EDA / Descriptive Statistics

## Introduction:

Pallet is a flat structure that is used to store and transport goods from inventory. The number of pallets to be stored in inventory for shipping to different customers is very volatile, leading to understocking or overstocking. Understocking is leading to not honoring client requirements and overstocking is leading to inventory cost. To solve these challenges, we propose to develop and implement a data-driven solution to minimize the volatility in inventory stock. This will be used to predict the demand for pallets and to optimize the inventory levels accordingly.

## Overall design strategy

The overall design strategy is to use a data-driven approach to predict the demand for pallets and to optimize the inventory levels accordingly. This analysis is used to predict demand based on historical data and other factors such as customer orders, seasonality, and economic trends. The analysis will then be used to optimize the inventory levels to minimize volatility without reducing customer satisfaction.

First, we need to perform data cleaning and preprocessing using python and SQL queries. Once the data is ready, we can import it into power bi to create visualization depicting the quantity of pallets required for inventory management.

For consistency purpose Verdana font is used for all the titles and subtitles in the dashboard. For all numerical axis labels Cambria font with 10 size is used and for textual axis labels Calibri 10 font is used.

For dashboard, background color white is used and for all titles background color of white is used. For all tool tips and titles, where ever emphasis was required to highlight the data different colors are used.

## Data Overview

Data is extracted from pallet\_Masked\_fulldata.xlsx which contains order data for pallets according to warehouse name. geographical wise the data will be collected to use in the visualization. It contains Around 80962 records spanning from Jan 2019 to Aug 2023. There are 4182 Unique records.

* Date: datetime
* Customer Name: Integer
* City: string
* Region: string
* State: string
* Product Code: string
* Transaction Type: string
* QTY: integer
* Ware House Name: integer

## Users

Users of the visualization dashboard will be:

* **Business stakeholders**: These are the people who have a vested interest in the success of the project, such as the CEO, CFO, COO, and sales and marketing leaders.
* **Operational stakeholders**: These are the people who will be responsible for implementing and managing the new inventory management system, such as warehouse managers, supply chain managers, and logistics providers.

## Questions

Questions which will be answered by this visualization:

**Business stakeholder:**

* What are the top 10 products that contribute to the most inventory volatility?
* Which customer has highest quantity of transaction?
* Which city has the maximum quantity of a product Transaction?

**Operational stakeholder:**

* How many numbers of pallets are transaction happened across different warehouse Name?
* What are the total number of quantities over a time period?
* What is the average quantity of pallets transaction happened over a city ?

## Describe Visualization and how it answers the questions

**Business stakeholder:**

* What are the top 10 products that contribute to the most inventory volatility?

Bar chart: A bar chart could be used to show the top 10 products that contribute to the most inventory volatility. This would help the business stakeholder to focus their attention on the products that are having the biggest impact on inventory volatility.

* Which city has the maximum quantity of a product Transaction?

Card: By knowing which cities have the highest demand for your products, business stakeholder can focus on marketing and sales efforts on those markets.

**Operational stakeholder:**

* How many numbers of pallets are transaction happened across different warehouse Name?

Bar chart: A Bar chart could be used to show the distribution of inventory levels across different warehouses. This would help the operational stakeholder to identify which warehouses have the highest and lowest inventory levels.

* What are the total number of quantities over a time period?

Line chart: A line chart could be used to show the trend in inventory volatility over time. This would help the business stakeholder to identify whether the volatility is increasing or decreasing.

* What is the average quantity of pallets transaction happened over a city?

Bar chart: A Bar chart could be used to show the average quantity of pallets transaction over a city and transaction type. This would help the operational stakeholder to identify whether there is a average allot is happen over a city.

## Conclusion

The conclusion of this project is that the data visualization tools and techniques described above can be used to answer a variety of questions about inventory volatility. We believe that this solution has the potential to significantly reduce inventory volatility and improve the efficiency and profitability of the business. By minimizing human intervention, we can also reduce the risk of errors and improve the accuracy of our inventory data. By understanding the visualization, stakeholders can make better decisions about inventory management, which can lead to significant cost savings and improved customer service.