Project Design Phase

Problem – Solution Fit

Date	23 June 2025
Team ID	LTVIP2025TMID36354
Project Name	Enchanted Wings: Marvels of Butterfly Species
Maximum Marks	2 Marks

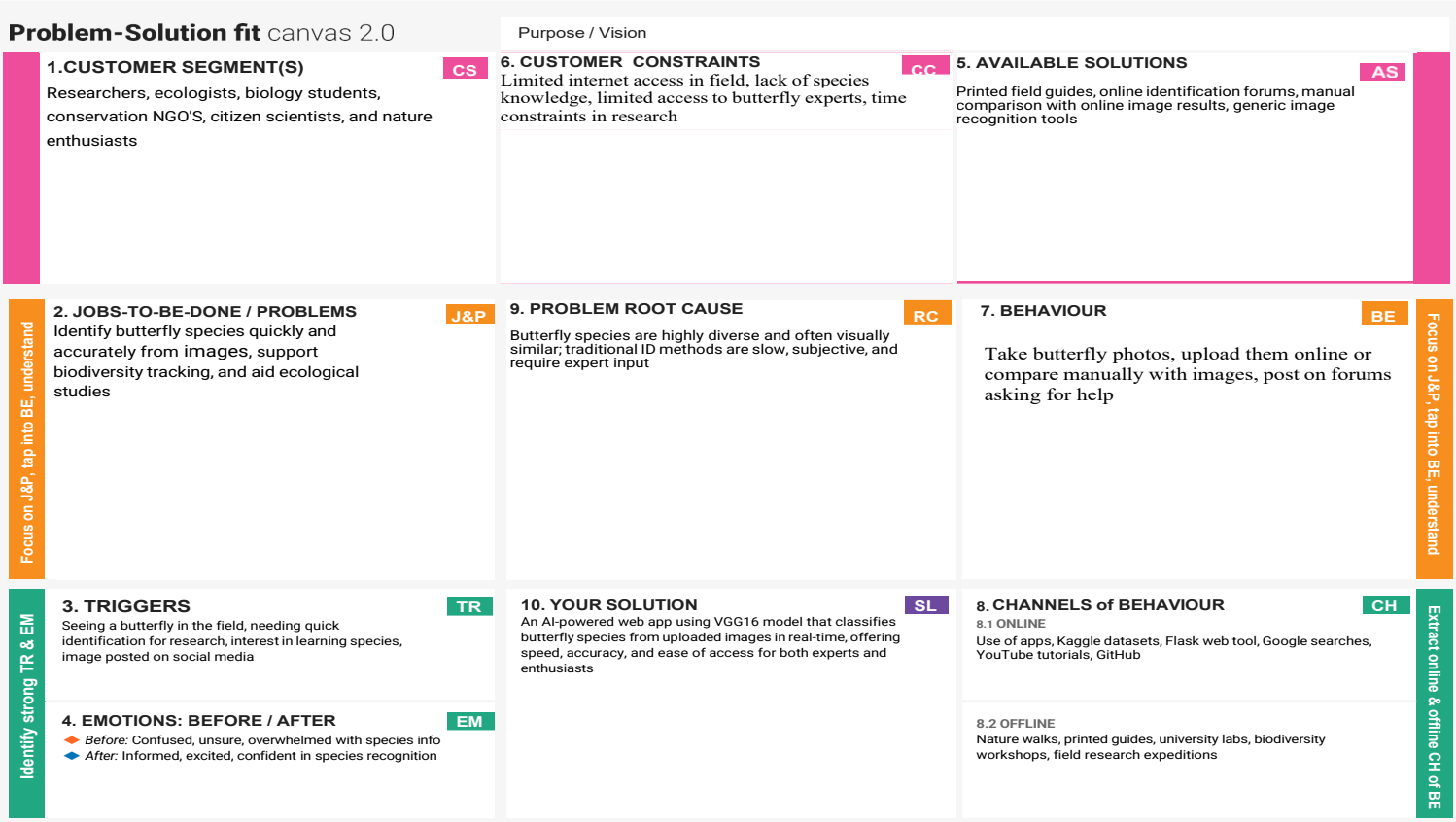
Problem:

Accurate identification of butterfly species is a significant challenge for students, nature enthusiasts, and researchers due to the need for expert knowledge, time-intensive classification processes, and the lack of real-time support tools. Traditional guides or manual search methods are inefficient and inaccessible to many users.

Solution:

The project "Enchanted Wings: Marvels of Butterfly Species" presents an end-to-end AI-powered butterfly classification system:

- A VGG16-based deep learning model trained on a structured dataset (/dataset/train) organized by butterfly species.
- A user-friendly Flask web application (app.py) with a clean frontend using HTML templates (/templates) for real-time butterfly image uploads and predictions.
- Images uploaded by users are handled through a secure file system (/static/uploads) for classification.
- A pre-trained model (vgg16_model.h5) and its corresponding species label mapping (class_indices.json) are used to ensure accurate predictions.
- The train_model.py script provides the complete training pipeline for reproducibility and updates.



Outcome for Users:

- Educators & Students: Instantly identify butterfly species through a web interface—boosting engagement and learning.
- Researchers & Conservationists: Quickly classify new samples, aiding ecological surveys and biodiversity tracking.
- Nature Enthusiasts: Easily explore butterfly species using only a camera and a browser.

Repository Resource:

🔗 https://github.com/JeevanKumar009/Enchanted-Wings-Marvels-of-Butterfly-Species-Project