DEMAND FORECAST

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Demand Forecast: It is known as the process of making future estimations in relation to customer demand over a specific period

- When a product is produced for a market, the demand occurs in the future.
- The production planning cannot be accomplished unless the volume of the demand is known.
- The success of the business in supplying the demand in the most efficient & profitable way will then depend on the accuracy of the forecasting process in predicting future demand.

Production and Operation Management - POM

- Production management deals with manufacturing of products like (computer, car, etc) while operations management cover both products and services.

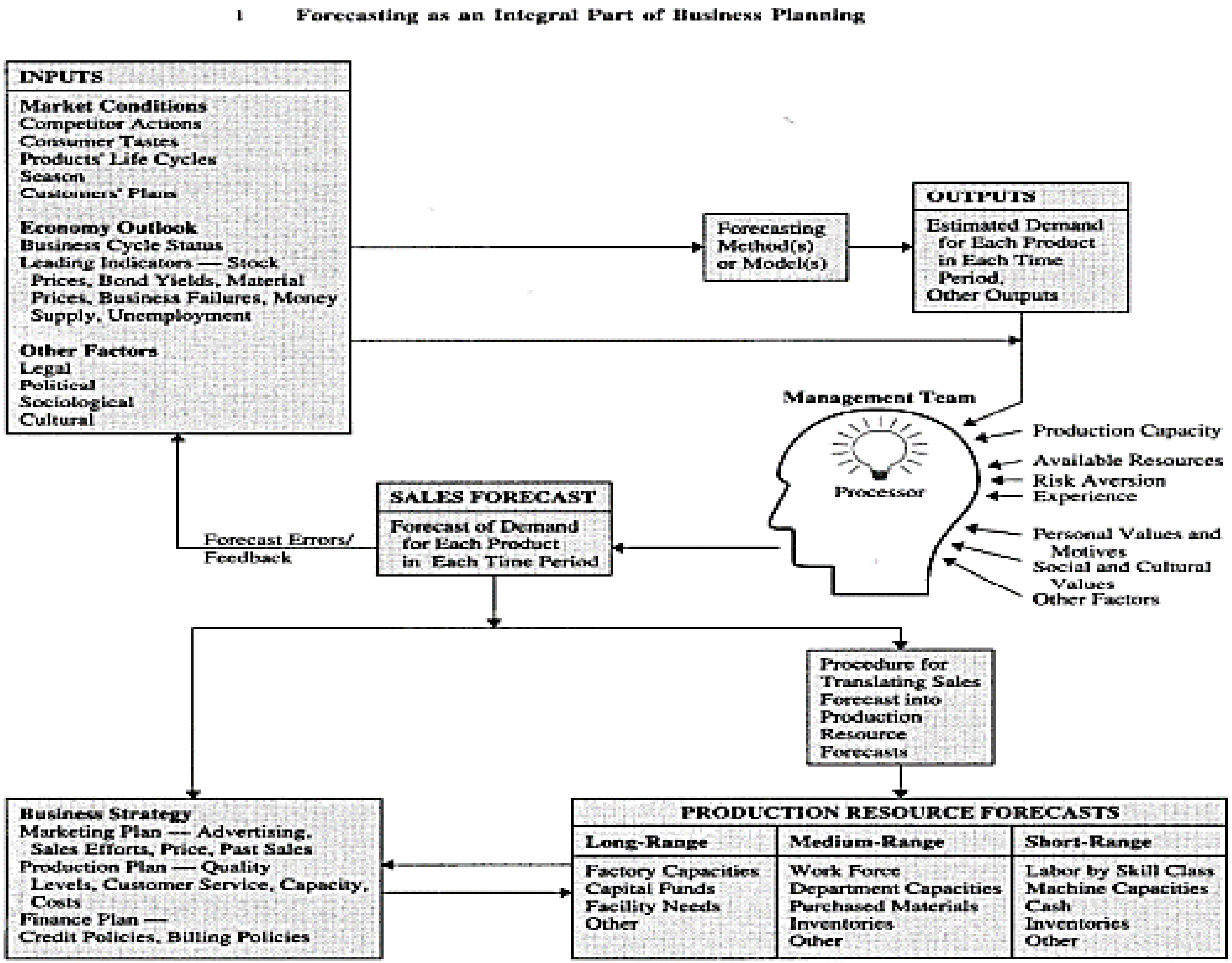
Why forecasting is essential in POM

Some Reasons Why Forecasting Is Essential in POM

1. **New Facility Planning.** It can take as long as five years to design and build a new factory or design and implement a new production process. Such strategic activities in POM require long-range forecasts of demand for existing and new products so that operations managers can have the necessary lead time to build factories and install processes to produce the products and services when needed.
2. **Production Planning.** Demands for products and services vary from month to month. Production rates must be scaled up or down to meet these demands. It can take several months to change the capacities of production processes. Operations managers need medium-range forecasts so that they can have the lead time necessary to provide the production capacity to produce these variable monthly demands.
3. **Work Force Scheduling.** Demands for products and services vary from week to week. The work force must be scaled up or down to meet these demands by using reassignment, overtime, layoffs, or hiring. Operations managers need short-range forecasts so that they can have the lead time necessary to provide work force changes to produce the weekly demands.

Some Examples of Things That Must Be Forecasted in POM

Forecast Horizon	Time Span	Examples of Things That Must Be Forecasted	Some Typical Units of Forecasts
Long-range	Years	New product lines	Dollars
		Old product lines	Dollars
		Factory capacities	Gallons, hours, pounds, units, or customers per time period
		Capital funds	Dollars
		Facility needs	Space, volume
Medium-range	Months	Product groups	Units
		Departmental capacities	Hours, strokes, pounds, gallons, units, or customers per time period
		Work force	Workers, hours
		Purchased materials	Units, pounds, gallons
		Inventories	Units, dollars
Short-range	Weeks	Specific products	Units
		Labor-skill classes	Workers, hours
		Machine capacities	Units, hours, gallons, strokes, pounds, or customers per time period
		Cash	Dollars
		Inventories	Units, dollars


1 Forecasting as an Integral Part of Business Planning
INPUTS
Market Conditions
Competitor Actions
Consumer Tastes
Products' Life Cycles
Season
Customers' Plans
Economy Outlook
Business Cycle Status
Leading Indicators — Stock Prices, Bond Yields, Material Prices, Business Failures, Money Supply, Unemployment
Other Factors
Legal
Political
Sociological
Cultural
Forecasting Method(s) or Model(s)
OUTPUTS
Estimated Demand for Each Product in Each Time Period,
Other Outputs
Management Team
Processor
Production Capacity
Available Resources
Risk Aversion
Experience
Personal Values and Motives
Social and Cultural Values
Other Factors
SALES FORECAST
Forecast of Demand for Each Product in Each Time Period
Forecast Errors/ Feedback
Procedure for Translating Sales Forecast into Production Resource Forecasts
Business Strategy
Marketing Plan — Advertising, Sales Efforts, Price, Past Sales
Production Plan — Quality Levels, Customer Service, Capacity, Costs
Finance Plan —
Credit Policies, Billing Policies
PRODUCTION RESOURCE FORECASTS
Long-Range
Factory Capacities
Capital Funds
Facility Needs
Other
Medium-Range
Work Force
Department Capacities
Purchased Materials
Inventories
Other
Short-Range
Labor by Skill Class
Machine Capacities
Cash
Inventories
Other

Technique for Demand Forecasting

1. Naïve techniques - adding a certain percentage to the demand for next year.
2. Opinion sampling - collecting opinions from sales, customers etc.
3. Qualitative methods – decision, based on the judgment from experts
4. Quantitative methods - based on statistical and mathematical concepts.

Quantitative Methods of Forecasting

- 1.Causal –There is a causal relationship between the variable to be forecast and another variable or a series of variables. (Demand is based on the policy, e.g. cement, and build material.
- 2. Time series –The variable to be forecast has behaved according to a specific pattern in the past and this pattern will continue in the future.

Qualitative Forecasting Methods

1. **Executive Committee Consensus.** Knowledgeable executives from various departments within the organization form a committee charged with the responsibility of developing a sales forecast. The committee may use many inputs from all parts of the organization and may have staff analysts provide analyses as needed. Such forecasts tend to be compromise forecasts, not reflecting the extremes that could be present had they been prepared by individuals. This method is the most common forecasting method.
2. **Delphi Method.** This method is used to achieve consensus within a committee. In this method executives anonymously answer a series of questions on successive rounds. Each response is fed back to all participants on each round, and the process is then repeated. As many as six rounds may be required before consensus is reached on the forecast. This method can result in forecasts that most participants have ultimately agreed to in spite of their initial disagreement.
3. **Survey of Sales Force.** Estimates of future regional sales are obtained from individual members of the sales force. These estimates are combined to form an estimate of sales for all regions. Managers must then transform this estimate into a sales forecast to ensure realistic estimates. This is a popular forecasting method for companies that have a good communication system in place and that have salespersons who sell directly to customers.

4. **Survey of Customers.** Estimates of future sales are obtained directly from customers. Individual customers are surveyed to determine what quantities of the firm's products they intend to purchase in each future time period. A sales forecast is determined by combining individual customers' responses. This method may be preferred by companies that have relatively few customers.
5. **Historical Analogy.** This method ties the estimate of future sales of a product to knowledge of a similar product's sales. Knowledge of one product's sales during various stages of its product life cycle is applied to the estimate of sales for a similar product. This method may be particularly useful in forecasting sales of new products.
6. **Market Research.** In *market surveys,* mail questionnaires, telephone interviews, or field interviews form the basis for testing hypotheses about real markets. In *market tests,* products marketed in target regions or outlets are statistically extrapolated to total markets. These methods are ordinarily preferred for new products or for existing products to be introduced into new market segments.

SALES FORECASTING

SALES FORECASTING

- Ideally the sales forecasting process needs different kinds of information from different departments.
- This could be done by integrating different departments by means of a common information system.
- The business functions of departments like production, sales, purchasing, planning, finance and logistics, and supply chain department are different; the strategies used by them also differ.
- While integrating the functions, all the departments share their information on a central information system which is joined with a central database warehouse.

- As all functions work towards the same target, sharing information facilitates productive work. Coordination can be achieved by a central information system.
- Furthermore sales forecasting also runs on information like marketing, sales, production planning, and logistics.
- All departments need sales forecasting to plan their activities effectively.
- Integration of coordination may be the best way to achieve integrated and interactive forecast.
- The managers at the different functional areas will make the decisions using the data available in the central repository.

- The activities that can be forecast in the area of marketing are **annual plans, product changes, promotional changes, channel placement, and pricing**; in the area of sales, identifying the sales target for the sales force; and in the area of finance.
- Forecasting is also made in the area of production and purchasing, planning the development of plant and equipment; and finally in the area of logistics and planning the development of storage facilities and transportation and equipment.

REASONS FOR UNDERTAKING SALES FORECASTS

- The sales forecasting process is a critical one for most businesses and the critical areas where sales forecasting is necessary for a company is discussed in the following section.

1. Sales forecasting need in Planning
2. Sales forecasting need in Financial planning
3. Sales forecasting need in Production / Purchasing
4. Sales forecasting need in Logistics
5. Sales forecasting need in Marketing

The process of coordinating and moving resources—people, materials, inventory, and equipment—from one location to storage at the desired destination.

1. Sales forecasting need in Planning

- Sales forecasting serves as the initial seeding to the Sales and operations planning (S&OP) process.
- The forecasting may originate from a study of past demand history.
- As the marketing function originates and manages the demand toward the final customer, the necessity of sales forecasting arises from the demand side.
- Based on the sales forecasting, the supply side prepares the capacity plan.
  - **The capacity plan** is nothing but the capabilities to satisfy demand using the maximum possible inputs via information net both forecasting and capacity plans are studied out to consider strategies.
- Considering different information collected from time to time and strategies undertaken, the demand plans are given out from S & OP system.
- The demand plans make marketing and supply departments understand future product launching and actions needed to achieve corporate strategies.
- Smooth running of S&OP needs accurate forecasting.
- Accurate forecast plays a major role in succession planning and achieving of the final goal.

2. Sales forecasting need in financial planning

- One of the model that is followed is Francis-Rowell(FR) model.
- The objective of this model is to generate proforma financial statements that describe the future financial condition of the firm for any assumed pattern of sales.
- The FR model is composed of **ten sectors,** they are

  i. Industry sales
  ii. Production sector
  iii. Fixed capital stock requirements
  iv. Pricing
  v. Production costs
  vi. Income
  vii. New financing required
  viii. Risks
  ix. Costs of financing
  x. Common stock valuation.

3. Sales forecasting need in production /purchasing

- Production and aggregate planning are closely related to demand forecasting.
- Plans are dependent on the future sale of products that will be produced and marketed.
- During short-term forecasting, the production plans depend on purchasing forecast.
- Wisner and Stanley (1994), indicate that forecasting and purchasing are closely related.
- It reveals the importance of forecasting in the process of preparation of a master purchase plan.
- Purchasing action includes time lags due to shipping and logistic action from suppliers hence purchasing department needs to know the forecasting for planning so that no stockout will occur.
- This helps in smooth production without stockouts.

4. Sales forecasting needed in logistics

- The logistic department is considered responsible for both storage and distribution toward the destination from the site of storage of produced goods.
- Therefore logistics department needs a forecast.
- Both short and long-term forecasts are needed while planning.
- Long-term planning is needed to decide the storage capacity of the warehouse and services together.
- Transportation services are also needed to be considered while this is being planned.
- Based upon the production plan, the logistics department prepares its own service plan, and hence forecasting plays an important role in logistics planning.

5. Sales forecasting need in Marketing

- The marketing success is based on the capability of the company to satisfy customer demand and needs.
- Conditions like stockouts and low innovativeness may decrease demand and loss of sales can occur
- Considering this principle a company plans its activities.
- Marketing plans are based on current demand, derived demand, competitors' pricing, and different promotions.
- To yield from a marketing plan, knowledge of forecasting is needed.
- Normally annual levels could be considered and intervals can be either monthly or quarterly, depending on the product.