flutr

sddec24-11

Team Members

Tayler Barnhart - Team Leader, Cloud Integration

Amanda Friis - Full Stack Developer, Documentation

Nathan Geater - Full Stack Developer (Back End)

Alex Brown - Front End Development Leader

Muralikrishna Patibandla - Integration & Back End Development Lead

Piper Ideker - Testing

Introduction

Flutr is an all-in-one web app for flight houses that aims to aid both flight house employees and visitors, each with their own goals.

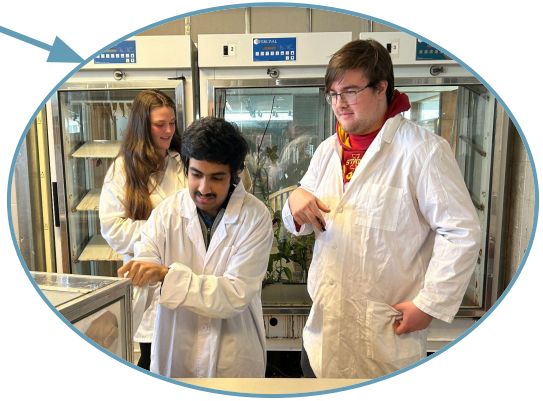
How do pavilions handle butterflies?

Step 1 - Receive

Pavilion receives a box of pupae and stores them in an incubation chamber

Step 2 - Emergence

Pavilion receives a box of pupae and stores them in an incubation chamber



Once butterflies emerge, they need to be transferred to the pavilion

Step 3 - Released

Pavilion receives a box of pupae and stores them in an incubation chamber

Once butterflies emerge, they need to be transferred to the pavilion

Beautiful butterflies flying in pavilions world-wide!

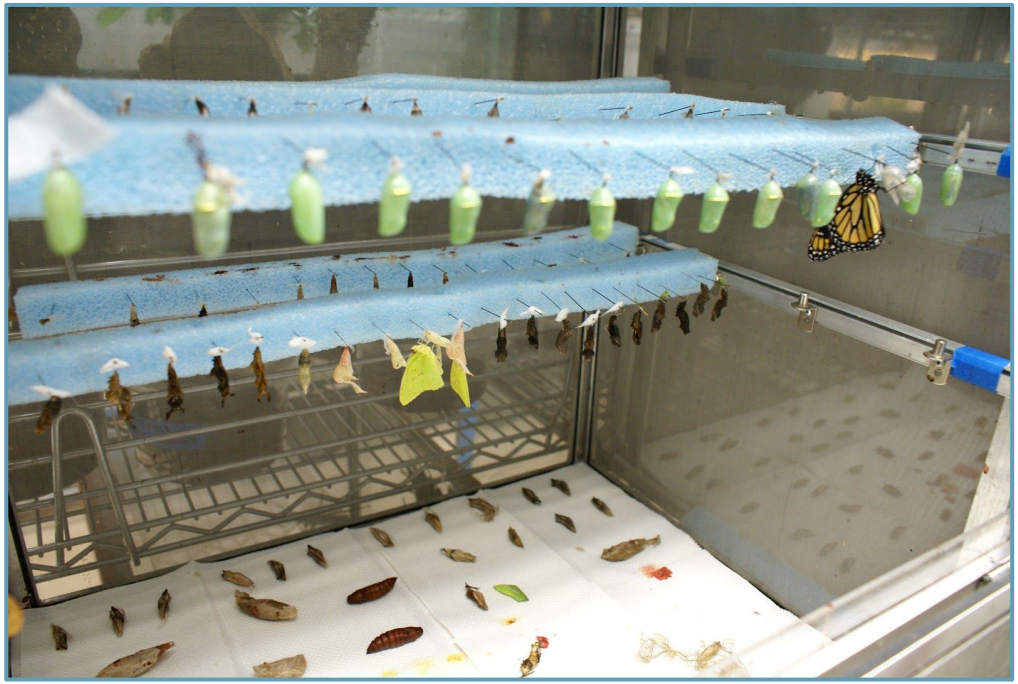
How are pavilions keeping data?

- Mostly spreadsheets
  - Slow
  - Prone to human error
  - Difficult to compile into usable data
- No data tracking once butterflies in-flight
- Certain data must be submitted annually to USDA

How can Flutr help?

Requirements

Flutr shall implement the adding, editing, and viewing of shipments



Requirements

Flutr shall track which butterflies are ready to be released

Requirements

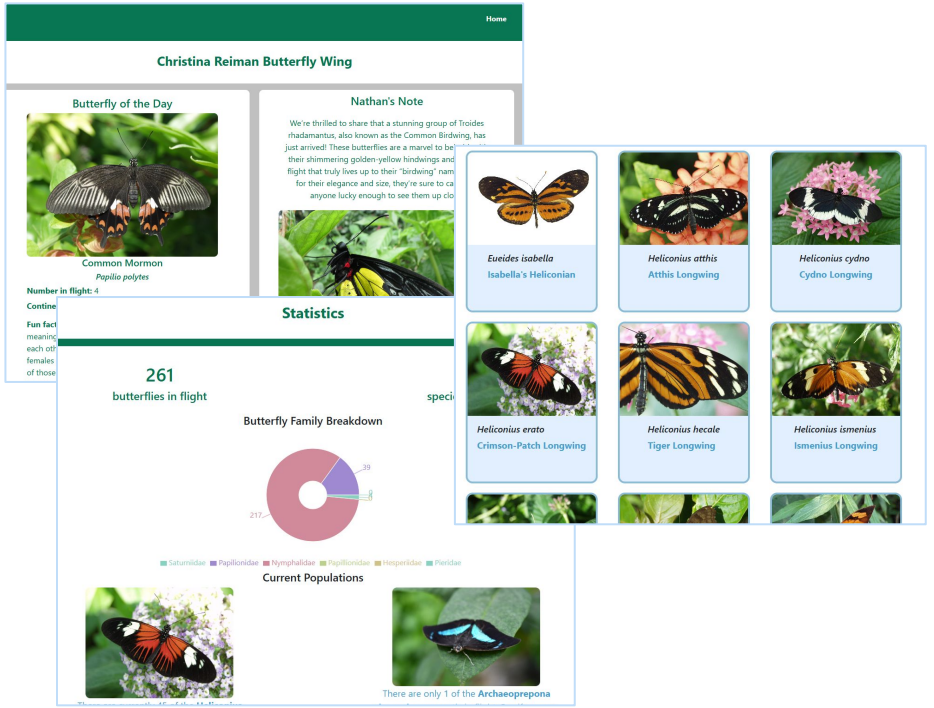
Flutr shall keep an estimate of butterflies in flight by

1. Utilizing butterfly predictive lifespan tracking
2. Automatically deleting end-of-life butterflies

Requirements

Flutr shall connect guests to a pavilion while providing a rich learning environment by:

- Keeping up-to-date with pavilion news via their home page
- Learning about butterflies using the butterfly gallery
- Viewing facts/statistics about butterflies in a pavilion

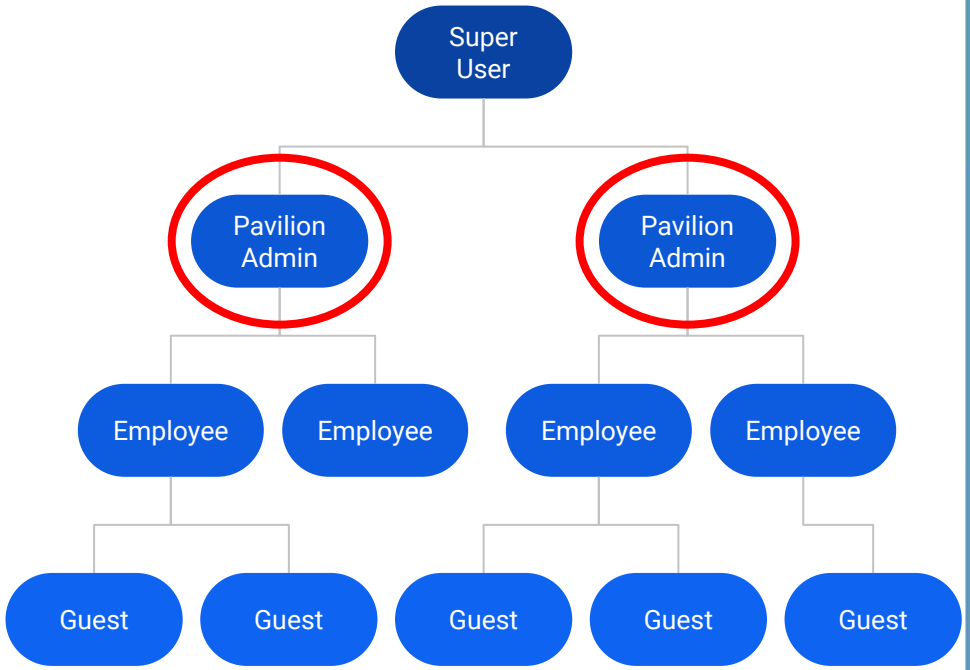


Requirements - Administration

Administration

Pavilion Admin:

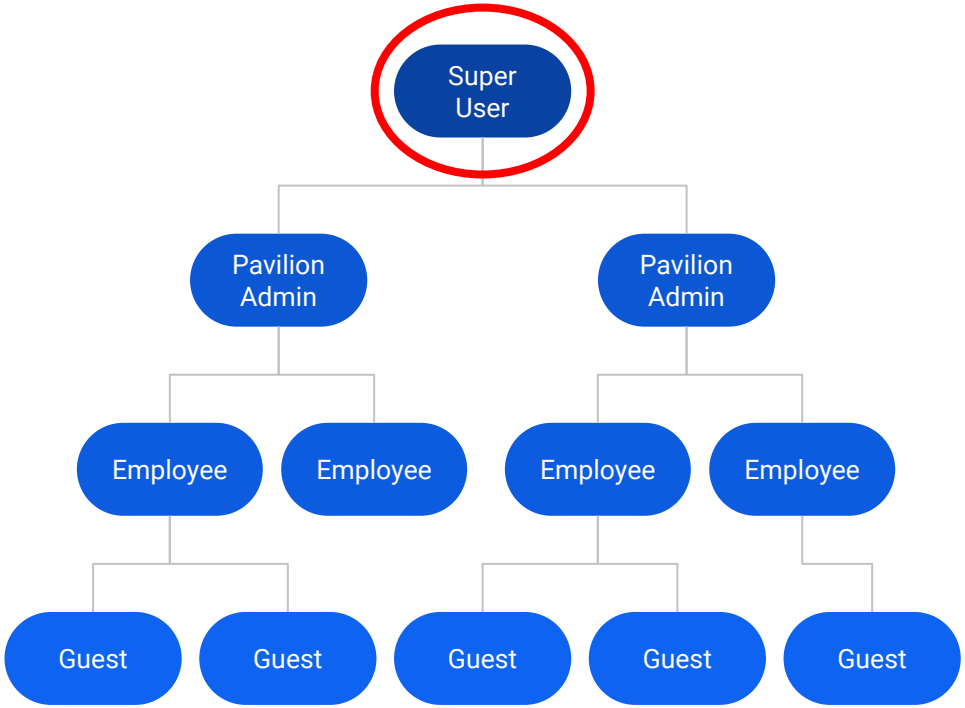
- Create, edit, deactivate employees
- Customize home page
- View, add, deactivate, edit shipment suppliers



Administration

Super User:

- Create pavilions
- Add and edit butterflies on master butterfly list
- Export data from pavilions



Kiosk

- Reiman Gardens exclusive in-pavilion access to Flutr
- Previous kiosk deemed inoperable after COVID
- Our team needed to:
  - Replace touchscreen
  - Improve heat/humidity resistance
  - Ensure guests cannot leave Flutr webpage

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Home About

Flutr Directory

Find butterfly houses from around the world.

Search for organization...

Christina Reiman Butterfly Wing

1407 University Blvd. Ames, IA 50011

Sophia Sachs Butterfly House

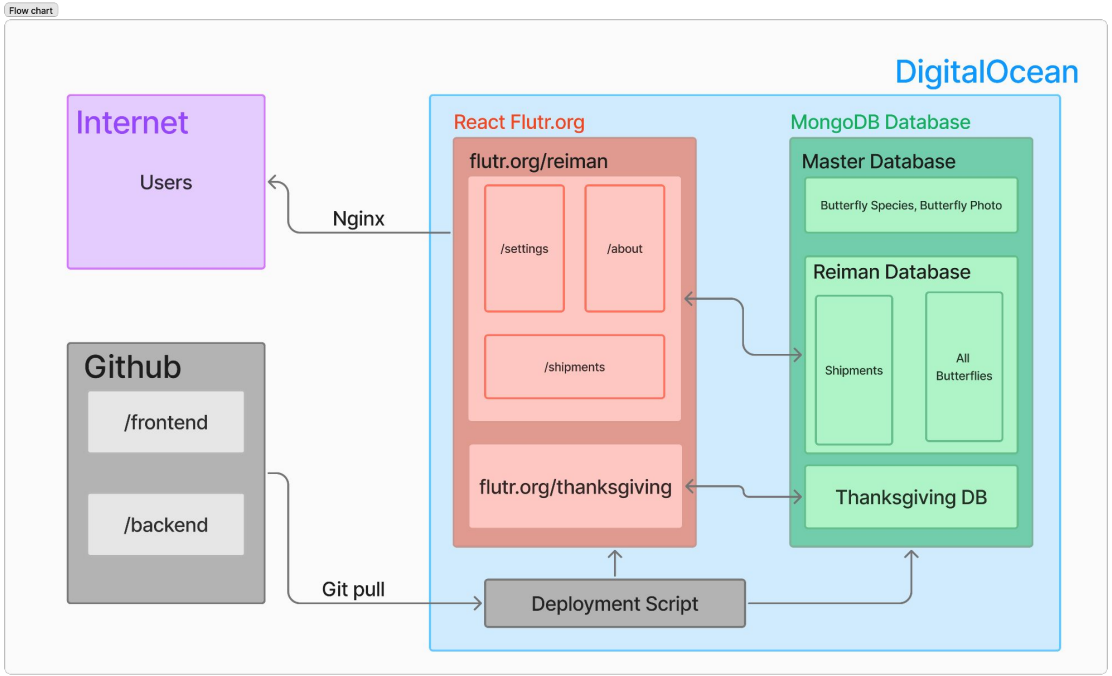
MO

Butterfly Pavilion

Westminster, CO

https://flutr.org/sophia-sachs

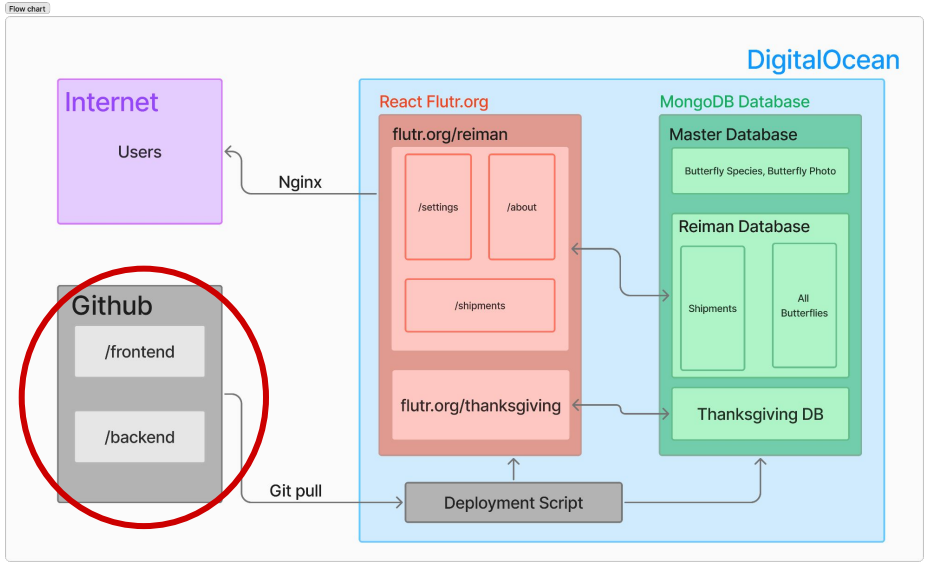
Design Overview



Design Overview

Code Repository: Github

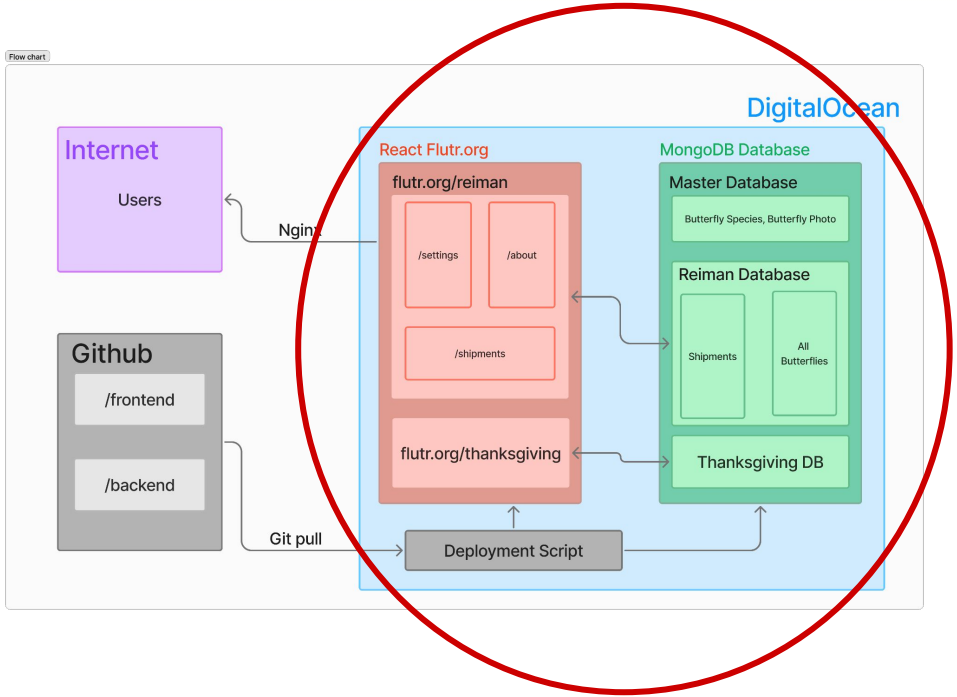
- Holds both frontend and backend code in 1 repository
- All team members have experience
- Deployed to cloud through developer-run script



Design Overview

Cloud: DigitalOcean

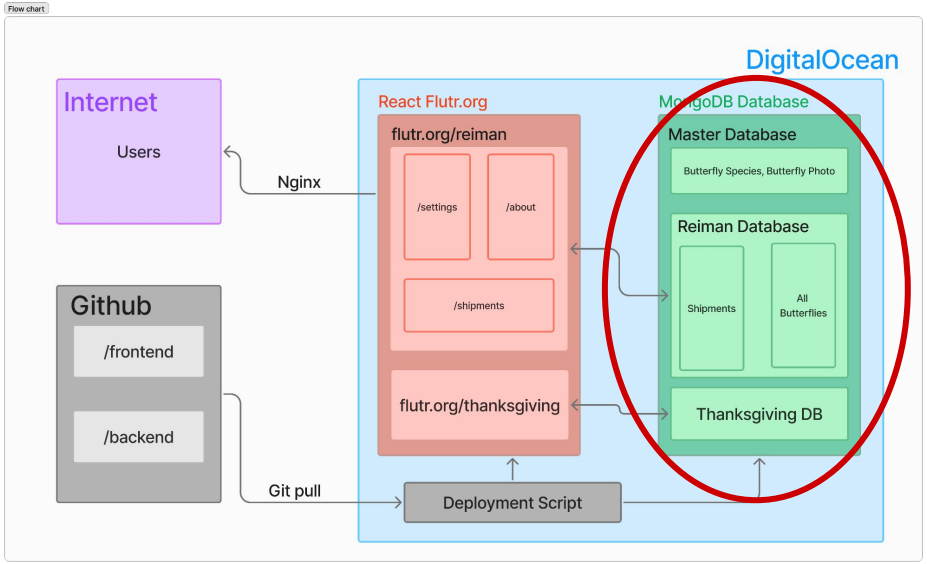
- Virtual Linux Machine
- Hosts frontend and backend services
- Controls flutr.org domain address



Design Overview

Backend: Springboot & MongoDB

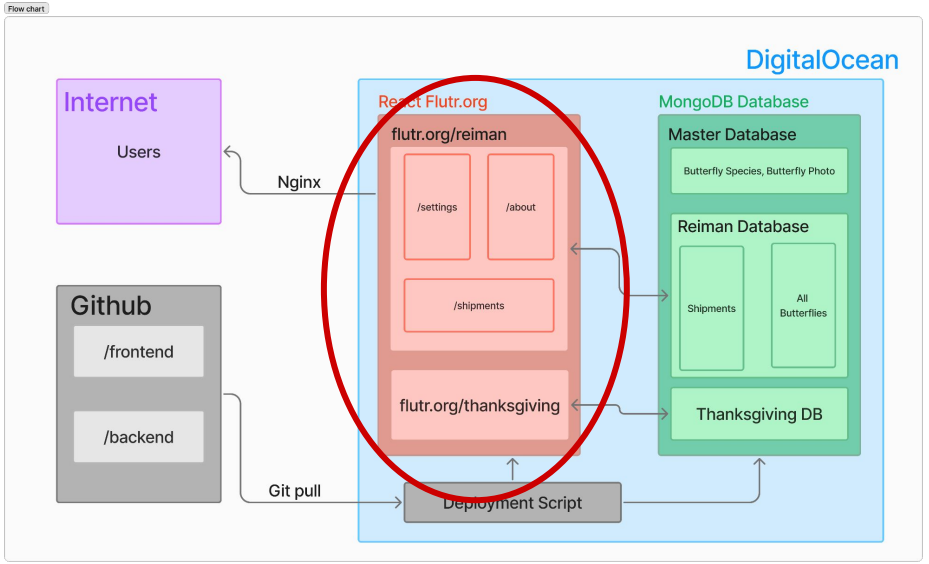
- Springboot handles data and places it into MongoDB databases
- Springboot handles API calls from frontend through VM port 8282
- MongoDB holds butterfly info, org info, etc



Design Overview

Frontend: React & Nginx

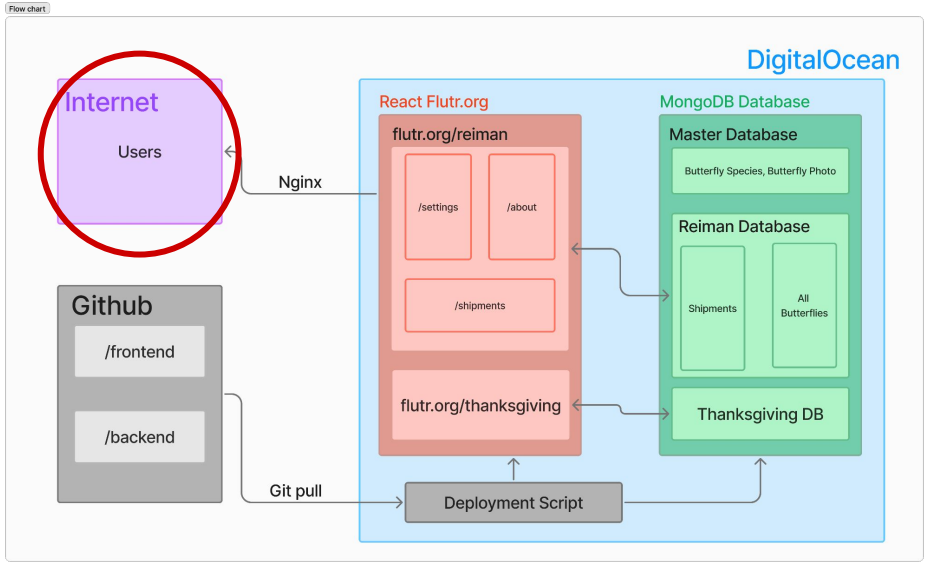
- React.js is the framework that our UI is based upon
- Nginx hosts the React.js application through the server's IP address



Design Overview

Users: Any Web Browser

- www.flutr.org
- Added HTTPS support



Frontend Overview

- Built In React.js
  - New Standard
  - Component Based
- 24 Unique Pages
- Fetch Library
- Pages Require Authorization

Frontend Tech

- Commonly Used Items as Components
- React-Router for Paths
- JWT in window.sessionStorage
- State for Inter-Page Context

Backend

- SpringBoot Backend and RESTful endpoints
- MongoDB multi-tenant database architecture
- DigitalOcean Cloud hosting, File storage and CDN caching with Spaces
- User Authentication using Json Web Tokens

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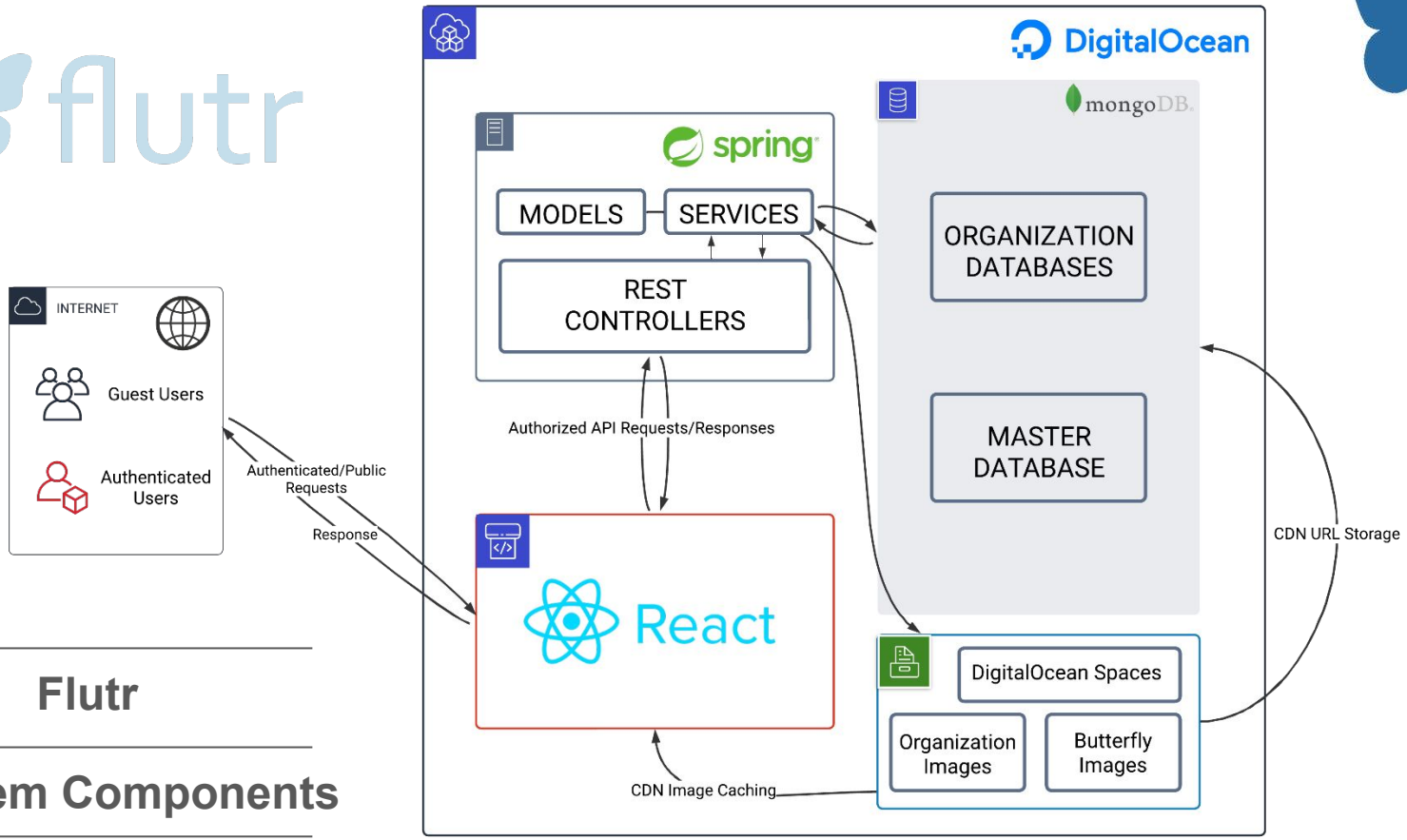
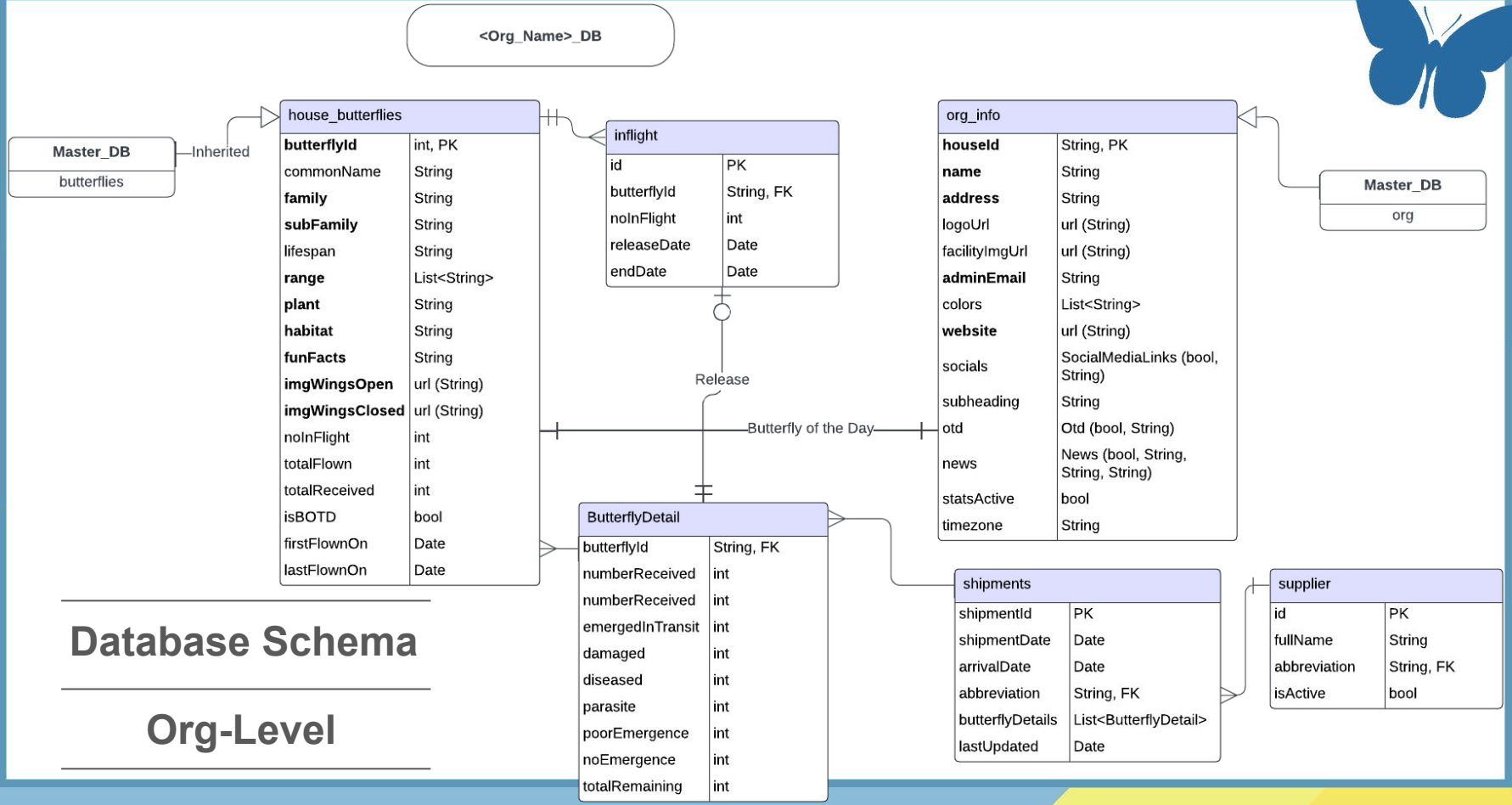
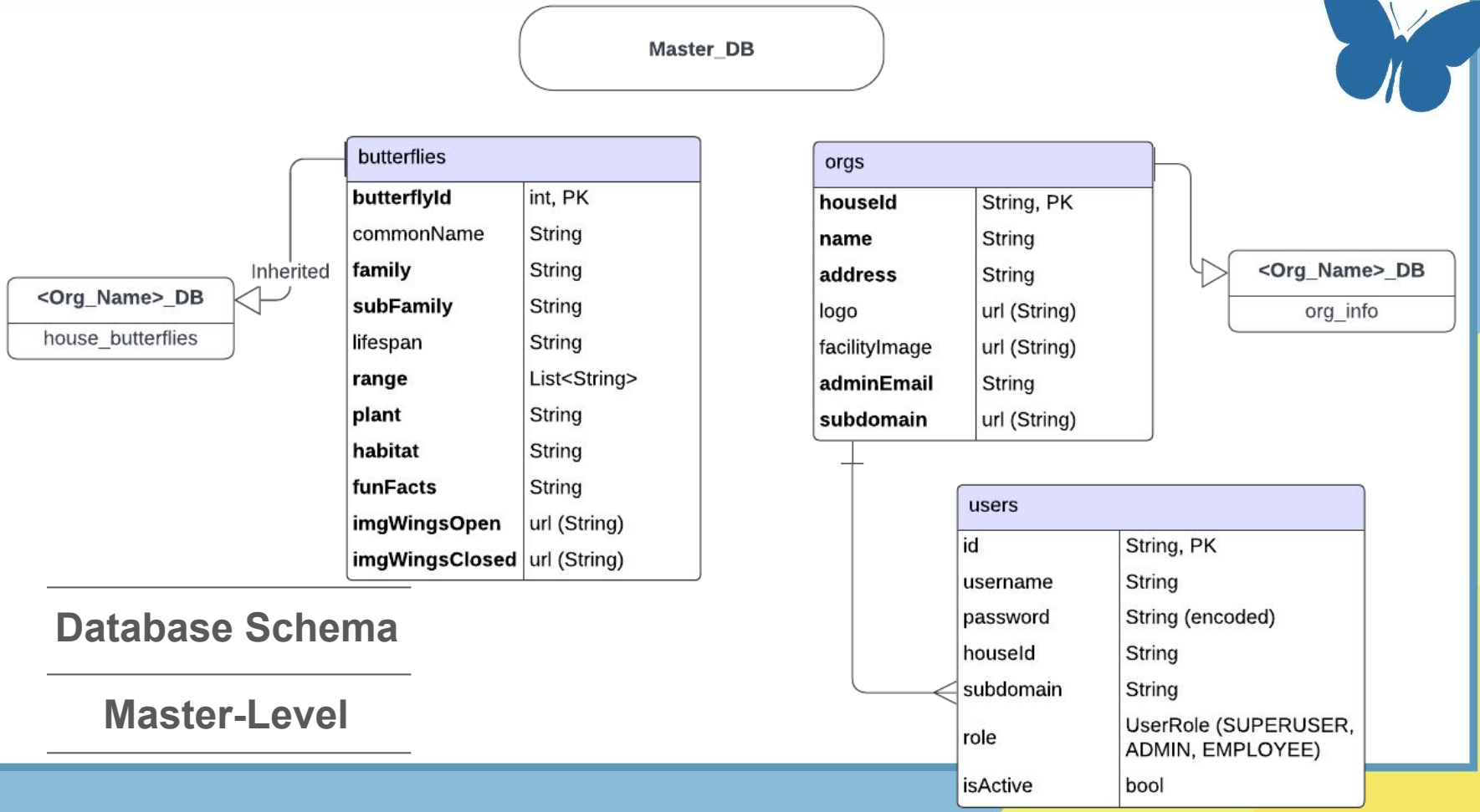
System Components





Database Schema

Org-Level



Database Schema

Master-Level

Final Progress - General Overview

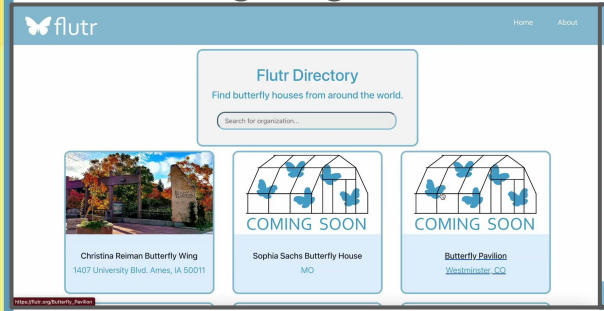
- Overview of project:
  - We have fulfilled every requirement for the entomologists and general public.
  - We have more organizations on board:
    - Omaha Henry Doorly Zoo & Aquarium
    - Tucson Botanical Gardens
    - The Butterfly Place (Westford MA)
  - We currently have 184 butterflies in the Christina Reiman Gardens gallery page
- Final Touches:
  - Our client will continue to import butterflies (pictures and information) into the system.
  - We are cleaning up some test environments.

Final Progress - Engineering Standards

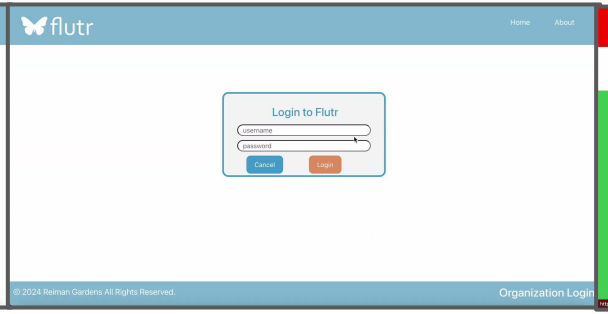
- IEEE 830-1998: Software Requirements Specification - Ensures that all parties have a clear, shared understanding of the software's functionality and non-functional properties.
  - Tracks butterfly release data (e.g., species, date, damaged, etc.).
  - Provides an interface for kiosk users to view current butterflies.
  - Exports data in USDA-compliant formats.
- IEEE 1012-2016: System and Software Verification and Validation - Establishes the processes and tasks for Verification and Validation.
  - Verification: Unit tests for each page (e.g., gallery, statistics, organization page, etc.).
  - Validation: Gathered feedback from entomologists to confirm Flutr meets their needs.

Demo Videos

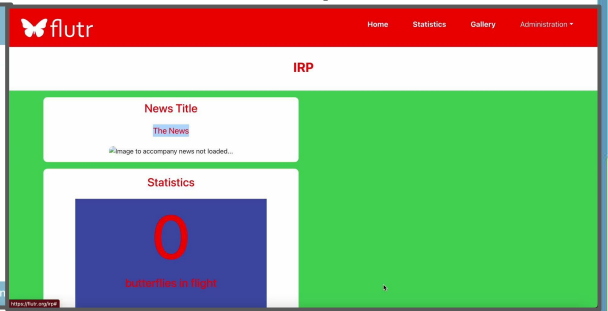
Creating Organization



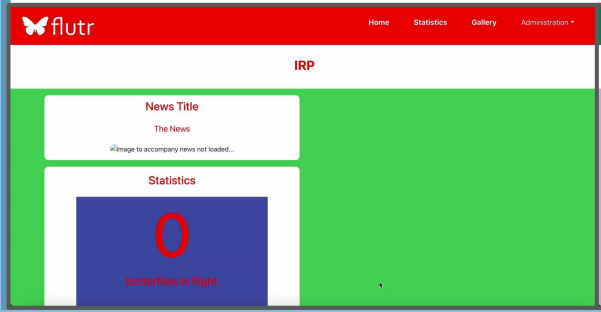
Edit



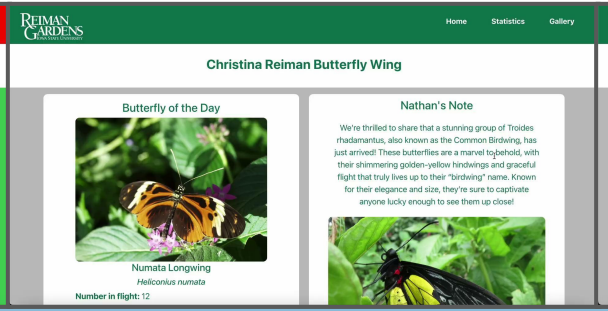
Add Shipment



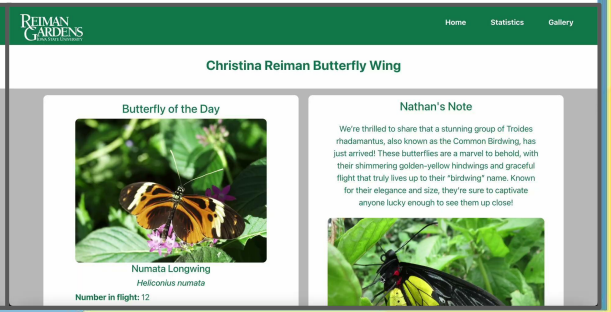
Make Release



Stats



Gallery



Thank You For Listening

Questions?