

Enchanted Wings: Marvels of Butterfly Species

Team ID :

LTVIP2025TMID35569

Team size : 4

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Team members :

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Phase 1: Understanding Butterfly Diversity

Problem statement: Many people lack access to accurate, engaging, and scientifically reliable information about butterfly species. This results in missed opportunities for environmental education, conservation awareness, and ecological appreciation. There's a need for an interactive and visually rich system to explore and identify butterfly species.

Proposed Solution: We propose an educational web application called "Enchanted Wings" that uses a structured database and intuitive design to showcase various butterfly species. Users can explore species by habitat, color, size, and location, with detailed descriptions and high-quality images to enhance learning and engagement.

Target Users: Students, nature enthusiasts, researchers, educators, eco-tourists, and wildlife conservationists.

Expected Outcome: An informative and user-friendly platform that enhances awareness about butterfly species, promotes conservation, and supports education through engaging content and visuals.

Phase 2: Requirements Analysis

Technical Requirements:

- React.js (Frontend)
- Node.js + Express.js (Backend)
- MongoDB (Database)
- Cloudinary or local image storage for species pictures

Functional Requirements:

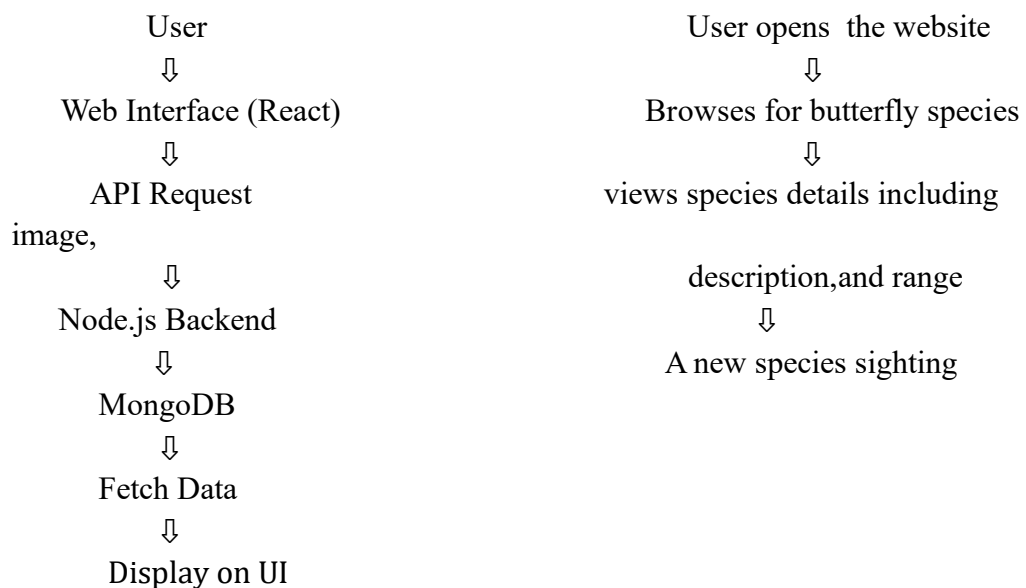
- Browse butterfly species
- Search and filter by criteria (e.g., color, region, size)

- View detailed species profiles (image, description, habitat, range)
- Submit sightings or feedback

Constraints & Challenges:

- Quality image sourcing
- Accurate scientific classification
- Ensuring fast load times for image-rich content
- **System Architecture Diagram& user flow:**

journey:



UI/UX Considerations:

- Clean, nature-inspired theme
- Responsive and mobile-friendly layout
- Intuitive navigation by species categories
- Interactive image gallery and map view

Phase 4: Project Planning (Agile Methodologies)

• Sprint Planning:

Week 1: Collect species data and images
 Week 2: Backend development & database integration
 Week 3: Frontend development
 Week 4: Testing, documentation, and deployment

• Task Allocation:

Member A: Database & species data collection
 Member B: Backend API development

Member C: Frontend UI/UX

Member D: Testing & final documentation

- **Timeline & Milestones:**

Milestone 1: Dataset ready (week 1)

Milestone 2: Model trained (week 2)

Milestone 3: Web integration (week 3)

Milestone 4: Testing + Report (week 4)

Phase 5: Project Development

- **Technology stack used:**
 - React.js
 - Node.js + Express.js
 - MongoDB
 - Cloudinary (for image hosting)
- **Development Process:**
 - ✚ Designed species schema for MongoDB
 - ✚ Built REST API endpoints to fetch butterfly data
 - ✚ Developed frontend with dynamic search and filters
 - ✚ Integrated image gallery and species detail pages
- **Challenges & Fixes:**
 - ✚ Improved contrast, font sizes, and added ARIA labels.
 - ✚ Added input validation, CAPTCHA, and admin moderation.
 - ✚ Configured environment variables and used MongoDB Atlas.

Phase 6: Functional & Performance testing

- **Test cases Executed:**
 - ✚ Verified API responses for all endpoints
 - ✚ Checked image display and responsiveness
 - ✚ Tested search and filter accuracy
- **BUG Fixes & improvements:**
 - ✚ Resolved UI layout shifts on mobile
 - ✚ Fixed species data loading delays
 - ✚ Improved image loading with lazy loading
- **Final Validation:**
 - ✚ The platform successfully presents butterfly species in an engaging, informative way
 - ✚ Meets educational, environmental, and user experience goals