Inventory Division Module

Inventory distribution has two major factors which play a crucial role -

1. **Supply Chain -**
   Current situation - We mostly depend on the centralised Inventory system which puts a lot of burden on the inventory.

   Solution - We Propose a Omni channel supply chain. Instead of having a centralised inventory, we propose regionally distributed inventory, dark stores and retail stores.

   Assumptions -
   - Omni channel supply chain.
   - Presence of physical/retail stores.

   Variables -
   - Current functioning retail stores
   - the holding capacity of inventory and dark stores of retailers.
   - Labour laws and transportation in that region.
   - Previous records of sale before becoming a part of Omni channel.

   Output -
   - Plan for warehouse, transportation and previous sales record with help the AI will help to effective Inventory management.
   - The labour laws, transportation and customer reviews will tell whether offline retail inventories should be targeted or the centralised inventory.
   - Determine the required capacity and product flows to handle returns.

   Working -
   - Traditional AI techniques such as linear programming and mixed integer programming can be leveraged to design the fulfillment network.
   - Understand optimal SKU-Location mapping with network product flows and stocking levels to meet projected demand.

2. **Demand Sensing and Shaping -**

Loophole - Failing to depict the future demands causes either overstock of goods wasting inventory or shortage of stock resulting in poor and delayed services.

Solution - With gradually changing to omni channel, retailers will benefit by being more demand driven and orchestrate their supply chains to fulfill increasingly volatile demand.

Assumptions -

- Omni channel supply chain
- Availability of online as well as offline stores.

Variables -

- Seasonal behavior of customers.
- Location of regional as well as centralized inventory
- Present inventory situation.
- Other variables like - weather, interest rates, inflation etc.

Output -

- Used to channelize inventory items by giving discounts & digital coupons.
- Help in dividing inventory according to seasonal and regional demands.
- Also helps in predicting abrupt increase or decrease in demand for particular items.The expected demand can be broken out by fulfillment method (ship from store, pick up at store, ship from DC) to drive inventory replenishment needed.
- Also look at the impact of changing timing and duration of promotions.

Working -

- Modeling of these ML techniques helps in generating the optimum price which in turn helps in giving discounts and clearing inventory.
    - These model can use Gradient Boosting and Support Vector Machines for better forecasting of demand.