

CRAB CAKES



Team: Jered Angous, Daniel Arden, Alexander King, Anthony Narvaez

Sponsors: David Rogowski (AZGFD), Mara Dzul (USGS), Pilar Rinker (USFWS)

Mentor: Scott LaRocca

Motivation:

Researchers at the US Geological Survey, AZ Game & Fish Department, and US Fish & Wildlife Service are collecting vital data on endemic fish in the Colorado River to advise policy decisions.

However, they are currently using outdated, unmaintained software with an unintuitive interface, which slows down their research operations.

Solution:

We are building a modern, flexible data entry application with robust backups, customizable fields and full offline capabilities. This will remove data entry errors, eliminate reliance on outdated software and ensure that researchers can save and add data without the internet.

Key Features:

- Customizable fields for different study designs.
- Compatible with Bluetooth PIT Tag Readers.
- Auto-backup to external storage
- Export to .CSV File Format.
- Full offline capabilities for fieldwork.

Technologies:



Flutter



Dart

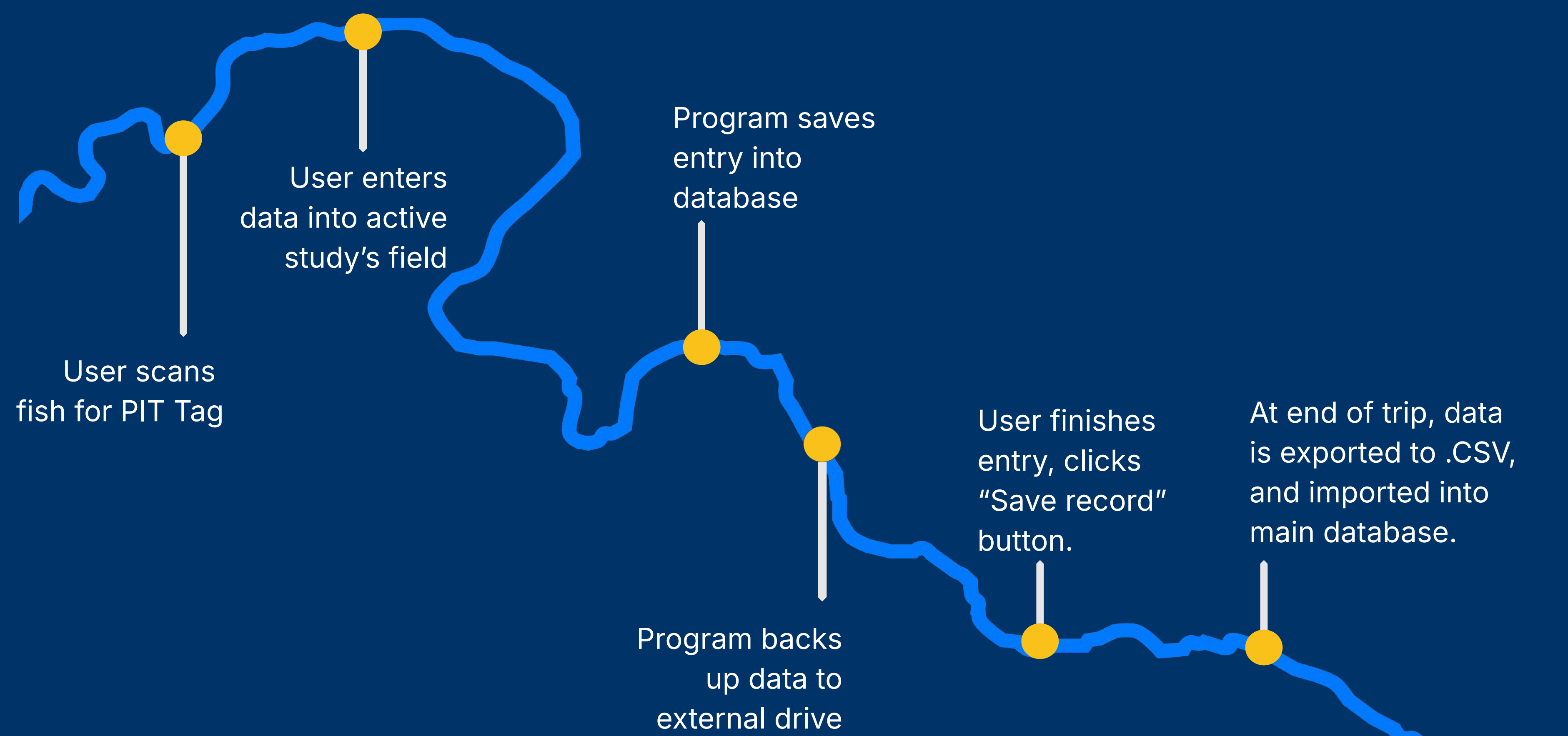


SQLite



Bluetooth

Data Flow:



Design approach: Clean Architecture

Clean Architecture separates concerns and follows the single responsibility principle allowing for easy development, maintenance, and long-term scalability.

Domain:

The Language

- Provides the **ground truth** rules for the application
- Defines the classes and structures that the application interacts with.

Application:

The Orchestrator

- Controls access to infrastructure tools using interfaces
- Contains application use cases (saving a record, connecting the scanner, etc.)

Infrastructure:

The Tools

- Contains app-level interface implementations
- Contains external tools/dependencies (SQLite, Bluetooth API, etc.)

Presentation:

The Face

- Builds and manages the User Interface
- Controls the state and behavior of UI screens and components

Challenges:

- **Application Flexibility:** Dynamic Fields supports a variety of data entry needs
- **Ensuring Future Maintainability:** Modern tools and clean architecture improve longevity
- **Version Control Recovery:** We restored lost files and strengthened Git practices

Future Work:

Future development includes historical database comparison, enhanced screen layout customization, and a more advanced constraints system to reduce data-entry mistakes.

Conclusion:

Our team developed a tool that streamlines data collection for researchers, helping inform policy decisions while providing a modern and maintainable platform that will support continued research on the Colorado River for years to come.

