

Project Design Phase-II
Solution Requirements (Functional & Non-functional)

Date	27 June 2025
Team ID	LTVIP2025TMID59407
Project Name	Enchanted Wings: Marvels Of Butterfly Species
Maximum Marks	4 Marks

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-001	Image Upload & Classification	Upload butterfly image via web/mobile interface
		Preprocess and resize image for model input
		Predict species using trained deep learning model
		Display top-1 or top-3 predictions with confidence scores
FR-002	Species Information Display	- Fetch species details (name, habitat, facts) from Wikipedia or local DB
		- Show species info when user clicks on prediction result
		- Link to external learning resources
FR-003	Explainability of Prediction (Explainable AI)	- Implement Grad-CAM for visual explanation of model decision
		- Overlay heatmap on the original image
		- Toggle explanation on/off from UI
FR-004	User Experience & Interface	- Mobile-responsive design
		- Progress loader/spinner while predicting
		- Display recent predictions in session history
FR-005	Model & Dataset Management (For Developers)	- Load pretrained .h5 model in backend
		- Update training dataset and retrain model
		- Export model performance metrics for evaluation

Non-functional Requirements:

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

NFR No.	Category	Non-Functional Requirement
NFR-001	Performance	The model should predict the butterfly species within 2 seconds for a given image.
NFR-002	Accuracy	The model must maintain a minimum classification accuracy of 85% on the validation set.
NFR-003	Usability	The interface must be mobile-friendly and easy to use for non-technical users.
NFR-004	Scalability	The system should support at least 100 concurrent users during peak usage.
NFR-005	Availability	The deployed web app should maintain 99.5% uptime during active hours.