

Project Plan Presentation

Clean and Sterilized Instrumentation

The Capstone Experience

Stryker IST

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From Students...
...to Professionals

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Project Sponsor Overview

- Sponsor: **stryker**
- Global Leader in Medical Technologies
- Medical & Surgical Equipment, Neurotechnology and Orthopedic Products
- Mission: Together with our customers, we are driven to make healthcare better



Project Functional Specifications

- Problem: Human error in cleaning process leaves surgical tools unusable for future operations
- Solution: Tablet monitoring system
- Detects soiled, broken, misplaced tools
- Notifies staff through app



Project Design Specifications

- Package Error Checking
- Data Collection
- History/Past Data
- Package Database
- OR and SPD Roles

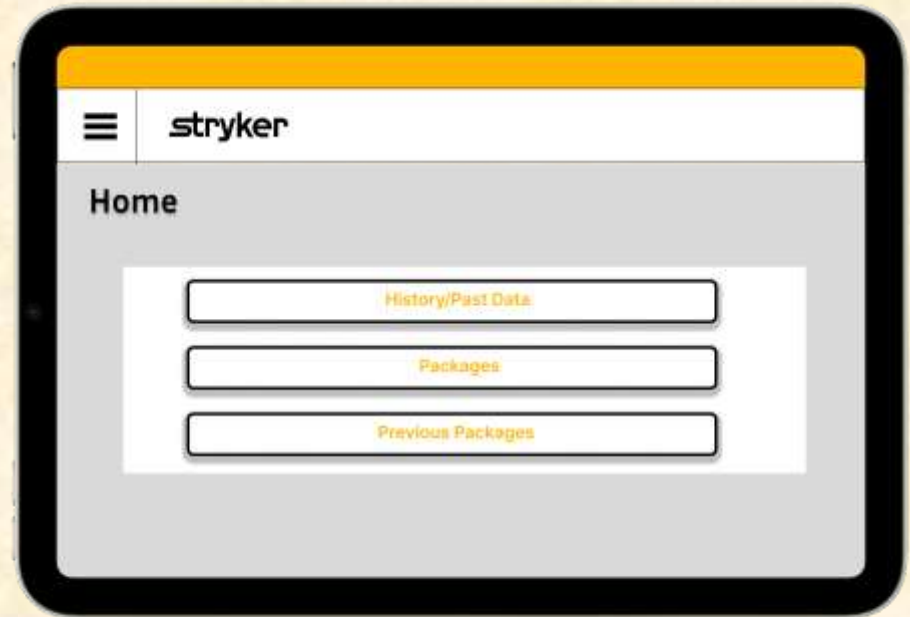


Screen Mockup: SPD & OR Home Page

SPD Home Screen

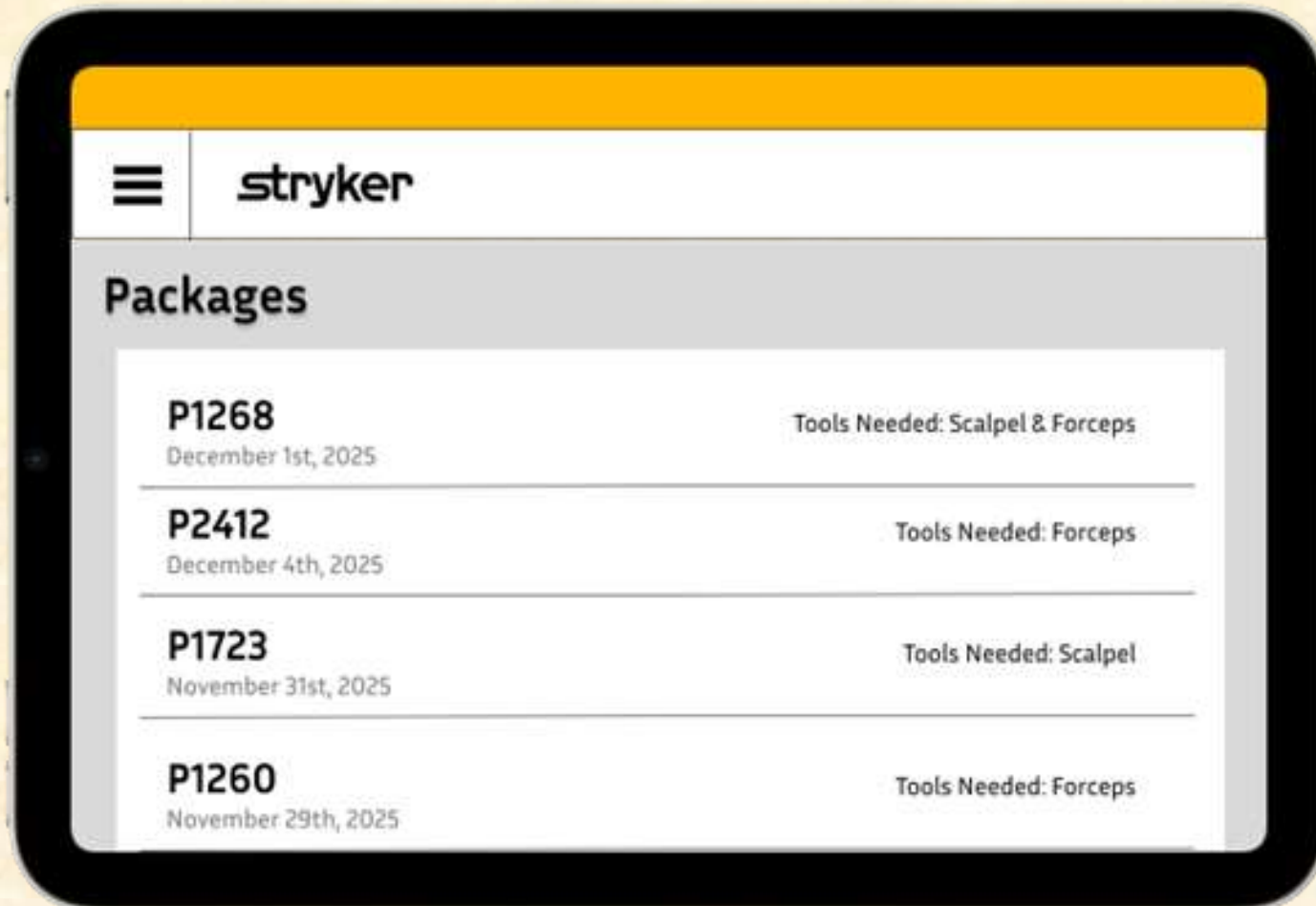


OR Home Screen

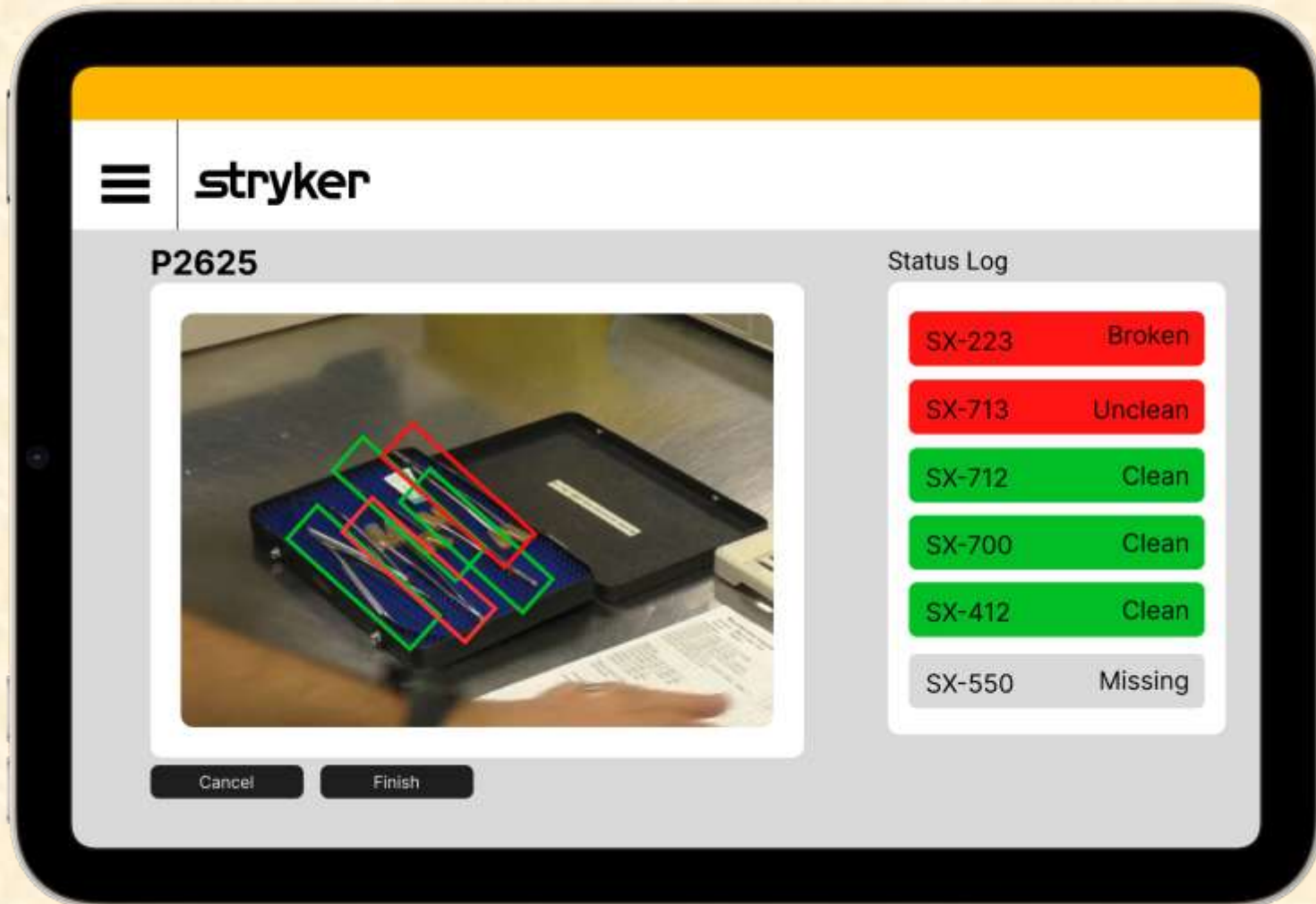


Screen Mockup: Packages Page

Section 1

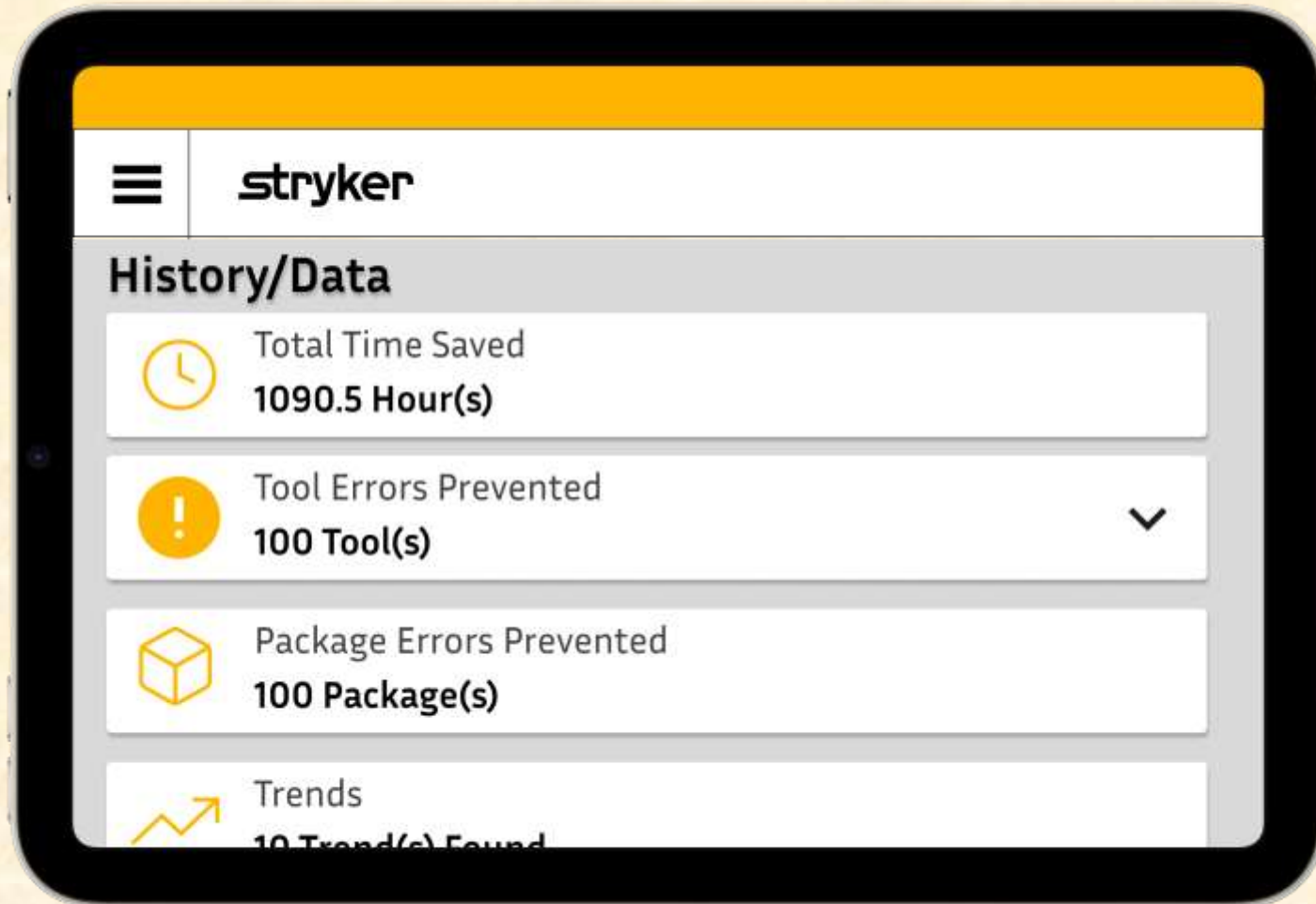


Screen Mockup: Camera Page



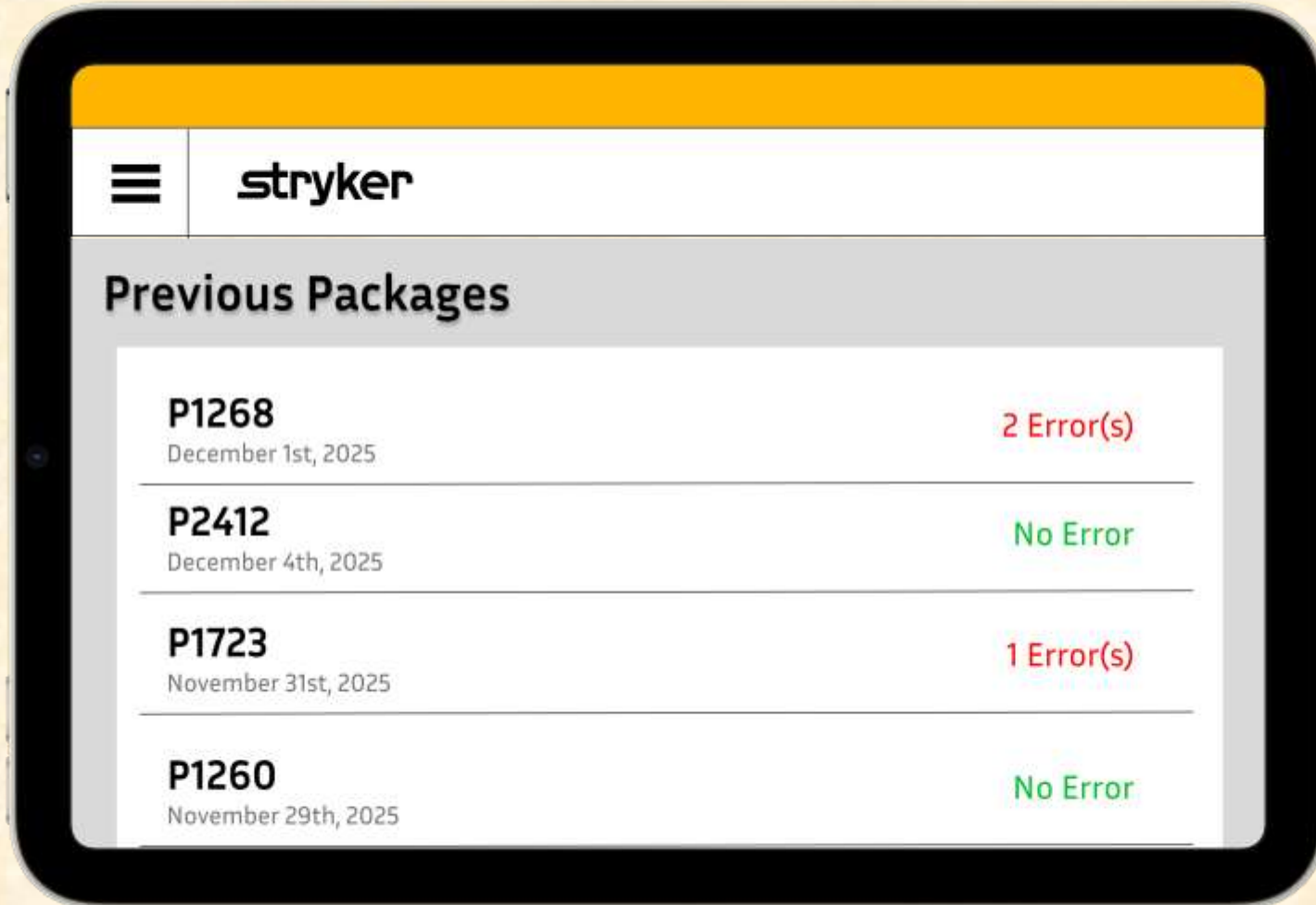
Screen Mockup: History/Data Page

History/Data



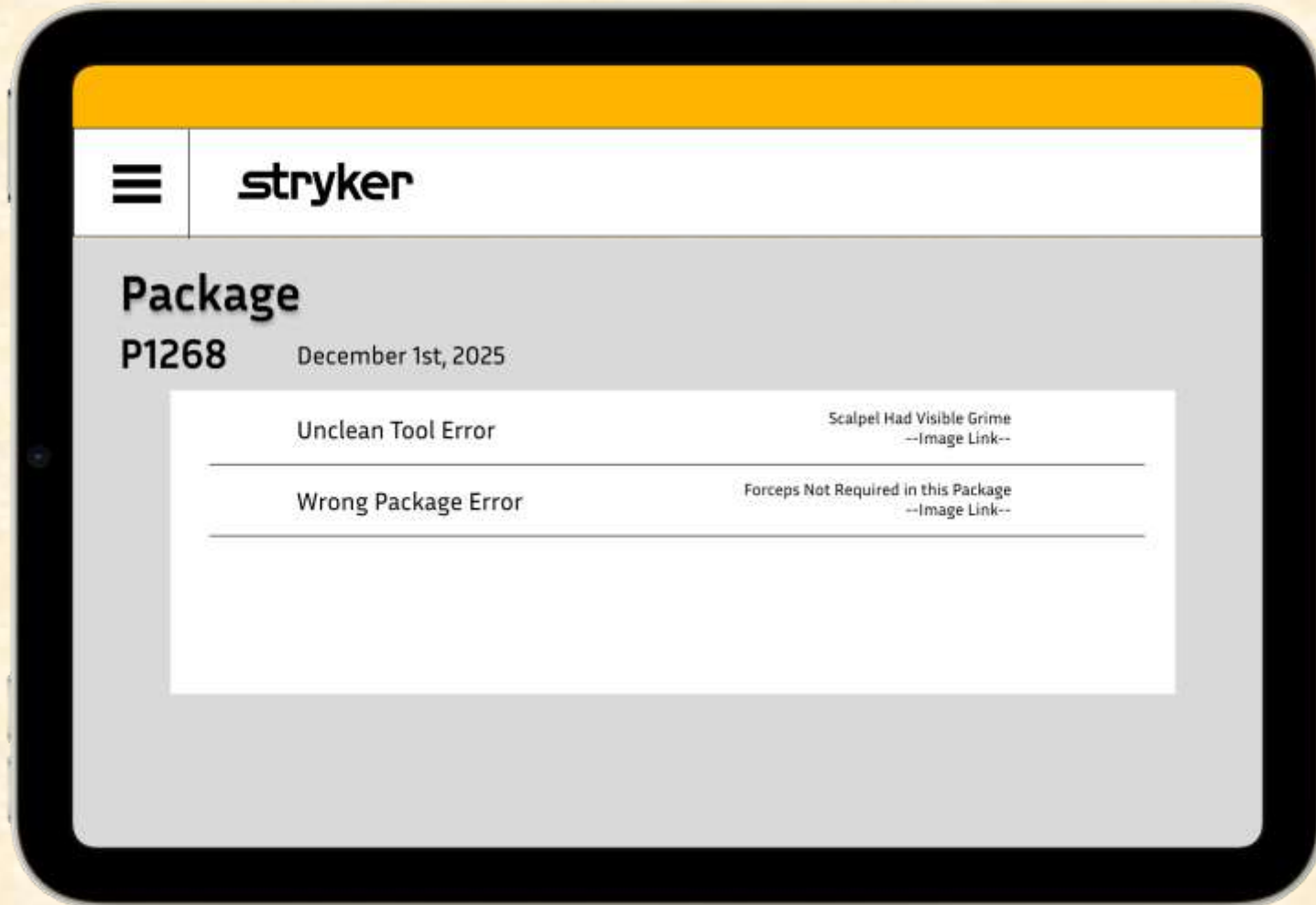
Screen Mockup: Past Packages Page

Previous Packages



Screen Mockup: Package Page

Package Data

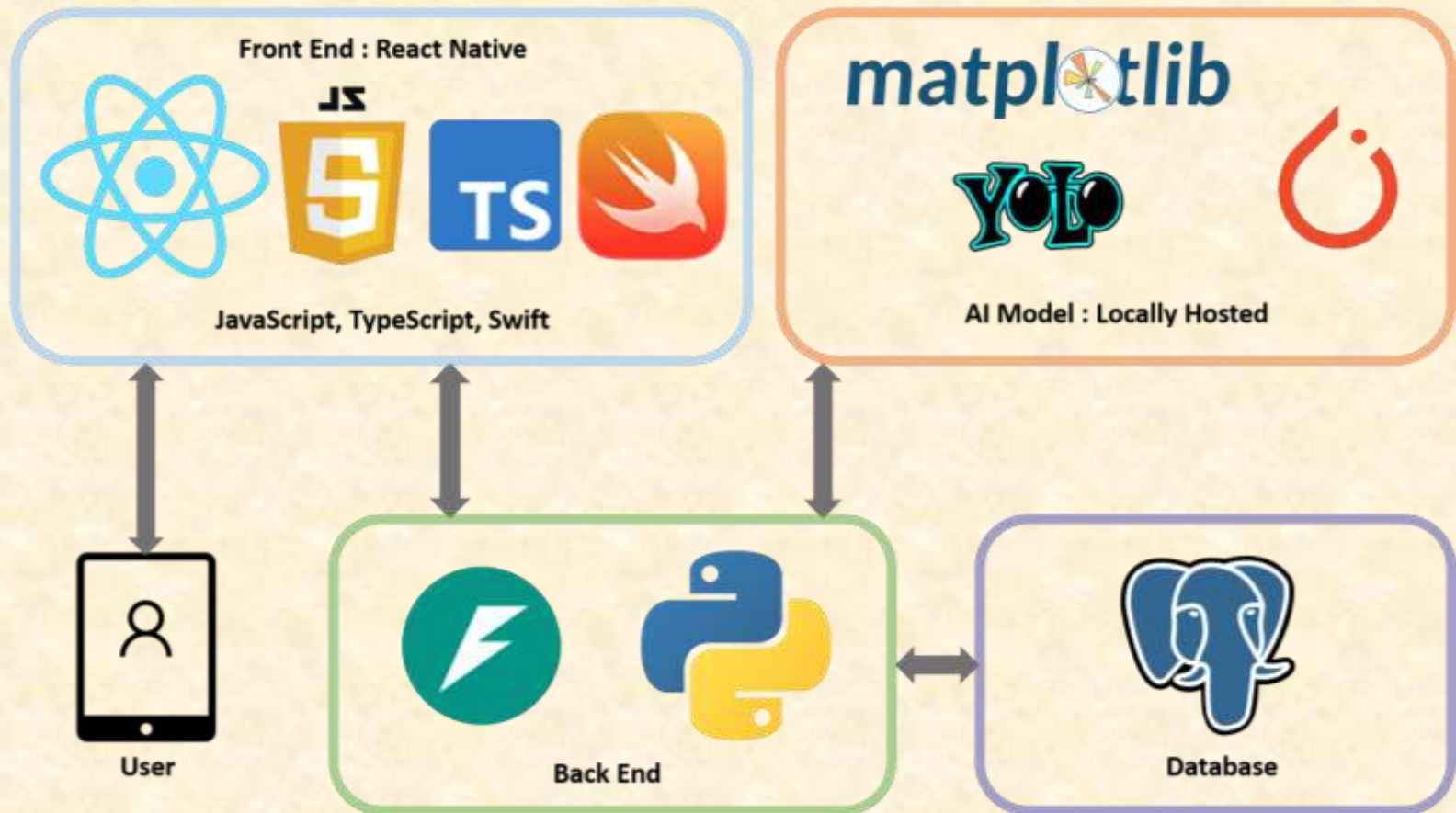


Project Technical Specifications

- Front end:
 - React Native
- Back end:
 - Python
 - FastAPI
 - PostgreSQL Database
- AI/Machine Learning:
 - PyTorch
 - YOLO



Project System Architecture



Project System Components

- Hardware Platforms
 - Tablets (iOS, Android)
 - Local machine hosts AI model
 - Remote Postgres Database
- Software Platforms / Technologies
 - React Native
 - Python and FastAPI
 - PostgreSQL
 - PyTorch and YOLO



Project Risks

- Data Acquisition Risk
 - We have insufficient tool images for training our AI/ML model
 - We will compile images and ways to simulate soiled tools
- Artificial Intelligence and Machine Learning Risk
 - Our AI/ML model needs to be fast and responsive for video processing
 - We will train our model with tool and package images, keeping the scope of the model minimal
- Sterile Processing Department Environment Variability Risk
 - SPDs within hospitals have different layouts and lighting conditions
 - Test and train in variable lighting, different tray layouts, and different levels of cleanliness of the camera lens
- Quantitative Results Tracking Risk
 - Our application needs to track quantitative data that Operating Room managers assess
 - We are working with Stryker to get the best estimates of data



Questions?

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