

Manufacturing Cycle

The manufacturing cycle typically occurs at the distributor/manufacturer (or retailer/manufacturer) interface and includes all processes involved in replenishing distributor (or retailer) inventory. The manufacturing cycle is triggered by customer orders (as is the case with Dell), replenishment orders from a retailer or distributor (Wal-Mart ordering from P&G), or by the forecast of customer demand and current product availability in the manufacturer's finished-goods warehouse.

One extreme in a manufacturing cycle is an integrated steel mill that collects orders that are similar enough to enable the manufacturer to produce in large quantities. In this case, the manufacturing cycle is reacting to customer demand (referred to as a pull process). Another extreme is a consumer products firm that must produce in anticipation of demand. In this case, the manufacturing cycle is anticipating customer demand (referred to as a push process). The processes involved in the manufacturing cycle include the following:

- Order arrival from the finished-goods warehouse, distributor, retailer, or customer
- Production scheduling
- Manufacturing and shipping
- Receiving at the distributor, retailer, or customer

Order Arrival. During this process, a finished-goods warehouse or distributor sets a replenishment order trigger based on the forecast of future demand and current product inventories. The resulting order is then conveyed to the manufacturer. In some cases the customer or retailer may be ordering directly from the manufacturer. In other cases a manufacturer may be producing to stock a finished-products warehouse. In the latter situation, the order is triggered based on product availability and a forecast of future demand. This process is similar to the retail order trigger process in the replenishment cycle.

Production Scheduling. This process is similar to the order entry process in the replenishment cycle where inventory is allocated to an order. During the production scheduling process, orders (or forecasted orders) are allocated to a production plan. Given the desired production quantities for each product, the manufacturer must decide on the precise production sequence. If there are multiple lines, the manufacturer must also decide which products to allocate to each line. The objective of the production scheduling process is to maximize the proportion of order filled on time while keeping costs down.

Manufacturing and Shipping. This process is equivalent to the order fulfillment process described in the replenishment cycle. During the manufacturing phase of the process, the manufacturer produces to the production schedule. During the shipping phase of this process, the product is shipped to the customer, retailer, distributor, or finished-product warehouse. The objective of the manufacturing and shipping process is to create and ship the product by the promised due date while meeting quality requirements and keeping costs down.

Receiving. In this process, the product is received at the distributor, finished-goods warehouse, retailer, or customer and inventory records are updated. Other processes related to storage and fund transfers also take place.

Chopra, Sunil and Peter Meindl. Supply Chain Management. 2 ed. Upper Saddle River: Pearson Prentice Hall, 2004.