Project Proposal – Group 6

Creating Supply Chain Efficiencies

Team Members

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Project Description

This project aims at creating an efficient supply chain process for an anonymous company by analyzing the Purchase and Sales data for office products. This company acts as a distributor by purchasing the office products from manufacturers, holding them and then reselling them to its business customers.

The purpose of the project deliverable is to add more automation to the product ordering process based on the demand, inventory at hand, and shipment times. Another objective is to help identify the products that are highest contributor to overall sales and prioritize them to increase the company's overall profitability. We also intend to factor in the space taken by products in the warehouse based on their dimensions and their profitability to optimize the ordering process.

The project objective will be achieved by identifying target and feature variables, creating clusters and performing regression, if needed, to create and optimize machine and deep learning models. This will, in turn, assist in making predictions for the optimal product mix to be ordered to achieve the highest profitability.

Target Audience

The intended target audience who will benefit from this project will be the following company officials:

- Supply Chain team with focus on Procurement aspect

- Sales team

- Strategy team/ decision makers at the top level

Data Sources

The data used for this project comes from CSV files obtained from the company. The original data has been anonymized for the purpose of this project. The CSVs have 5-years worth of data (2018 to 2022) for Purchase, Sales and Products.
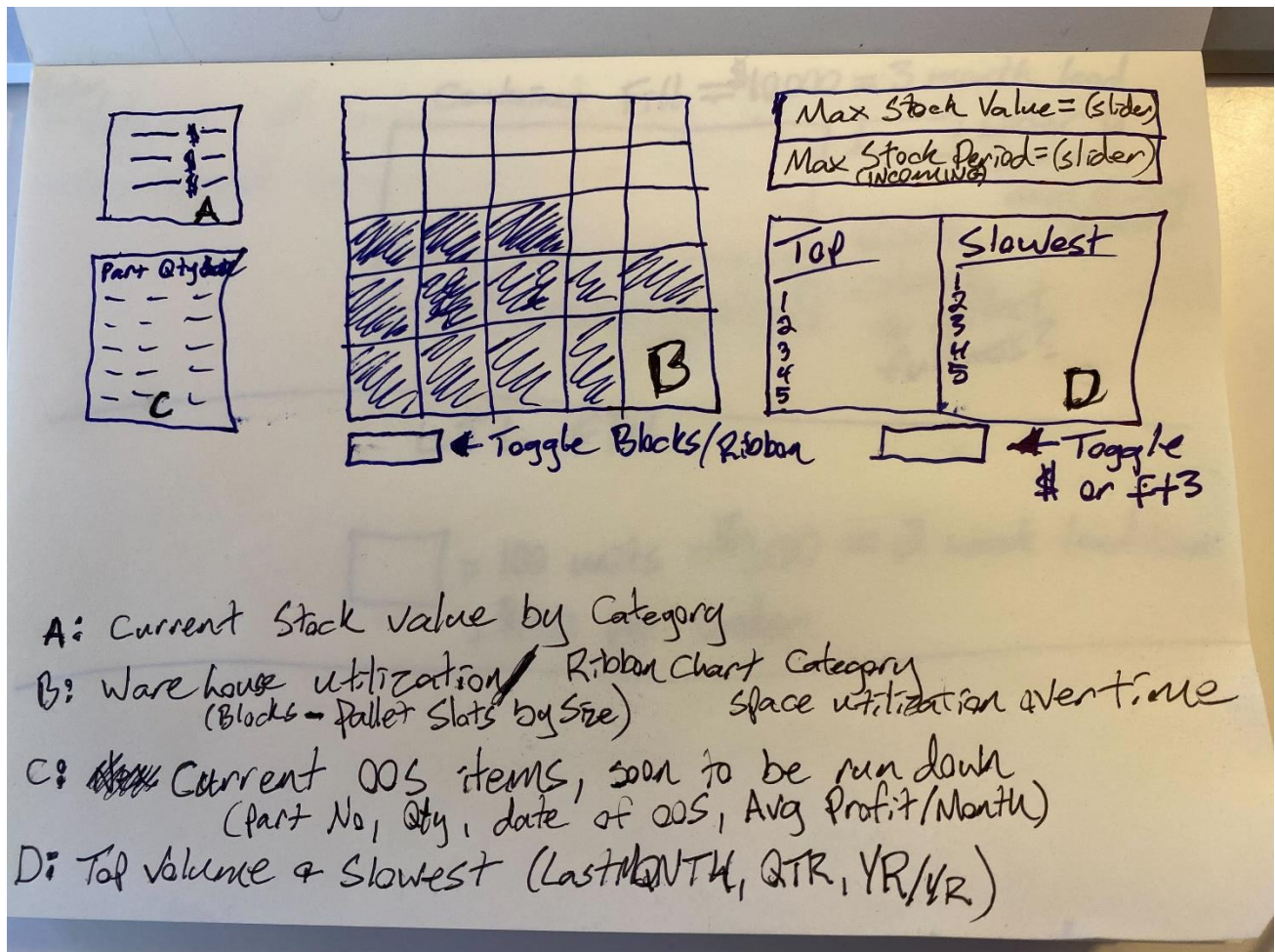
Platforms Used:

The following platforms will be used for ETL, machine learning and creating the dashboard:

- PySpark for ETL
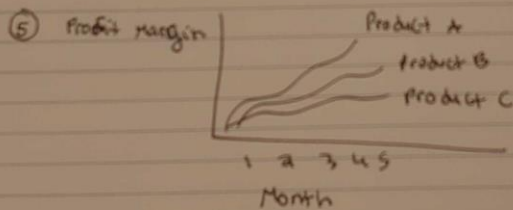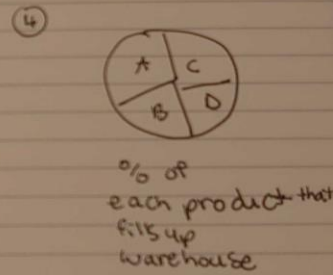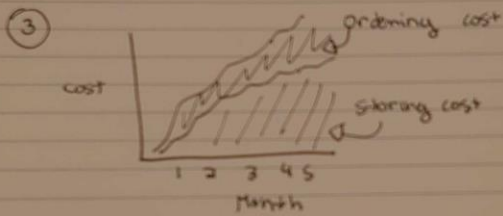
- Amazon AWS for hosting the data

- Python for Machine Learning models and optimization

- Python Model and JavaScript for visualizations

- HTML/CSS/Bootstrap for dashboard

Napkin Drawings:

Following are some napkin drawings we created to give an idea about what the dashboards will look like:

A: Current Stock value by Category

B: Warehouse utilization / Ribbon Chart Category (Blocks ~ Pallet Slots by Size) Space utilization over time

C: Current OOS items, soon to be run down (Part No, Qty, date of OOS, Avg Profit/Month)

D: Top Volume & Slowest (Last MONTH, QTR, YR/YR)

Dropdown: Product A ☑
Multiple   Product B ☑
Checkbox   Product C ☐
            Product D ☐

① Inventory Count — (bar chart) — Month 1 2 3 4 5

Products
▨ A
☐ B
▨ C

② Sales — (line chart) — Month 1 2 3 4 5
Product A
B Product
C Product

③ Cost — (area chart) — Month 1 2 3 4 5
ordering cost
storing cost

④ (pie chart)
A C
B D
% of each product that fills up warehouse

⑤ Profit margin — (line chart) — Month 1 2 3 4 5
Product A
Product B
Product C
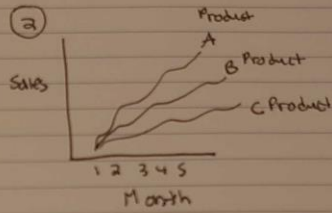
DASHBOARD

Dropdown
↓
Product List

Sales Trend
Sales — (bar chart) — Time

Total Sales
Product Sales

Scatter
Profit — (scatter plot) — Shipping Time

Cost — (bar chart) — Volume (in warehouse)