



# Senior Data Scientist Test

Cel Consulting

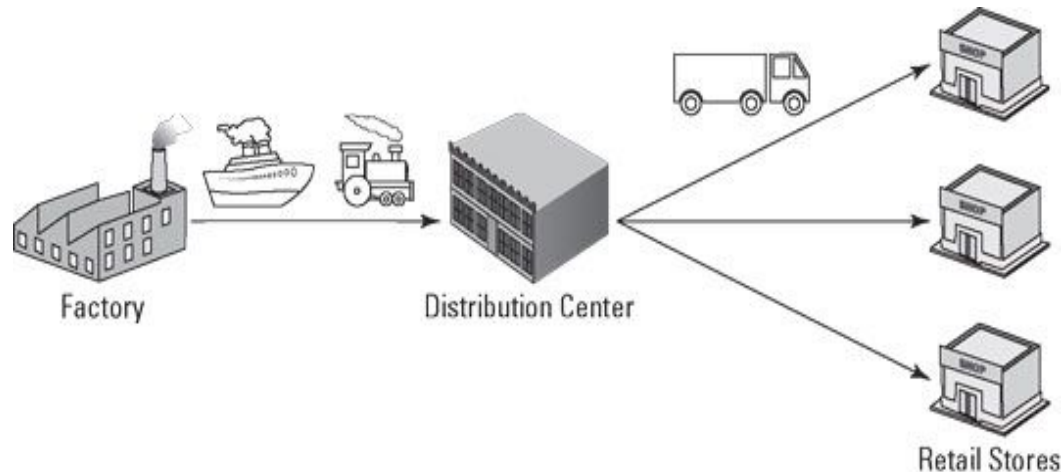
# Introduction

- ABC is a multinational company.
- The company wants to find a better demand forecasting method. Currently, it forecast manually with basic excel statistics and judgment for month rolling.
- The company knows that its data has a quality issue.
- However, it wants to apply data science to create an automated and more efficient method.
- You are provided a dataset for the company's business in Indonesia:
  - `physical_network.csv`: Transactional sale from 01-Jan-2017 to 03-Dec-2019



# ABC's business

- ABC has only one factory located at the same place of its central distribution center (DC).
- The DC can transfer stocks to the company's regional depots where deliver to retail customers.
- **The company needs to forecast the monthly demand of its retail customers.**
- The company uses bottom-up approach to forecast its monthly demand. It starts at the SKU level to SKU group, then the national level.
- The forecasting info is essential for the company to produce enough stock to avoid lost sales or to overstock.



# physical\_network.csv

- We construct this file by consolidating the client's customer.
- We also did some basic clean for data, but try to keep it the same as original as possible.
- We provide the explanation for some important columns. You can feel free to use any columns in dataset as well as external data if necessary.



# physical\_network.csv

Column	Description
Sold To	The code of customer
Ship To	The code of facility where stock is delivered to (one sold to can have several ship to)
2nd Item Number	SKU code
Quantity	The ordered quantity
UOM	Unit of measurement for ordered quantity
Extended Amount	Monetary value of the order.
Request date	The date an order is placed.
Unit price	Price for a SKU for sold to customer
Price UOM	Unit of measurement for SKU price
Brands	The group of SKU
Volume (MT)	Ordered quantity in metric ton
destination_simple	The destination of the transaction. Whether it's a customer or another depot (Customers : Retail customers, Facilities : internal movement between DC and depots)



# Output

- Our ABC client expects not only technical solutions but also a practical working methodology to improve its forecasting and its usage.
- The company also wants the solution to apply not only for existing products but also for new products.
- You can submit a report by PowerPoint, Rmarkdown, or Jupyter. The test duration is **7 days** from the day you receive the test.
- We expect the minimum content for the report as below:
  - An explanation for your approaches
  - Reason for selecting it
  - Forecasting result
  - Limitation of your approaches
  - Improvement proposal
- In case your report is unclear, we may invite you to explain it.
- For any further question, please contact **chau.nguyen@cel-consulting.com**



# Appendix

- Demand forecasting in the supply chain can go with different detail levels:
  - Customer - SKU
  - Customer - Product group
  - SKU
  - Product group
  - Total demand
- The minimum level is the SKU or Product Group so that the factory can plan for its production capacity.
- You can feel free to add more external factors to enhance your forecasting.



*Good Luck*

