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# Preparing Your Production Plan

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## What is a production plan?

A production plan is that portion of your intermediate-range business plan that your manufacturing / operations department is responsible for developing. The plan states in general terms the total amount of output that the manufacturing department is responsible to produce for each period in the planning horizon.

The output is usually expressed in terms of pesos or other units of measurement (e.g. tons, liters, kgs.) or units of the aggregate product (this refers to the weighted average of all the products in your company). The production plan is the authorization of your manufacturing department to produce the items at a rate consistent with your company's overall corporate plan.

This production plan needs to be translated into a **master production schedule** so as to schedule the items for completion promptly, according to promised delivery dates; to avoid the overloading or under loading of the production facility; and so that production capacity is efficiently utilized and low production costs result.

Why is it important to have a carefully developed production plan?

Production planning is one of the planning functions that a firm needs to perform to meet the needs of its customers. It is a medium-range planning activity that follows long-range planning in P/OM such as process planning and strategic capacity planning. Firms need to have an aggregate planning or production planning strategy to ensure that there is sufficient capacity to meet the demand forecast and to determine the best plan to meet this demand.

A carefully developed production plan will allow your company to meet the following objectives:

- Minimize costs / maximize profits
- Maximize customer service
- Minimize inventory investment

- Minimize changes in production rates
- Minimize changes in work-force levels
- Maximize the utilization of plant and equipment

### How is a production plan prepared?

#### Activity 1 Determination of Requirements

The 1<sup>st</sup> activity in Production Planning is the determination of the requirements for the planning horizon. **Demand forecasting** plays an important role in the conduct of these three tasks. Managers thus need to be aware of the various factors that would affect the accuracy of the demand and sales forecast.

Activity 1 involves the conduct of the following tasks:

| ACTIVITY 1<br>Tasks | Description                                                                                                        |
|---------------------|--------------------------------------------------------------------------------------------------------------------|
| 1                   | Draw up the sales forecast for each product or service over the appropriate planning period                        |
| 2                   | Combine the individual product / service demands into one aggregate demand                                         |
| 3                   | Transform the aggregate demand for each time period into staff, process, and other elements of productive capacity |

There are **company factors** that could influence the level of demand for the firm's products. These internal factors include the company's marketing effort; the product design itself; the strategies to improve customer service; and the quality and price of the product.

There are also external factors or **marketplace factors** that significantly affect demand such as the level of competition or possible reaction by competitors to a firm's business strategy; the perception of consumers about the products and the consumer behavior as affected by their socio-demographic profile. Lastly, there are random factors that could affect the accuracy of demand forecasts such as the overall condition of the economy and the occurrence of business cycle.

#### Activity 2 How to Meet the Requirements

The next major activity involves the identification of the alternatives that the firm may employ to meet production forecasts as well as the constraints and costs involved. Specifically, this activity involves the following tasks:

| ACTIVITY 2<br>Tasks | Description |
|---------------------|-------------|
|                     |             |

|   |                                                                                             |
|---|---------------------------------------------------------------------------------------------|
| 1 | Develop alternative resource schemes to meet the cumulative capacity requirements           |
| 2 | Identify the most appropriate plan that meets aggregate demand at the lowest operating cost |

Once the most appropriate plan has been selected, then the firm evaluates the plan and later on finalizes it for implementation. For more efficient and effective planning process, the formation of a production planning team composed of managers from manufacturing, marketing, purchasing and finance, is recommended.

### **What are the inputs to the production planning process?**

To be able to perform the aggregate planning process, the following information should be available to this production planning team. These data include the following:

- Materials / purchasing Information
- Operations / manufacturing Information
- Engineering / process Designs
- Sales, marketing and distribution Information
- Financial and accounting information
- Human resources information

### **How do you address the demand fluctuations?**

There are three basic production planning strategies that the company can choose from to address demand fluctuations. These are the (1) Chase Demand strategy, (2) Level Production strategy, and the (3) Mixed Strategy.

| Strategy                  | Description                                                                                                                                                                                                                                                                                                                                        |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Demand Chase Strategy     | Matches the production rate to the order or demand rate through the hiring and firing of employees as the order rate varies                                                                                                                                                                                                                        |
| Level Production Strategy | Maintains a stable workforce working at a constant production rate with the shortages and surpluses being absorbed by any of the following: • Changing the inventory levels • Allow order backlogs (commit to the customer that you will deliver the product (s) at a much later date) • Employ marketing strategies (e.g. promotional activities) |
| Mixed Strategy            | The strategies here could include combination of any of the following: • Having a stable workforce but employ variable work hours (e.g., increase no. of shifts, flexible work schedules or overtime) • Subcontracting / outsourcing                                                                                                               |

- |  |                                                                               |
|--|-------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Changing inventory levels</li> </ul> |
|--|-------------------------------------------------------------------------------|

Source: Dilworth, James B. Production and Operations Management: *Manufacturing and Services* . Fifth Edition. McGraw-Hill, Inc. 1993

What are the important considerations in selecting the production planning strategy?

### Demand Chase Strategy

| Specific Methods                            | Costs                                                                                                                                | Remarks                                                                                      |
|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Hire additional workers as demand increases | Employment costs for advertising, travel, interviewing, training, and others<br><br>Shift premium costs if additional shift is added | Skilled workers may not be available when needed                                             |
| Layoff workers as demand decreases          | Cost of severance pay & increases in unemployment insurance costs                                                                    | The company must have adequate capital investment in equipment for the peak work force level |

### Level Production Strategy

| Specific Methods                                                          | Costs                                                               | Remarks                                                                |
|---------------------------------------------------------------------------|---------------------------------------------------------------------|------------------------------------------------------------------------|
| Produce in earlier period and hold until product is needed                | Cost of holding inventory                                           | Service operations cannot hold service inventory                       |
| Offer to deliver the product or service later, when capacity is available | Delay in receipt of revenue, at minimum; company may lose customers | Manufacturing companies with perishable products often use this method |
| Exert special marketing efforts to shift the demand to slack period       | Advertising costs, discounts, other promotional programs            | Exemplifies the inter-relationship                                     |

|  |  |                                        |
|--|--|----------------------------------------|
|  |  | among functions within an organization |
|--|--|----------------------------------------|

### Mixed Strategy

| Specific Methods                                                             | Costs                                                                      | Remarks                                                                                                                        |
|------------------------------------------------------------------------------|----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Work additional work hours without changing the workforce size               | Overtime premium pay                                                       | The time available for maintenance work without interrupting production is reduced                                             |
| Staff for high production levels so that overtime is not necessary           | Excess personnel wages during period of slack demand                       | Work force may be used for deferred maintenance during periods of low demand                                                   |
| Subcontract work to outside firms                                            | Continuing company overhead; subcontractor's overhead and profits          | The capacity of other firms can be utilized, but there is less control of schedules and quality levels                         |
| Revise make-or-buy decisions to purchase items when capacity is fully loaded | Waste of company skills, tooling and equipment unutilized in slack periods | These methods require capital investments sufficient for the peak production rate, that will be underutilized in slack periods |

### How can you monitor effectiveness of your production plans?

The important considerations in monitoring the effectiveness of your production plan are shown below:

### Systems and Procedures

| Consideration | Present? | Remarks<br>(if any) |
|---------------|----------|---------------------|
|               |          |                     |

|                                                                                                                                                                       |    |  |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|--|--|
| Yes                                                                                                                                                                   | No |  |  |
| • Is there a current documentation of production planning and control systems and procedures? Has this been communicated to all concerned?                            |    |  |  |
| • Does production planning and control have a formal monitoring system to maintain and update master scheduling records?                                              |    |  |  |
| • Is there a system of coordination between sales forecasts to be prepared in sufficient detail so that these may be readily translated to specific production plans? |    |  |  |

### Production Planning

| Consideration                                                                                                                           | Present? |  | Remarks<br>(if any) |
|-----------------------------------------------------------------------------------------------------------------------------------------|----------|--|---------------------|
| Yes                                                                                                                                     | No       |  |                     |
| • Does production planning and control prepare a master production schedule with all the production assignments and time allocation?    |          |  |                     |
| • Do the production schedules permit adequate planning of purchases and inventory levels?                                               |          |  |                     |
| • Are there signs of significant lost time or low rate of worker productivity? Are the numbers of such orders appear to be significant? |          |  |                     |

### Production Control

|               |  |  |
|---------------|--|--|
| Consideration |  |  |
|---------------|--|--|

|                                                                                                                 | Present? |  | Remarks<br>(if any) |
|-----------------------------------------------------------------------------------------------------------------|----------|--|---------------------|
| Yes                                                                                                             | No       |  |                     |
| • Can the status of any order or work in progress be readily determined?                                        |          |  |                     |
| • Do actual production levels deviate significantly in comparison with planned schedules?                       |          |  |                     |
| • Do actual shipments of orders almost always occur according to schedule?                                      |          |  |                     |
| • Are essential production control records and reports maintained to cover current and future production loads? |          |  |                     |

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