These notes are summary of chapter 18 of Principles of Management by Tripathi, chapter 18 of Management by Robbins and chapter 18 of Essentials of Management by Koontz (prepared by Dr. Mandeep Kaur).

Introduction to Controlling System:

Controlling is one of the fundamental functions of management, alongside planning, organizing, staffing, and directing. It involves **monitoring activities** to ensure they are being accomplished as planned and correcting any significant deviations.

Key Points:

1. **Definition:** Controlling is the process of **measuring actual performance**, **comparing it with planned goals**, and **taking corrective action** if necessary to ensure that organizational objectives are achieved efficiently and effectively.

2. **Importance:**

    - Ensures that organizational activities are aligned with established plans.
    - Helps in achieving goals within set timelines and budgets.
    - Minimizes errors and deviations from standards.
    - Encourages better performance through feedback and accountability.
3. **Steps in the Controlling Process:**

    - Setting performance standards.
    - Measuring actual performance.
    - Comparing actual performance with standards.
    - Analyzing deviations and identifying causes.
    - Taking corrective actions.
4. **Features:**

    - A continuous and forward-looking process.
    - Applied at all levels of management.
    - Closely linked with planning—often called the “twin of planning”.

Planning-Control Link emphasizes the **interdependence between planning and controlling**, which are often referred to as **"twin functions of management."** Here's a concise explanation of their link:

Planning-Control Link:

1. **Control is Based on Plans:**
    - **Planning sets the goals and standards** that control uses as benchmarks.
    - Without a plan, there is **nothing to control** against.
2. **Control Measures Performance Against Plans:**
    - The control process involves **comparing actual performance with planned objectives**.
    - It identifies deviations and helps ensure that performance aligns with the original plan.
3. **Control Helps Improve Future Planning:**
    - Insights gained from controlling—like deviations, errors, and inefficiencies—are **feedback for better planning**.
    - It helps managers **revise goals, strategies, or resource allocations**.
4. **Cyclical Relationship:**
    - Planning and controlling form a **continuous loop**:
        - **Plans guide actions → Control monitors outcomes → Feedback improves future plans**.
5. **Mutual Reinforcement:**
    - Good planning makes control more effective.
    - Effective control ensures that plans are successfully implemented.

Summary Statement:

"Planning is looking ahead, while controlling is looking back—but both are essential to move forward effectively."

Control is not about rigid enforcement but about **guiding and improving** performance to achieve the best outcomes. The **process of control** is a systematic sequence of steps designed to ensure that organizational activities align with planned objectives. Here's a clear breakdown of the **control process**:

Process of Control:

1. **Setting Performance Standards:**

    - Standards are the criteria against which actual performance is measured.
    - They may be **quantitative** (like cost, output, time) or **qualitative** (like customer satisfaction, employee morale).
    - Standards must be clear, realistic, and aligned with organizational goals.
2. **Measuring Actual Performance:**
    - Involves collecting data and assessing actual outcomes.
    - Methods include reports, audits, observations, and performance appraisals.
    - Measurement should be **timely and accurate**.
3. **Comparing Actual Performance with Standards:**
    - The measured performance is compared with predetermined standards.
    - This comparison helps identify **deviations**—whether positive or negative.
4. **Analyzing Deviations:**
    - Not all deviations require action; **tolerance limits** may be set.
    - Important deviations are analyzed to understand their causes.
    - Focus is often on **critical deviations** that impact goals significantly.
5. **Taking Corrective Action:**
    - If performance is not as per standards, management must take corrective measures.
    - Actions may include **retraining employees**, **changing processes**, or **revising goals or standards**.
    - The aim is to bring performance back in line with expectations.

This cycle is **continuous** and helps maintain control over the dynamic environment of a business. It also emphasizes the **feedback loop**, where the results of corrective actions influence future planning and controlling efforts.

The **requirements of an effective control system** refer to the essential features that make the control process functional, efficient, and supportive of organizational goals. Here are the main requirements highlighted:

Requirements of Effective Control:

1. **Accuracy:**
    - Control must provide **precise and reliable information** about performance.
    - Inaccurate data can lead to wrong decisions and actions.

2. **Timeliness:**
    - Control information must be **available at the right time**.
    - Delayed reports can make corrective actions ineffective or irrelevant.
3. **Flexibility:**
    - The control system should be able to **adapt to changes** in the environment, such as market conditions or technology.
    - Rigid controls can obstruct innovation and responsiveness.
4. **Suitability:**
    - Controls must be **appropriate to the activity** and the level of management.
    - For example, strategic-level controls differ from operational-level controls.
5. **Economy:**
    - The cost of the control system should not exceed its benefits.
    - Efficient control means using **minimum resources** for maximum effectiveness.
6. **Simplicity:**
    - Control mechanisms should be **easy to understand and operate**.
    - Complicated systems can confuse employees and reduce compliance.
7. **Objectivity:**
    - Control standards and evaluations should be **based on facts and data**, not personal opinions.
    - Objective control ensures fairness and credibility.
8. **Forward-looking:**
    - Good control not only detects errors but also **anticipates potential problems**.
    - It helps in **preventive action** rather than just corrective action.

These elements ensure that control supports decision-making, improves efficiency, and promotes accountability. Effective control is not about strict supervision but about **guiding performance toward desired outcomes**.

The **problems of a control system** refer to the limitations and challenges that may reduce the effectiveness of control in an organization. These issues often arise due to poor design, implementation gaps, or resistance within the system. Here's a clear explanation:

Problems of Control System:

1. **Difficulty in Setting Standards:**
    - It's often hard to set **clear, measurable, and realistic standards**, especially for qualitative areas like employee morale or creativity.
    - Vague standards lead to ineffective comparisons and control.
2. **Resistance from Employees:**
    - Strict controls may lead to feelings of **distrust or micromanagement**.
    - Employees may resist or even try to bypass controls if they feel they are being overly monitored.
3. **Cost of Control:**
    - Designing and operating a control system can be **expensive and resource-intensive**.
    - If the cost exceeds the benefits, the control becomes uneconomical.
4. **Delay in Feedback:**
    - Some control systems provide **delayed feedback**, making it hard to take timely corrective actions.
    - This can lead to the continuation of errors or inefficiencies.
5. **Overemphasis on Quantitative Aspects:**
    - Control systems often focus on measurable data and **ignore qualitative factors** like leadership, innovation, or employee satisfaction.
6. **Rigidity of Control:**
    - Some systems are **too rigid**, not allowing for flexibility in dynamic environments.
    - This can prevent quick adjustments or innovation.
7. **Inaccurate or Incomplete Information:**
    - Control depends heavily on accurate data. If the data is **incomplete or false**, decisions based on it may be flawed.
8. **Control for the Sake of Control:**
    - Excessive control may create **bureaucracy** and reduce efficiency.
    - Controls should be purposeful, not implemented just as a formality.

Conclusion:

To overcome these problems, a control system should be **flexible, economical, participative, and focused on strategic priorities**, not just operational details.

NEED FOR CONTROL SYSTEM

A control system is needed for four purposes:

1. to measure progress;
2. to uncover deviations;
3. to indicate corrective action; and
4. to transmit corrective action to the operation.

To Measure Progress

There is a close link between planning and controlling the organisation's operations. The control process continually measures progress towards goals. As Fayol3 so clearly recognised decades ago, "In an undertaking, control consists in verifying whether everything occurs in conformity with the plan adopted, the instructions issued and principles established". As the navigator continually takes readings to ascertain where he is relative to a planned course, so does the manager take readings to see where his enterprise or department is on the charted and predetermined course.

To Uncover Deviations

Once a business organisation is set into motion towards its specific objectives, events occur that tend to pull it "off target". Major events which tend to pull an organisation "off target" are as follows:

Change: Change is an integral part of almost any organisation's environment. Markets shift, new products emerge, new materials are discovered and new regulations are passed. The control function enables managers to detect changes that are affecting their organisation's products or services. They can then move to cope with the threats or opportunities that these changes represent.

Complexity: Today's vast and complex organisations, with geographically separated plants and decentralised operations make control a necessity. Diversified product lines need to be watched closely to ensure that quality and profi tability are being maintained; sales in different retail outlets need to be recorded accurately and analysed; the organisation's various markets—foreign and domestic—require close monitoring.

Mistake: Managers and their subordinates very often commit mistakes. For example, wrong parts are ordered, wrong pricing decisions are made, problems are diagnosed incorrectly, and so on. A control system enables managers to catch these mistakes before they become serious.

Delegations: As we discussed in Chapter 8, when managers delegate authority to subordinates, their responsibility to their own superiors is not reduced. The only way managers can determine if their subordinates are accomplishing the tasks that have been delegated to them is by implementing a system of control. Without such a system, managers will not be able to check on

their subordinates' progress, and so not be able to take corrective action until after a failure has occurred.

To Indicate Corrective Action

Controls are needed to indicate corrective actions. They may reveal, for example, that plans need to be redrawn or goals need to be modified or there is need for reassignment or clarification of duties or for additional staffing or for conforming to the way the work should be done.

To Transmit Corrective Action to the Operation

Controls are needed to transmit corrective action to the operation while it is progressing so that the transformation subsystem modifies its inputs or its production plan to reduce any discrepancy or error and keeps the output "on course". The thermostat is a classic example of this operating principle.

When the room temperature drops below a desired level, the control mechanism in the transformation subsystem at once transmits this information (called "feed forward") and the temperature begins to rise till it reaches the selected level.

Control-related information flows in most of our modern organisations also follow the above-mentioned thermostat operating principle. They make available to the transformation subsystem at all times the information about operating results in various forms, such as electronic impulses, written or spoken words, reports, etc. to serve as the basic input for comparison with the standards and for automatic decision-making.

BENEFITS OF CONTROL

A well developed control system

- Increases Productivity
- reduces defects and mistakes,
- helps meet deadlines,
- facilitates communication,
- improves safety,
- lowers cost, and
- gives the workers control over their environment.

Control techniques are broadly classified into **past-oriented** and **future-oriented** based on their timing and focus. These techniques help managers monitor and guide performance either **after actions are taken** or **before/during** operations to prevent issues.

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1. Past-Oriented Control Techniques (Feedback Control):

These are applied **after the task is completed**. They evaluate past performance to identify deviations and suggest improvements for the future.

Key Features:

- Focuses on **historical data** and results.
- Useful for **assessing success/failure**.
- Helps in **correcting future actions**, but doesn't prevent current errors.

Examples:

- **Financial Statements**: Balance sheet, income statement, cash flow statement.
- **Audits**: Internal and external audits to check compliance and accuracy.
- **Statistical Quality Control**: Analyzes product quality after production.
- **Performance Appraisals**: Review of employee performance based on past results.

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2. Future-Oriented Control Techniques (Feedforward and Concurrent Control):

These are **proactive techniques** designed to identify and prevent problems **before they occur** or **as they occur**.

Key Features:

- Based on **forecasting and planning**.
- Helps in **preventing deviations**.
- More effective in **dynamic and uncertain environments**.

Examples:

- **Budgetary Control**: Planning future income and expenditure to control costs.
- **Break-even Analysis**: Determines sales volume needed to avoid losses.

- **Network Techniques (PERT/CPM)**: Plan and control project timelines in advance.
- **Standard Costing**: Compares actual costs with pre-set standards to take timely action.
- **Forecasting Techniques**: Predict future market trends, demand, etc.

Summary Table:

Control Type	Orientation	Timing	Focus	Examples
Past-Oriented Control	Feedback	After execution	Evaluate & correct	Financial reports, audits
Future-Oriented Control	Feedforward	Before/during	Predict & prevent deviations	Budgets, PERT, forecasting

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These classifications help managers choose the **right control tool** depending on the nature of the task and the timing of intervention.

Market Control, **Bureaucratic Control**, and **Clan Control** are three major types of **organizational control techniques**, each differing in approach, structure, and application.

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1. Market Control:

Definition:
Market control uses **external market mechanisms** such as price, competition, and exchange relationships to regulate performance.

Features:

- Based on **economic forces**.
- Works well when output can be **clearly measured** and **compared with market standards**.
- Common in decentralized organizations, divisions, or subsidiaries.

Examples:

- Comparing division profits based on market rates.
- Using competitive bidding or outsourcing based on cost-efficiency.

Advantages:

- Encourages **cost-effectiveness** and **efficiency**.
- Motivates performance by linking results to market outcomes.

Limitations:

- May not work where performance is **not easily quantifiable** or where market data is unavailable.

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2. Bureaucratic Control:

Definition:
Bureaucratic control relies on **formal rules, policies, procedures, and authority hierarchies** to guide and evaluate performance.

Features:

- Emphasizes **compliance**, **standardization**, and **clear reporting structures**.
- Based on **formal authority and supervision**.

Examples:

- Standard operating procedures (SOPs).
- Performance appraisals based on rule compliance.
- Internal audits and formal reports.

Advantages:

- Ensures **discipline and consistency**.
- Works well in **stable, routine environments**.

Limitations:

- Can be **rigid**, **slow**, and reduce **employee initiative** or innovation.

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3. Clan Control:

Definition:
Clan control uses **shared values, culture, traditions, and beliefs** to influence behavior and performance.

Features:

- Works through **social norms**, trust, and teamwork rather than formal rules.
- Employees are **self-regulated** through a sense of belonging.

Examples:

- Organizational culture emphasizing collaboration or excellence.
- Mentorship and informal peer feedback.
- Strong corporate identity and shared mission.

Advantages:

- Encourages **commitment**, **adaptability**, and **creativity**.
- Effective in **complex, dynamic environments**.

Limitations:

- Takes time to develop a **strong culture**.
- Difficult to measure or control directly.

Comparison Table:

Type of Control	Basis	Mechanism	Best Suited For
Market Control	External market forces	Prices, competition	Measurable outputs, decentralized units
Bureaucratic Control	Formal rules and hierarchy	Policies, supervision	Stable, rule-based organizations
Clan Control	Organizational culture	Norms, values, traditions	Creative, team-oriented environments

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Each control type suits different organizational contexts. A modern business may use a **mix of all three** for optimal performance.

OLD CONTROL TECHNIQUES

Budgeting is described as an important **old control technique** that helps organizations plan and control their financial and operational activities. Budgeting is a method of **quantifying** the

resources needed for achieving specific objectives and comparing actual performance against these plans.

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a) Budgeting as a Control Technique:

Definition:
Budgeting as a control technique involves **setting financial and operational targets** for a specific period and then using those targets as a benchmark to monitor and regulate actual performance. It is a **planning and control mechanism** that helps ensure efficient resource allocation and prevents overspending.

Key Features of Budgeting:

1. **Setting Financial and Operational Targets:**
    - Budgets establish **financial limits** (e.g., sales targets, production costs, profit margins) and **operational goals** (e.g., labor hours, resource utilization).
    - These targets act as a clear guide for departments to follow.
2. **Comparison of Actual vs. Planned Performance:**
    - Budgets allow managers to **track actual performance** and **compare it with the budgeted values** (e.g., actual expenses vs. budgeted expenses).
    - Deviations are identified, analyzed, and corrective actions are taken if necessary.
3. **Resource Allocation:**
    - Budgets help in the **efficient allocation of resources** by clearly defining where funds and efforts are to be directed, ensuring that resources are used effectively.
4. **Control over Expenditures:**
    - Budgets serve as a control tool by setting **limits** on spending, which helps in **cost control**.
    - If expenditures exceed budgeted figures, corrective actions (such as cost-cutting or reallocation of funds) are required.
5. **Facilitates Planning and Forecasting:**
    - The budgeting process itself is an integral part of **planning**. It predicts future financial outcomes based on current information, aiding in strategic decision-making.
    - It also acts as a **forecasting tool** to anticipate problems like cash shortages, and over or underestimation of resource needs.

Types of Budgets:

1. **Fixed Budgets:**
    - These are **static** budgets prepared for a specific level of activity.
    - They do not change even if there are variations in activity levels.
    - **Example:** A set amount of budget for marketing activities, regardless of the number of campaigns.
2. **Flexible Budgets:**
    - These are **adjustable** budgets that change according to changes in activity levels or operational requirements.
    - They offer more flexibility and are useful in **dynamic environments**.
    - **Example:** A flexible budget for sales, where the budget increases or decreases based on actual sales performance.
3. **Master Budget:**
    - A **comprehensive budget** that includes various individual budgets (e.g., sales, production, expenses, cash flow).
    - It gives an overall view of the organization's financial health and helps ensure **coordination** among departments.
4. **Cash Flow Budget:**
    - Focuses on the **cash inflows and outflows** to ensure that the company has enough liquidity to meet its obligations.
    - It helps manage **short-term financial needs**.

Advantages of Budgeting as a Control Technique:

1. **Cost Control:**
    - Budgets help in **controlling costs** by setting limits on spending for different departments or activities.
    - Unnecessary expenditures can be identified and avoided.
2. **Performance Evaluation:**
    - Budgeting serves as a tool for **evaluating performance** by comparing actual results with budgeted goals.
    - Variances can be analyzed to understand the reasons behind underperformance or overspending.

3. **Resource Optimization:**
    - By allocating resources based on the budget, organizations can avoid **wastage** and make the best use of available funds.
4. **Motivation:**
    - **Realistic budgets** can serve as **motivational tools** for employees, providing clear performance targets to aim for.
5. **Planning for the Future:**
    - Budgets provide a framework for **long-term strategic planning** by forecasting future financial needs and trends.

Limitations of Budgeting:

1. **Rigidity:**
    - **Fixed budgets** can be too rigid and may not allow for adjustments in changing conditions.
2. **Time-consuming:**
    - The process of preparing and revising budgets can be **labor-intensive** and time-consuming.
3. **Potential for Misuse:**
    - Some managers may **inflate** budgets to ensure they are not penalized for under-performance.
    - **Budgetary slack** (overestimation of needs) can lead to inefficiencies.
4. **Short-term Focus:**
    - Budgets often focus on **short-term performance** and may overlook long-term growth or strategic goals.

Conclusion:

Budgeting is a powerful control technique, offering **financial discipline**, **performance tracking**, and **resource management**. However, it needs to be carefully designed and periodically reviewed to avoid issues like rigidity, budgetary slack, or misalignment with long-term goals.

b) Financial statements and **ratio analysis** are fundamental tools for assessing the financial performance and health of an organization. These tools help managers make informed decisions based on the company's financial data.

1. Financial Statements:

Definition:
Financial statements are formal records of the financial activities and position of a business. These statements provide key information for **analyzing profitability, financial stability, and liquidity**.

Key Financial Statements:

1. **Income Statement (Profit & Loss Statement):**
    - **Purpose**: Shows the company's performance over a period, detailing revenues, expenses, and profits or losses.
    - **Components**:
        - **Revenue/Sales**: Total income generated from the sale of goods or services.
        - **Expenses**: Costs incurred in running the business (e.g., cost of goods sold, operating expenses, taxes).
        - **Net Profit or Loss**: The difference between total revenue and expenses.
2. **Balance Sheet:**
    - **Purpose**: Provides a snapshot of the company's **financial position** at a specific point in time.
    - **Components**:
        - **Assets**: What the company owns (e.g., cash, equipment, inventory).
        - **Liabilities**: What the company owes (e.g., loans, debts).
        - **Equity**: The owner's interest in the company (e.g., retained earnings, capital).
    - **Formula**:
      Assets = Liabilities + Equity.
3. **Cash Flow Statement:**
    - **Purpose**: Tracks the movement of cash into and out of the business, showing the company's liquidity.
    - **Components**:
        - **Operating Activities**: Cash generated or spent from core business activities.
        - **Investing Activities**: Cash used or received from buying/selling assets or investments.
        - **Financing Activities**: Cash received from or paid to investors, creditors (e.g., issuing stock, repaying loans).

4. **Statement of Changes in Equity:**

    - **Purpose**: Shows the changes in the owner's equity during a specific period (e.g., from profits, dividends, or new capital invested).

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2. Ratio Analysis:

Definition:
Ratio analysis is a tool used to evaluate the financial performance of a company by comparing relationships between figures in the financial statements. Ratios provide insights into **profitability**, **liquidity**, **solvency**, and **efficiency**.

The ratios most commonly used by organisations are the following:

1. Liquidity Ratios: They measure the company's ability to pay back short-term debts by converting assets quickly into cash. In other words, they are a measure of a company's liquidity. One such ratio is the current ratio. It is expressed by the fraction: Current assets /Current liabilities.

2. Debt ratios While liquidity ratios are used to measure a company's short-term financial position, debt ratios are computed to assess its ability to meet long-term commitments. The simplest debt ratio is total debt divided by total assets. This ratio tells us what proportion of the company's assets is owned by its creditors.

3. Profitability ratios: These ratios express profits as percentage of sales or of total assets to depict the company's efficiency of operation. A profit of Rs 4 lakh, for example, is unimpressive if it is derived from a total sales of Rs 40 crore or a capital investment of Rs 100 crore.

4. Operating Ratios: These ratio measure how efficiently the manufacturing and sales are being carried out. Some of the more common operating ratios are the inventory turnover ratio and the total assets turnover ratio. The inventory turnover ratio is defined as sales 4 inventory. For example, if a company has sales of Rs 10 lakh and an average daily inventory of Rs 2 lakh, it may be said to be turning over its inventory five times. A high rate of inventory turnover is frequently a positive sign. It suggests that these assets are being used efficiently by the firm.

The total assets turnover ratio is expressed as sales/ total assets. This ratio gives an indication of how effectively the firm's assets are being used. Too low a ratio may indicate the need for either an increased sales effort or possibly the liquidation of the company's less productive assets.

Return on Investment: Also known as the Du Pont system of financial analysis this ratio is expressed by the following formula:

ROI= sales.profit/Investment. sales

This ratio is computed on the basis of capital turnover (sales/ investment) multiplied by earnings as a proportion of sales (profit/ sales). This calculation recognises that one division, with a high capital turnover and a lower percentage of earnings to sales, may be more profitable in terms of return on investment than another with a high percentage of profits to sales but with low capital turnover.

Break-even Analysis Break-even analysis is another control device used in business fi rms. It involves the use of a chart to depict the overall volume of sales necessary to cover costs. It is that point at which the cost and revenue of the enterprise are exactly equal. In other words, it is that point where the enterprise neither earns a profi t nor incurs a loss.

Figure 18.2 depicts a simple break-even chart for a single product firm:

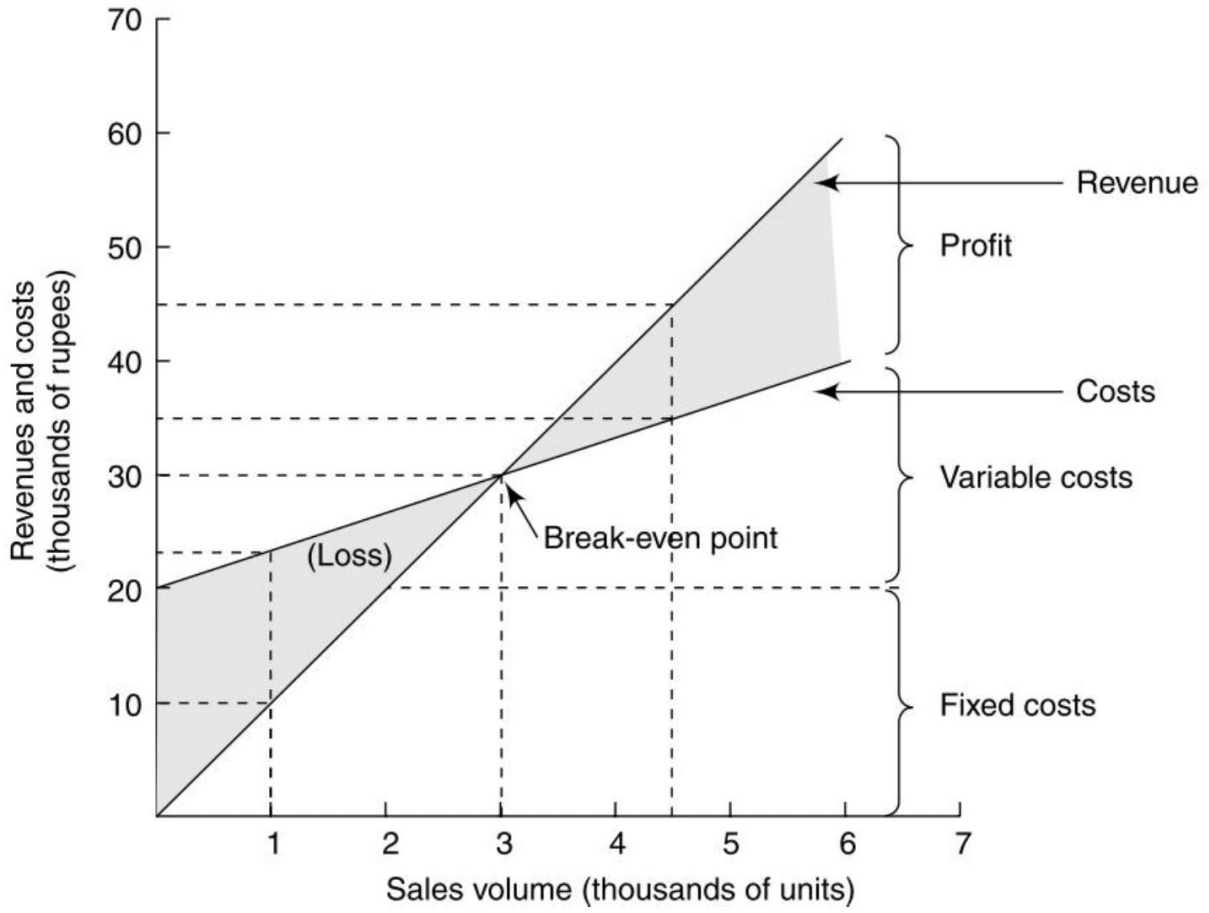

Fig. 18.2 Break-even chart

Importance of Ratio Analysis:

1. **Performance Evaluation:**
    - Ratio analysis helps assess **financial performance** in areas like profitability, liquidity, and solvency, making it easier to spot trends, issues, and opportunities.
2. **Decision Making:**
    - It provides management with **quantitative insights**, aiding decisions on pricing, cost-cutting, investments, and financing.
3. **Investor Confidence:**
    - Ratios help **investors, analysts**, and stakeholders understand the financial health of the business, influencing investment decisions.
4. **Trend Analysis:**
    - Comparing ratios over multiple periods reveals **trends** in the company's financial position, allowing for timely intervention when performance declines.

Conclusion:

- **Financial statements** offer a comprehensive view of an organization's financial health, while **ratio analysis** helps evaluate the numbers in a more insightful and meaningful way. Together, these tools provide valuable insights into an organization's **profitability**, **liquidity**, **efficiency**, and **financial stability**, essential for informed decision-making.

NEW CONTROL TECHNIQUES

PERT (Program Evaluation and Review Technique) and **CPM (Critical Path Method)** are two new project management tools used to plan and control complex projects. Both methods focus on managing time, resources, and task dependencies, but they are used in different types of projects.

1. PERT (Program Evaluation and Review Technique):

- **Purpose**: PERT is primarily used for projects that involve uncertainty or when the time required for each activity is uncertain. It is useful for research and development projects where tasks and timeframes are not predictable.
- **Key Features**:
    - **Probabilistic Nature**: PERT uses three-time estimates for each activity: **Optimistic time (O)**, **Pessimistic time (P)**, and **Most Likely time (M)**. These are then used to calculate the expected time for each task.

2. CPM (Critical Path Method):

- **Purpose**: CPM is used for projects where the activities' time duration is more predictable, and it aims to optimize project duration and resource allocation. It is commonly used in construction and manufacturing projects where the tasks and timelines are relatively well-known.
- **Key Features**:
    - **Deterministic Nature**: CPM assumes that the duration of each activity is fixed and predictable.
    - **Critical Path**: The **critical path** is the longest path of dependent activities that determines the shortest possible project duration. If any activity on the critical path is delayed, the entire project will be delayed.
    - **Time and Cost**: CPM helps in minimizing the cost of project completion by optimizing the use of resources.
    - **Network Diagram**: Similar to PERT, CPM also uses a network diagram to represent tasks and their dependencies, but it focuses more on the optimization of time and cost rather than dealing with uncertainty.

Comparison of PERT and CPM:

Feature	PERT	CPM
Focus	Uncertainty and time estimation	Time and cost optimization
Activity Duration	Probabilistic (estimated)	Deterministic (fixed duration)
Usage	Research and development projects	Construction and manufacturing projects
Analysis	Focus on task dependencies and uncertain time	Focus on task dependencies and optimizing the critical path

Key Differences:

- **Time Estimation**: PERT uses a range of time estimates (optimistic, pessimistic, and most likely), while CPM uses a single, fixed duration.
- **Nature of Project**: PERT is more suitable for projects with uncertain time frames, like R&D, while CPM is used for projects where the time is predictable, like construction.

- **Critical Path**: In PERT, there's no explicit critical path; it focuses more on task dependencies with time estimates. In CPM, the critical path is a central element for determining the project's duration.

In summary, PERT is helpful for projects that are more uncertain and exploratory, while CPM is best suited for projects with well-defined tasks and timelines.

DETERMINATION OF CRITICAL PATH

Both under PERT and CPM, the purpose is to divide the project into a number of operations and then to draw a picture of the order in which and of the time when these operations should be started and completed. This picture is known as the Project Graph or Arrow Diagram. For example, if in a project three activities A, B and C are to be completed, of which activities A and B (requiring six days and three days, respectively) can simultaneously be carried out but activity C (requiring two days) can start only on the completion of the first two activities, then the critical path would be along the activities A and C as shown in Fig. 18.4. If A takes six days, and B three days, the shortest elapsed time to reach event 1 when activity C can be started would be six days. Thus there is no point in spending money to expedite activity B but there may be a good reason for expediting A if the total time is to be shortened.

Paths other than the critical path are called sub-critical. The difference in length (time) between the critical and a sub-critical path represents the cushion for the sub-critical sequence and is known as the slack or float. It indicates that there is extra time available for activities along the sub-critical paths while those lying along the critical path are in progress. If the activities lying along the critical path can be speeded up sufficiently, the slack time along other paths may disappear, and the critical path may change. One of the ways in which PERT and CPM provide for completion time to be reduced is to find ways to transfer resources from activities on the sub-critical paths to activities on the critical paths. Jobs that have slack time can be delayed without affecting completion dates; so, manpower and/or funds can be shifted to jobs that are critical.

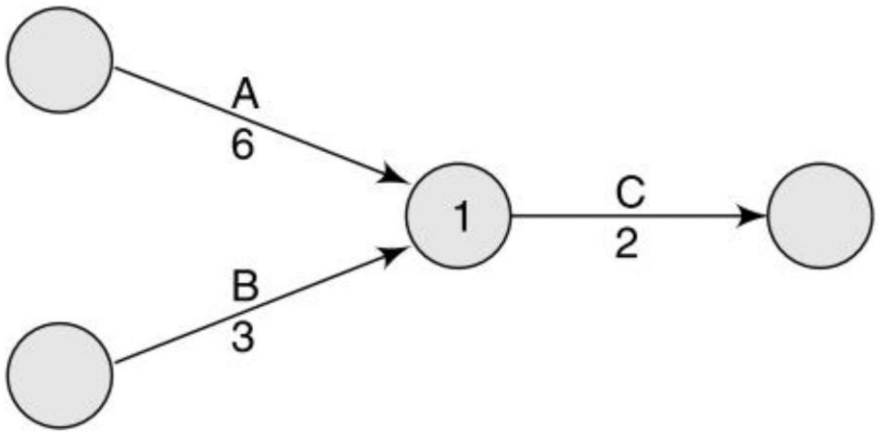

Fig. 18.4 Critical path

Organizational performance is defined as the measure of how well an organization achieves its goals through efficient and effective use of resources:

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1. Definition:

Organizational performance refers to **how efficiently and effectively managers use organizational resources to satisfy customers and achieve goals**.

- **Efficiency** = Doing things right (minimizing resource use).
- **Effectiveness** = Doing the right things (achieving desired outcomes).

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2. Components of Performance:

Robbins and Coulter highlight two primary aspects:

- **Productivity** – the amount of goods or services produced relative to the inputs used.
- **Goal attainment** – how well the organization reaches its stated objectives (e.g., profitability, market expansion, innovation, etc.).

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3. Managerial Role:

Managers are responsible for driving performance by:

- Setting goals,
- Allocating resources,
- Leading and motivating employees,
- Monitoring and adapting processes.

Their effectiveness in carrying out the four management functions (planning, organizing, leading, controlling) directly impacts performance.

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4. Relevance in Management:

High organizational performance means the organization is:

- **Efficient** in resource use (e.g., labor, capital, materials),

- **Effective** in satisfying stakeholders (e.g., customers, investors, employees).

This concept is introduced in early chapters as part of understanding the fundamentals of what managers do and how success in management is measured.

There are various **measures of organizational performance** which are the tools that help assess how well an organization is achieving its goals. Robbins emphasizes that performance must be evaluated from both **efficiency** and **effectiveness** perspectives.

Key Tools for Measuring Organizational Performance:

1. Organizational Productivity

- **Tool**: Productivity ratios (output/input).
- **Purpose**: Measures how efficiently resources are converted into outputs.
- **Example**: Units produced per labor hour, sales per employee.

2. Organizational Effectiveness

- **Tool**: Goal-based evaluation.
- **Purpose**: Assesses whether the organization is achieving its strategic and operational goals.
- **Example**: Market expansion, innovation targets, customer retention rates.

3. Financial Tools

- These are used to measure performance in economic terms:
    - **Profit and Loss Statements**
    - **Return on Investment (ROI)**
    - **Profit Margins**
    - **Revenue Growth**

4. Balanced Scorecard

- A **comprehensive performance measurement tool** mentioned in the book.
- Developed by Kaplan and Norton, it evaluates performance from **four perspectives**:
    1. **Financial**
    2. **Customer**
    3. **Internal Business Processes**
    4. **Learning and Growth**
- **Purpose**: Provides a more balanced and strategic view of performance, not just financial outcomes.

5. Benchmarking

- **Definition**: Comparing your organization's performance with industry leaders or best practices.
- **Purpose**: Identifies performance gaps and areas for improvement.

6. Total Quality Management (TQM) Tools

- Focuses on **continuous improvement and customer satisfaction**.
- Includes tools like:
    - Quality control charts
    - Six Sigma
    - ISO standards

Summary:

Robbins and Coulter emphasize that **no single tool is sufficient**; effective managers use a combination of **quantitative and qualitative measures** to get a complete picture of performance. These tools support **decision-making, strategic planning, and continuous improvement**.

There are several **contemporary issues in control**, reflecting modern challenges and trends that affect how managers monitor and guide organizational performance.

Contemporary Issues in Control:

1. Cross-Cultural Differences

- **Challenge**: Control practices that work in one culture may not work in another.
- **Example**: In some cultures, direct feedback and formal control systems may be seen as disrespectful or intrusive.
- **Implication**: Managers need to adapt control systems to align with local customs, laws, and employee expectations when operating globally.

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2. Workplace Privacy

- **Challenge**: Organizations use technology to monitor employee behavior (emails, internet use, GPS tracking).
- **Tension**: Balancing the need for control with respecting employee privacy rights.

- **Implication**: Managers must ensure monitoring is ethical, legal, and clearly communicated to employees.

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3. Employee Theft

- **Issue**: A significant concern in many organizations, especially in retail and service sectors.
- **Control Response**: Strong internal controls, such as audits, inventory checks, and ethics training.
- **Emphasis**: Robbins stresses the importance of building a culture of trust while implementing preventative controls.

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4. Workplace Violence

- **Challenge**: Increasing concern over employee and customer safety.
- **Control Mechanism**: Creating safe environments, having clear reporting procedures, and employee assistance programs.
- **Manager's Role**: Monitor warning signs, maintain open communication, and enforce zero-tolerance policies.

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5. Controlling Customer Interactions

- **Focus**: As customer service becomes a key differentiator, control systems are extended to monitor service quality.
- **Examples**: Call center monitoring, customer feedback systems, service-level benchmarks.
- **Goal**: Ensure customer satisfaction and brand consistency.

Summary:

These contemporary issues highlight the **need for managers to go beyond traditional financial controls** and consider ethical, cultural, and human-centered aspects of control. It is emphasized that **flexibility, sensitivity, and balance** as key traits for effective control in today's complex work environments.

Control of overall performance refers to the process of **monitoring and evaluating the organization's total functioning** to ensure that strategic goals are being achieved effectively and efficiently.

Example: Control of Overall Performance

Scenario:

A **manufacturing company** sets a strategic goal to **increase annual profits by 15%** while improving **product quality** and **reducing waste**.

Control Process Example:

1. Establishing Performance Standards:

- Profit increase target: 15%
- Quality benchmarks: Less than 2% defect rate
- Waste reduction goal: Cut material waste by 10%

2. Measuring Actual Performance:

- Monthly financial reports
- Quality control metrics (defect rate per batch)
- Waste tracking via production reports

3. Comparing Actual Performance with Standards:

- Profit growth is at 10% (below target)
- Defect rate is at 3% (above standard)
- Waste has been reduced by 12% (exceeds goal)

4. Taking Corrective Action:

- Increase sales efforts and streamline marketing to meet profit targets
- Implement additional employee training to reduce defects
- Maintain current waste reduction practices as they are effective

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Summary:

This example illustrates **overall organizational performance control** by evaluating multiple key outcomes — financial, quality, and operational — and taking coordinated corrective actions when targets aren't met. Koontz emphasizes that **effective control links strategy to actual results** and adjusts management actions accordingly.

Information technology (IT) is described as playing a **critical role in the control function** of management by enabling faster, more accurate, and more comprehensive monitoring and decision-making.

Information Technology's Role in Control:

1. Enhancing Data Collection and Monitoring

- IT systems automate the collection of real-time data across departments (e.g., sales, inventory, finance).
- Managers can **track performance indicators** continuously and immediately spot deviations from plans.

2. Improving Decision-Making

- **Management Information Systems (MIS)** provide summarized reports and dashboards.
- These tools support **quick and informed decisions** by presenting trends, forecasts, and comparisons to standards.

3. Supporting Corrective Action

- IT helps managers **identify problem areas quickly** and simulate the impact of corrective measures.
- For example, ERP systems (like SAP) allow managers to trace issues back to their source and coordinate responses across departments.

4. Enabling Decentralized Control

- With cloud-based systems and mobile access, managers at all levels can access relevant control data.
- This supports **empowered decision-making** and responsiveness at the operational level.

5. Facilitating Communication and Coordination

- Tools such as email, collaboration platforms, and internal portals **ensure timely communication** of control data.
- IT bridges geographical gaps, especially in multinational or remote organizations.

Hence, **effective control in modern organizations is virtually impossible without IT**, especially given the complexity and speed of business today. He also notes the importance of

designing IT systems that align with organizational goals to avoid data overload or irrelevant metrics.

Therole of **information and technology in control** is addressed with a balanced view—highlighting both the **opportunities** and **challenges** it brings to modern management practices.

Opportunities Created by Information and Technology in Control:

1. Real-Time Monitoring and Feedback

- IT enables **instant tracking of performance** through dashboards and reports.
- Managers can **respond to issues quickly**, improving control accuracy.

2. Improved Decision-Making

- Decision support systems (DSS) and data analytics tools help in analyzing trends and predicting future performance.
- Enhances **fact-based management** and reduces guesswork.

3. Greater Transparency and Accountability

- Automated records and audit trails increase visibility into processes and employee actions.
- Encourages **responsible behavior and compliance**.

4. Enhanced Communication and Coordination

- IT facilitates fast, clear communication across departments and locations.
- Helps synchronize **control efforts in decentralized or global organizations**.

5. Cost Efficiency

- Automation reduces manual control tasks and administrative overhead.
- Tools like ERP systems integrate various control functions into a **single platform**.

Challenges Created by Information and Technology in Control:

1. Information Overload

- Too much data can overwhelm managers, making it hard to focus on **what truly matters**.

- Koontz warns of “paralysis by analysis.”

2. Security and Privacy Risks

- Storing sensitive performance data electronically increases the risk of **data breaches and cyber threats**.
- Organizations must invest in robust **IT security and data governance**.

3. Dependence on Technology

- Over-reliance on automated systems can reduce **critical thinking** and the human element in decision-making.
- Risk of **system failures** affecting control processes.

4. Resistance to Change

- Employees and even managers may resist new control systems due to **lack of understanding or fear of monitoring**.
- Requires **training and change management**.

5. Ethical Concerns

- Monitoring tools can raise concerns about **employee surveillance and trust**.
- Ethical use of control technologies is essential to maintain morale.

Hence, it is emphasized that while **IT enhances the scope and effectiveness of control**, it must be used **wisely, ethically, and strategically**. The goal is not just to collect data, but to use it meaningfully to improve performance.
