day 1 | Alle Srija | Python, Stable Diffusion Setup | Model successfully integrated |
| Sprint 1 | GUI Development (Tkinter/Streamlit) | 🟡 Medium | 2 hours (Day 1) | End of Day 1 | A.Nandu priya | API response format finalized | Basic UI with input fields |
| Sprint 2 | Text-to-Image Processing | 🔴 High | 3 hours (Day 2) | Mid-Day 2 | B.Hari priya | Model setup, UI ready | Image generation functional |
| Sprint 2 | Error Handling & Debugging | 🔴 High | 1.5 hours (Day 2) | Mid-Day 2 | A.Srija & A.Shivani | API logs, UI inputs | Improved model stability |
| Sprint 3 | Testing & Enhancements | 🟡 Medium | 1.5 hours (Day 2) | Mid-Day 2 | A.Nandupriya& B.Susmitha | Model output, UI layout completed | More realistic image generation |
| Sprint 3 | Final Presentation & Deployment | 🟢 Low | 1 hour (Day 2) | End of Day 2 | Entire Team | Working prototype | Demo-ready project |

## **Phase-5: Project Development**

**Objective:**

Implement core features of **CoutureAI**.

**Key Points:**

**Technology Stack Used:**

* Frontend: Tkinter / Streamlit
* Backend: Stable Diffusion Model
* Programming Language: Python

**Development Process:**

* Integrate the Stable Diffusion pipeline.
* Develop text-to-image functionality.
* Implement customization features for clothing designs.

**Challenges & Fixes:**

* **Challenge:** Long processing time.
  + **Fix:** Optimize model inference with smaller checkpoints.
* **Challenge:** Blurry image outputs.
  + **Fix:** Fine-tune model with fashion-specific datasets.

## **Phase-6: Functional & Performance Testing**

**Objective:**

Ensure **CoutureAI** works as expected.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Case ID** | **Category** | **Test Scenario** | **Expected Outcome** | **Status** | **Tester** |
| TC-001 | Functional Testing | Enter "A casual blue denim jacket" | A realistic denim jacket should be generated | Passed | Tester 1 |
| TC-002 | Functional Testing | Enter "A silk evening gown with floral print" | High-quality silk dress image is generated | ✅ Passed | Tester 2 |
| TC-003 | Performance Testing | Generate 5 images in a row | Model should maintain speed under 3 seconds per image | Needs Optimization | Tester 3 |
| TC-004 | Bug Fixes & Improvements | Fix incorrect sleeve details in images | Model should generate more accurate designs | Fixed | Developer |
| TC-005 | Final Validation | Ensure UI is user-friendly and responsive | GUI should work without issues | Failed - Needs UX improvement | Tester 2 |
| TC-006 | Deployment Testing | Deploy the app | The app should be accessible | Deployed | DevOps |

## **Final Submission**

* Project Report based on the template
* Demo Video (3-5 Minutes) showcasing CoutureAI
* GitHub/Code Repository Link
* Presentation