MICHIGAN STATE UNIVERSITY

Project Plan Presentation

Smart Dashboard Monitoring Platform

The Capstone Experience

Team Amazon

Eduardo Ferdinandi

Siddarth Akalankam

Ryan Pham

Aditya Butle

Rishon Casson

Attulya Pratap Gupta

Department of Computer Science and Engineering

Michigan State University

Spring 2026

From Students…

…to Professionals

Project Sponsor Overview

Sponsor Overview

- **Founded 1994** - Garage startup to $2 trillion tech giant
- **AWS Cloud Leader** - 30%+ global market share, powers Netflix, NASA, Fortune 500
- **Innovation DNA** - Pioneered one-click purchasing, Prime delivery, serverless computing
- **Core Principles** - Customer obsession & operational excellence drive every decision







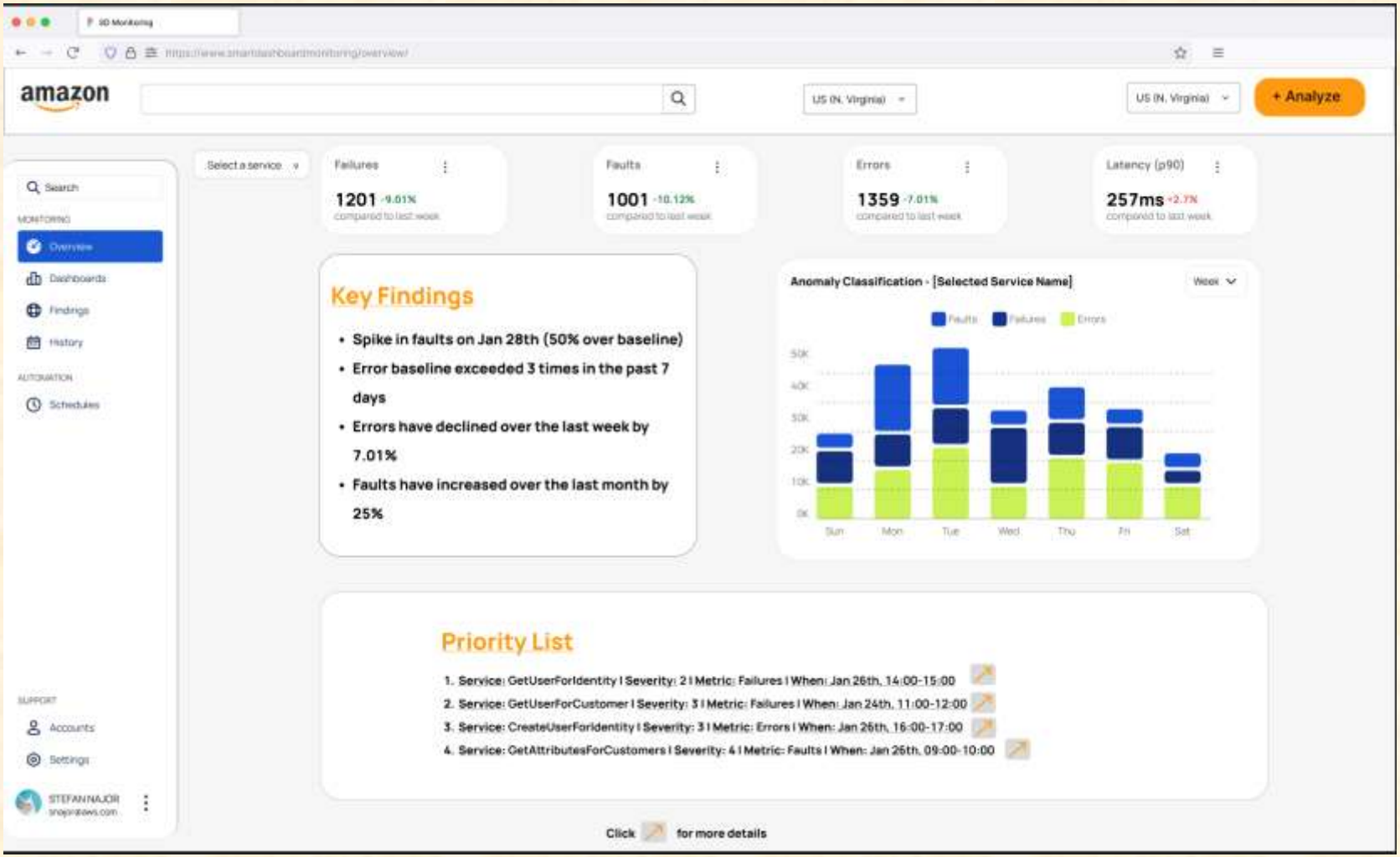
Project Functional Specifications

- Automates manual dashboard reviews for anomalies through ML and calculations
- **Saves 80% of Daily Review Time** - Eliminates 80-120 minutes of manual dashboard monitoring per team, freeing engineers for feature development
- **Catches What Humans Miss** - 95%+ anomaly detection accuracy vs 80-85% human accuracy, especially during high-traffic periods
- **Prevents Alert Fatigue** - AI filters noise and surfaces only genuine anomalies with severity rankings and investigation guidance

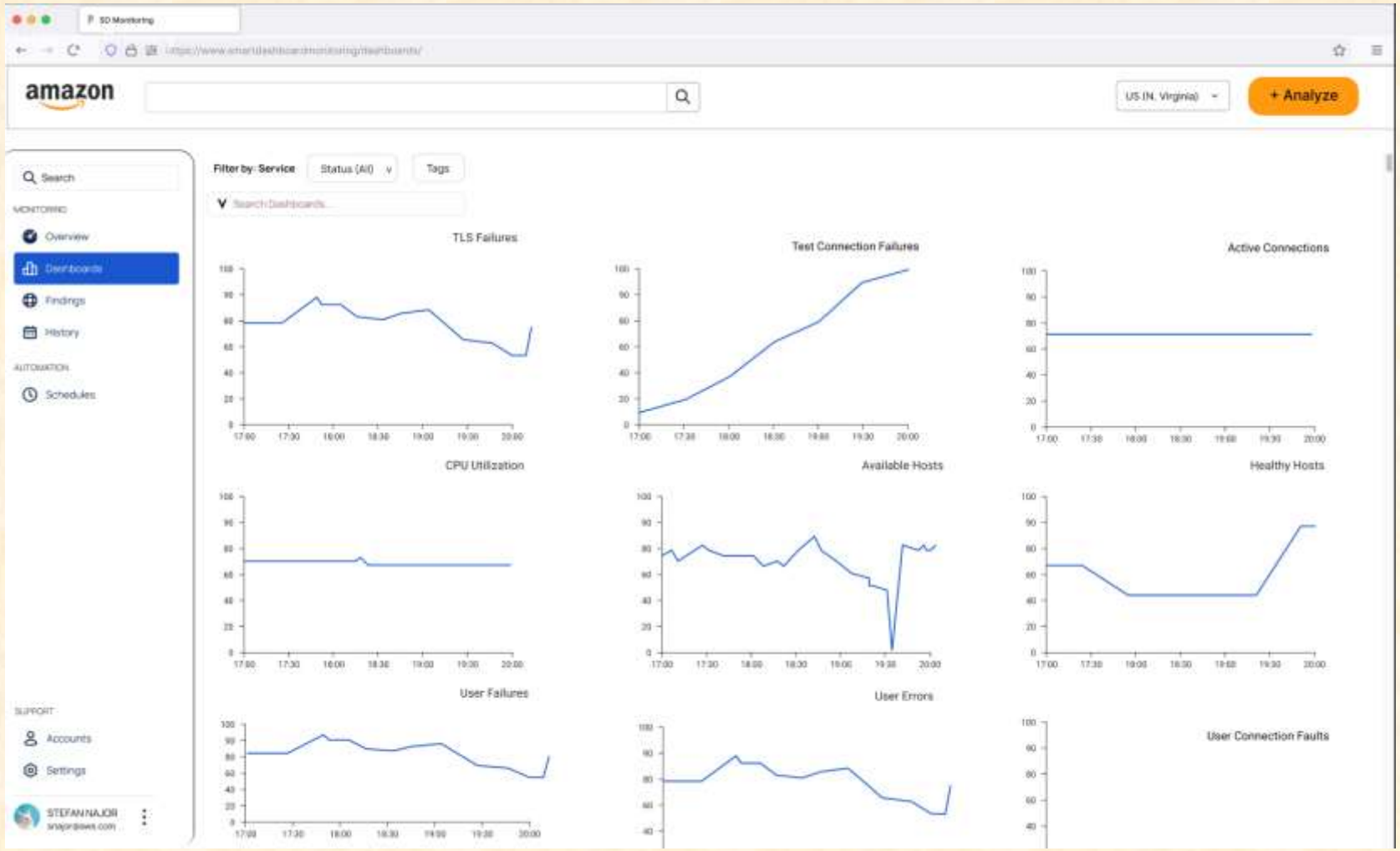
Project Design Specifications

- **Multi-Input Analysis** - Upload dashboard screenshots (Rekognition OCR) or CSV/JSON/XML data files (time-series analysis)
- **AI-Powered Detection** - SageMaker ML models identify spikes, drops, and trend anomalies with 95%+ accuracy
- **Smart Findings Management** - Auto-generated findings with severity rankings, organized by service/dashboard/tags
- **CloudWatch Integration** - Scheduled analysis via EventBridge, real-time alarm notifications, direct API queries
- **Enterprise Security** - AWS Cognito authentication, role-based access control, team-based data isolation

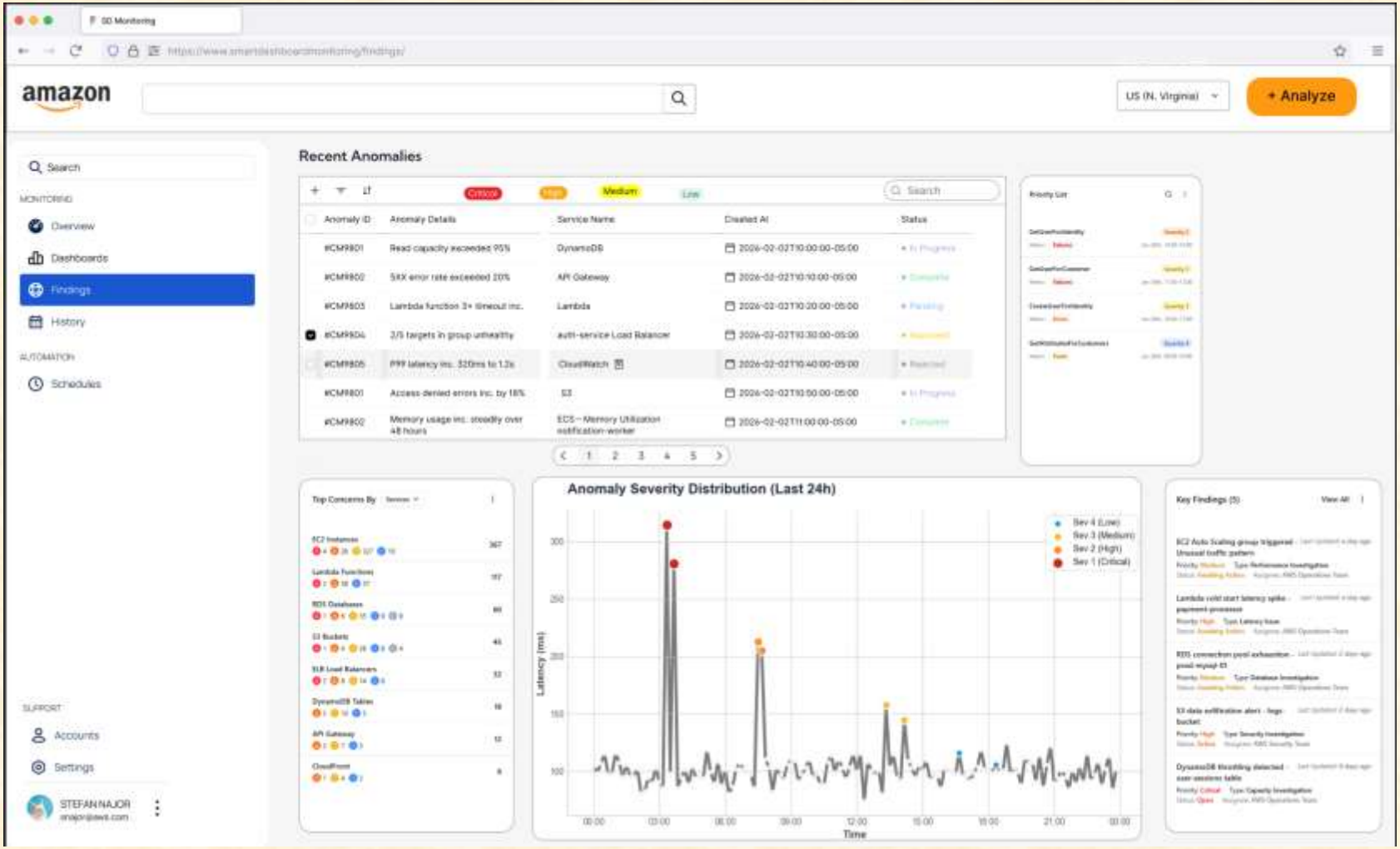
Screen Mockup: Overview Page



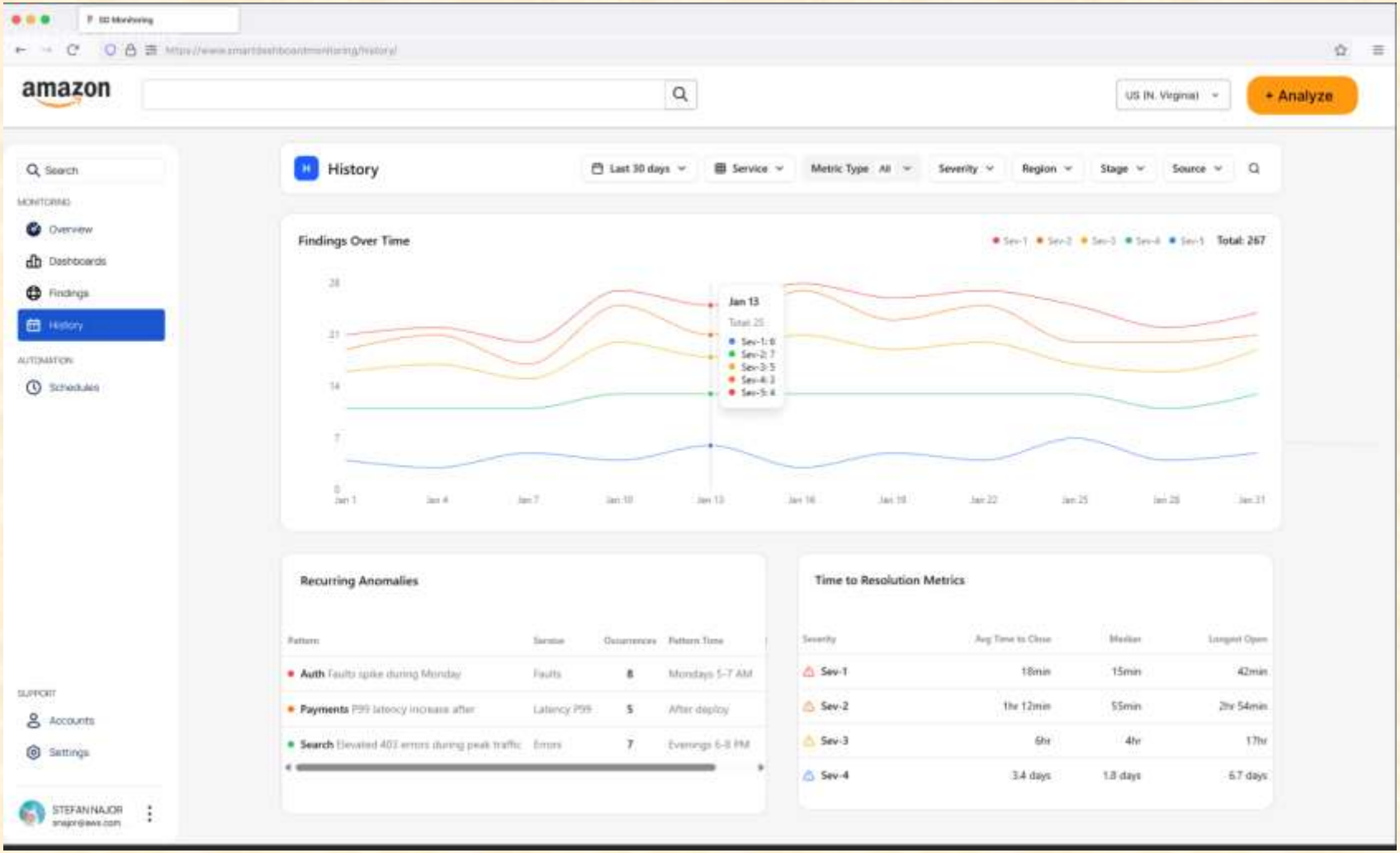
Screen Mockup: Dashboard



Screen Mockup: Findings



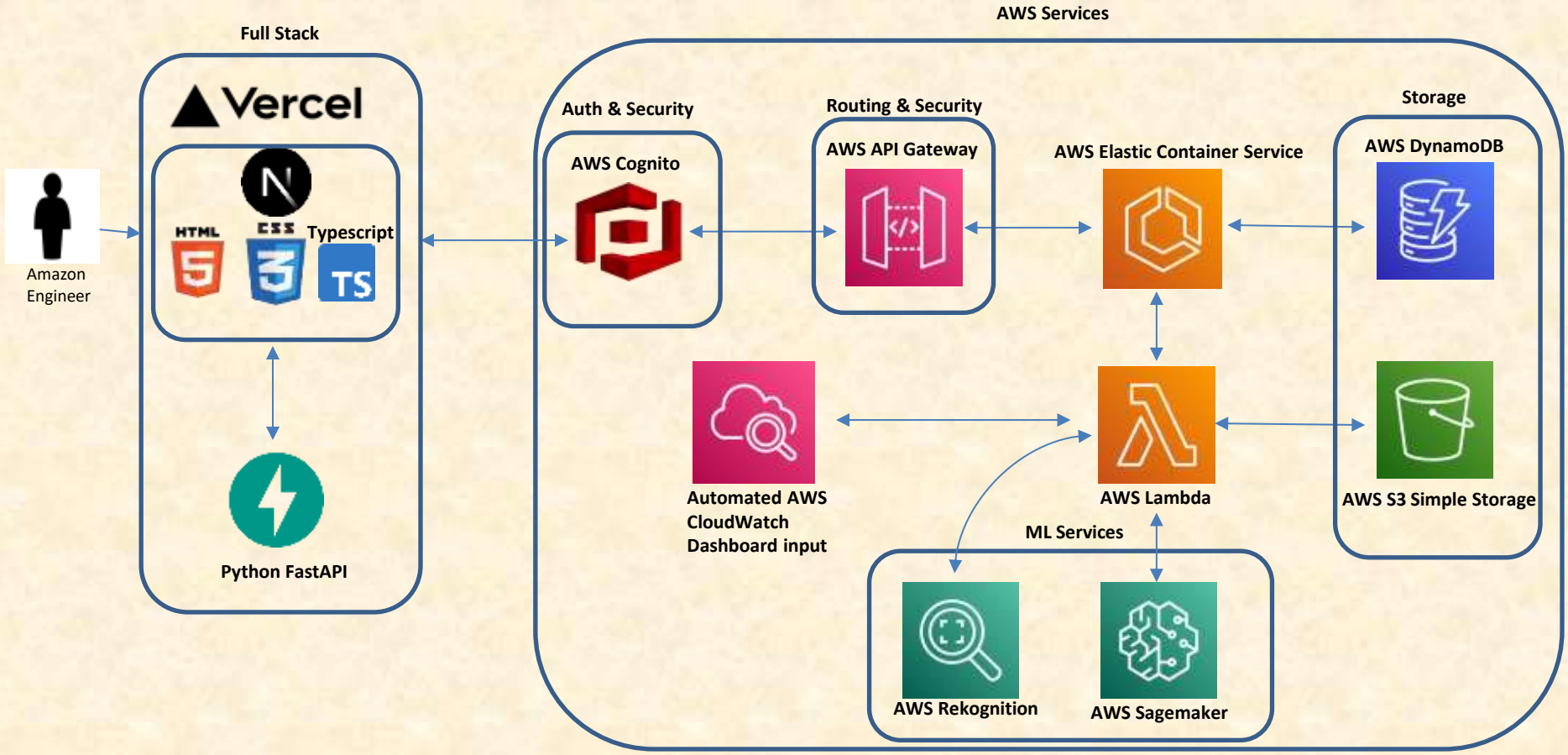
Screen Mockup: History



Project Technical Specifications

- Required Technologies:
  - AWS Lambda - Serverless compute for image processing and analysis workflows
  - AWS Rekognition - Computer vision for dashboard image analysis
  - AWS SageMaker - Custom ML model hosting and training for anomaly detection
  - AWS S3 - Frontend hosting and storage for uploaded images/data
  - AWS Cognito – User authentication and security
  - AWS API Gateway - RESTful API endpoints for web interface
  - AWS CloudWatch - Monitoring, logging, and cost tracking
  - AWS CloudFormation or CDK - Infrastructure as code for deployment
  - AWS DynamoDB
- Tech Stack:
  - Backend: Python, FastAPI, Docker
  - Frontend: TypeScript, HTML, CSS, React, Next.js

Project System Architecture



Project System Components

- Hardware Platforms
  - iOS
  - Windows
  - MacOS
  - Etc…
- Software Platforms / Technologies
  - AWS Services (Functions, DBs, Object storage, ML Platforms, User Auth)
  - Docker
  - TypeScript, HTML, CSS, Next.js, React, Python
  - Etc…



Project Risks

- High Usage Costs
  - Using different AWS services in conjunction can potentially lead to high usage costs
  - Setup budgets, limits, and notifications
  - Rate Limiting
  - Best AWS practices for cost-efficient development
- Error Rate Threshold for Anomaly Detection
  - Need to figure out the number of spikes before reporting anomalies
  - Speak with client and run different tests to find patterns
- Image Recognition Accuracy
  - The image recognition model needs to be reliable enough to properly read graphs
  - Compare the real data to the dashboard image and fine tune to be consistent
- Implementing completely automated version
  - So that engineers don't have to manually download and upload files
    - We won't have access to the actual dashboard with the data graphs
  - We will have to create our own dashboard with graphs using AWS CloudWatch with sample data and implement the automated anomaly checking there

Questions?

