MBA643A
END-SEM PRESENTATION

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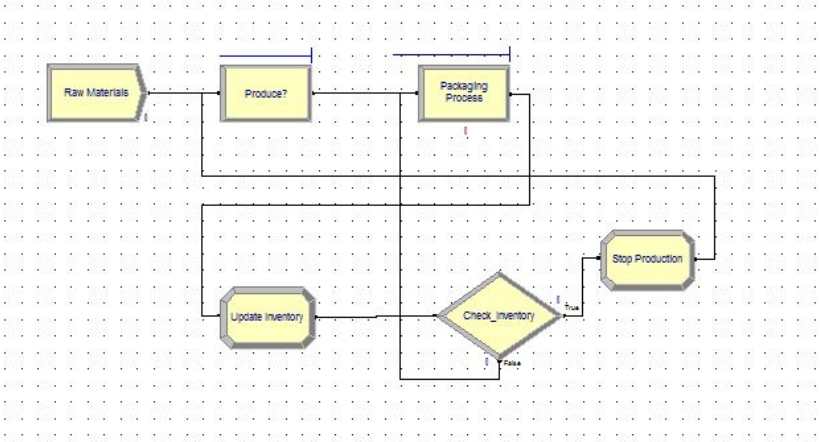
Supply Chain System

Component 1

Supply Chain System Simulation

The model is composed of 2 segments:

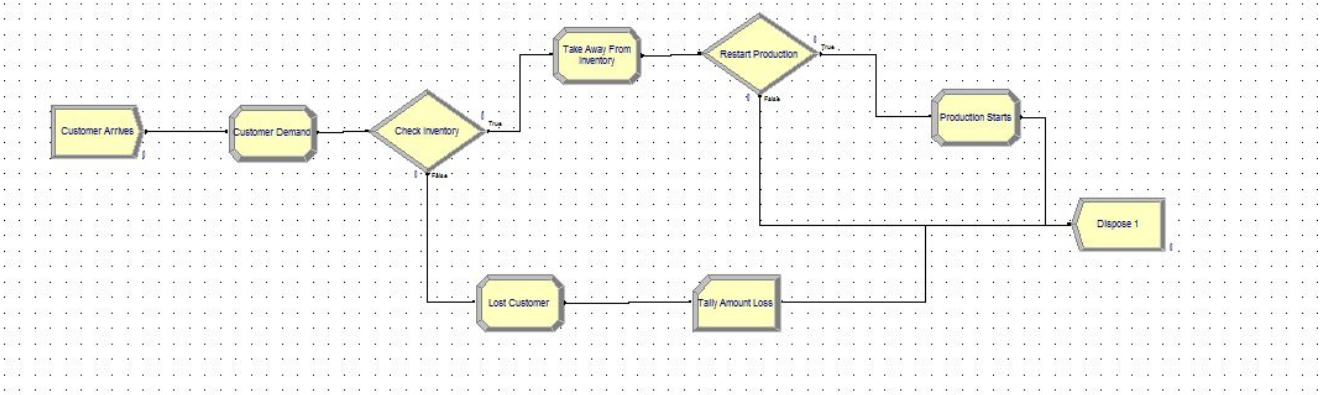
- Inventory management segment:
  - Keeps track of product unit entities
  - The packaging process:
    - takes the unit of raw material from its queue
    - process it in a batch of five
    - adds the finished lot to the warehouse inventory
  - If inventory crosses the target level: Production is stopped until the reorder point
  - Processing of new batch starts immediately when the reorder point is reached



Supply Chain System Simulation

The model is composed of 2 segments:

- Demand management segment:
  - Generates customers and their demands
  - Adjusts Inventory upon customer arrival
  - Monitors the value of Inventory; revives the suspended production when the reorder point is reached
  - Also keeps track of lost demands (customers whose demand is not fulfilled)



Analysis & Experimentation

- To improve the customer service level (probability that the demand of arriving customer is increased):
  - Investing more in maintenance:
    - Reduce the downtime probability
    - Make the process more available for production
  - Increase the reorder point
    - The inventory will hit the reorder level sooner
    - Production will resume earlier
    - Decreasing the chance of inventory shortfall

Port Shippo Optimisation and Analysis

Component 2

Berth and Loader Utilisation

- Simulation was done with 4/12 hour operating window and one tugboat in Arena for 720 hours.
- Berth Utilisation = **80.63%**
- Loader Utilization = **56.24%**
- The discrepancy comes from the fact that Berths are acquired by ships while waiting for tugboats.

Optimum number of tugboats

- Increasing one tugboat leads to very small amount of improvement in service time. The average service time decreases by **6 minutes.**
- Adding one more tugboat leads to an even smaller, insignificant decrease in service time.
- The third tugboat doesn’t lead to improvement in service times as there is only one loader in the system. Thus, we need two tugboats at the maximum, one to offload and one to onboard. The third tugboat does not lead to improvement.
- The optimal number of tugboats is **one**.

Analysis on dredging

- We ran simulations of 30, 45 and 60 days on systems with 4, 5 and 6 hours of operational time per 12 hours.
- No significant improvement noted by increasing operational window.
- This is likely because the coincidence of ship availability and increase in operational time is very small.

Thank You