The Controlling Function

Presented
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General Definitions

- An org is an information processing system: has critical implications in area of control
- Control specifically refers to:
  - monitoring of plans,
  - identifications of deviations, and
  - their corrections
- The control process has four stages:
  - Establishing standards
  - Measuring actual standards
  - Comparing actual performance with standards
  - Taking necessary action
- Purpose of control is to get the job done despite environmental, org obstacles and uncertainties

Types of Control

- Three types of control in a production system
- **Feed forward control (input control)**
  - monitoring inputs,
  - anticipating and
  - preventing problems
- **Concurrent control (concurrent/on going process control)**
  - monitoring processes, and
  - adjusting ongoing activities
- **Feedback control (output/product control)**
  - monitoring products
  - learning from mistakes
- **Proper control requirements**
  - Well defined objectives (targets)
  - Set standards
  - Evaluation actual against set standard

Signs of Poor Control

- **Poor signs include** the following:
  - Decline in profits
  - Increased customer complaints
  - Manifested employee dissatisfaction
  - Cash shortages caused by bloated inventories
  - Idle facilities and/or personnel
  - Disorganised operations, workflow bottlenecks, excessive paper work etc.
  - Excessive costs
  - Evidence of waste and inefficiency (scrap rework)

Methods Of Control

- **Methods include**:
  - Internal audit
  - The budget
  - Financial ratios
  - Cash management
  - Cost/mgt accounting
- **Computer based control systems** include:
  - Electronic data processing (EDP)
  - Management information system (MIS)
  - Decision support system (DSS)

Production & Operations Mgt

- POM – a subfield of mgt which focuses on the manner in which input resources are converted into products
- **Three modes of production**:
  - **Batch** – dependent on existing demand; production proceeds if there is a demand for the product
  - **Mass production** occurs when there is a continuous demand in large quantities of product.
  - **Continuous production** occurs in primary industries which provide material for further processing or manufacturing by other companies.

Traditional Factories

- High degree of specialisation of labour
- Specialisation in form of departments arranged similar to assembly lines
- Accounting procedures to track costs of production
- Use of interchangeable parts – allowed mgt to employ semiskilled workers since they only needed to follow precise rules to meet guidelines
- Early factories were small employing a few hundreds of workers. Labour costs were a major cost item
- Under mass production, work became unskilled in nature and workers performed a few simple operations.
- Mass production was responsible for employing thousands of workers

The Modern Factory

- **Outstanding characteristics**:
  - Replacement of workers with automated equipment
  - Focus is more on efficiency of production system and quality of product resulting in increased customer satisfaction
  - Fewer production bottlenecks
  - Good inventory mgt systems resulting in
  - Significant cost reduction.

Development of Modern Factory

- **First development – use of CAD** (computer aided design)
- **Second – CAE** use of computer aided engineering
- **Third – CAM** (computer aided manufacturing);
  - Can determine the best route for product to follow within factory if several machines must work
  - Can determine most efficient order that a machine should follow to produce the best product
- **Fourth – CIM** (computer integrated mfrg) works well when every operation in the factory is under the control of a computer system
- In most advanced factories FM (flexible mfg) – production process that can be changed to make different products with minimum fuss.

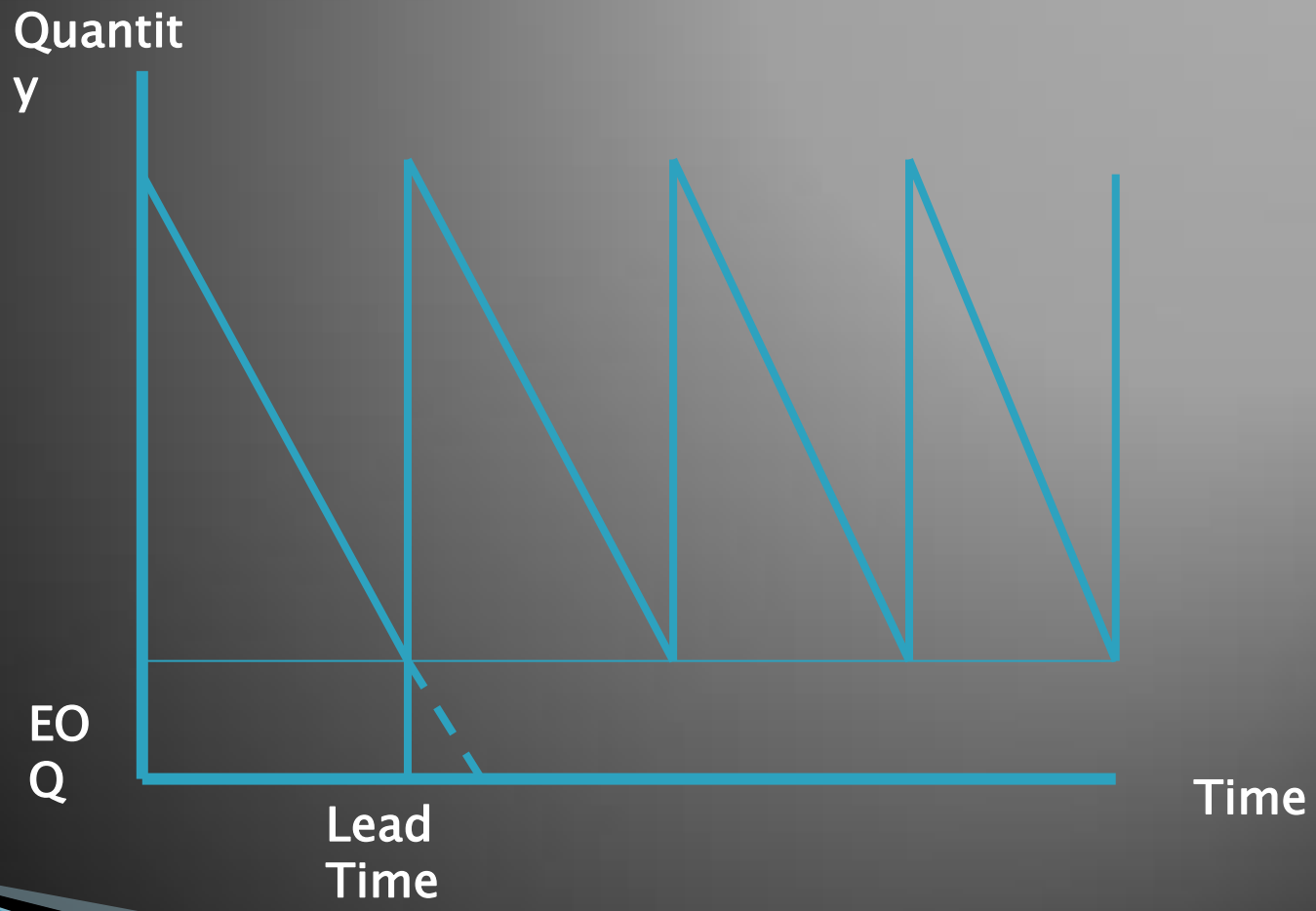
Inventory Control

- **Three models** which are closely related:
  - Economic Order Quantity (EOQ),
  - Economic Order Point (EOP) and
  - Materials Requirement Planning (MRP)
- **EOQ model** is based on mgt of inventory levels of each item as usage occurs:
  - Reorder of items is placed when inventory levels fall to a predetermined level.
  - Useful if items can be ordered independently of one another

Inventory Control

- **EOP** – reordering practice based on placing orders for all items simultaneously at certain intervals. Typical of retail business
- **MRP** – suitable when there is a commonality among products; when a sub component is used in more than one product
- Inventory control systems purpose is to control costs

EOQ Model



Complementary Inventory Systems

- **Three systems** have helped orgs to **further reduce inventory costs** :
- **Just in Time (JIT)** – enables org to keep minimum stock of parts thus cutting inventory cost to negligible levels.
- **Manufacturing Resource Planning** (MRPII) – combines CIM and MRP inventory control.
- Essentially **MRPII integrates**:
  - Financial planning,
  - Marketing
  - Engineering and
  - Purchasing through simple mathematical tools of MRP
- **Optimum Production technology (OPT)** – computer soft ware which uses plant-floor input to locate bottle-necks and remove them
- OPT is used in conjunction with MRP
- JIT, MRPII and OPT are appropriate in automated factories

Other Monitoring & Control Systems

- Serious difficulties arise in planning and controlling execution of interrelated activities.
- Methods used include:
- **Gantt charts** – graphic representations of the workflow through various departments of an organisation.
- The use of charts eventually led to the development of **two prominent network techniques PERT and CPM:**
- **Program Evaluation and Review Technique (PERT)** – a probabilistic technique to determine a series of interrelated steps necessary to complete a specific project
- **Critical Path Method (CPM)** – a technique to determine time duration of interrelated events necessary to complete a specific project.
- Managers use either CPM or PERT to discover deviations from the time allotted to each milestone and take correction action.

Additional Techniques – LP

- Other additional techniques of importance in production and operations mgt include:
  - **Linear programming (LP)**
  - **Simulation (SM)**
  - Queuing (QU)
- **LP** focuses on either maximising or minimising objective functions such as profits or costs
- **LP** involves solution of linear equations and is appropriate when manager must allocate scarce resources to competing projects or objectives.
- **LP** is a powerful tool for managerial decision making and it has two functions:
  - It establishes optimal operating conditions and
  - It pinpoints areas that may need managerial attention
  - It identifies the sensitivity of operating variables to change conditions
- The info allows manger to focus attention on areas sensitive to change, where the input is most important

Simulation

- **Simulation** – a process of building, testing and operating models of real-world phenomena through mathematical relationships existing among critical factors
- With the use of computers it has become possible to simulate complex situations to determine the best course of action
- **Simulation methodology** comprises four steps:
  - **Step 1 Define Problem**; set objectives of the study and variables that affect achievement
  - **Step 2 Construct Simulation Model**; specify variables, parameters, decision rules , probability distribution and time incrementing procedures
  - **Step 3 Specify Values And Parameters**; determination of starting conditions and run length
  - **Step 4 Evaluate Results**; determine statistical tests and compare with other information

Queuing

- **Simulation** – technique that can be applied to a variety of problems in and outside production entities in such areas as:
  - complicated waiting lines
  - arrangement of offices
  - physical distribution systems
  - alternative corporate strategies and
  - product demand patterns.
- **Queuing (waiting line analysis)** – focuses on the speed with which units or individuals come into a queue and speed of processing.
- Orgs have applied waiting line analysis to variety of problems as:
  - Checkout lines
  - Shipping or receiving docks and
  - Work flow through an org.

Information Systems

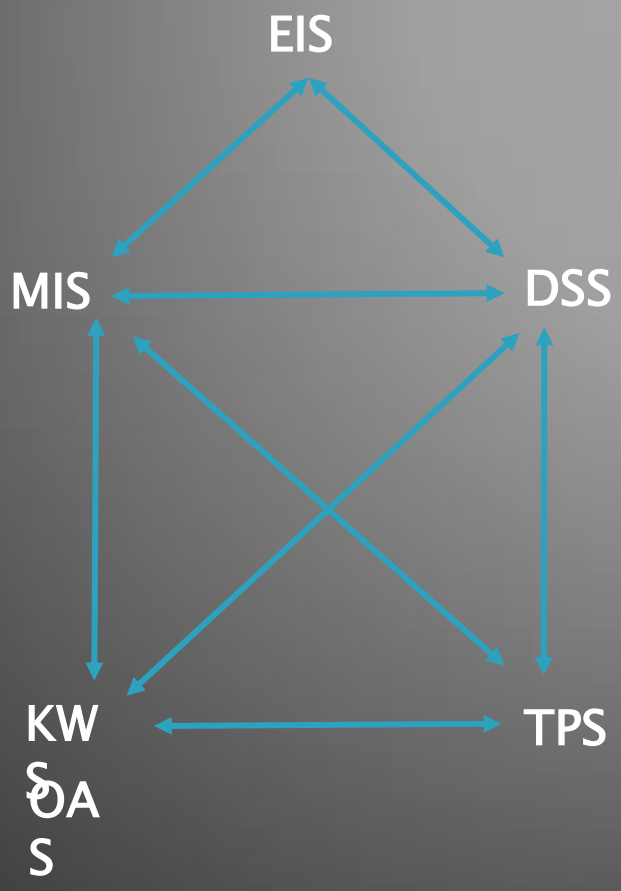
- **Six types are possible**:
- **Executive Info System (EIS)** – used by top mgt to develop and monitor progress of org strategy and plans
- **Mgt Info System (MIS)** – used by middle mgt to develop and monitor org tactical plans based on available resources
- **Decision Support System (DSS)** – used by mgt to allocate resources to various org activities in pursuit of org objectives
- **Knowledge Workers System (KWS)** – used by expert units in the org to provide guidance/direction in light of internal and external environmental pressures
- **Office application systems (OAS)** – used by administrators to track progress of org activities on a daily or weekly basis
- **Transaction Processing Systems** – used online and live by workers recording bsn transactions with customers or clients

Org Info Systems

Top Executives

Manager level

Experts and officers



Decision Support Systems

Live Transaction Processing

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