Radio-Frequency Identification (RFID) Project

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Background

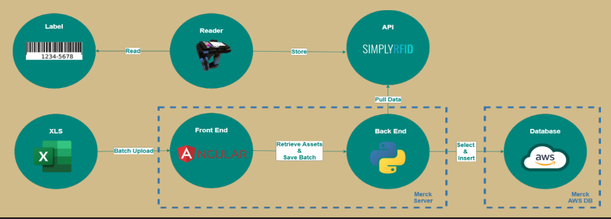
Background:
Merck is a multinational research-intensive biopharmaceutical company that works to develop medicines and vaccines.

Problem:
- Lack of standardization in sample storing
- No geolocation system for sample storing
- Lack of data integration systems with Merck and vendor data streams

Project Goal:
Build a dashboard that displays location and other data from RFID tags scanned within Merck facilities

Solution Overview

- Web app displaying location and data of RFID tags scanned at the Merck HQ
- Python script for batch uploading CSV files of scanned RFID tag to a PostgreSQL DB
- Developed a Python script that updates RFID Tags within the PostgreSQL DB whenever the RFID scanner scans a tag.
- Angular CLI, Node JS and the Google Maps API for a platform for Visuals
- Utilized GeoJSON for scanner and zone divisions within the floors
- Process depicted below



Dashboard Features

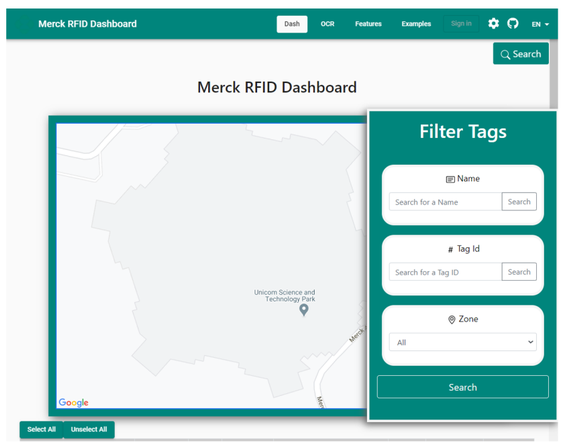
Plotting:
Selected data will be plotted using the coordinate locations on the map

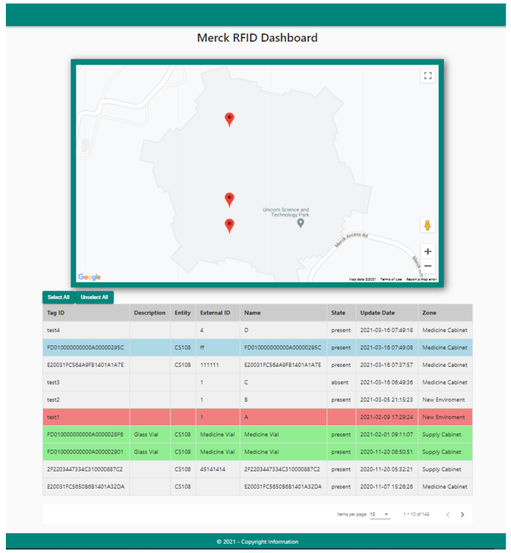
Searching/Filtering and Highlighting:

Search for characteristics such as name, tag ID, and zone and see them highlighted by color in the datatable

Batch Uploads:

Can select multiple files or directories to import onto the dashboard in order to all be processed.





Conclusions

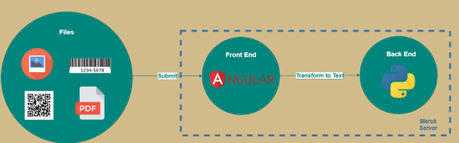
Conclusions:
- The Development of such a dashboard required a large deal of time and resources
- Overall, a connection was able to be established through the utilization of a variety of tools in the back-end which allowed flexibility in data display for the front end

Future Goals:
- The code implemented within the project can be applied to different locations and serves as a foundation for more advanced functions in the future such as item tracking or representation in a 3D space.

OCR Side Project

Project Goal:
Transform pictures of lab reports, QR/Barcodes and PDF to text for easier analysis and storage of data.

Methodology:
- Import image files using OpenCV
- Conduct Preprocessing on image
- Use OCR methods to extract text from images or obtain data from barcodes.
- For PDFs, transform to text
- Extract and keep PDFs which have valid parameters



Conclusion:
The current implementation works only with higher lighting environments, and requires flat labels. Curved labels wrapped on containers, is a problem still unsolved.

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