

Project Report Format – Section-wise Explanation

1. INTRODUCTION

1.1 Project Overview

Summary of the butterfly species classification system using AI and transfer learning.

1.2 Purpose

Goal: Support biodiversity monitoring, ecological research, and education using automated classification.

2. IDEATION PHASE

2.1 Problem Statement

Manual identification is time-consuming and inefficient in large-scale or field use.

2.2 Empathy Map Canvas

Defines stakeholders and their thoughts, feelings, and behaviors regarding species identification.

2.3 Brainstorming

Initial solution ideas including dataset selection, AI modeling, and interface design.

3. REQUIREMENT ANALYSIS

3.1 Customer Journey Map

Outlines steps from image input to final prediction output for end users.

3.2 Solution Requirement

Lists functional and non-functional requirements of the system.

3.3 Data Flow Diagram

Shows flow from user input to AI output.

3.4 Technology Stack

Keras, TensorFlow, Flask, HTML/CSS, Matplotlib, etc.

4. PROJECT DESIGN

4.1 Problem-Solution Fit

Validates that the solution meets real needs of researchers and students.

4.2 Proposed Solution

AI model with transfer learning deployed via Flask.

4.3 Solution Architecture

Illustrates image input, model inference, result display system.

5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

Two-week task schedule: preprocessing, training, testing, deployment.

6. FUNCTIONAL AND PERFORMANCE TESTING

6.1 Performance Testing

Details tests for accuracy, speed, reliability, and user feedback.

7. RESULTS

7.1 Output Screenshots

Examples of predictions with species names and confidence scores.

8. ADVANTAGES & DISADVANTAGES

Advantages

Fast, scalable, accurate model usable in real scenarios.

Disadvantages

Needs good image quality, dataset-dependent, requires internet.

9. CONCLUSION

Highlights project success, purpose achieved, and application potential.

10. FUTURE SCOPE

Expand dataset, create mobile app, integrate with conservation systems.

11. APPENDIX

Source Code

GitHub repository link.

Dataset

Kaggle butterfly dataset link.

Demo

Hosted web app or video walkthrough.