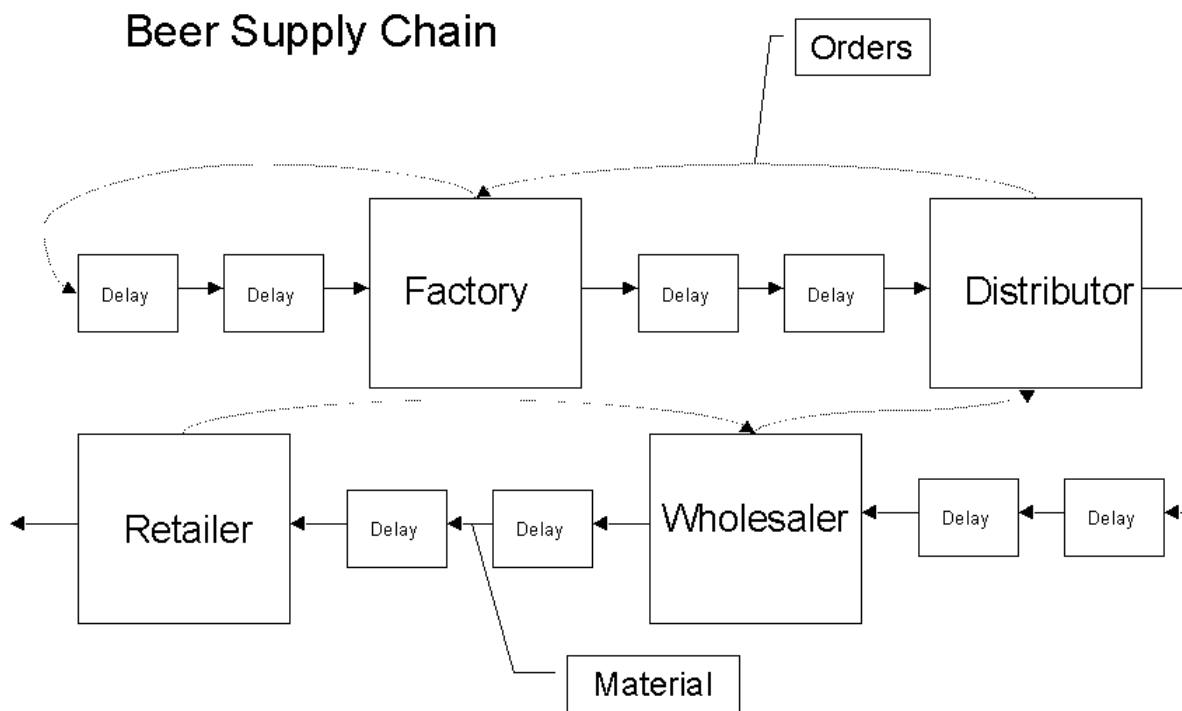


The Beer Distribution Game - Internet Version

Topic: Logistic supply chains, system dynamics

Purpose: To introduce participants to the supply chain concept and to the effects decisions along the chain have on inventory levels and costs.

Introduction: In this game the retailer sells cases of beer to a consumer and orders cases of beer from the wholesaler; the wholesaler sells cases of beer to the retailer and orders cases of beer from the distributor; and the distributor sells cases of beer to the wholesaler and orders beer from the factory (brewery). The factory brews the beer. The beer supply chain is shown below:



Players of the game each take on a different role in the supply chain. The roles are the Factory, Distributor, Wholesaler and Retailer. Each position is directly linked, and beer cannot skip the adjacent position. For example, the Wholesaler orders beer from the Distributor, and ships beer to the Retailer.

An important consideration in making decisions is the delay in the movement of beer through the supply chain. It takes three periods to move an order of beer between each player in the supply chain. If during period 3 the Wholesaler decides to ship 10 cases of beer to the Retailer, the beer would take periods 4 and 5 to move to the Retailer and then would be available for sale by the Retailer at the beginning of period 6. Similarly, orders are not visible to the upstream player for one period. For example, if the Wholesaler places an order in period 3, the order is received by the Distributor at the beginning of period 4.

For each period of play, every participant follows the same cycle:

1. The system is updated by your instructor where new orders and shipments are received, shipments en route are advanced, and inventory levels and backorder positions are calculated (these tasks are done automatically by the server program).
2. The player updates the status screen and reviews current position.
3. A shipping decision is made according to new orders and backlog, subject to inventory availability,
4. An ordering decision is made for more beer.

There are only two costs involved in this simplified version of a logistics supply chain: inventory holding cost (\$1.00/case/period) and backorder costs (\$2.00/case/period). Each team has the goal of minimizing the sum of these costs by balancing the cost of having inventory (inventory holding cost) with the cost of being out of inventory when a customer orders beer (backorder cost).

The server program keeps track of the costs incurred by each team. At the end of the game, the total game cost for the distribution system is the sum of the four individual participants' total costs (retailer cost + wholesaler cost + distributor cost + factory cost). The goal is to minimize team costs.

Action: The game begins with a fully-loaded "pipeline" of cases of beer:

- 16 cases of inventory in each position's "current inventory,"
- 4 cases in each of the "production delay" pipeline,
- 4 cases in each of the "shipping delay" pipeline,
- each position has an initial order for 4 cases of beer.

Definitions: The following terms are used in the status report:

Current Demand: This is the demand for the current period at this position. For the Retailer, this demand is determined by an external demand stream. For all other positions, this demand reflects an order placed by the downstream position in the supply chain during the previous period.

Backorder: This is the demand that has not been met to date at this position. When a position does not meet demand by shipping cases of beer, the backorder amount is increased. This amount does not include the demand during the current period.

Current Shipment: This is the amount that is being shipped to the downstream position during the current period. After the ordering and shipping decisions have been made, the "status" button can be used to update the status report. The status report will reflect the current order and shipment decisions. Remember that after the instructor has updated the system, the "status" button should be pressed again to receive a report that reflects the execution of the decisions for the previous period.

On Hand - This is the current amount in inventory at the position. This is the total amount that can be shipped this period from this position.

Due Next Period - This is the number of units that are scheduled to arrive at this position next period.

Due In Two Periods - This is the number of units that are scheduled to arrive in two periods.

Current Order Release - This is the number of units that are being ordered from the upstream position. The upstream position will not see this order until after the system has been updated to the next period.

Inventory Cost - This is the cumulative inventory cost for this position. This is calculated from the actual inventory balance at the end of each simulated period. During the update process, the system first ships material to the downstream position, updates the cumulative inventory and backorder costs based on the inventory and backorder levels, and then receives new material into the position.

Backorder Cost - This is the cumulative backorder cost for the position.

Total Cost - This is the total cumulative cost for the position.

Each position can communicate orders via the Web form only. No other form of communication is allowed between positions.