Project Phases Template

Project Title:

Pattern Sense: Classifying Fabric Patterns Using Deep Learning

Team Name:

Visionary Threads

Team Members:

- Member 1: [Bhavya Sri Puvvala]
- Member 2: [Perumahanthi Varshini Lakshmi Durga]
- Member 3: [Morla Jaya Chandu]
- Member 4: [Aalapati Kusuma Kavya]

Phase-1: Brainstorming & Ideation

Objective:

- Understand the scope of the problem.
- Generate innovative ideas for solving it.

Key Points:

1. Identified Challenge: Classifying fabric patterns manually leads to inefficiencies in production workflows.
2. Idea Generation: Utilize convolutional neural networks to identify fabric styles in images.
3. Stakeholders: Tailors, fabric retailers, inventory management systems.
4. Impact: Enhances decision-making by providing automated insights from pattern analysis.

Phase-2: Requirement Analysis

Objective:

- Analyze what is required to build the system successfully.

Key Points:

1. Technical Tools: Python libraries (TensorFlow, OpenCV), cloud training on Google Colab.
2. Required Features: Upload interface, backend model integration, output visualization.
3. Obstacles: Finding balanced datasets and managing training time effectively.

Phase-3: Project Design

Objective:
- Map out the technical flow and structure of the application.

Key Points:
1. Workflow Diagram: Image input → Data preprocessing → Model inference → Result display.
2. Interaction Plan: End-user submits image, model gives prediction, user sees result instantly.
3. UX Choices: Easy upload access, minimal screens, fast feedback loop.

Phase-4: Project Planning (Agile Methodologies)

Objective:
- Organize the timeline using Agile principles.

Key Points:
1. Sprint Cycles: Each week tackles a new component – from data to UI and testing.
2. Role Assignments: Responsibilities split across development, testing, research, and documentation.
3. Review Checkpoints: End of each week includes demo and internal feedback.

Phase-5: Project Development

Objective:
- Implement all components of the proposed system.

Key Points:
1. Core Stack: Python with TensorFlow/Keras for modeling, Colab for training, Streamlit for deployment.
2. Development Tasks: Construct dataset pipeline, define CNN layers, run training and evaluate accuracy.
3. Fixes & Refinements: Tackled accuracy dips by using dropout and tuning learning rates.

Phase-6: Functional & Performance Testing

Objective:
- Test for proper operation and performance under different conditions.

Key Points:
1. Testing Scope: Ran classification on unseen fabric images with different lighting and resolutions.
2. Adjustments Made: Modified architecture to enhance speed and avoid model overfitting.

3. Result Verification: Ensured output labels were consistent with true fabric types.
4. Hosting: Deployed solution on a lightweight Streamlit platform for ease of access.