**Project Design Phase-II**

**Solution Requirements (Functional & Non-functional)**

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| Date: | 29 June 2025 |
| Team ID: | LTVIP2025TMID47029 |
| Project Name: | Enchanted Wings: Marvels of Butterfly Species |
| Maximum Marks: | 4 Marks |

## ✅ Functional Requirements

Following are the functional requirements of the proposed solution.

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| FR No. | Functional Requirement (Epic) | Sub Requirement (Story / Sub-Task) |
| FR-1 | Image Upload Interface | Upload butterfly image through browser |
| FR-2 | Image Preprocessing | Resize image to 224x224 pixels |
| FR-3 | AI Model Prediction | Use VGG16 model to predict species |
| FR-4 | Display Prediction Result | Show predicted butterfly name and image |
| FR-5 | Model Training | Load dataset, apply transfer learning, train model |
| FR-6 | Dataset Management | Organize and access images by species class |
| FR-7 | Flask Web Application | Create front-end and back-end for real-time inference |
| FR-8 | User Feedback (Optional) | Allow user to confirm or reject prediction (future scope) |

## ⚙️ Non-functional Requirements

Following are the non-functional requirements of the proposed solution.

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| NFR No. | Non-Functional Requirement | Description |
| NFR-1 | Usability | Simple UI for image upload and result display |
| NFR-2 | Security | Limit image file types and size to avoid injection or abuse |
| NFR-3 | Reliability | Model should provide consistent predictions under expected image inputs |
| NFR-4 | Performance | Predict results in < 2 seconds on typical hardware |
| NFR-5 | Availability | Web app available locally or optionally deployed to public cloud |
| NFR-6 | Scalability | Can be deployed to larger servers or integrated into mobile apps later |