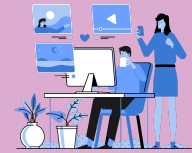# NWU®

ANDROID-POWERED FLEET TRACKING

Trucking companies need to track their fleets

Trucking fleet managers need to monitor and track their fleets, alllowing them to ensure their truckers are
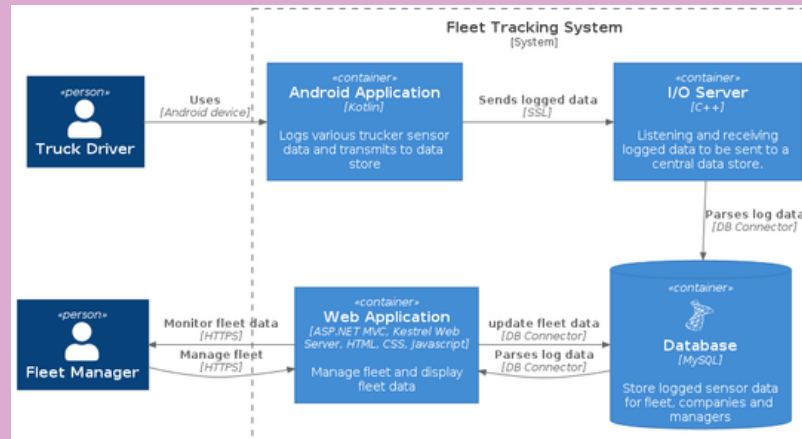
- driving to the correct locations
- not stopping for excessive amounts of time
- driving in an appropriate manner, at steady and appropriate speeds

A tracking system which provides this information will allow trucking companies to minimize losses and operate efficiently.

Fleet Tracking System [System]

«person»
Truck Driver

Uses [Android device]

«container»
Android Application [Kotlin]
Logs various trucker sensor data and transmits to data store

Sends logged data [SSL]

«container»
I/O Server [C++]
Listening and receiving logged data to be sent to a central data store.

Parses log data [DB Connector]

«person»
Fleet Manager

Monitor fleet data [HTTPS]
Manage fleet [HTTPS]

«container»
Web Application [ASP.NET MVC, Kestrel Web Server, HTML, CSS, Javascript]
Manage fleet and display fleet data

update fleet data [DB Connector]
Parses log data [DB Connector]

«container»
Database [MySQL]
Store logged sensor data for fleet, companies and managers

Solution

- **Android App** tracking and logging **acceleration, altitude, location and speed**, stored locally when there's no network
- **Input/Output Server** relaying data to/from Android App to central data store.
- **Database** storing log data
- **Web Application** allowing managers to manage and view log data of their fleets, ensuring truckers behave correctly

Design/Implementation Approach

- Hypothesize high-level architecture and main components, and choose suitable technologies
- Design software classes using good design principals in sub-system design, achieving modular scalable software systems
- Incremental development and testing, using version control
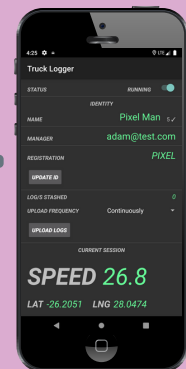
C++ for fast servers

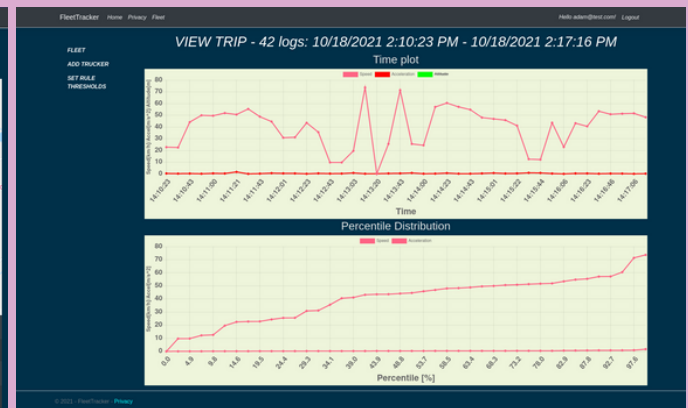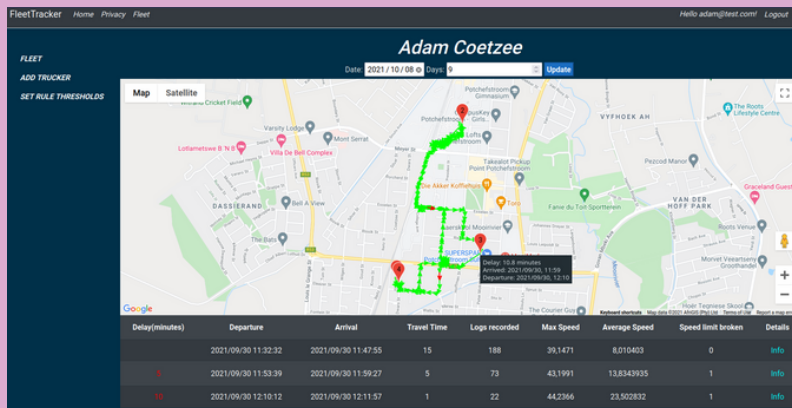Kotlin for Android Applications

DEVELOPED WITH

ASP.NET with JavaScript for web apps

MySQL database

How it works!

Truckers install the Android App

Truck Logger
STATUS — RUNNING
IDENTITY
NAME — Pixel Man
MANAGER — adam@test.com
REGISTRATION — PIXEL
UPDATE ID
LOG'S STASHED — 0
UPLOAD FREQUENCY — Continuously
UPLOAD LOGS
CURRENT SESSION
SPEED 26.8
LAT -26.2051 LNG 28.0474

Monitor/manage/ view truckers in your fleet and check their activity

Conclusions

- The tested solution successfully logs the required variables to a satisfactory accuracy (location within 20 meters)
- I/O server and web application enjoy 100% uptime. Android application performs well on Android 10
- Truckers can use **one device** to perform all activities dependent on software, including stock tracking, communication **and tracking,** appealing as a **budget-conscious** solution
- Truckers must operate their devices properly, and ensure full charge and constant running of the application
- Further improvements to robustness and up-time can make this an interesting solution to tracking.

Adam Coetzee – Supervisor: Prof W Venter