MICHIGAN STATE UNIVERSITY

Project Plan Presentation

Automated Damage Logging for Truck Drivers

The Capstone Experience

Team RPM

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From Students…
…to Professionals

Project Sponsor Overview

- RPM is a non-asset based logistics company specializing in freight and vehicle transportation.
- Founded in 2012 and based in Birmingham, Michigan.
- Facilitates the movement of over 600,000 vehicles annually across North America and Europe and has network of over 40,000 drivers.

Project Functional Specifications

- Truck drivers must log the damages on cars they transport. Currently that logging is done manually.
- RPM wants to automate this process to streamline their logging process and increase accuracy of reports
- Our project is to build a mobile app that leverages machine learning to automatically identify and log damages on cars using images.

Project Design Specifications

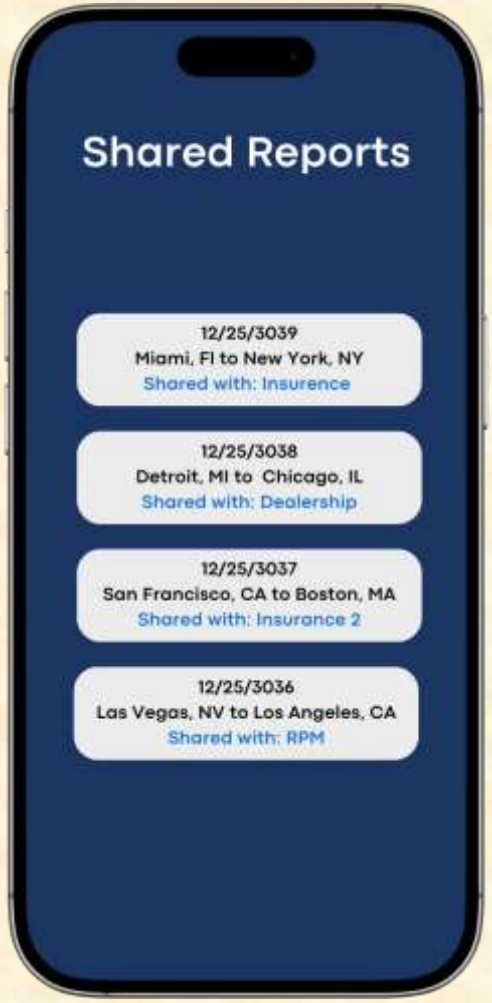
- The app will have an intuitive and user-friendly interface, allowing drivers to quickly record damages, input necessary details, and store reports securely.
- The website will display report analytics and data as well as a simple interactive interface using PowerBI.

Screen Mockup: Home Page & Past Transports

Screen Mockup: New Transport Page

Screen Mockup: Camera Logging Page

Screen Mockup: Shared Reports Page

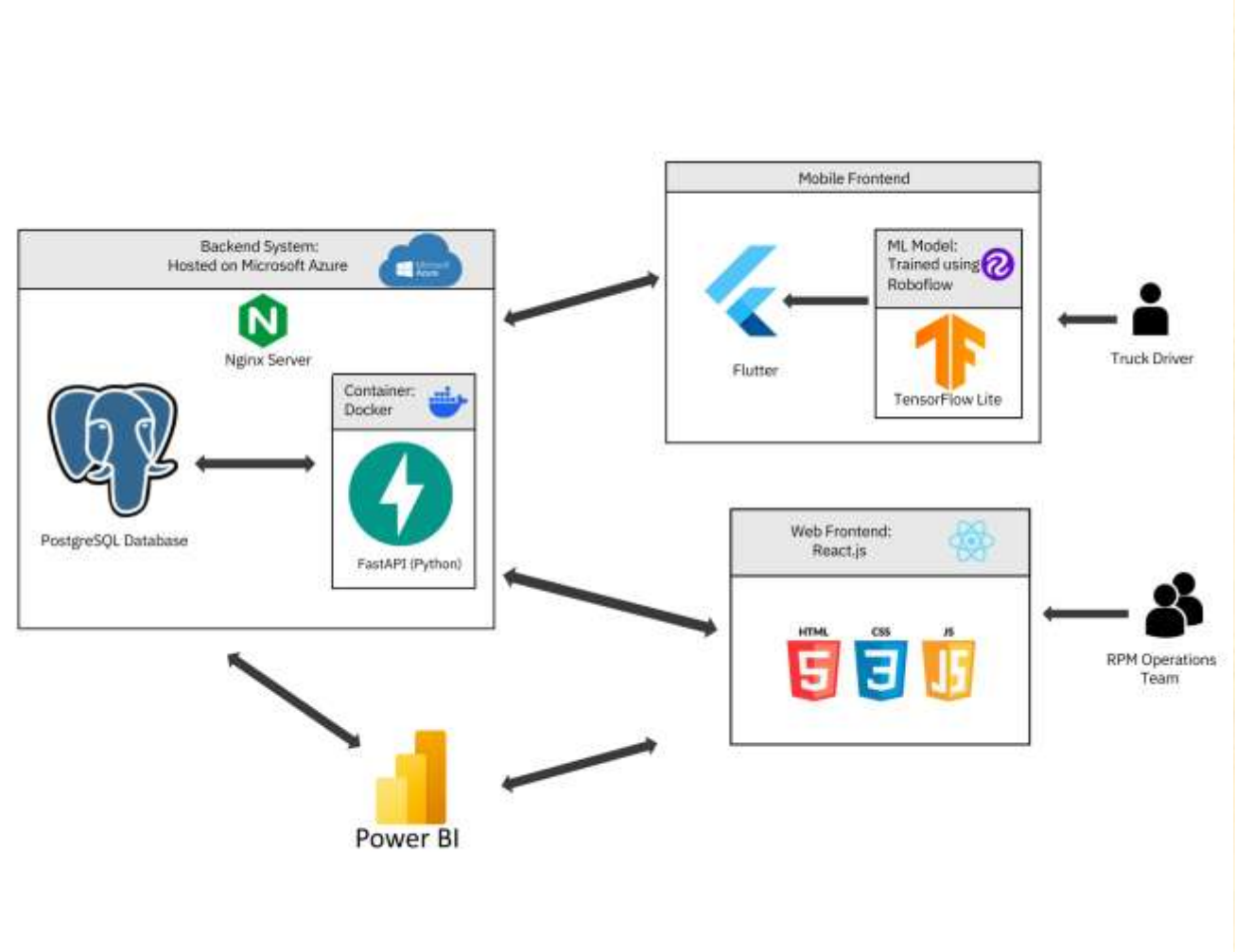


Screen Mockup: Power BI Web Interface

Project Technical Specifications

- Flutter-based mobile application for truck drivers.
- Web-based analytics platform (React + Power BI) will allow RPM to monitor damage trends and generate insights.
- FastAPI backend will handle report submission, data storage, AIAG code management, and analytics integration.
- ML model runs on-device ensuring real-time damage detection without relying on server-side inference.

Project System Architecture



Project System Components

- Hardware Platforms
  - iMacs in the lab
- Software Platforms / Technologies
  - Flutter
  - FastAPI
  - PostgreSql
  - Azure
  - TensorFlow Lite
  - React

Project Risks

- Obtaining an accurate model
  - Mitigation: train, test, and optimize different models to find the ideal one
- Running the model on device while increasing speed
  - Mitigation: write SWIFT code and connect it to Flutter
- Difficulty accurately mapping AIAG codes
  - Mitigations: Optimize the data set to match the AIAG codes;
  - Use the output of the model to map it to the AIAG codes
- Making the automation real time
  - Mitigation: fall back would be to make automation not real time

Questions?