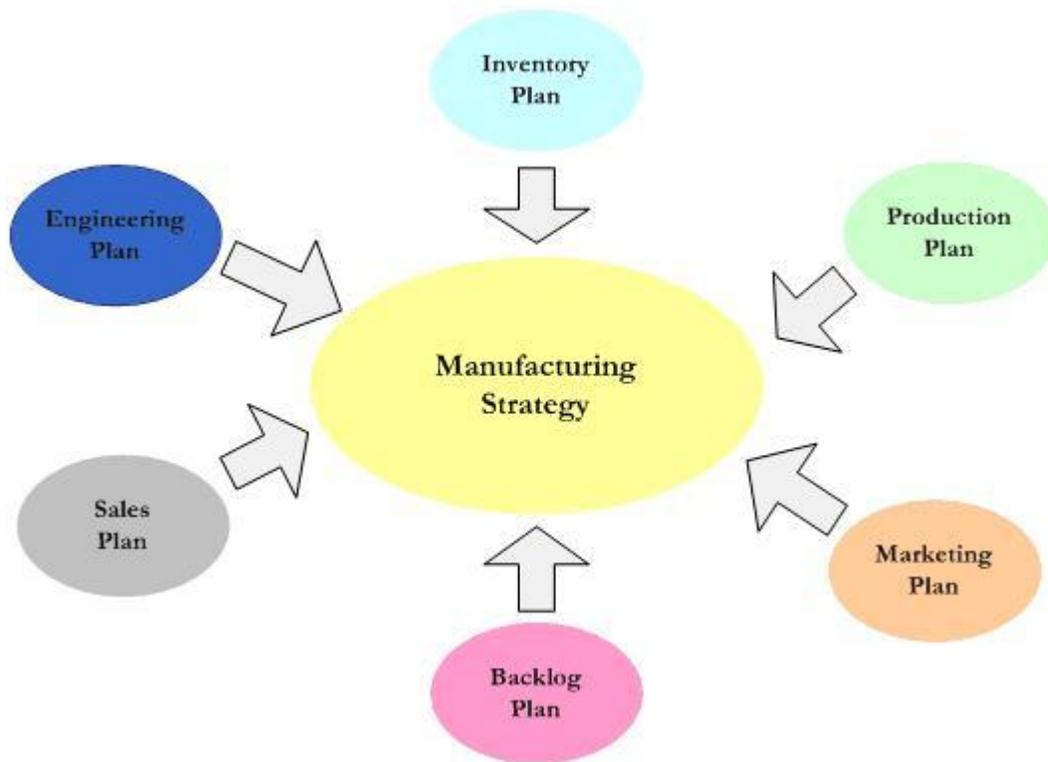


White Paper



Best Practice

mbas – Manufacturing Strategy

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1. Introduction

To flourish in today's increasingly time-sensitive and competitive markets, industries need manufacturing strategies that are quick, flexible, and adapt quickly to changes. Manufacturing strategy can be defined as a set of synchronized objectives and action program applied to a firm's manufacturing function and intended at securing medium and long term, sustainable advantage over that firm's competitors. Demand fluctuates over time. Every industry's manufacturing strategy have to be evaluated occasionally to make sure its production line and inventory are aligned efficiently and stocks meet true demand. Signs of a misaligned manufacturing strategy include shortages, high inventories and poor quality performance.

2. Overview

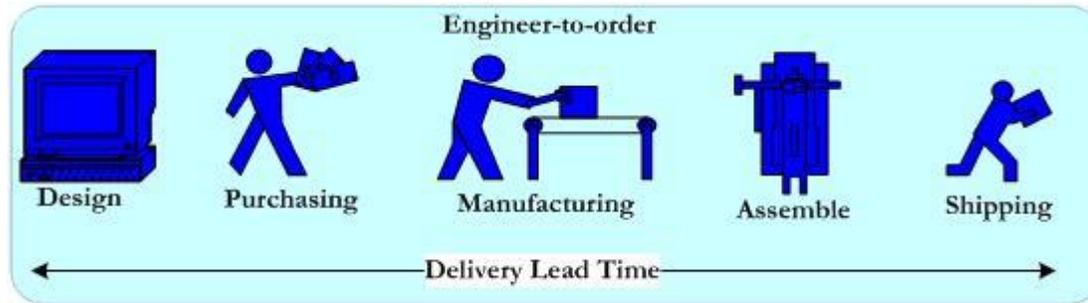
In order to remain extremely competitive in the customer-oriented market a manufacturing firm should focus on either meeting or exceeding customer expectations. For achieving both the firm should choose a strategy that allows it to fulfill the requirements of the market place and provide speedy on time delivery. There are four basic strategies to achieve these objectives of a firm.

- Engineer-to-order
- Make-to-order
- Assemble-to-order
- Make-to-stock

1. Engineer-to-order (ETO)

Engineer-to-order (ETO) means that the customer's requirements need unique engineering design or customization. The process is initiated with the preparation of highly customized engineering designs. Once the designs are finalized, required raw materials are purchased and sub assemblies are produced. Inventory of sub assemblies are maintained and the finished goods are produced and shipped. The delivery time for this kind of strategy is the longest

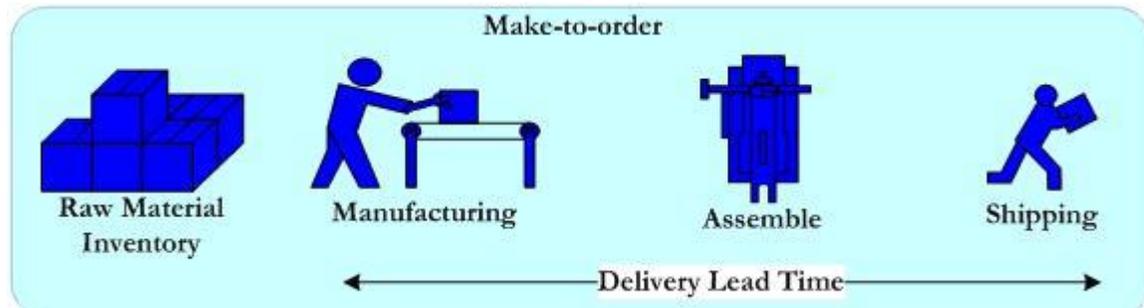
because it not only includes the purchase lead time but also considers the design lead time as well.



Lets' consider an example, a renowned car manufacturing firm in order to expand it's market introduces a two cylinder 623cc, 33 HP Rear Mounted, all aluminum, multi-point fuel injection petrol engine car. If the engine is 623 cc then accordingly the complete transmission assembly, brake assembly, Chassis, steering, suspension and all other units have to be customized. So here the firm will choose ETO Strategy that is the entire manufacturing will start from the design. Once the design is finalized all the necessary raw material will be either produced or procured. Once the procurement is done the manufacturing of sub assemblies happens. These manufactured sub assemblies will be assembled and shipped to the customer. The delivery time includes design, purchase, manufacturing, assembly and finally shipment.

2. Make-to-order (MTO):

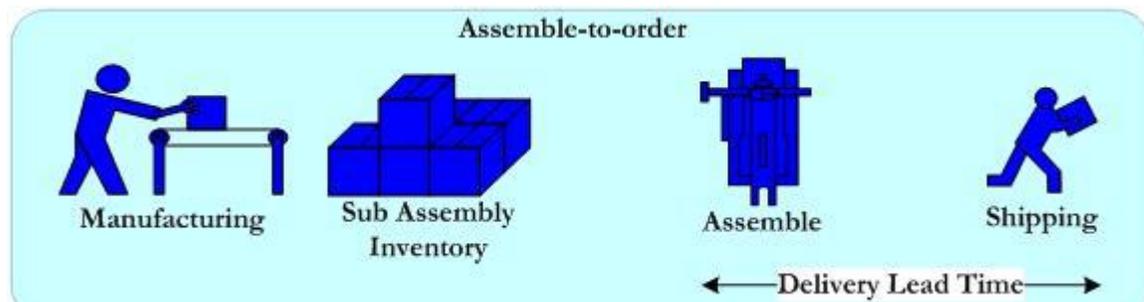
Make-to-order (MTO) means that the manufacturing firm does not start to make the finished good until a customer's order is received. Commonly used parts are purchased /manufactured and are usually stored as raw material inventory. The process is initiated only on receipt of customer order. The finished goods are made from these parts that are in inventory. These parts may include custom-designed components as well. Delivery lead time in this kind of a strategy includes the manufacturing, assembly and shipping lead time. Here the planning will happen at the raw material level.



Returning to the 623cc car for moment, let's assume on releasing the car to the market it did a fairly good business in the first six month of release and the demand for the same is gradually moving up. Now the firm will start procuring the raw material much earlier and inventory for the same will be maintained to meet the demand. The lead time will shorten as the firm doesn't have to invest time on design as its quiet established. So for manufacturing the concern can always follow make to order strategy. That is as and when the order is received finished goods are produced.

3. Assemble-to-order (ATO)

Assemble-to-order means that the finished goods are produced from sub assemblies that the manufacturer can stock and assemble once an order is received. Delivery time in this kind of a strategy only includes assemble and shipping lead time. Here the planning normally happens at the assembly level.



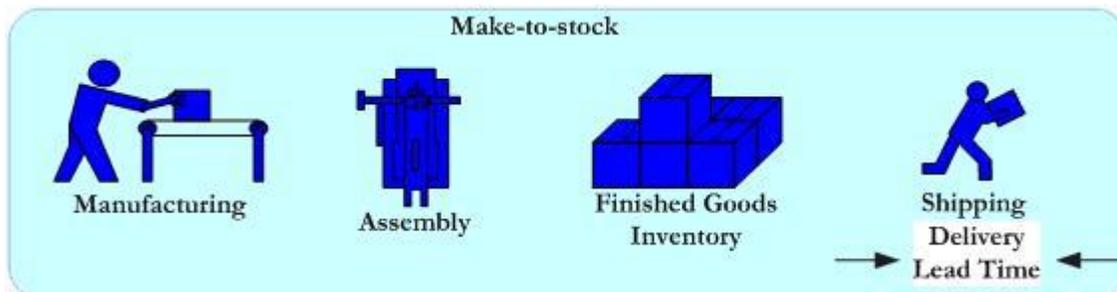
Let's get back to the same example discussed above, let assume that the car is very much accepted in the market and firm now moves on to the next level of adding variants to the base feature. Power Steering, Manual Steering, Diesel Engine are different variants available. Firm will start to maintain inventory all the sub assembly, once it receives an order the

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production will start. Assume that there is an order for a diesel engine with power steering. Diesel engine assembly & power steering assembly will be added to the base version to meet this particular order.

4. Make-to-stock (MTS)

Make-to-stock means that the inventory for the finished goods will be maintained. Once the customer order is received order will be fulfilled directly from the inventory that is maintained for the same. Delivery lead time is the shortest for this kind of strategy as no design, procurement, manufacturing or assembly is involved in producing the finished goods.



Once again returning to the 623cc car, as days progresses the firm is very much sure that it will sell say 5000 units of petrol engine car & 10000 units of diesel engine car every year. Hence the firm will start to produce and maintain inventory of both diesel & petrol engine car and as and when they receive the order the finished will be directly shipped to the customer.

How different kind of strategies are used in mbas Application:

mbas supports all the four kind of strategy mentioned above. The strategies are defined either at the item level or at item group level. In the forecasting screen the strategy are defined for a particular item/Item Group.

Let's consider an example where a forecasting is being done for item CAR. The manufacturing strategy selected is MTS.

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Forecast for the month of September 2009						
Item Code	Item Name	UOM	Week 1	Week 2	Week 3	Week 4
1000	CAR	Nos	100	100	100	100

The inventory plan for the above mentioned forecast will be carried out in the Preliminary SOP Screen.

Preliminary SOP for the month of September 2009			
Week	Sales Plan	Production Plan	Inventory Plan
Week 1	100	120	20
Week 2	100	150	70
Week 3	100	50	20
Week 4	100	100	20

Calculation:

- Inventory Plan for the first week = (Production Plan Quantity – Sales Plan Quantity)
- Inventory Plan for the succeeding weeks = {Inventory Plan Quantity + (Production Plan – Sales Plan)}

In the similar way backlog plan will be arrived for the other strategies (ATO, MTO & MTE).

3. Benefits

- Enhance customer satisfaction.
- High product variety.
- Ability to supply the customer with the exact product specification required

4. Conclusion

An organization should select a correct manufacturing strategy in order to achieve better customer service level.