**Project Design Phase**

**Proposed Solution Template**

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| Date | 15 February 2025 |
| Team ID | LTVIP2025TMID34696 |
| Project Name | Enchanted Wings: Marvels Of Butterfly Species |
| Maximum Marks | 2 Marks |

**Proposed Solution Template:**

Project team shall fill the following information in the proposed solution template.

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| **S.No.** | **Parameter** | **Description** |
|  | Problem Statement (Problem to be solved) | Manual identification of butterfly species is time-consuming, requires expert knowledge, and is not scalable for large biodiversity monitoring. There is a lack of AI-based tools to automate butterfly species classification. |
|  | Idea / Solution description | The project proposes an AI-powered butterfly classification system using **Transfer Learning (VGG16)** that can accurately identify butterfly species from images. It helps automate the classification process, supporting research, education, and conservation efforts. |
|  | Novelty / Uniqueness | Unlike generic image classifiers, this solution is fine-tuned specifically for butterflies with a large dataset of 75 species. It combines deep learning with a user-friendly interface (Flask + HTML) for use in mobile/web platforms. |
|  | Social Impact / Customer Satisfaction | The system promotes **biodiversity conservation**, **citizen science**, and **environmental education**. It empowers researchers, students, and the public to learn about and monitor butterflies, contributing to ecological awareness. |
|  | Business Model (Revenue Model) | The solution can be monetized through:  - Freemium model (basic free version, paid pro features) - API subscriptions for research organizations - Educational packages for schools - NGO/CSR partnerships for sustainability |
|  | Scalability of the Solution | The model is scalable to include more species, support multiple languages, and integrate with mobile apps, conservation databases, and real-time citizen submissions via cloud APIs. It can also be extended to other insect species. |