Work Orders Integration System

Functions: These are run in this order in a main function.

1. **Get Freightliners and Trailers:**
   - Gets the Freightliner and Trailer assets from eMaint.
   - **Returns: Pandas Data Frame with columns:**
     - ‘c_description': Number of the truck (ex: C19 - Mill Mountain).
     - 'c_assettype': The type of asset (either 'Freightliner' or 'Trailer').
     - 'id': The unique identifier of the asset.

2. **Get Motive Data:**
   - Gets inspection reports created within the last day from Motive.
   - Stores the reports if they have a major or minor issue associated with them.
   - Checks if the inspection reports have not been uploaded to eMaint already:
     - Check if each issue was reported more recently than the latest eMaint Base Truck Work Order or Work Order Request.
   - **Returns: List of inspection reports that have major/minor issues that have not already been put on eMaint.**

3. **Convert to Post: (Given result of Get Motive Data and Get Freightliners and Trailers)**
   - Given the Motive data and assets data from eMaint.
   - For each inspection report that needs to be uploaded as a work order: Create the work order payload
     - Get the asset id: Match motive truck name with an eMaint asset using ‘c_description’ and get the corresponding ‘id’ of the asset.
     - Build the description and notes from the motive report.
     - Create the base payload:
       - Add form id and requested on date if it is a work order request
       - Add occurred on and add priority, job status, and work order type if it is a work order – these are constant values.
   - **Returns: List of inspection reports that have been converted to payloads to be uploaded to eMaint**

4. **Post Work Order: (Given result of Convert to Post)**
   - Post the work order list given from (Convert to Post)
   - For each work order post, post it to either work orders requests or work orders
     - Work Orders if it is a major issue
     - Work Orders Requests if it is a minor issue
   - **Returns: Responses to attempted uploads of work orders**

Analysis:

There are 3 major sections that could produce an error: 1. Getting the data from Motive and Fluke, 2. Checking if the Motive data is new, and 3. Uploading the created payloads to Fluke.

1. Getting the data from Motive and Fluke: If there is an error getting the data from either API the program will stop, and the last action will be printing what data cannot be attained. (Ex: “Error getting Motive Data”)
2. Checking if the Motive Data is New: Whenever checking if the data is new, the times being used will be printed to the console. It will print what the latest time is and whether it comes from Work Orders or Work Orders Requests. Then it will print what the time is from Motive. These times are given in UTC, if there is an issue they need to be compared to the times on Motive and eMaint dashboards.
3. Uploading created payloads to Fluke: For each work order attempted to be uploaded to fluke it will print the result of the attempt. If it works it will print the Work Order ID, but if this is not printed then this is the issue.

1, 3: May occur due to a network issue. Usually, rerunning it will work, however if it does not then there is an issue with the system running the script.

2: Should never occur. However, if the system unexpectedly stops working and there is not an error exit code the script this is most likely the cause of it.

If either of these cases occur the data can still be recovered if the program is rerun and runs without errors.

Odometer Integration System

Get Motive Odometer Values

- Get the total number of pages that display trucks
- Get vehicle information from every truck on motive (loop through each page)
- Loop through vehicles and add necessary data to list
    - Truck Number, Truck Odometer, Truck Position (lat, long)
- **Returns all of the odometer and position data of the trucks in motive**

Get All Truck Assets

- Gets all of the trucks with the "freightliner" attribute from fluke
- **Returns list of freightliners**

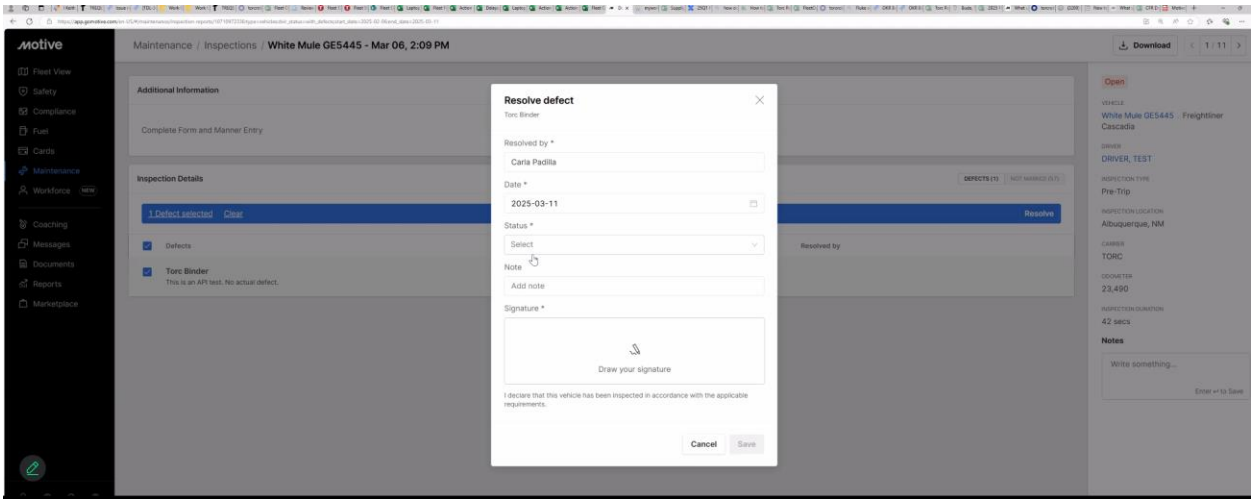
Update Odometer Values

- For each truck from motive:
    - Match the truck with the identical truck in motive
        - Check if the truck name from motive is contained in the eMaint freightliner name
    - Once matched, if the truck has an odometer value from motive continue, else break out
    - Gets the related information from the fluke asset:
        - Check if the asset has a meter attached to it, if it does not:
            - **Return: id, name, odometer value, position (lat, long), related information and does not have a meter**
        - Check if the asset has moved since last update
            - **Return: id, name, meter id, odometer value, position (lat, long), related information and has a meter**
    - If the asset does have a meter:
        - Add Asset Meter Reading
        - Update geolocation property of the asset
    - If the asset does not have a meter:
        - Create an asset meter payload
        - Upload the new asset meter

Analysis:

For each run, there will be one output for each truck detailing its current status with respect to the APIs. The outputs a truck can take on include:

- {truck Number} has no odometer reading
- {truck Number} has not updated position
- {truck Number} moved position
    - This is followed by the response of the update call on the API
    - It is common to get a failure. Status Code 400. The error will read “The reading has to be higher than the current value in Asset Meters…”
    - **This is not a problem and will automatically fix itself when Motive updates again.**
- {truck Number} needs an asset meter
    - This is followed by the response of the creation call on the API and the result of it.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