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

Date	27th june 2025
Team ID	LTVIP2025TMID42332
Project Name	*Enchanted Wings: Marvels of Butterfly Species*
Maximum Marks	4 Marks

Functional Requirements

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	- Registration through form (email & password)- Registration through Gmail- Registration through LinkedIn *(optional/future scope)*
FR-2	User Confirmation	- Confirmation via email- Confirmation via OTP *(future enhancement)*
FR-3	Image Upload & Prediction	- Upload butterfly image via web interface- Run prediction using trained deep learning model- Display species name and confidence score
FR-4	Prediction Logging & History	- Log predictions with timestamps in database- Maintain session-based prediction history *(if login implemented)*- Export results (CSV/JSON)
FR-5	Model Management	- Load pre-trained CNN model at runtime (e.g., MobileNetV2)- Handle multiple model versions *(future support for VGG16, ResNet50)*
FR-6	Offline Functionality	- Full functionality offline using local model and assets- No internet required once dependencies are installed
FR-7	Visualization & UI Interaction	- Display prediction results in user-friendly layout- Confusion matrix and accuracy charts- Animated background and butterfly facts on UI

Non-Functional Requirements

NFR No.	Non-Functional Requirement	Description
NFR-1	Usability	Simple and intuitive interface designed with Streamlit/Flask. Requires minimal technical knowledge to operate.
NFR-2	Security	Basic validation on image uploads. Local use ensures low exposure; future login/session tracking can use token-based auth.
NFR-3	Reliability	Trained model provides consistent outputs. Logging system helps verify and audit past predictions.
NFR-4	Performance	Image prediction takes less than 2–3 seconds. Optimized model is loaded in memory for fast inference.
NFR-5	Availability	Application is functional both online and offline. Can run

NFR No.	Non-Functional Requirement	Description
		independently on local machines without cloud dependency.
NFR-6	Scalability	The architecture supports easy integration of new butterfly classes, model upgrades, and geolocation in future releases.