Supply Chain Management

Course Code : MGMT4037

Unit – 3 & 5 :SCM Enablers & Contemporary Issues in SCM

Part-I

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SUPPLY CHAIN MANAGEMENT

- **Unit: 3**

SCM Enablers : Tools and Techniques of Information & Communication Technology (ICT) in Supply Chain; Supply Chain Forecasting; Buyer-Supplier Partnership.

- **Unit: 5**

Contemporary Issues in SCM : The content of the unit depends upon the recent developments in the field of SCM such as Lean Approach; Green SCM & Reverse Logistics

❑ SCM Enablers

Supply chain management (SCM) is the management of a network of interconnected businesses involved in the ultimate provision of product and service packages required by end customers (Harland, 1996).

Supply chain management spans all movement and storage of raw materials, work-in-process inventory, and finished goods from point of origin to point of consumption. Organizations experienced that they must rely on effective supply chains, or networks to be able to compete in the global market and the networked economy.

Organizations have figured out that to be successful in this proactive business world they need to collaborate with their partners in their supply chain. It is obvious that only this way will bring the excellence in their business.

It is experienced by different organizations that bringing the excellence to the environment will also bring benefits for all parties. However benefits worth some extra initial effort for the enablers and some extra struggle to the barriers of the supply chain collaboration.

❑ SCM Enablers Cont…

Supply chain collaboration enablers are the keys to value creation.

They are mostly about positive reaction (problem solving, not punishing), trustworthiness, helping each other, protecting your partner and sharing the benefits. Actually the system is acting like human nature.

There are four main supply chain enablers and these are :

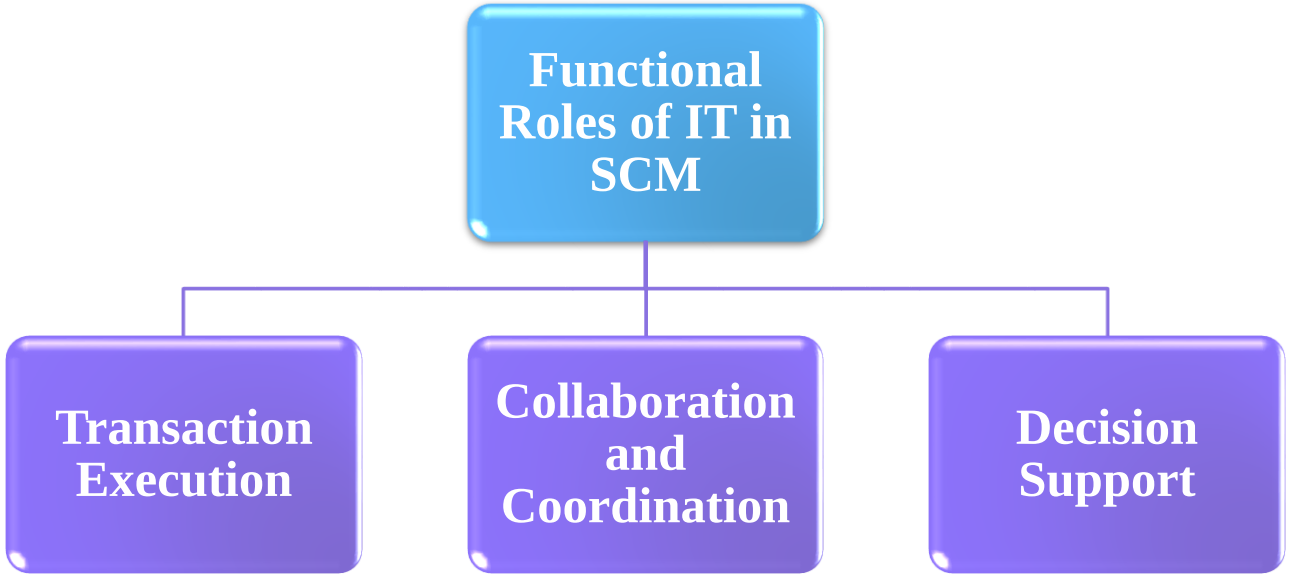
1. Organizational infrastructure,
2. Information technologies,
3. Strategic alliance and,
4. Human resource management.

❑ SCM Enablers Cont…

1. **Organizational infrastructure :** How business units and functional areas are organized, how change – management programs are led and coordinated within the existing organizational structure.
2. **Technology :** How technology (not just information technology but also the physical material- management technologies for material design, operations, and materials handling) affects a company's operational and strategic supply chain process.
3. **Strategic alliance :** How external companies (customer, suppliers, and logistics- service providers) are selected as business allies; how intercompany relationships are built and managed.
4. **Human resources management :** How job descriptions are designed, how positions are filed, how people are recognized and compensated, and how career paths are directed.

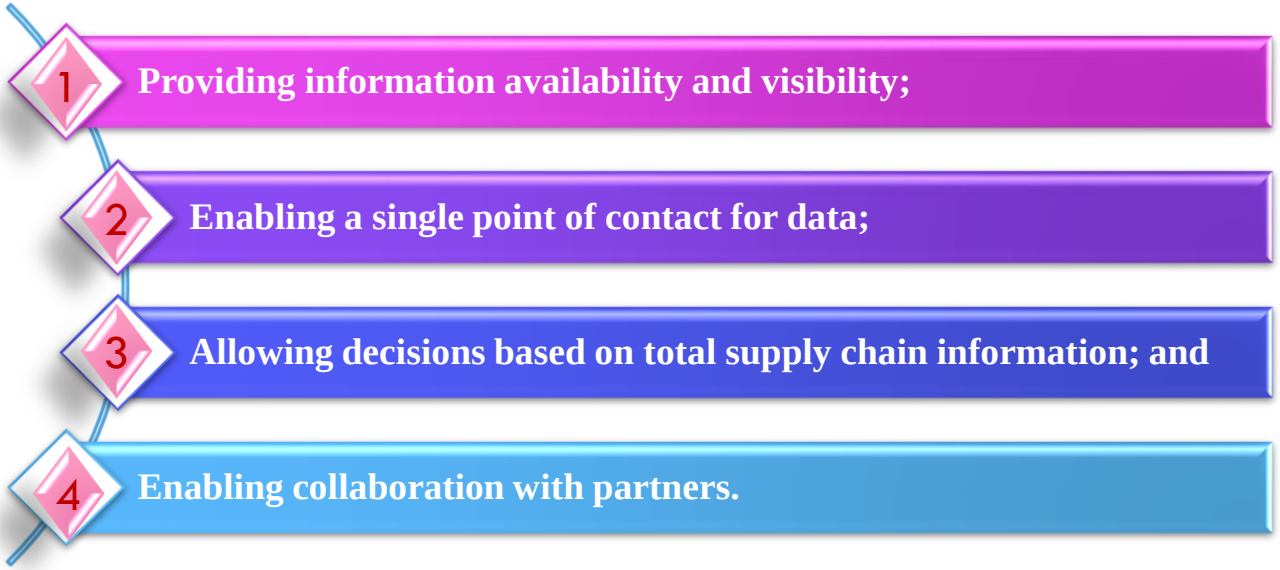
❑ Functional Roles of It in SCM

The functional roles of IT in SCM have been outlined as follows (Auramo et al 2005):



❑ Objectives and Benefits of IT In SCM

The objectives of Information Technology in Supply Chain Management are (Simchi-Levi, 2003):



IT in SCM enables great opportunities, ranging from direct operational benefits to the creation of strategic advantage. It changes industry structures and even the rules of competition. IT is key in supporting companies creating strategic advantage by enabling centralized strategic planning with day-to-day centralized operations. In fact supply chain become more market-oriented because of IT usage.

❑ Challenges In Implementing Information Technology In SCM

- Any company that has undertaken the mission of implementing an integrated supply chain management strategy with the use of IT tools knows that one of the greatest challenges it faces is the significant change in internal culture that is required to make the supply chain redesign successful.
- Integrating new applications with existing and legacy systems could also pose problems.
- Incompatible systems at buyer and vendor facilities are another management challenge to tackle.
- Data sharing with diverse stakeholders like suppliers and customers, filtering and mining data generated and finding “business” value of the data are other issues.
- Disconnected enterprise systems create data redundancy, errors and can lead to costly business inefficiencies.
- Poor coordination between enterprise systems leads to flawed production plans, increased supply chain pressure and poor customer service.
- Lack of visibility of orders, schedules and shipments can lead to costly administrative decision making processes.

❑ Existing Information Technology Tools and Applications in SCM

▪ Electronic Data Interchange (EDI) :

- Electronic Data Interchange (EDI) technology is introduced in 1970 and it has been widely used by firms in supply chains to facilitate transactions and information exchanges.
- EDI is defined as computer to computer exchange of structured data for automatic processing.
- EDI is used by supply chain partners to exchange essential information necessary for the effective running of their businesses.
- These structural links are usually set up between organizations that have a long term trading relationship.

Advantages :

- EDI are to enter only informative needs on the computer system once, and then it is able to speed of transaction and to reduce cost and error rates.
- Other benefits of EDI are Quick process to information, Better customer service, reduced paper work, increased productivity, improved tracing and expediting, Cost efficiency and improved billing.

❑ Cont…

- **Bar coding and Scanner**
  - Bar codes are widely used throughout the supply chain to identify and track goods at all stages in the process.
  - Bar codes are a series of different width lines that may be presented in a horizontal order, called ladder orientation, or a vertical order, called picket fence orientation.
  - Bar code scanners are most visible in the checkout counter of super markets and hyper markets.
  - This code specifies name of product and its manufacturer. Other applications are tracking the moving items such as components in PC assembly operations, automobiles in assembly plants.
- **Enterprise Resource Planning (ERP) Systems**
  - Enterprise Resource Planning (ERP) Systems are Enterprise-wide Information Systems used for automating all activities and functions of a business.
  - These are transaction-based information systems that are integrated across the whole business.
  - Basically, they allow for data capture for the whole business into a single computer package which's give a single source for all the key business information activities, such as customer orders, inventory and financials.
  - Many companies now view ERP systems from vendors like Baan, SAP and People soft as the core of their IT infrastructure.

❑ Cont…

- **Warehouse Management Systems**
  - Warehouse management systems are systems that control all the traditional activities of warehouse operations.
  - Areas covered usually include receipt of goods, allocation or recording of storage locations, replenishment of picking locations, production of picking instructions or lists, order picking, order assembly and stock rotation.
  - The warehouse management system communicates with the RF system and directs the activities of the warehouse staff.
  - This has the advantage of updating the stock holding in real time.
- **Transportation Management Systems**
  - Transportation Management Systems provide more visibility into shipments and orders. Scheduling issues are also addressed on time.
  - Multiple transportation options can be explored as a result of earlier visibility into the supply chain.
  - Timely communication and status reports can also be obtained. By having control on its supply chain, businesses can make efficient routing decisions.
  - An example of such a system is developed by Target Corporation and NTE.

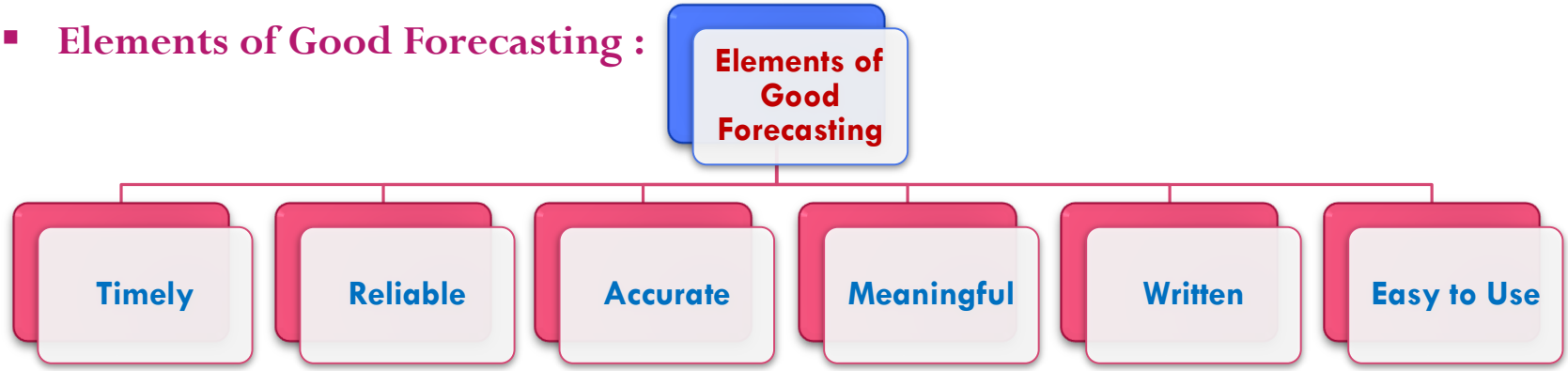
Cont…

- **Inventory Management Systems**
  - Inventory management systems are the rule for such enterprises, but smaller businesses and vendors use them, too.
  - The systems ensure customers always have enough of what they want and balance that goal against a retailer's financial need to maintain as little stock as possible.
  - Mismanaged inventory means disappointed customers, too much cash tied up in warehouses and slower sales.
  - Modern inventory management systems must have the ability to track sales and available inventory, communicate with suppliers in near real-time and receive and incorporate other data, such as seasonal demand.
  - They also must be flexible, allowing for a merchant's intuition.
  - And, they must tell a storeowner when it's time to reorder and how much to purchase.

❑ Supply Chain Forecasting

- Forecasting is a technique that uses historical data as inputs to make informed estimates that are predictive in determining the direction of future trends.
- Businesses utilize forecasting to determine how to allocate their budgets or plan for anticipated expenses for an upcoming period of time. This is typically based on the projected demand for the goods and services offered.
- Forecasting works as addresses a problem or set of data. Economists or analysts make assumptions regarding the situation being analyzed that must be established before the variables of the forecasting are determines.

- **Elements of Good Forecasting :**



❑ The Strategic Role of Forecasting in SCM and TQM

In today's global business environment, strategic planning and design tend to focus on supply chain management and total quality management (TQM).

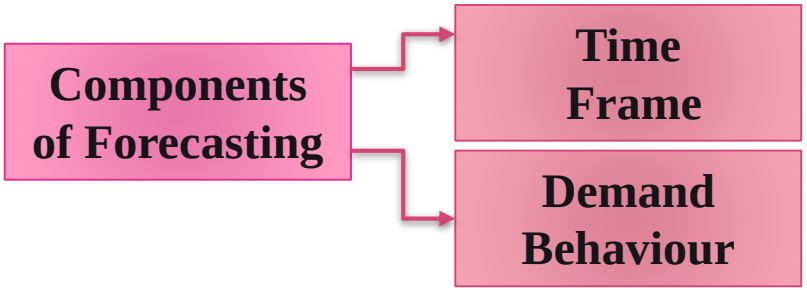
▪ Supply Chain Management

- Supply chain functions include purchasing, inventory, production, scheduling, facility location, transportation, and distribution.
- All these functions are affected in the short run by product demand and in the long run by new products and processes, technology advances, and changing markets.
- Forecasts of product demand determine how much inventory is needed, how much product to make, and how much material to purchase from suppliers to meet forecasted customer needs. This in turn determines the kind of transportation that will be needed and where plants
- Warehouses, and distribution centers will be located so that products and services can be delivered on time.
- Without accurate forecasts large stocks of costly inventory must be kept at each stage of the supply chain to compensate for the uncertainties of customer demand.This is especially hurtful in today's competitive global business environment where customer service and on-time delivery are critical factors.

- **Supply Chain Management Cont…**
  - Long-run forecasts of technology advances, new products, and changing markets are especially critical for the strategic design of a company's supply chain in the future.
  - In today's global market if companies cannot effectively forecast what products will be demanded in the future and the products their competitors are likely to introduce, they will be unable to develop the production and service systems in time to compete.
  - The forecast also has to be able to respond to sudden, quick changes in demand.
  - Longer forecasts based on historical sales data for six to twelve months into the future are also generally required to help make weekly forecasts and suggest trend changes.
- **Total Quality Management and forecasting**
  - Forecasting is crucial in a total quality management (TQM) environment. More and more, customers perceive good-quality service to mean having a product when they demand it.
  - This holds true for manufacturing and service companies.
  - For example When customers walk into a McDonald's to order a meal, they do not expect to wait long to place orders. They expect McDonald's to have the item they want, and they expect to receive their orders within a short period of time.

- **Total Quality Management and forecasting Cont…**
  - An inaccurate forecast causes service to break down, resulting in poor quality.
  - For manufacturing operations, especially for suppliers, customers expect parts to be provided when demanded.
  - Accurately forecasting customer demand is a crucial part of providing the high-quality service.
- **Strategic Planning**
  - There can be no strategic planning without forecasting.
  - The ultimate objective of strategic planning is to determine what the company should be in the future--what markets to compete in, with what products, to be successful and grow.
  - To answer these questions the company needs to know what new products its customers will want, how much of these products customers will want, and the level of quality and other features that will be expected in these products.
  - Forecasting answers these questions and is a key to a company's long-term competitiveness and success.
  - The determination of future new products and their design subsequently determines process design, the kinds of new equipment and technologies that will be needed, and the design of the supply chain, including the facilities, transportation, and distribution systems that will be required.
  - These elements are ultimately based on the company's forecast of the long-run future.

➢ Components of Forecasting Demand



- **Time Frame**

  Forecasts are either short- to mid-range, or long-range. Short-range (to mid-range) forecasts are typically for daily, weekly, or monthly sales demand for up to approximately two years into the future, depending on the company and the type of industry. A long-range forecast is usually for a period longer than two years into the future. A long range forecast is normally used for strategic planning--to establish long-term goals, plan new products for changing markets, enter new markets, develop new facilities, develop technology, design the supply chain, and implement strategic programs such as TQM

- **Demand Behavior**

  Demand sometimes behaves in a random, irregular way. At other times it exhibits predictable behavior, with trends or repetitive patterns, which the forecast may reflect. The three types of demand behavior are trends, cycles, and seasonal patterns.

❑ Forecasting Methods

Here, we are going to discuss three basic types of forecasting:

- ✓ **Time Series Methods,**
- ✓ **Regression Methods, and**
- ✓ **Qualitative Methods.**

- **Time series** methods are statistical techniques that use historical demand data to predict future demand.
- **Regression** (or causal) forecasting methods attempt to develop a mathematical relationship (in the form of a regression model) between demand and factors that cause it to behave the way it does.

In this section we will focus our discussion on qualitative forecasting:

- **Qualitative** methods use management judgment, expertise, and opinion to make forecasts. Often called "the jury of executive opinion," they are the most common type of forecasting method for the long-term strategic planning process.
- The Delphi method is a procedure for acquiring informed judgments and opinions from knowledgeable individuals using a series of questionnaires to develop a consensus forecast about what will occur in the future.

❑ Cont…

- It was developed at the Rand Corporation shortly after World War II to forecast the impact of a hypothetical nuclear attack on the United States.
- Although the Delphi method has been used for a variety of applications, forecasting has been one of its primary uses. It has been especially useful for forecasting technological change and advances.

Forecasting is not simply identifying and using a method to compute a numerical estimate of what demand will be in the future

✓ Time Series Method :

Time series methods are statistical techniques that make use of historical data accumulated over a period of time. Time series methods assume that what has occurred in the past will continue to occur in the future. As the name time series suggests, these methods relate the forecast to only one factor--time.

They include the moving average, exponential smoothing, and linear trend line; and they are among the most popular methods for short-range forecasting among service and manufacturing companies.

These methods assume that identifiable historical patterns or trends for demand over time will repeat themselves

- **Moving Average :**
  - A time series forecast can be as simple as using demand in the current period to predict demand in the next period. This is sometimes called a naive or intuitive forecast.
  - The simple moving average method uses several demand values during the recent past to develop a forecast.
  - This tends to dampen, or smooth out, the random increases and decreases of a forecast that uses only one period.
  - The simple moving average is useful for forecasting demand that is stable and does not display any pronounced demand behavior, such as a trend or seasonal pattern.
- **Linear Trend Line :**
  - Linear regression is a causal method of forecasting in which a mathematical relationship is developed between demand and some other factor that causes demand behavior.
  - However, when demand displays an obvious trend over time, a least squares regression line, or linear trend line, can be used to forecast demand.
  - A linear trend line relates a dependent variable, which for our purposes is demand, to one independent variable, time, in form of a linear equation:

- Linear Trend Line Cont… :

Linear Equation :

$Y = a + bx$ Where, a = intercept (at period 0)

b = slop of the line

x = the time period

y = forecast for demand for period x

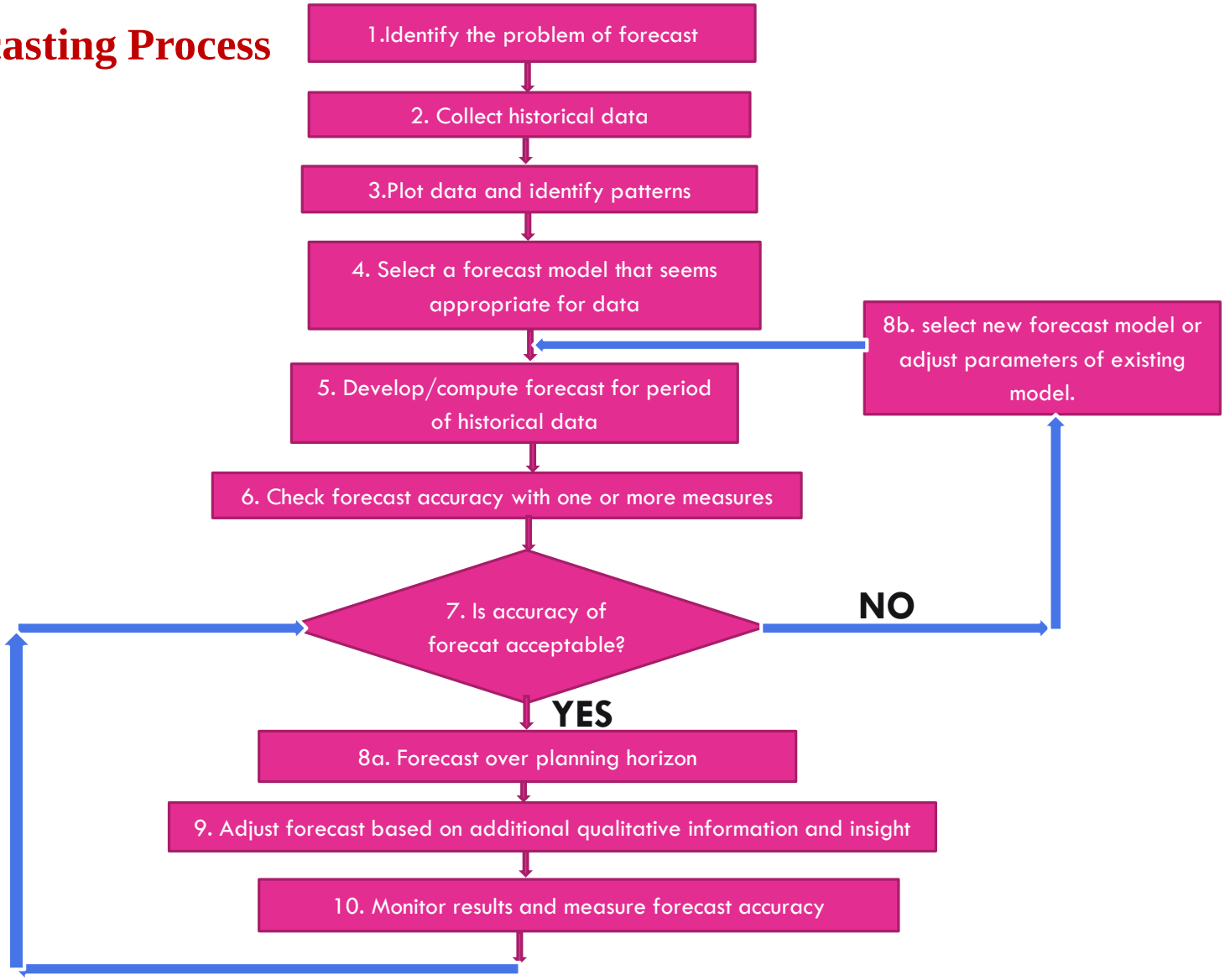
These parameters of the linear trend line can be calculated using the least squares formulas for linear regression:

$$b = \sum xy - n\,xy / \sum x^2 - nx^2$$

$$a = y + bx$$

Where, n= number of periods, $x = \sum x/n$= the mean of the x value, $y = \sum y/n$

❑ Forecasting Process




Thank You