Project Design Phase
Proposed Solution

Date	24 June 2025
Team ID	LTVIP2025TMID36354
Project Name	Enchanted Wings: Marvels of Butterfly Species
Maximum Marks	2 Marks

Proposed Solution Details

S.No.	Parameter	Description
1	Problem Statement (Problem to be solved)	Accurate identification of butterfly species is challenging due to the high number of visually similar species. Traditional identification methods are time-consuming and require expert knowledge, which limits accessibility for students, researchers, and enthusiasts.
2	Idea / Solution Description	The project uses a pre-trained Convolutional Neural Network (VGG16) to classify images of butterflies into 75 species. A lightweight Flask web application allows users to upload butterfly images and receive real-time species predictions. The model is trained using a dataset of 6,499

		images and fine-tuned with custom layers for efficient classification.
3	Novelty / Uniqueness	The solution leverages transfer learning to reduce training time and increase accuracy. Its uniqueness lies in combining deep learning with real-time species identification in a web-based interface, making advanced image classification accessible to non-technical users in research, education, and conservation.
4	Social Impact	The project supports biodiversity conservation, scientific education, and citizen science by simplifying species identification. It enhances ecological awareness and allows even non-experts to contribute to species monitoring, promoting inclusiveness and knowledge sharing.
5	Business Model (Revenue Model)	Potential revenue streams include: freemium access for public use, subscription-based model for researchers/institutions, licensing to educational platforms, and data-as-a-service for ecological

		monitoring agencies. Customization services for other species or regions can also generate income.
6	Scalability of the Solution	The system is designed to be lightweight and modular, allowing easy expansion to include more species or be adapted for different ecological regions. It can be deployed on both local machines and cloud servers, making it scalable for individual users as well as institutional use.