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(MCA)

Management Process and Organizational Behaviour with Environmental Ethics
(DMCAVA105T24)

Self-Learning Material
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Course Code: DMCAVA105T24
Management Process and Organizational Behaviour with Environmental Ethics

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Course Introduction

Management Process and Organizational Behaviour with Environmental Ethics is assigned 3 credits and contains 9 units. This course will help students to be cognizant of these workplace dynamics so that they make conscious decisions in their future work life as well as long term career.

In this course each unit is divided into sections and subsections. Each unit begins with a statement of objectives to indicate what we expect you to achieve through the unit. There are several assignments in each unit which you may attempt.

Course Outcomes

1. Aware about the application of psychological concepts such as Personality, Learning, Motivation, Leadership, Attitude, Leadership in Organizational context.
2. Help the students to develop cognizance of the importance of human behaviour.
3. Enable students to describe how people behave under different conditions and understand why people behave as they do.
4. Help the students to acquire and develop skills to make rational decisions in the process of O.B.
5. Analyse individual and group behaviour, and understand the implications of organizational behaviour on the process of management.
6. Recommend the request proposals from various options available in the Market.

We hope you enjoy the course.

Acknowledgement

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UNIT : 1

INTRODUCTION TO MANAGEMENT

Learning Objectives:

- Understand the concept of management and its importance.
- Recognise the core concepts of management.
- Comprehend the concept and process of planning.
- Differentiate between various types of planning.
- Understand the process and importance of organising.
- Identify different organisational structures and designs.
- The controlling process in management.
- The principles of scientific management.

Structure:

1.1 Introduction to Management: Concepts and Functions

In simplest words, management is all about the act of coordination and directing to achieve a set of predetermined goals within an organisation. These resources can be human (employees), financial (capital), or physical (equipment, technology).

A more comprehensive definition of management involves a variety of aspects, and using all available organisational resources to reach stated objectives. The role of management is pervasive, impacting every aspect of organisational operation, from strategic decision-making to the execution of specific tasks.

Core Concepts of Management

Here are the core concepts that underpin the practice of management:

- **Organisational Objectives**: Management begins with the identification and definition of the objectives that an organisation wants to achieve. These objectives guide all decisions and strategies.

- **Efficiency and Effectiveness**: Efficiency relates to making the best use of resources, while effectiveness is about achieving goals. Good management aims to maximise both.

- **Decision Making**: Managers must make a myriad of decisions to drive the organisation towards its goals. Decision-making involves choosing the best option for task completion.

- **Planning and Forecasting**: Planning involves mapping out how to achieve the organisational goals. Forecasting predicts future trends or occurrences that may affect these plans.

- **Organisational Structure**: This represents the formal lines of authority, communication, rights, and duties within an organisation. A good structure fosters effective communication and efficient work processes.

- **Leadership and Motivation**: Leadership is about directing and influencing the behaviour of others. Motivation involves inspiring team members to put forth their best effort.

- **Key Functions of Management**

Management functions are traditionally classified into four main categories:

- **Planning**: It is defined as process of setting targets and choosing best alternative to achieve the target. It involves creating a detailed action plan specifying what needs to be done, when, and by whom.

- **Organising**: This involves arranging and structuring work to meet the organisation's goals. It includes determining what tasks are to be done, who is to do them, how the tasks are to be grouped, and who reports to whom.

- **Leading**: Involves directing and influencing the behaviour and work of organisation members towards achieving organisational goals.

- **Controlling**: Monitoring, comparing, and correcting work performance as per standards are basic tasks in Controlling. Managers must ensure that the organisation's resources are being used effectively and efficiently towards the achievement of the predetermined objectives.

1.2 The Function of Planning in Management

The planning process in management is a series of steps taken by managers to determine the future course of action for an organisation. This process involves setting objectives, assessing the environment, developing alternative actions, selecting the best alternative, and implementing the decision.

- **Setting Objectives:** Initial most step in planning, where managers set the targets or goals they want the organisation to achieve. The objectives could range from increasing revenue, and improving customer satisfaction to improving overall efficiency.

- **Assessing the Environment:** This involves conducting an internal and external analysis to identify the strengths, weaknesses, opportunities, and threats (SWOT). The aim is to understand the current situation of the organisation and the market conditions.

- **Developing Alternative Actions:** Based on the objectives and the assessment of the environment, managers develop multiple courses of action that could be taken to achieve the goals.

- **Selecting the Best Alternative:** Out of the various alternatives, managers select the one that is most likely to achieve the objectives in the most efficient and effective way. This decision-making often involves evaluating the costs.

- **Implementing the Decision:** The final step is putting the chosen course of action into practice. This involves coordinating resources, setting tasks, and directing personnel.

➢ **Types of Planning: Strategic, Tactical, Operational, and Contingency Planning**

Different types of planning are involved in the management process to handle varying scopes and timeframes.

- **Strategic Planning:** This is the highest level of planning that involves determining the long-term goals of the organisation and formulating strategies to achieve them. It generally covers a period of three to five years and is formulated by top-level management.

- **Tactical Planning:** This level of planning translates strategic plans into actionable short-term plans. It involves creating specific policies and programs to implement strategic plans, usually spanning a year or two.

- **Operational Planning:** This is a detailed plan that specifies the activities and resources needed to implement the tactical plans on a day-to-day basis. It is usually done by lower-level managers and covers a period of weeks or months.

- **Contingency Planning:** This type of planning involves preparing for unforeseen events or emergencies. It is a backup plan that outlines how to deal with potential risks and uncertainties that could disrupt the normal functioning of the organisation.

➢ **The Importance of Planning in Management**

Planning is a vital function in management due to the following reasons:

- **Direction:** Planning provides a clear path for all organisational activities. It helps align the efforts of all members of the organisation towards the set goals.

- **Reducing Uncertainty:** By foreseeing changes and preparing for them, planning can reduce the uncertainty associated with the future.

- **Efficiency:** Proper planning helps in utilising resources efficiently by avoiding waste, redundancy, and overlapping efforts. It helps in achieving the desired goals with minimal cost and effort.

- **Risk Management:** Through contingency planning, managers can anticipate risks and devise strategies to mitigate them. This can greatly help in preventing crises and ensuring smooth operations.

- **Performance Measurement:** The goals set during the planning process serve as standards against which real performance can be measured. This helps in evaluating the effectiveness of strategies and making necessary adjustments.

1.3 The Function of Organizing in Management

The Process and Importance of Organizing

The organising function in management is the process of creating and implementing a structure within the organisation. This function involves the arrangement and distribution of work among members of the organisation, defining their roles, and establishing relationships for the purpose of effective cooperation.
The importance of organising is manifold:

- **Resource Optimisation:** Organising ensures optimal utilisation of resources, reducing wastage and redundancy by assigning the right quantity and quality of resources to the right tasks.

- **Role Definition:** It provides a clear understanding of individual roles and responsibilities, reducing potential conflict and confusion within the organisation.

- **Efficiency and Effectiveness:** Organising helps in maintaining order, facilitating smooth operations, and ensuring an effective and efficient functioning of the organisation.

- **Adaptability and Flexibility:** Organised structures are better equipped to adapt to changes, providing a framework that allows for flexibility in responding to dynamic business environments.

➢ Organisational Structure and Design

Organisational structure is the formal system of task and reporting relationships that control, coordinate, and motivate employees so that they cooperate to achieve an organisation's goals. This structure is usually depicted in an organisational chart, illustrating the hierarchy and the flow of information within the organisation.

Organisational design is the process of aligning the organisational structure with the company's mission, objectives, and strategies. This involves decisions about the following:

- **Division of Work:** This refers to the job specialisation that allows individuals to focus on specific tasks and roles.

- **Departmentalisation:** This is the process of grouping jobs into logical units such as departments, divisions, or teams.
- **Chain of Command:** This determines the line of authority from the top management to the lowest ranks.
- **Span of Control:** This indicates the scope of management.
- **Centralisation and Decentralisation:** This refers to the level at which decisions are made in the organisation. In a centralised structure, decision-making authority is held at the top levels; in a decentralised structure, decision-making authority is delegated to lower levels.

➢ **Departmentalisation and Division of Labor**

Departmentalisation refers to the process of dividing an organisation's functionally distinct activities into different departments, with each unit taking responsibility for a specific facet of the operation. There are several bases for departmentalisation, including function, product, geography, process, and customer.

The division of labour is the allocation of various tasks to different entities or individuals in an organisation. This process promotes specialisation, which in turn improves efficiency and effectiveness. Benefits include:

- **Increased Productivity:** As employees specialise in certain tasks, their skills and proficiency improve, leading to increased productivity.

- **Efficiency:** Division of labour reduces the time taken to train employees as they only need to learn a specific task rather than multiple tasks.

- **Job Satisfaction:** Workers can focus on what they do best, which often leads to greater job satisfaction.

1.4 The Function of Controlling in Management

Controlling is a fundamental managerial function. It entails ensuring that the performance of the organisation does not deviate from the predetermined objectives or plans. The controlling function comprises a three-step process:

- **Establishing performance standards:** The first step is setting up performance goals and standards. These are derived from the organisation's objectives. Standards can be set for different aspects, such as quality, time, cost, customer satisfaction, employee turnover, etc.

- **Measuring actual performance:** This involves the detailed collection and analysis of data to assess actual performance. This could range from qualitative assessments, such as customer feedback, to quantitative metrics, like financial results.

- **Comparing actual performance with standards and taking corrective action:** If actual performance deviates significantly from the standards, management should investigate the cause, take corrective action, and revise the standards, if necessary. This could involve additional training, a change in resource allocation, or a restructuring of a department.

➢ **Techniques of Control in Management**

There are numerous control techniques that managers can employ:

- **Budgetary Control:** This method involves the use of budgets for income, expenditure, production, etc. By comparing actual with budgeted figures, managers can identify variances and take corrective action.

- **Financial Control:** This involves the analysis of financial statements, ratios, etc., to control profitability, liquidity, and financial stability.

- **Statistical Control:** Use of statistical methods, like correlation analysis, regression analysis, etc., to identify trends and predict future outcomes.

- **Direct Supervision and Observation:** This technique involves direct oversight of operations and processes to ensure adherence to standards.

- **Management Audits:** A comprehensive and systematic examination of the entire organisation or specific units to assess their performance against the set objectives.

➢ **Importance of Control in Ensuring Organisational Goals**

Control is crucial in an organisation because it:

- **Ensures efficiency:** By monitoring operations and performance, management can identify inefficiencies and take corrective action to optimise resource utilisation.

- **Facilitates coordination:** Control mechanisms ensure that different departments and units work towards common organisational goals, facilitating better coordination and cohesion.

- **Helps in risk management:** Control helps in identifying potential risks and issues early, allowing for proactive steps to be taken to mitigate these risks.

- **Provides direction:** It ensures that all actions and processes are aligned with the organisational objectives, thus providing a clear direction to the organisation.

- **Aids in decision-making:** By providing accurate and timely information about performance, control aids managers in making informed decisions.

1.5 Evolution of Management Theories

The classical management theories were the earliest attempts to systematise and codify management practices to improve organisational efficiency. This group of theories can be further classified into three categories: scientific management, administrative management, and bureaucratic management.

- **Scientific Management:** This theory proposes that work processes should be studied scientifically to identify the 'one best way' to perform a task. Emphasis was placed on time and motion studies, standardisation of work, and incentivising employees based on their output.

- **Administrative Management**: Proposed by Henri Fayol, this theory emphasised the higher levels of management and identified fourteen principles of management, including division of work, authority, discipline, unity of command, and so on. Fayol's ideas are widely accepted as a foundation of modern management education.

- **Bureaucratic Management**: This theory was developed by Max Weber, who envisioned an ideal organisation characterised by division of labour, a hierarchical structure, detailed rules and regulations, and impersonal relationships. His model aimed to ensure fairness, eliminate favouritism, and improve efficiency.

➢ **Neo-Classical Management Theories**

The neo-classical management theories arose as a response to the classical theories, which were criticised for neglecting human and social aspects of the organisation. The central theme of the neo-classical theory is the emphasis on understanding human behaviours, needs, and attitudes in the workplace.

- **Human Relations Movement:** The Hawthorne studies conducted by Elton Mayo established that human relations and social factors are significant influencers of productivity. Workers were found to be motivated by financial rewards, dynamics and a sense of belonging.

- **Behavioural Management Theory:** Advancing the understanding of motivational factors, leadership styles, and the importance of managerial behaviour on employee productivity. They emphasised the need for managers to understand employee needs and adopt participative leadership styles.

➢ **Modern Management Theories**

Modern management theories, also known as contemporary management theories, incorporate aspects of classical and neo-classical theories but also consider the influence of environmental factors. They highlight the complexity and dynamics of modern organisations and the need for adaptive and flexible approaches.

- **Systems Theory:** This theory views an organisation as an interdependent set of parts (subsystems) forming a complex whole system. Changes in one part of the system affect all other parts.

- **Contingency Theory:** The most effective management style relying on various internal and external factors, including organisational structure, technology, size, and environmental uncertainty.

- **Quality Management Theories**: These theories emphasise the importance of quality in achieving competitive advantage. Notable among these are which stress continuous improvement, customer satisfaction, and error reduction.

1.6 Introduction to Scientific Management

Scientific management, also known as Taylorism, is an approach towards management that utilises scientific methods to define the "one best way" for a job to be done. The fundamental principles include:

- **Replacement of rule-of-thumb work methods**: Scientific management calls for the end of traditional or arbitrary methods of working.

- **Scientific selection and training of workers**: Rather than leaving the workers to train themselves, scientific management requires managers to select workers based on their capacities and train them to perform their jobs optimally.
- **Cooperation between workers and managers**: This principle asserts the importance of mutual cooperation between management and workers to ensure efficiency. This contradicts the prevailing adversarial relationship prevalent during Taylor's time.
- **Equal division of work**: According to this principle, the responsibility for work should be equally divided between managers and workers. Managers should engage in planning and supervision, while workers should execute the tasks.

➢ Contributions of Frederick Taylor to Scientific Management

Frederick Winslow Taylor, often called "the father of scientific management," made significant contributions to the field:

- **The concept of the 'One Best Way'**: Taylor introduced the concept of finding the most efficient way to perform a task, achieved through systematic observation, measurement, and analysis.

- **Time and motion studies**: These were performed to break down every job into its constituent parts and find the best and fastest ways to perform each part, hence improving overall efficiency.

- **Differential Piece-Rate System**: This system offered two different pay rates. One for workers who didn't meet the standard output and a higher one for those who did, thus incentivising efficient performance.

- **Functional Foremanship**: Taylor suggested the division of authority among various specialists to ensure quality and efficiency.

➢ Impact and Criticism of Scientific Management

The impact of scientific management has been significant and long-lasting. It has influenced modern management thinking and practices, leading to increased efficiency, standardisation of tasks, and the use of scientific methods in decision-making. Moreover, it paved the way for other systematic and efficiency-oriented management theories, such as Operations Research and Management Science.

However, scientific management hasn't been without its criticisms:

- **Overemphasis on mechanisation**: Critics argue that Taylorism treats workers like machines, overemphasising efficiency at the cost of human considerations like worker satisfaction or creativity.

- **Potential for exploitation**: The efficiency focus could potentially lead to exploitation, with managers using it to pressure workers to perform more in less time.

- **Ignores social and psychological needs**: Scientific management primarily focuses on physical labour efficiency.

- **Lack of universality**: Critics argue that the principles of scientific management may not apply universally, especially in jobs requiring high levels of creativity, knowledge, or unpredictability.

1.7 Summary:

- Management is a systematic process which utilises human, financial, and material resources efficiently and effectively.

- Management theories have evolved from classical theories focusing on efficiency and productivity, through the human relations movement emphasising employee welfare, to contemporary theories like the systems approach and contingency approach, addressing the complexity of modern organisations.

- Frederick Taylor, it advocates using scientific methods to design work processes for efficiency, including real time studies, set work procedures, and incentive payment.

- Views an organisation as a beehive of interrelated parts. It emphasises the inter linkages of these parts and the importance of understanding the organisation as a whole.

- Contingency Approach to Management: Reveals that appropriate management style depends on the specific circumstances, including the environment, technology, and people involved.

1.8 Keywords:

- **Planning:** The initial function of management that involves the blueprinting of strategy to achieve set target.

- **Organising:** A systematic process of bringing all processes for optimum utilization of resources to achieve set objective.

- **Leading:** Influencing others to engage in the work behaviours necessary to reach organisational goals.

- **Controlling:** To execute the planning in a controlled fashion to achieve set objective.

- **Classical Management Theories:** Theories focusing on efficiency, productivity, and output of employees.

- **Neo-Classical Management Theories:** An extension of the classical management theory that emphasises on behavioural analysis and results.

- **Modern Management Theories:** These theories, such as systems approach, socio-technical theory, and contingency theory, focus on the overall organisation's efficiency and the integration of all elements of the organisation.

- **Scientific Management:** Concept of management that analyses and synthesises overall functioning of organization.

1.9 Self-Assessment Questions:

- What are the four key functions of management, and how do they contribute to an organisation's success? Provide an example of each function from a real-world business scenario.

- How has the evolution of management theories influenced the way modern organisations are managed? Discuss at least one classical, one neoclassical, and one modern management theory in your answer.

- Which of principles of scientific management do you think is most relevant in today's business environment and why?

- What is the systems approach to management?

- How might the principles of the contingency approach to management be applied in a rapidly changing business environment such as the tech industry? Use a specific case study to support your answer.

1.10 Case study:
Transformation of Nokia

Nokia had an estimated global market share of almost 40% in 2007. However, the company faced a significant decline in the subsequent years with the advent of smart phones, particularly those of Apple's iPhone and later Android-based phones.

They stuck to their traditional approach while competitors invested heavily in creating smart phones with a focus on user-friendly design and advanced features. Additionally, Nokia's commitment to its in-house operating system, Symbian, further compounded the problem, as it couldn't compete with the iOS and Android platforms in terms of functionality and app availability.

However, in a surprising turn of events, in 2013, Microsoft acquired Nokia's mobile and services division. Despite the initial struggles, Microsoft restructured Nokia's approach, focusing on the smart phone segment, optimising the hardware-software integration, and providing a better user experience. This strategy didn't bring the expected results, and Microsoft sold the brand to HMD Global in 2016.

Despite the turbulent journey, Nokia, under the new leadership, learned from its past mistakes and began focusing on creating smart phones with strong build quality, clean software, and regular updates. By 2023, Nokia has managed to regain some of its lost market share, showing that it's never too late for a well-planned, strategic comeback.

Questions:

1. What were the key mistakes that Nokia made which led to its decline in the mobile phone market?
2. How did the acquisition by Microsoft impact Nokia's business strategy and outcomes?
3. What strategic changes did HMD Global implement to revive Nokia's market position, and why were they effective?

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UNIT : 2

DIVERSE APPROACHES IN MANAGEMENT

Learning Objectives:

- Understand the concept and historical context of bureaucracy in management.
- Identify the main principles of bureaucratic management.
- Discuss the advantages and disadvantages of bureaucracy.
- Learn about key theorists and their contributions to the behavioural approach.
- Understand the role of management science and operations research in the quantitative approach.

Structure:

2.1 Bureaucracy in Management

Bureaucracy refers to an organisational structure characterised by formalised procedures, a clear hierarchy of authority, division of labour, and impersonal relationships.

The concept was first formally conceptualised by the sociologist Max Weber during the early 20th century as he was observing the trend towards rationalisation in Western society. Weber viewed bureaucracy as the most rational and efficient form of organisation, a system where rules, procedures, and hierarchy would reduce ambiguity and maximise efficiency.

➢ Principles of Bureaucratic Management

Max Weber outlined several key principles that form the basis of a bureaucratic management structure:

- **Hierarchy:** In a bureaucratic organisation, power and authority are organised in a clear hierarchical structure.

- **Division of Labor:** Each role in the organisation is clearly defined and specialised. This leads to high efficiency as individuals become experts in their specific tasks.

- **Formal Rules and Regulations:** The organisation's processes and procedures are clearly outlined and adhered to, creating consistency across the organisation.

- **Impersonality:** The rules apply to all members equally, and personal feelings or relationships should not influence decision-making.

- **Competence:** Jobs are filled based on a person's skills and qualifications rather than favouritism or personal relationships.

➢ Advantages and Disadvantages of Bureaucracy

- **Advantages**
    - **Consistency:** Due to its strict rules and procedures, decisions and actions taken are consistent and predictable.
    - **Efficiency:** Specialisation and division of labour enhance efficiency as employees focus on their particular roles or task.
    - **Accountability:** Clear hierarchy and rules make it easy to determine accountability in case of problems or mistakes.
- **Disadvantages**
    - **Rigidity:** Strict adherence to rules can hamper creativity and innovation, limiting the organisation's flexibility in responding to changes.
    - **Bureaucratic Red Tape:** Excessive regulations and paperwork can slow down decision-making and operations.
    - **Impersonality:** The emphasis on rules and hierarchy may lead to impersonal work environments, potentially affecting employee motivation and satisfaction.

2.2 Behavioural Approach to Management

This perspective evolved from the traditional task-oriented, mechanistic views where employees were regarded primarily as means to an end. It argues that focusing on the human dimension of work, such as understanding different motivations, fostering positive relationships, and creating conducive work environments, can lead to better employee satisfaction, which in turn can improve productivity and organisational performance.

- **Key Theorists and Their Contributions**

  - Elton Mayo: Known as the father of the Human Relations Movement, Mayo conducted the famous Hawthorne studies, which revealed the importance of groups in affecting individual behaviour. He suggested that better communication, understanding employee needs, and involving workers in decision-making could boost productivity.

  - Abraham Maslow: Maslow categorised these needs into five levels: physiological, safety, love/belonging, esteem, and self-actualisation.

  - Douglas McGregor: McGregor's Theory X and Theory Y offer insights into managerial attitudes towards employees. Theory X managers believe employees dislike work and must be coerced, while Theory Y managers believe employees are self-motivated and enjoy their work responsibilities.

  - Frederick Herzberg: Herzberg’s Two-Factor Theory suggests that certain factors in the workplace cause job satisfaction (motivators), while a separate set of factors cause dissatisfaction (hygiene factors).

- **Behavioural Models of Management**

There are several key behavioural models of management, including:

- Autocratic model: Management has power over employees. This model doesn't consider much about employee satisfaction or motivation.

- Custodial model: Management acts as a custodian for employees' economic security and welfare benefits.

- Supportive model: Management's main role is to support employees' job performance rather than simply push them to achieve company goals.

- Collegial model: Management works alongside employees, creating a collegial atmosphere that is person-centred.

➢ Applications of the Behavioural Approach

The behavioural approach has been applied in various ways to improve organisational effectiveness:

- Leadership: Behavioural theories are often applied to the understanding and practice of leadership, suggesting that effective leaders are those who can understand and respond appropriately to their followers' behaviour.

- Motivation: By understanding what motivates employees, managers can create conditions that enhance employee motivation and engagement.

- Organisational culture: A behavioural approach can help to create a culture that values employees, encourages positive interactions, and fosters a supportive, engaging work environment.

➢ Strengths and Limitations of the Behavioural Approach

- **Strengths:**

    - The behavioural approach emphasises the importance of the human element, leading to improved employee satisfaction and productivity.

    - It encourages managers to understand their employees and adapt their leadership style to meet employee needs and circumstances.

    - It provides valuable insights into motivation, leadership, and group dynamics, which are crucial for effective management.

- **Limitations:**

    - People are complex, and what works for one individual or group may not work for another.

    - It often overlooks the larger environmental and economic context of organisations, focusing mostly on individual and group dynamics.

    - It may be time-consuming for managers to understand and implement the principles of the behavioural approach fully. However, the potential benefits often outweigh the costs.

2.3 Quantitative Approach to Management

Application of quantitative techniques to enhance decision-making processes is one of management approach. It emphasises the use of mathematical and statistical models to analyse various business scenarios and make objective decisions.

As the name implies, this approach is firmly rooted in numbers and seeks to minimise subjectivity and intuition as much as possible in the decision-making process. It promotes evidence-based management, where actions are guided by data analysis and empirical evidence rather than personal experience or judgment.

➢ **Quantitative Techniques in Management**

There are several quantitative techniques used in management, each designed to solve specific problems or achieve certain objectives. These include:

- **Linear Programming**: This technique helps in optimising limited resources in the best possible manner. It is commonly used in problems related to production scheduling, transportation, and financial planning.

- **Decision Trees**: This graphical tool is used for decision-making under uncertainty. It allows managers to assess various alternatives and their possible outcomes.

- **Statistical Quality Control**: It is used to analyse the quality of products or services and minimise errors in production processes.

- **Time Series Analysis and Forecasting**: These techniques are used to predict future trends based on past data. They are commonly used in sales forecasting, financial analysis, and inventory management.

➢ Management Science and Operations Research

Management Science and Operations Research are two closely related disciplines that heavily utilise the quantitative approach. Management Science is primarily concerned with decision-making within an organisation, while Operations Research focuses more broadly on complex systems optimisation.

Both these fields use sophisticated mathematical models to analyse business operations, aiming to improve efficiency, reduce costs, and increase profits. Some common areas of application include supply chain management, logistics, production scheduling, and strategic planning.

➢ Role of Technology in the Quantitative Approach

In the modern business environment, technology plays a pivotal role in facilitating the quantitative approach. It is instrumental in data collection, analysis, and interpretation. For instance:

- **Big Data Analytics**: With the vast amount of data that businesses generate, big data analytics tools are essential for sorting, analysing, and deriving insights from this information.

- **Predictive Analytics**: Leveraging machine learning and AI, predictive analytics tools help in forecasting future outcomes based on historical data.

- **Business Intelligence Tools**: These provide visualisation capabilities and interactive dashboards, helping managers understand complex data and make informed decisions.

Benefits and Drawbacks of the Quantitative Approach

The quantitative approach to management has several benefits:

- It helps in making objective decisions based on factual data, reducing the influence of personal biases and emotions.
- It improves efficiency and productivity by optimising business operations.
- It aids in risk management by providing tools to analyse various outcomes under uncertainty.

However, there are also some potential drawbacks:

- It may oversimplify complex business scenarios, as not all factors affecting a decision can be quantified or modelled accurately.
- It may not account for qualitative factors like employee morale, organisational culture, or customer satisfaction.
- Poor quality data can lead to inaccurate conclusions and bad decisions.

2.4 Systems Approach to Management

The systems approach to management is an organisational philosophy that treats an organisation as an interrelated and interdependent set of parts, also known as subsystems, all working towards a common goal. This holistic view prioritises the interaction and alignment between various subsystems over their individual performances. Key characteristics include:

- Holism: The organisation is seen as a whole rather than in fragmented parts.
- Interdependence: Each part of the organisation affects and is affected by other parts.
- Input-Process-Output: This system takes inputs from the environment, processes them, and produces outputs that are either consumed or fed back into the system as inputs.
- Equanimity: Different paths can lead to the same output or result.

- **Elements of Systems Theory in Management**

Systems theory in management involves several key elements, which include:

- Subsystems: These are the various parts of the organisation, such as departments or teams, each performing specific functions.
- Synergy: The idea that the whole is greater than the sum of its parts; in an effective system, subsystems working together can achieve more than if they worked independently.
- Open and Closed Systems: Closed systems are self-contained and do not interact with the environment while open ones are related to environment.
- Entropy: The natural tendency of a system to move toward disorder, which must be counteracted to maintain organisational effectiveness.
- Homeostasis: The system's capacity to maintain stability or equilibrium amid environmental changes.

- **The Process of Systems Management**

The process of systems management involves a series of actions taken to ensure that all subsystems work efficiently and effectively towards achieving the organisation's goals. The steps typically include:

- Identifying Subsystems: Recognising the various parts of the organisation that function together.
- Defining Interactions: Understanding how the subsystems interrelate and impact each other.
- Developing Policies and Procedures: Creating rules and guidelines to govern the operation and interaction of subsystems.
- Monitoring and Adjusting: Regularly checking the system's functioning and making necessary adjustments to maintain alignment with the organisation's goals.

- **Interrelation of Subsystems in Organizations**

In organisations, subsystems are interconnected and depend on each other to function optimally. For example, the marketing department relies on the research and development department for information about new products, while the production department depends on the procurement department for the necessary materials. This interrelation leads to a ripple effect, where a change in one subsystem can significantly impact others.

- **The Role of Feedback in System Control**

Feedback plays a crucial role in system control. It provides information on the output of a system, which is then used to adjust the input or process to maintain or improve efficiency and effectiveness. Feedback can be:

- Positive, reinforcing the current direction of the system, or
- Negative, indicating a deviation from the desired state and necessitating corrective action.

- **Pros and Cons of the Systems Approach**

There are several advantages and disadvantages of the systems approach:

- **Pros:**
  - Comprehensive View: It allows managers to see the organisation as a whole and understand the interrelations between different parts.
  - Greater Efficiency: By coordinating the efforts of subsystems, the systems approach can achieve synergies and improve overall efficiency.
  - Better Problem-Solving: By viewing problems from a holistic perspective, the systems approach facilitates more effective problem-solving and decision-making.
- **Cons:**
  - Complexity: It can be difficult to implement due to the complexity of understanding and managing multiple interrelated subsystems.
  - Resource-Intensive: It may require significant resources (time, money, and skills.

2.5 Summary:

- Bureaucracy pertains to a management system characterised by strict rules, hierarchical order, and clear divisions of labour. It offers stability and predictability but can also lead to inefficiencies.

- The behavioural approach emphasises human interactions and motivation in the workplace. It takes into account the emotional and social aspects of human behaviour in managing organisations.
- The quantitative approach employs mathematical models, statistical analysis, and computer simulations to make managerial decisions. It is effective in problem-solving but requires specialised skills.
- The systems approach views an organisation as an interconnected and interdependent system. It stresses the importance of understanding the relationships between various sub-systems within an organisation for effective management.
- Technology plays a crucial role in modern management practices, specifically in the quantitative approach, streamlining processes, and improving decision-making through data analytics

2.6 Keywords:

- **Max Weber:** A German sociologist, Weber is widely regarded as the founder of the bureaucratic approach to management. His theory emphasises formal procedures, a hierarchy of authority, and an impersonal nature in organisations.
- **Hierarchy:** A critical feature of bureaucracy, referring to the structured levels of authority in an organisation, where each level controls the one below and is controlled by the one above.
- **Human Relations Movement:** This movement was a reaction to classical management approaches and focused on the importance of social interactions and employee satisfaction in the workplace.
- **Maslow's Hierarchy of Needs:** Individuals do have a pyramid of needs, ranging from basic physiological needs to the need for self-actualisation, which influences their behaviour and motivation at work.
- **Systems Theory:** This refers to viewing the organisation as a system composed of interrelated and interdependent parts working towards a common goal. It acknowledges the complexity and dynamics within organisations.
- **Subsystems:** These are smaller systems within the overall system (the organisation). Each subsystem has its function, but all work together to ensure the entire system

functions properly. For example, in a business, subsystems could be departments like HR, marketing, production, etc.

2.7 Self-Assessment Questions:

- How does a bureaucratic approach impact the decision-making process within an organisation? Provide an example from a real-world organisation.
- What are the key principles of the behavioural approach to management, and how might these principles affect employee motivation and satisfaction?
- Which of the quantitative techniques covered in the course do you find most applicable to problem-solving in operations management, and why?
- What are the primary components of the systems approach to management, and how do they interrelate to contribute to the overall success of an organisation?
- How would you apply the principles of the behavioural approach to improve team dynamics in a scenario where interpersonal conflicts are affecting team performance?
-

2.8 Case study:

Itaipu Binational's Adoption of the Systems Approach to Management

Itaipu Binational is one of the world's largest hydroelectric facilities situated on the border of Brazil and Paraguay. The company provides 15% of Brazil's electrical needs and 90% for Paraguay. In the mid-2010s, Itaipu faced multiple challenges, including balancing the energy needs of two nations, managing environmental impact, and dealing with fluctuating river levels. To address these complex problems, Itaipu adopted a systems approach to management.

With the systems approach, Itaipu viewed the organisation as a system of interrelated and interdependent parts, including the hydroelectric dam, employees, environmental factors, and the two nations it served. Recognising these interrelationships allowed the company to design comprehensive strategies that accounted for the various factors influencing the organisation.

For instance, to manage fluctuating river levels, Itaipu integrated a sophisticated hydro-meteorological prediction system with the dam's operational processes. This system allowed the organisation to predict and prepare for variations in river flow, ensuring the facility's consistent operation and energy supply.

Moreover, understanding its role as an environmental steward, Itaipu initiated projects like reforestation and wildlife protection. They integrated these projects into their core business strategy, considering the interdependencies between the dam's operations, the local ecosystem, and the surrounding communities.

As a result of this systems approach, Itaipu Binational has become a global leader in hydroelectric power generation, delivering reliable energy to Brazil and Paraguay while simultaneously addressing environmental issues. The company's success offers a compelling example of how the systems approach can guide complex organisations to balance various demands and ensure sustainable success.

Questions

1. How did the systems approach to management help Itaipu Binational address its complex challenges?
2. In what ways did Itaipu Binational benefit from integrating environmental considerations into its overall strategy?
3. How can other organisations, particularly those operating in complex environments, learn from Itaipu Binational's use of the systems approach?

2.9 References:

- Bureaucracy: What Government Agencies Do and Why They Do It by James Q. Wilson
- The Systems Thinking Playbook by Linda Booth Sweeney, Dennis Meadows
- Quantitative Analysis for Management by Barry Render, Ralph M. Stair Jr., Michael E. Hanna

UNIT : 3

DECISION MAKING

Learning Objectives:

- Understand and define the concept of decision-making in a business management context.
- Recognise the importance and role of decision-making in managing businesses and driving organisational success.
- Classify different types and forms of decision-making, such as individual, group, programmed, non-programmed, strategic, and tactical decisions.
- Explore various quantitative and qualitative techniques used in decision-making, including data analysis, decision trees, and flowcharts.
- Gain a comprehensive understanding of the step-by-step process involved in effective decision-making.
- Identify common barriers to effective decision-making and learn strategies to overcome them.

Structure:

3.1 Understanding Decision Making

Decision-making refers to the process of choosing a course of action from multiple alternatives. It is a critical function in every organisation, driving the course of its operations and influencing its future trajectory. The importance of decision-making lies in the following:

- The direction it provides: Decisions set the strategic direction for the organisation and its individual units, helping to define goals and objectives.
- Its role in problem-solving: Effective decision-making can help identify and solve problems, avoiding potential pitfalls or crises.
- Resource allocation: Through decision-making, resources (financial, human, and material) are allocated effectively and efficiently.

➢ The Role of Decision-Making in Management

In management, decision-making is fundamental to all functions and levels. Managers routinely make decisions about planning, organising, leading, and controlling activities within an organisation.

- **Planning:** Managers make decisions about future courses of action, defining strategic objectives and determining how to achieve them.
- **Organising**: Managers decide how best to arrange resources and tasks to meet the goals set in the planning stage.
- **Leading:** Decisions about how to influence and motivate staff towards achieving organisational objectives.
- **Controlling:** Managers make decisions regarding the monitoring and evaluation of activities.

➢ Understanding Rational and Intuitive Decision Making

Rational and intuitive are two key approaches to decision-making. Rational decision-making is systematic, based on analysis, logic, and evaluation of alternatives. It involves:

- Defining the problem
- Identifying decision criteria
- Rating the criteria
- Creating options
- Calculating options
- Selecting the best alternative

- Implementing and then evaluating the decision

On the other hand, intuitive decision-making is largely subconscious and relies on instinct, experience, and 'gut feelings'. It often occurs when there is insufficient data or time or when the decision is highly complex. Despite being less systematic, it is equally vital, especially when dealing with uncertain or ambiguous situations.

- **Decision Making: The Essence**

Decision-making is arguably the most significant aspect of a manager. Managers at all levels are constantly required to make decisions, both minor and major. These decisions can significantly impact an organisation's success or failure. Therefore, developing effective decision-making skills is critical for effective management. This involves:

- **Understanding the context**: Each decision has a specific context, and understanding this context is essential for making appropriate choices.
- **Information gathering and analysis**: Managers must be able to gather, understand, and analyse relevant information to inform their decisions.
- **Evaluating alternatives**: Managers need to be able to consider multiple options and evaluate their potential impacts.
- **Implementation and review**: After a decision is made, it must be implemented, and its outcomes monitored and reviewed. This process can provide valuable feedback for future decision-making.

3.2 Types and Forms of Decision Making

- **Individual v/s Group Decision Making**

The decision-making process is a pivotal element of the management function. Decisions can either be made individually or as a group.

- Individual Decision Making is where a single person is responsible for decision, on their knowledge and understanding of the situation. This type of decision-making can be quick, as it doesn't involve discussion or consensus. It is best used when time is limited or when the decision-maker has significant experience and understanding of the matter at hand. However, it may suffer from a lack of diversity in perspectives.

- Group Decision Making, on the other hand, involves two or more people collaboratively making a decision. The group can benefit from diverse viewpoints, skills, and experiences, leading to a more comprehensive analysis of the situation. However, group decisions might take more time due to discussions and sometimes might lead to conflicts.

- **Programmed v/s Non-Programmed Decisions**

This classification is based on the frequency and the procedure of the decision-making process.

- Programmed Decisions are routine and repetitive decisions that occur frequently in an organisation. These decisions have clear procedures or rules to guide the decision-making process. For example, decisions regarding inventory restocking in a supermarket are programmed decisions.
- Non-Programmed Decisions are unique, non-recurring, and complex decisions that require creative solutions. They are made in response to unexpected and novel situations. For example, decisions made by a company to handle a public relations crisis are usually non-programmed.

- **Tactical v/s Strategic Decision Making**

These two types of decision-making differ based on their impact and scope.

- Tactical Decision Making involves decisions that deal with the regular operations and functions of the organisation. These decisions are short-term, specific, and have limited impact. For instance, a decision to purchase office supplies would be a tactical decision.
- Strategic Decision Making involves decisions that are long-term, broad in scope, and have significant implications for the entire organisation. They usually involve the vision, mission, and direction of the organisation.

- **Centralised v/s Decentralised Decision Making**
  - Centralised Decision Making refers to a structure where the decision-making authority is confined to the top management. This model provides consistency in

decisions but can lead to slower response times and less empowerment of lower-level staff.

- Decentralised Decision Making distributes decision-making authority throughout the organisation, usually empowering lower-level employees and teams to make decisions. This can lead to faster decision-making and more innovation but might result in inconsistency across the organisation.

3.3 Techniques and Tools for Effective Decision Making

➢ Quantitative Techniques in Decision Making

Quantitative techniques in decision-making use mathematical and statistical methods to help managers make decisions. These techniques make use of numbers and measurable forms of data to analyse situations and outcomes. They often include:

- **Cost-Zenefit Analysis**: This technique helps managers analyse the potential costs against the advantages of a decision, ensuring the decision will bring a net benefit.
- **Decision Matrix**: This tool helps in evaluating and prioritising multiple options based on specific, weighted criteria.
- **Linear Programming**: This is used for achieving the best result in an arithmetical model whose requirements are represented by linear correlations.
- **Forecasting**: This is the process of making assumptions about the future based on historical record and analysis of trends.

➢ Qualitative Techniques in Decision Making

While quantitative methods are focused on numerical data, qualitative techniques deal with non-measurable data, often associated with human intuition, experience, and emotions. They include:

- **Brainstorming**: A process for generating multiple potential solutions to a problem, encouraging free thinking and open discussion.
- **Delphi Technique**: An iterative method used to estimate the likely outcome of future events, typically by a panel of experts.
- **SWOT Analysis**: Identifying internal Strengths and Weaknesses and external Opportunities and Threats to inform decision-making.

- **Nominal Group Technique (NGT)**: A structured method for group brainstorming that encourages contributions from everyone and facilitates the prioritisation of issues or solutions.

➢ The Role of Big Data and Analytics in Decision Making

Big data means the vast amounts of structured and unstructured data that businesses generate. The key aspects include:

- **Predictive Analytics**: Using data, statistical algorithms, and machine learning techniques to identify the likelihood of future outcomes.
- **Data Mining**: The practice of examining large databases to generate new information and spot patterns or trends.
- **Real-Time Analytics**: Allows for immediate interpretation of data as soon as it enters the system, facilitating timely decision-making.

➢ Using Decision Trees and Flowcharts for Complex Decisions

Decision trees and flowcharts are effective tools for dealing with complex decisions.

- **Decision Trees**: It's a structured approach that presents possible alternatives and outcomes before arriving at a decision represented in graphical form.
- **Flowcharts**: A flowchart is a diagram representing a process or workflow, which can help in understanding a process, finding bottlenecks and opportunities for improvement. It's a useful tool for presenting and analysing processes in decision-making.

3.4 The Decision-Making Process

At its core, the decision-making process involves the selection of a course of action from among multiple alternatives. This process is not purely analytical; it's often characterised by a blend of rationality, intuition, and judgement. In a management context, resolving problems, capitalising on opportunities, and guiding the company towards its strategic goals.

Key aspects of the decision-making process include:

- **Problem Recognition:** This is the stage where the need for a decision becomes apparent. It could be an issue that needs resolution or an opportunity that requires action.
- **Information Gathering:** Relevant information is collected to better understand the situation and the potential courses of action.
- **Evaluation of Alternatives:** The collected information is used to evaluate the potential actions that could be taken.
- **Decision Making:** After evaluating the alternatives, the best one is chosen.
- **Implementation:** The decision is put into action.
- **Evaluation of Decision Effectiveness:** When the expected result is achieved only then results of the specific decision are calculated.

➢ Stages of Decision Making: From Identifying Problems to Evaluating Outcomes

The stages of decision-making, while linear in theory, often involve cyclical feedback loops in practice. They include:

- **Identifying Problems or Opportunities:** The decision-making process begins when a problem is detected or an opportunity is recognised. Accurate identification is crucial to direct the course of the subsequent stages.
- **Information Gathering:** A thorough understanding of the problem or opportunity is established by collecting relevant data and information. This could involve internal data, market research, competitor analysis, and other sources of relevant information.
- **Developing Alternatives:** Based on the collected information, various potential solutions or actions are brainstormed and developed.
- **Evaluating Alternatives:** Each alternative is assessed in terms of its potential outcomes, feasibility, cost-effectiveness, and alignment with the organisation's strategic objectives.
- **Selecting an Alternative:** The most suitable alternative, considering all factors, is selected.
- **Implementing the Decision:** The selected alternative is executed. It involves marshalling the necessary resources and actions to implement the decision effectively.

- **Evaluating Outcomes:** The final stage involves reviewing the results of the decision to determine if the initial problem has been resolved or the opportunity has been successfully seized. This evaluation informs future decision-making processes.

➢ **Barriers to Effective Decision-Making and How to Overcome Them**

Several barriers can impede effective decision-making, such as cognitive biases, lack of information, time constraints, and emotional influences. Overcoming these barriers involves cultivating awareness of these challenges and developing strategies to address them:

- **Cognitive Biases:** These are systematic errors in thinking that can distort decision-making processes. Awareness and education about these biases can help mitigate their impact.
- **Lack of Information:** Inadequate data can lead to ill-informed decisions. Cultivating robust data-gathering methods and fostering a culture of information sharing can help address this barrier.
- **Time Constraints:** Hasty decisions made under pressure can be less effective. Establishing decision-making protocols and deadlines can help ensure adequate time for deliberation.
- **Emotional Influences:** Emotions can cloud judgement and distort decision-making. Emotional intelligence training and practices like mindfulness can help manage the impact of emotions on decision-making processes.

3.5 Ethics and Decision Making

➢ **Ethical Considerations in Decision Making**

Decision-making often goes beyond cost and benefit analysis to incorporate ethical considerations. Ethical decision-making involves making choices that are morally right and respectful to all stakeholders involved.

Key points:

- An understanding of ethics involves recognising and reconciling conflicting values, such as individual versus collective rights, fairness versus efficiency, and short-term versus long-term impacts.

- Ethical decision-making often involves trade-offs and compromises, as it can be difficult to please every stakeholder. The key is to balance various interests while maintaining a commitment to ethical standards.
- Ethics must be applied throughout the decision-making process, from identifying and analysing the problem to evaluating the outcomes and potential implications.

➢ Corporate Social Responsibility (CSR) and Decision Making

Corporate Social Responsibility (CSR) is the commitment by businesses to contribute to sustainable economic development by delivering economic, social and environmental benefits for all stakeholders. It influences decision-making by adding another layer of consideration.

Key points:

- CSR encourages businesses to extend their responsibilities beyond shareholders to other stakeholders, such as employees, communities, and the environment.
- Decision-making informed by CSR might involve accepting higher costs or lower profits in the short term to achieve long-term benefits, such as a stronger reputation, better employee morale, and a healthier environment.
- The incorporation of CSR into decision-making processes requires businesses to think creatively and strategically, as it's often possible to find solutions that serve both business and social/environmental interests.

➢ The Impact of Organizational Culture on Decision Making

Organisational culture relates to common assumptions, values, and trusts that characterise the functioning of the company. It significantly impacts decision-making processes and outcomes.

Key points:

- In a strong culture, employees have a clear sense of what behaviours are expected and valued, which influences how decisions are chosen, and problems are resolved.
- A culture that promotes openness and transparency tends to encourage participative decision-making, where input is sought from various levels within the organisation.

- Cultural norms also influence the willingness to take risks. In a risk-averse culture, decisions may lean towards conservative options, whereas in a risk-tolerant culture, more innovative and daring solutions may be pursued.

- **Ethics: The Line between Profit and Principle in Decision Making**

Balancing the pursuit of profit with adherence to ethical principles is a major challenge in decision-making. While businesses must generate profits to survive and grow, they also have ethical responsibilities to various stakeholders.

Key points:

- Profit-driven decisions can conflict with ethical principles. For example, a business might be tempted to cut costs in ways that harm the environment or infringe upon worker rights.
- A firm commitment to ethics can protect a business from risky or short-sighted decisions that generate immediate profits but cause long-term harm.
- Ethical businesses can often achieve sustainable profitability by building strong relationships with customers, employees, and communities. In this way, profit and principle can work together rather than being in opposition.

3.6 Summary:

- Decision-making is a critical managerial function. It involves the choice of a course of action from amongst different alternatives. It's key to an organisation's success.
- There are different types and forms of decision-making in an organisation, such as individual vs group decision-making, programmed vs non-programmed decisions, tactical vs strategic decision-making, and centralised vs decentralised decision-making. The choice of decision-making form depends on the circumstances and the organisational culture.
- Various techniques and tools can be used to enhance decision-making, including quantitative and qualitative techniques, decision trees, flowcharts, and data analytics.
- Decision-making follows a process that begins with identifying a problem and generating alternatives, then evaluating these alternatives, making the decision, implementing it, and finally evaluating the outcomes.

- Ethical considerations are paramount in decision-making. They influence the perception of the organisation by its stakeholders. Decision-makers must consider the organisation's corporate social responsibility and culture.

3.7 Keywords:

- **Rational Decision Making:** This approach involves making decisions based on logical analysis, evaluation of alternatives, and objective judgement. In a rational decision-making process, a manager would identify the problem, gather relevant information, generate potential solutions, evaluate these alternatives, and then implement the best solution.
- **Intuitive Decision-Making:** Unlike the rational process, intuitive decision-making involves relying on instinct, gut feelings, or subconscious information. Managers might use this approach when time is limited, when they have significant experience in a certain area, or when the decision involves elements that are difficult to quantify.
- **Programmed Decisions:** These are routine and repetitive decisions that managers make regularly. They usually follow established guidelines or procedures. Examples might include decisions about restocking inventory or scheduling staff shifts.
- **Non-Programmed Decisions:** These are unique, non-routine decisions that require creative solutions. They're often required in response to unexpected or novel situations. An example might be a decision about how to respond to a sudden drop in market share.
- **Quantitative Techniques:** These techniques involve the use of statistical and mathematical models, such as decision trees, simulations, or cost-benefit analysis, to assist in decision-making. These techniques can help managers make more objective, data-driven decisions.
- **Ethical Decision Making:** This involves considering the ethical implications of different choices when making a decision. Managers must often balance the need for profitability with ethical considerations like fairness, justice, and corporate social responsibility.

3.8 Self-Assessment Questions:

- How would you differentiate between programmed and non-programmed decisions? Provide an example of each from a business context.
- What role does organisational culture play in the decision-making process? Provide an example to support your explanation.
- Which decision-making technique would you prefer to use when faced with a complex business problem: a quantitative technique or a qualitative one? Justify your choice.
- What steps would you take to ensure that your decision-making process is ethical and aligns with corporate social responsibility? Provide a hypothetical scenario to illustrate your approach.
- How has the advent of technologies like artificial intelligence and machine learning impacted the decision-making process in businesses? Provide an example of a company effectively leveraging these technologies for decision-making.

3.9 Case Study:

The Digital Revolution of Tata Motors

Tata Motors, one of India's largest automotive companies, faced a challenge in the early 2020s. A slowdown in the domestic market, stiff competition, and changing consumer preferences had started impacting its market share. The company realised that it had to evolve with changing times, and digital transformation became its strategic priority.

In 2022, Tata Motors decided to overhaul its decision-making process, leveraging digital technologies for better efficiency and customer engagement. It partnered with tech giants to streamline operations, implement data analytics, and enhance its online presence.

The company implemented a data-driven approach, where analytics played a pivotal role in decision-making. Machine Learning algorithms were used to analyse consumer behaviour, market trends, and operational data, facilitating strategic and informed decisions.

The result was a significant improvement in production efficiency, marketing strategies, and customer satisfaction. The company's market share saw a steady increase, and Tata Motors was able to navigate the challenging market conditions effectively.

This digital transformation at Tata Motors is a prime example of how traditional companies in India are adopting modern technologies for improved decision-making and competitive advantage.

Questions:

1. How did digital transformation enhance decision-making capabilities at Tata Motors?
2. What challenges might Tata Motors have faced during this digital transformation, and how might they have overcome them?
3. How can the use of data analytics and machine learning contribute to a company's strategic decision-making process?

3.10 References:

- Drucker, Peter F. The Effective Executive: The Definitive Guide to Getting the Right Things Done.
- Bazerman, Max H., and Don A. Moore. Judgment in Managerial Decision Making. Wiley, 2012.
- Russo, J. Edward, and Paul J.H. Schoemaker. Winning Decisions: Getting It Right the First Time. Currency, 2002.

UNIT : 4

PERSONALITY & VALUES

Learning Outcomes:

- Students will learn about personality.
- Students will learn about the Myers-Briggs Type Indicator and the importance of values.
- Students will learn about types of values, values across cultures and a Self-Assessment test on personality.

Structure

4.1 Personality

4.2 Myers-Briggs Type Indicator The Big Five Personality Model

4.3 Importance of values

- Knowledge Check 1
- Outcome-Based Activity 1

4.4 Types of values

4.5 Values across cultures (Global Implications)

4.6 Self-Assessment test on personality

- Knowledge Check 2
- Outcome-Based Activity 2

4.7 Summary

4.8 Self-Assessment Questions

4.9 References

4.1 Personality

‘The word "personality" is derived from the Greek word "persona" which means "to speak through". A person's personality is made up of a variety of characteristics or qualities that give them their unique personality.’ Every person has a unique, essential behaviour-defining characteristic that makes them who they are.

Two key characteristics primarily impact personality traits:

- Inherited characteristics
- Learned characteristics

Inherited Characteristics

Inherited characteristics are features that a person get hereditically. It possesses the following qualities:

- A person's race and faith
- Their eye colour
- Their snout's shape
- Their earlobes' shape

Learned Characteristics

Nobody is born with all the knowledge. The traits that a person learns from others and their surroundings through observation, practice, and practice are known as learned characteristics. The following traits are examples of learned characteristics:

Traits of Personality

Personality traits are the enduring qualities that define an individual's behaviour. A distinctive quality of an individual is their personality. The best five personality traits are as follows.

- Extrovert
- Neurotic
- Open
- Agreeable

- Conscientious

The top five psychological traits that affect OB are as follows. −

- **Center of Control**

The centre of a person's moral code is known as the locus of power. Internals and externals are two distinct groups of individuals. Those who identify as internals believe they are in control of their own fate, as opposed to those who identify as externals, who think outside forces are in charge of their lives. They also desire environmental management. Internals, therefore, excel in occupations that call for analyzing complex knowledge, independent judgment, and action. However, because they are more willing to comply and more obedient, externals excel in routine, structured tasks.

- **Machiavellianism**

Machiavellians are master manipulators who constantly seek to win. The qualities that define a high-mach individual are as follows:

- ✓ Direct communication is preferred over an indirect speech by High-Machs.
- ✓ High-Machs frequently create as opposed to always abiding by the law.
- ✓ High-Machs get distracted by sentimental details that have no impact on the outcome of an undertaking.

- **Self-esteem**

It admires a person's level of self-like or detest. Relationships between self-esteem and expectations for success, and job happiness are inverse. People with high self-esteem think they have what it takes to succeed.

- **Self-monitoring**

Self-monitoring is the ability to regulate one's behaviour in reaction to social situations. People with high self-monitoring skills respond to external factors by changing their behaviour right away. Because of their impulsive tendencies, they can present public personalities that are wholly different from who they really are. However, those with inadequate self-monitoring skills are unable to defend themselves. Whatever the situation, they always stay loyal to themselves. What you see is what you get becomes their guiding principle.

- **Having Risks**

It is essential to comprehend these variations and match a propensity for taking risks with sensible job requirements.

In a company, there are different personality types that can control how others behave. Here are a few prevalent behavioural types:

1. **Extrovert personality:** An extroverted persona radiates warmth and effortlessly forges connections with others. Their outgoing nature and rapid rapport-building skills make them adept at social interactions. Gregarious by nature, they thrive in social settings, relishing lively engagements with others and gravitating towards large gatherings. Active and enthusiastic participants, extroverts eagerly immerse themselves in a plethora of diverse activities.
2. **Agreeable personality:** These individuals rely on the goodness, character, and skills of others. The agreeable personality feels the need to assist others and finds satisfaction in doing that kind of work.
3. **Conscientious personality:** Conscientious individuals have a fruitful outlook and believe they are capable of achieving their objectives.
4. **Cautious personality:** People will consider all options before moving decisions, in contrast to those who are not as circumspect.
5. **Self-conscious personality:** Self-conscious individuals are extremely perceptive of what others are saying and thinking about them. While those who are less self-conscious are unconcerned about being evaluated by others, those who are more self-conscious find criticism and rejection to be painful.
6. **Adventurous personality:** While those who are less adventurous may have traditional values and favour security over adventure, they may be unafraid to question authority and conventions. People with an adventurous disposition may be more willing to take risks and happy to having power.

4.2 Myers-Briggs Type Indicator The Big Five Personality Model

Jung's theories on personality type gave rise to the Myers-Briggs Type Indicator (MBTI). Katherine Briggs initiated the development of the MBTI in the early 1900s. Initially, Briggs wanted to create a test that would reveal children's identities. In this manner, educational programs could be created taking into account the strengths and weaknesses of every single child. After her daughter Isabel left for college, Briggs began perusing Jung's book Psychological Types. She even wrote to the foremost psychologist to inquire about the details of his theories. To help people comprehend their type and make the most of that knowledge, Briggs aimed to use Jung's theories. Isabel Briggs Myers began her own research on personality type after learning about it from her mother. She started developing the MBTI at the start of the 1940s. Her mission was to assist people in discovering the careers best matched to their personality types. The exam was first made available by the Educational Testing Service in 1957, but it was quickly discontinued after a negative internal review. The test then became famous after Consulting Psychologists Press purchased it in 1975. Every year, over 2 million American adults take the MBTI personality test, and over 88 per cent of Fortune 500 businesses, according to The Myers-Briggs Company, use the results to assess the personalities of their staff.

According to the MBTI, people are classified into one of 16 personality types. These categories originate from two groups in each of the four dimensions. Participants are divided into one category in each dimension of the exam based on their responses to a series of either/or questions. Personality types are created by combining the four characteristics. The MBTI was created to help people better understand who they are and how that affects their preferences in various spheres of life, including employment and relationships. Since no one of the 16 personality types revealed by the exam is superior to another, they are all regarded as being equal.

Three of the MBTI's dimensions were taken directly from Jung's writings, while Briggs and Myers introduced a fourth. These four parameters are:

Comparing extraversion (E) and introversion (I) According to Jung, this dimension represents a person's mindset.

Intuition (I) versus Sensing (S) they enjoy learning and focusing on details with their senses. The appeal of impressions is greater for intuitive individuals. They tend to think vaguely and enjoy speculating.

Comparing thinking (T) and feeling (F) To determine how one responds to the information they have ingested, this dimension relies on the sensing and intuition functions. Those who place a strong emphasis on thinking base their choices on logic, facts, and data. In contrast, those who place a strong emphasis on feelings base their choices on people and their emotions.

Comparing judging (J) and perception (P) This final factor was introduced to the MBTI by 'Briggs and Myers' to determine whether a person tends to make rational or irrational decisions when interacting with the outside world. While a judging person relies on structure and makes firm choices, a perceiving person is flexible and open.

16 distinct personality traits.

Based on the four characteristics, there are 16 different personality types, each of which is intended to be distinct. Each variation is identified by a four-letter code. While an ISTJ is introverted, detecting, thinking, and evaluating, an ENFP is extraverted, intuitive, feeling, and perceiving. The MBTI categories that a person falls into are believed to dominate their mentality, and one's type is believed to be unchangeable.

4.3 Importance of Values

Your values have an impact on your views, actions, and thoughts. They encourage honesty and proper conduct in a variety of social settings. Because they are not situation-specific, they are different from short-term or long-term goals. Although you might not always be mindful of your values, knowing what they are can help you make the best choices for yourself. Knowing your principles can make it easier to find that most closely align with your deeply held beliefs. You may feel more self-assured in auditions as a result. If you value stimulation, you might search for a job where you can travel frequently, and your responsibilities change every day.

The advantages of identifying your beliefs include the following:

1. **Values can help with your issue-problem-solving and judgment abilities**
   You may be better able to handle stressful situations that occasionally affect your capacity to solve problems and make choices if you have an understanding of the things you value most. When faced with a difficult decision, think about how you can draw on your principles. It may be tempting to respond to a circumstance quickly, but taking a moment to consider your values can help you make the most sensible decision that truly reflects your values.

For instance, if you place a high value on selflessness and come across someone in need, assisting them can make you feel good about yourself because you are able to show your selflessness in action.

2. **Your values can assist you in identifying what's most crucial.**

   By Self Exploration, you can better focus on what matters to you and get rid of things in your life that don't make as much sense to you or don't accurately represent who you are and what you want to become.

   Your sense of self-worth can grow as a result of your values.

   Your ability to perform at your best during job applications and once you land the job is aided by your level of confidence. The likelihood that you will make the correct choices increases when you are aware of who you are and what you believe. Your capacity to handle complex problems and get past challenges others may put in your path at work or during interviews can be improved by having self-confidence. Additionally, it can support more natural interactions between you and those around you, such as classmates, co-workers, and superiors.

3. **Your career decisions can be improved by your values.**

   You're likely to make a lot of decisions throughout your job, all of which could have a different effect on both your personal and professional lives. Knowing your values can help you make better decisions at work, choose the job you really want, and make the transition to that career easier if you decide to take on a completely different role. You may determine a career in freelancing, or entrepreneurship is best for you if you value independence highly. If lifelong learning is one of your core beliefs, you may choose to pursue a job in academia.

- **Knowledge Check 1**

  Fill in the Blanks:

  1. **_________** proposed a novel theory of personality that includes the id, ego, and superego.
  2. The logical, sensible, and practical aspect of the personality is the **_________**.
  3. **_________** allows us to keep our self-esteem intact by preventing us from acknowledging our undesirable traits, but it severely distorts how we see the outside world.
  4. A personal trait that is used to define and clarify identity is a **_________**.

- **Outcome-Based Activity 1**

Explain, using examples, how environmental variables affect human personality.

4.4 Types of Values

Value classification has always been challenging because values are interconnected, and there is no set method to categorize them. These are a few of the crucial numbers.

1. **Personal Values:** Both in terms of ownership and use, something is personal to an individual. Regardless of his societal relationships, the individual cherishes and desires them. These principles enable one to do well by oneself. Examples include aspiration, orderliness, and restraint.
2. **Family Values:** The foundation of the family as a social institution is a set of widely recognized values that are fostered and developed within a family system. These values primarily originate from the head of the family, usually the father, who passes them on to their offspring, who then pass them on to succeeding generations.
3. **Social Values** -Social values are specific behaviours and viewpoints that are held in common by particular social and cultural groups. These ideals are beneficial to society and serve as the cornerstone of a person's interactions with other members of the community. Among them are decency, altruism, social responsibility, etc.
4. **Moral values:** These attitudes and behaviours are what a community considers to be necessary for peace, order, and overall well-being. It allows someone to distinguish between good and bad, right and wrong, etc. Fairness, justice, human respect, etc., are some examples.
5. **Ethical Values** - A collection of moral guidelines that are relevant to a particular population, line of work, or mode of behaviour are known as ethical values. These ideals demand moral fortitude and the ability to follow one's moral principles even when doing so puts one's finances, mental stability, or social security at risk. These have to do with how we interact with other people on an intimate level. Ethical standards encompass all moral principles as well.
6. **Spiritual Values** – Spiritual values are the act of contemplating life's non-material aspects and learning from one's own experiences. They influence a person's relationships with themselves and are preoccupied with a person realizing their self and uniting with divinity. Examples include kindness, truth, and beauty.

7. **Cultural Values** - Cultural values are the norms that determine what is right or wrong, essential or unimportant, in a society. It emphasizes the need to protect cultural customs, rituals, and traditions that the materialistic culture of the contemporary era may threaten. Examples include civility, societal order, and tolerance, among others.
8. **Trans-cultural values** – Transcultural values are those that are shared by all cultures in the world and are demonstrated in comparable ways. Since they are shared by all cultures, these can be categorized as universal principles.
9. **Intrinsic Values:** They are goals in and of themselves, not just a means to an end. These values are at the top of the hierarchy of human values and are better than all other principles of living. Examples include virtue, beauty, joy, and bliss.
10. **Instrumental Values** – Values that are helpful in gaining some other benefit, such as financial gain or a rise in status, are referred to as instrumental values. When a topic is pursued purposes other than its own, it is said to have instrumental value. Examples include education for career achievement, political influence for charitable work, etc.
11. **Aesthetic Principles**: It aims to imitate the divine's loveliness through the arts. Aesthetic ideals are those things and actions that bring pleasure from beauty. Examples include elegance, good taste, and design.
12. **Democratic values:** These values are defined by respect for each person's uniqueness, equality for all, ensuring that everyone has access to the same social, political, and religious freedoms, objectivity and social justice, and reverence for democratic institutions.
13. **Dis-Value:** Values that undermine and demoralize human progress can be referred to as dis-value. This involves retaliation, envy, and jealousy.

4.5 Values across cultures (Global Implications)

1. **Power Distance** - Power Distance is the level of acceptance of unequal power distribution in organizations and society. High power distance individuals frequently tolerate unequal power distribution. People who have comparatively little power distance favour an equal distribution of power. India is an example of a low-power-distance culture that practices democratic governance, while a high-power-distance culture practices authoritarian governance. (For e.g., Gulf countries).
2. **Collectivism v/s Individualism:** In contrast to collectivism, which favours group goals over individual goals.

3. **Masculinity v/s Femininity:** In contrast to femininity, which holds that there should be no distinction between men's and women's responsibilities, masculinity is the degree to which society supports traditional masculine dominance over privilege and power (such as the Afghan Taliban).
4. **Long-term v/s short-term orientation** – In contrast to long-term orientation, which is a national value that emphasizes the future, short-term orientation puts more emphasis on the past and the present.
5. **Indulgence v/s restraint:** Indulgence is the degree to which people prefer to enjoy life, have fun, and satisfy their natural desires, whereas restraint is the degree to which a person's ability to satisfy their needs, satisfy their desires, and behave in a way that is consistent with social norms or spiritual values. (Spiritual way of life).

4.6 Self-Assessment Test on Personality

The information provided by self assessment tools will help you better understand who you are and will give you the ability to express your priorities, focus your job search, and consider your choices. However, they won't tell you what type of job or career is the best fit for you.

Tools for Self-Assessment

- The Myers-Briggs Test is one of many free online personality assessments available at Human Metrics and www.16personalities.com. It is a questionnaire that describes your favoured method of interaction.
- Another personality test is the Strong Interest Inventory, which compares your interests to those of people who are effective in a variety of occupations. The analysis is typically expensive, but you can find free versions online. (keep in mind that you often get what you pay for)
- A job counselling tool called the job Beliefs Inventory can help people recognize and change their attitudes about selecting a profession.
- Values Assessment (free) - Values tests can helps in understand underlying requirements and motivations for work and can assist you in determining what is significant to you in a position of employment.
- Kiersey Temperament Sorter – A free mini-report called the Kiersey Temperament Sorter gives you a thorough overview of your personality type and fundamental traits, as well as

suggestions for potential jobs and work environments. A more thorough job occupation report is chargeable.

- **Knowledge Check 2**

  True or False:

  1. A psychologists refer to a person's personality, that means a dynamic notion that describes, their entire psychological system grows and develops.
  2. The etymological history of the term "personality" is fascinating.
  3. A non-relatively unpredictable collection of traits that affected a person's behaviour.
  4. Animal studies have demonstrated that both bodily and psychological traits can be passed down through the generations.
  5. Although usually consistent and stable, a person's personality can change depending on the circumstances.

- **Outcome-Based Activity 2**

  How would you, as a manager of HR, handle a worker who, as a result of his cultural heritage, has an independent and aggressive work attitude and outperforms the other employees who put in just as much effort but lack that enthusiasm?

4.7 Summary

- A personality of a person is referred to as a set of generally constant traits that affect their behaviour.
- A person's observable personality traits are most frequently used to characterize this.
- The most significant factor in determining an individual's degree of effectiveness is personality.
- The mentality not only grows, but also alters in response to different circumstances.
- A feeling, thought, or action is called an emotion, which is a mental and physiological state.
- The writings of philosophers like Descartes, Spinoza, and David Hume also contain sophisticated ideas.
- Recent developments in empirical study frequently influence later theories of emotions.

- Many times, ideas are not mutually exclusive, and many researchers use a variety of viewpoints in their work.

4.8 Self-Assessment Questions

1. Explain personality.
2. Explain various theories of personality?
3. What is a thorough explanation of personality? Briefly describe each of the key components.
4. What are the different biochemical components that contribute to personality?

4.9 References

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UNIT : 5

MOTIVATION

Learning Outcomes:

- Students will learn the concept of motivation and its application.
- Students will also learn different types of theories of motivation.
- Students will understand about rewards to motivate employees.

Structure

5.1 Brief on theories of motivation & concepts and application

Management staff and employees can use motivational to complete a professional goal or work toward an outcome. To identify the factors that affect a person's motivation, psychologists and management experts develop motivation theories workers to strive toward their own goals as well as those of the company. It might be required to inspire qualified individuals to perform consistently at their highest level. Ideas for motivation are used by managers to boost output, revenue, employee happiness, and retention rates. Continuous motivation is a process. A motivation theory seeks to understand what spurs individuals to work toward an objective or result. Managers and organizations can accept and put to use the motivational theories that are effective for them in order to create a workforce that is consistently fruitful. It is possible to use cognitive, process-based, and content-based motivational reasons. Cognitive theories examine the effects of a person's environment and views on motivation. Teachers can use these concepts to motivate their pupils, and sports coaches can use them to improve the performance of their athletes.

Motivation drives individuals to act in certain ways. ones. As a consequence, we frequently need to extrapolate from apparent behaviours to determine why people act the way they do.

Extrinsic or intrinsic motivation are the two main types of motivation that are frequently differentiated.

- Extrinsic incentive derives from outside of the person and frequently involves material rewards like medals, money, accolades, or social acceptance.
- When someone is motivated purely by the satisfaction of solving a problem, as when they finish a difficult crossword puzzle, this is an illustration of intrinsic motivation.

According to research, the three major components of the drive are activation, persistence, and intensity.

- Enrolling in psychology classes to earn your grade is an instance of establishment.
- Persistence can be demonstrated by attending psychology class despite feeling fatigued from a late night the night before.

- Intensity can be seen in the focus and zeal with which one pursues a goal. Another student may carefully study, participate in class discussions, and take, whereas one student may put forth little effort (minimal intensity). (greater intensity).

5.2 "Early theories of motivation- Maslow's Hierarchy of Needs"

In 1943, humanistic psychologist Abraham Maslow proposed the Maslow order of needs. He presented this theory in an article titled "A Theory of Human Motivation" that was published in Psychological Review. Later, he added the study of human conduct to further develop the concept. In addition to providing a parallel justification for many other theories of human psychological development, the theory stresses the stages that foster human growth. Maslow bases his theory on physiological ideas like self-actualization, self-transcendence, respect, belongingness, safety, and physiological needs. The biological and humanistic theories of human identity are also included in this theory. Numerous biological variables have an impact on human personality. Maslow's theory and biological factors are related, which serves to explain the humanistic theory's component and the biological components of personality.

- **Physiological needs-** Simple physiological needs include having access to "air, water, food, clothing, and refuge. In other words, a person's physiological needs are their fundamental wants for amenities".
- **Safety needs**- Securing emotional, physical, and natural safety and security are all requirements for safety.
- **Social needs-** Friendship, love, and other human connection-related feelings
- **Esteem needs**- "Esteem needs can be divided into two categories: internal (self-respect, confidence, competence, success, and freedom) and external"

Self-actualization need- "This includes the desire to reach your full potential and become everything you are capable of becoming. It covers the need for development and satisfaction with oneself. According to Maslow's theory, individuals are motivated by unmet wants.

The fact that each of these needs has been essentially satisfied encourages and compels the emergence of the next need. Maslow divided the five criteria into two categories: higher-order needs and lower-order needs. Physiological and safety criteria made up the lower-order requirements.

The higher-order needs consisted of the prerequisites for social interaction, self-esteem, and self-actualization. Usually, these higher-order demands are satisfied inwardly or within the individual. Therefore, it follows that the fundamental needs of workers are generally met during a boom".

Workers should be paid a "fair wage" by managers so they can purchase the necessities of life and satisfy their physiological requirements. It is important to give workers time to consume and take breaks. Managers should provide job security, a tidy and secure workplace, and retirement benefits to retain their employees in terms of safety requirements.

The management should organize social events and encourage teamwork in order to meet social requirements. The management may decide to offer the deserving employee a promotion or a better place within the business.

5.3 Theory X and Theory Y

In Theory X, Douglas McGregor summarizes the traditional view of management in a number of defining assumptions, the three major ones being the hierarchical principle, strict supervision, and an autocratic leadership style. People are innately lazy, want to avoid work as much as possible, don't want to be accountable, don't have any ambition, and prefer to be in control, claims Theory X. People want to avoid working, so it is necessary to compel them to do so frequently and under close supervision.

Therefore, the system of rewards and punishments works best for them. Additionally, clear instructions on how to perform their responsibilities must be given. Theory Y management holds that people have a natural desire to accomplish objectives, advance professionally, take an active role in decision-making, and enjoy their work. The highest reward for employees is self-actualization, and the drive that propels people toward self-actualization enables them to realize their maximum potential. It is not essential to use a method that combines rewards and penalties.

5.4 Two-Factor Theory

In contrast to the need hierarchy method for motivation, Fredrick Herzberg looked at the experiences that met or didn't meet people's needs at work. The "two-factor theory" is the name given to this need motivation theory. Two hundred engineers and accountants from Western Pennsylvania were a part of Herzberg's initial study from the 1950s. This suggested that removing something that caused work satisfaction would also remove something that caused job dissatisfaction, and removing something that caused both would remove both. Based on unstructured interviews with 200 engineers and accountants, Herzberg came to the conclusion that this notion of job happiness was flawed and that satisfaction and dissatisfaction were actually conceptually separate factors caused by various workplace phenomena.

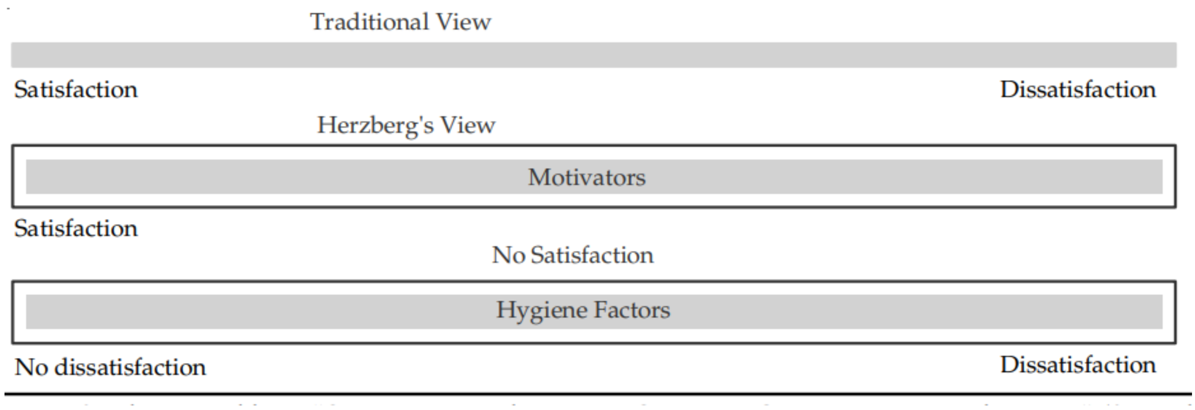
Hygiene Factors

According to Frederick Herzberg's theory, there are some elements that are necessary to keep workers satisfied but do not motivate them. These consist of favourable working circumstances, considerate human relations abilities, and a salary and benefits package that are satisfactory to the employee. Employee dissatisfaction will result if any of these hygiene elements are missing. They are additionally known as maintenance variables.

When the hygiene elements are either absent or insufficient, job dissatisfaction results. The initial study's hygiene factors included workplace administration and policy, technical supervision, relationships with one's supervisor on a personal level, working conditions, pay, and prestige. These elements may be regarded as supporting elements because they pertain to the environment of the job.

Motivating Factors

Herzberg asserts that adding motivational elements to work leads to job satisfaction. Job enrichment is the name given to this procedure. Responsibility, accomplishment, recognition, advancement, and the job itself were listed as the motivation factors in the initial research. These elements have to do with the duties of the employee and what the employee actually does while working.



5.5 McClelland's Theory of Needs

A different viewpoint, the "acquired needs" theory, is offered by psychologist David C. McClelland. It contends that our needs are taught or acquired based on our life experiences, in contrast to the hierarchy of needs theory and ERG theory, which see some needs as inherent parts of our makeup. Even though these needs typically result from a variety of circumstances to which we are subjected, occasionally, a particular event can have a significant impact on our desires.

Murray created the Thematic Apperception Test in the late 1930s. (TAT). The subjects were instructed to create a dramatic story for each of the twenty images after viewing them. Murray claimed that about twenty fundamental human needs that drove behaviour could be identified based on the findings. Power, affiliation, and achievement were three of these requirements that McClelland and his colleagues thoroughly investigated over the course of more than three decades beginning in the 1950s. Each person holds all three needs, according to m. McClelland, but each person differs in the extent to which each motive rules their behaviour. These are the stated motives:

1. **Need for power (nPow):** The dominant person who exhibits this need finds pleasure in having control over others. The high nPow person places less importance on actually achieving desired objectives than they do on the methods by which they are accomplished (the use of power). People with a high nPow find satisfaction in holding places of power and authority.
2. **Need for affiliation (nAff):** People who have this need as their primary motivation enjoy engaging in social and related activities. Strong interpersonal bonds must be established in order to "get close" to people mentally. High nAff people will choose their friends over technically competent people if given a choice between the two when working on a job.
3. **Need for achievement (nAch):** People with a high need for achievement (nAch) find satisfaction in achieving their objectives. The sense of successfully completing a job is significant and typically choose activities that fall somewhere between moderately simple and moderately difficult. Additionally, they favour working alone so that their efforts, rather than those of others, can be linked to successful job performance (or failure).

5.6 Contemporary theories- ERG theory

The ERG hypothesis was created by American psychologist Clayton Alderfer between 1961 and 1978. Maslow's hierarchy of needs serves as the foundation for the motivational paradigm known as the ERG theory. The ERG theory is based on the essential needs of groups' existence, relatedness, and development. The ERG hypothesis was created by American psychologist Clayton Alderfer between 1961 and 1978. Maslow's hierarchy of needs, which Alderfer improved over the period of seventeen years in accordance with empirical research on motivation, is the foundation of the ERG theory. After his research was finished, Alderfer condensed Maslow's five-level version into a three-level hierarchy.

Relatedness needs - These include a person's wish to maintain close relationships (whether with family, friends, or superiors), as well as to gain notoriety and respect from the general public. **Growth needs-** Personal development and self-improvement are requirements for success. Maslow's needs for intrinsic esteem and self-actualization are included in this set of prerequisites.

1) There is no strict progression from one stage to the next in the ERG model. Instead, it acknowledges the possibility that just one of the higher levels, or all three levels, could be active at any given moment.
2) It implies that if employees can't get the emotional support or acknowledgement they need at work (relatedness needs), they might demand more money or better health insurance as compensation for the other needs being unmet.
3) The model suggests that, in addition to being limitless, growth needs are also genuinely awoken each time some level of satisfaction is attained. Therefore, the ERG model predicts
4) A lot of challenge and creativity, our need for development may grow stronger, motivating us to seek out greater challenges at work.

5.7 Self-efficacy theory

The belief we have in our own abilities, especially our capacity to overcome challenges and effectively complete a task, is known as self-efficacy. Although self-efficacy and our sense of importance as humans are related, there is at least one key distinction.

- **Self-efficacy vs. self-esteem**

  Constructs that can exist on their own
- **Self-regulation and self-efficacy**

  the term "self-efficacy" is more closely related to their perceived abilities. To put it another way, self-efficacy is the belief that one can succeed, whereas self-regulation is more of a method for achieving one's objectives, especially in relation to learning.

- **Self-efficacy and motivation**

  Self-efficacy and motivation are separate concepts, even though they are closely linked, much how small, they frequently report a rise in motivation to keep growing and learning.

- **Self-efficacy and resilience**

There is room for failure even though experiences of success undoubtedly account for a sizable portion of the growth of self-efficacy. In addition to having a higher chance of success, they also have a higher chance of recovering from loss. Self-efficacy has a big effect on this ability, which is at the core of resilience.

- **Knowledge Check 1**

  Fill in the Blanks:

  1. Biological requirements are one type of need that needs to be met.
  2. The need for safety and stability is referred to as ______________ requirements.
  3. Self-fulfillment was referred to as __________________________.
  4. The ERG theory permits for variations in the order of the _______________ for various individuals.
  5. Providing employees with things like a feeling of accomplishment, responsibility, or recognition can lead to ____________________.

- **Outcome-Based Activity 1**

  Discuss in the group the importance of motivation in the workplace.

5.8 Equity theory

Equity theory (Adams, 1963) states that individuals engage in social comparison by comparing their actions and rewards to those of pertinent others. How fair they perceive their rewards to be in contrast to those of others affects how motivated people are. Equity happens when individuals think that their effort-to-reward ratio is equal to that of those they are comparing themselves to. Under-reward happens when someone feels that she exerts more effort than another person but still gets the same reward or exerts the same amount of effort as another person but receives a smaller reward. For instance, if an employee puts in more hours than a co-worker while earning the same pay, the employee would feel underappreciated. In contrast, a person who experiences over-reward will believe that his effort-to-rewards ratio is greater than that of another person, meaning that he is receiving more for making the same effort or the same reward even with less effort.

5.9 Cognitive Evaluation Theory

This hypothesis states that people want their views and actions to be in line with one another. Cognitive dissonance is a distressing state of arousal that causes people to seek consistency by altering one of their attitudes or actions. Thus, cognitive dissonance is produced in a person when they act in a manner that is inconsistent with their mindset. Then, by altering either the mindset or the behaviour, he or she tries to lessen the dissonance. Festinger contends that because inconsistency of any kind causes pain, people will try to lessen the dissonance and resulting discomfort. People will therefore look for a stable situation with the least amount of dissonance.

Dissonance is something that nobody can fully avoid. Consequently, how do individuals manage dissonance?

Festinger argues that an individual's wish to lessen dissonance depends on the significance of the factors contributing to it, the degree of control the person feels they have over those factors, and any potential rewards associated with dissonance.

1. **Importance of the Elements**: The pressure to rectify this imbalance will be less if the elements causing the dissonance are relatively insignificant.
2. **Degree of Influence**: How people respond to discord will depend on how much power they perceive they have over the various factors. They are less likely to be open to changing their attitudes if they believe the discord is unmanageable.
3. **Rewards:** Rewards have an impact on how driven people are to lessen dissonance. High rewards that go along with high dissonance have the tendency to lessen the stress that comes with the dissonance.

These moderating factors imply that people do not always move immediately toward consistency, which is the reduction of this dissonance, just because they feel dissonance. The person won't feel under great pressure to reduce the dissonance if the issues causing it is of minimal importance, if they believe it is externally imposed and is therefore largely beyond their control or if rewards are substantial enough to make up for it.

Five factors affect the relationship between attitudes and behaviours:

1. **Attitude Specificity:** People have both broad and narrow views. The relationship between a specific mindset and behaviour is stronger.
2. **Relevance of attitudes:** Relevance is an element that influences the relationship between attitudes and behaviour.

   For us, attitudes that speak to a matter in which we have a stake in it are more pertinent, and our following actions are consistent with those attitudes.
3. **Timing of Measurement:** The timing of the assessment has an impact on the correspondence between attitudes and behaviours.
4. **Personality traits:** Personality traits also affect the relationship between attitudes and behaviours. Self-monitoring is a personality trait that influences the harmony between thoughts and behaviour. Less self-aware people exhibit more consistency between their views and behaviours. Due to the fact that they act in response to cues from their surroundings and other people, people with high self-monitors tend to have little correlation between their attitudes and behaviours.
5. **Social Constraints:** Social constraints have an impact on how views and behaviour are related. The social environment informs us about proper views and conduct.

5.10 Goal setting theory

The main developers of the goal-setting idea were Locke and Latham. (1990).

The fundamentals of goal-setting philosophy are as follows:

- Employee acceptance of objectives is necessary for
- Goals that are challenging are challenging, but not unattainable, to achieve. They encourage people to work harder and longer, and when they are satisfied, they help people achieve their goals and attain self-actualization. The idea that difficult goals are more motivating than ones that are relatively simple to accomplish is supported by empirical research.

- Specific, pertinent, timely, credible, and adequate frequent feedback is deemed effective.

Goal-setting theory's managerial implications

According to goal-setting theory, managers must establish precise, difficult goals, ensure that employees genuinely accept organizational goals, and give frequent, precise performance-related feedback. A management-by-objectives program is a methodical approach to setting goals. Management by objective (MBO) places a strong focus on setting goals that are concrete, verifiable, and measurable through participation.

Analyzing the idea of goal-setting

The goal-setting theory has received support from studies performed over a 40-year period, indicating that it is a useful source of knowledge about how the goal-setting process functions. There is proof, though, that when tasks are straightforward, well-learned, and independent, goals have a more significant impact on performance. The idea also seems to be culturally restricted. Its essential elements mesh well with individualistic societies, making it well-suited to Western countries.

5.11 Expectancy Theory

Victor Vroom of the Yale School of Management first proposed the expectation theory in 1964. According to the theory, a person's propensity to behave in a particular manner is influenced by how strongly they believe their actions will lead to a particular outcome and by how desirable those outcomes are to them. The Expectancy Theory states that an employee's incentive is determined by their level of desire for a reward (Valence), the likelihood that their efforts will lead to the anticipated performance (Expectancy), and their conviction that their efforts will lead to a reward. (Instrumentality).

Instrumentality is the idea that good execution will lead to a valid outcome. The degree to which performance and results are related, the degree to which decision-makers can be trusted, and the simplicity of the decision-making process are all factors that affect instrumentality.

The anticipation theory focuses on the following three connections:

- The connection between effort and performance: What are the odds that the individual's effort will be taken into account when evaluating his performance?
- Performance and reward relationship: This section discusses how much an employee believes that getting a positive performance review will lead to them receiving incentives from their employer.
- Individual objectives and rewards: It all depends on how enticing the potential reward is to the person.

The employee's incentive level, which is dependent on three factors—expectancy, valence, and instrumentality—solely determined this choice.

The Expectancy Theory's benefits

- Individual who wants to maximize satisfaction and reduce dissatisfaction.
- This theory contends that reality is irrelevant and instead places a strong stress on perspective and expectations.
- It relies on rewards.
- A person aspires to feel the least amount of pain and the greatest amount of joy.

Expectancy Theory Restrictions

The expectancy theory appears to be idealistic because many people think success and rewards are strongly correlated, and its implementation is limited because reward and performance are frequently not closely correlated in organizations.

Expectancy Theory implications

- The managers are able to connect the desired performance standards to the desired outcomes.
- It is the supervisors' responsibility to make sure that the employees can execute at the required levels.
- It is important to recognize deserving employees for their excellent job.
- Companies must have a just and equitable compensation structure.
- They must establish positions that are interesting, challenging, and rewarding.
- A variety of methods, such as questionnaires, etc., should be used to constantly rank the level of employee motivation.

5.12 Job characteristics model

According to the job characteristics model (JCM), employees need to possess five key characteristics in order to thrive in their jobs. The JCM claims that while motivation suffers in jobs that are uninteresting or un stimulating, it flourishes in jobs that are challenging and exciting. The job characteristics model can help managers, and human resource professionals enhance the working atmosphere for their team members or employees. It can be used to assist their employees in energizing and personalizing their work, which will boost output, morale, and work quality. These are the five traits:

1. Task identification

Task identity refers to when a worker completes a complete, recognizable job. Task identity essentially occurs when a worker can complete a task entirely as opposed to concentrating on just a tiny portion of it. Task identity is essential because it helps one feel more accomplished when one can see the fruits of their efforts. When employees only finish small portions of the job, it might be harder to evaluate the results.

2.Task Importance

Task significance is the sense of importance associated with the work. When their job has a positive effect on others' lives, whether those others are clients, co-workers, or both, employees tend to find meaning in their work.

3. Diverse skill sets

A worker with a variety of special talents can make use of them to perform the obligations of their job. When a job provides a variety of skills, an employee has the opportunity to acquire various skills and take part in various experiences

4. Self-rule

Autonomy is another crucial job quality. Employees can choose to work independently when offered the chance. Autonomy can support a sense of personal meaning and higher-quality work because people who work in jobs with more autonomy frequently feel more responsible for their own choices.

5. Feedback

Feedback is another crucial work characteristic mentioned in the JCM. Therefore, it's crucial for employers to solicit feedback from their employees. Receiving criticism tends to boost employees' confidence and improve their performance at work. Once you have a firm grasp of the theory and foundation of the job characteristics model, you can start thinking about how to apply it at your place of employment. Applying the JCM requires that you complete the steps outlined below:

1. **Assign duties**

   The least experienced employees should be given tasks if they can manage them. Giving tasks to employees with less experience or training, when it is feasible, can support their autonomy development and skill development, despite the fact that it may seem counterintuitive. These employees may feel more personally responsible for their tasks as a result, which could motivate and engage them more.

2. **Change up the duties**

   Altering the tasks related to a job is another way to apply the JCM. This reflects the basic quality of skill variety by allowing workers to perform a range of tasks needing a diverse skill set. If their duties are varied, workers may find their work more interesting and fulfilling.

3. **Encourage cooperation**

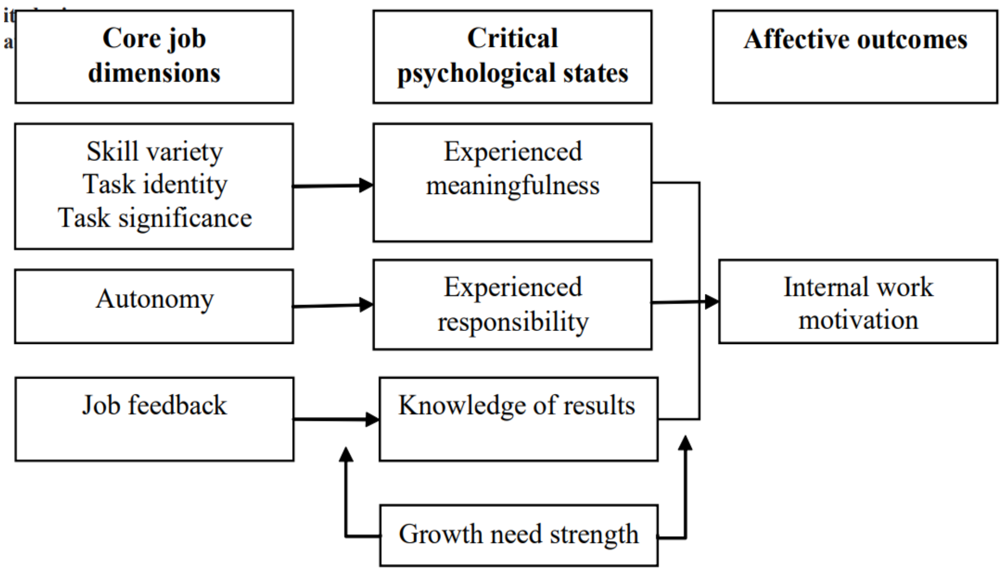
   Another way to incorporate the job characteristics model into your workplace is to assign collaboration. Teamwork gives workers the ability to see projects through to the end and to measure the results of their labour, which can help in implementing the task identity JCM characteristic. By enabling them to use a variety of skills, it might also encourage skill variety.

4. **Finalize achievement reviews**

   Conducting employee performance reviews is another way to put the JCM into action. Feedback is the model's primary duty, and performance reviews are a method to give your staff members consistent feedback. Consider implementing a rewards system, such as offering bonuses or creating an employee recognition board, once performance assessments are complete. Receiving rewards for good labour can inspire employees to keep improving.

5. **Encourage staff to switch roles**

   If feasible, design a workplace environment that allows for job rotation on a regular basis. Their duties may become more varied and interesting as a result. Employees may feel more engaged and satisfied with their job when they can regularly engage in novel experiences and put new skills to use.



5.13 Rewards to motivate employees

1. **Flexibility in the job**

If your business isn't remote, offering flexible work options can be a wonderful incentive. You can permit your staff to work from home on any given day or to select the schedule of their choice. Additionally, if you work from home during set hours, you can be a little more flexible with your working hours one day a week.

2. **Extra compensated time off**

Your workers will feel extra special if you give them a day off in addition to the regular vacation days. Some people might even value it more than any monetary compensation. An extended lunch break or a half-day off are additional options.

3. **Greater accountability**

If you give engaged workers more important duties and responsibilities, they might feel more motivated because it might advance their professional growth. Only a select group of individuals who enjoy overcoming obstacles and putting forth the effort to prove themselves are motivated by this type of incentive, though. Others may not consider it much of a prize but rather a burden.

4. **Ambassador assignment**

You might ask a star worker to an important gathering that they wouldn't normally be present for. Meeting a top client or senior business leader can greatly increase employee motivation.

5. **Give out a prize in front of the complete office**

Employees can feel valued and recognized right away if rewards are given in front of their co-workers. Who doesn't enjoy the spotlight every once in a while? Announce the employee's accomplishments that caused you to reward them to the group during coffee breaks or at an unscheduled meeting.

6. **Give your workers social media recognition**

Employee recognition on your company's social media channels, such as LinkedIn or Facebook, can be a significant reward for employee milestones, work anniversaries, etc. You can encourage the other members of your team to express their gratitude for the employee on these posts.

7. **Reliable medical treatment**

Offering low-cost, high-quality healthcare as part of your incentive programs is a fantastic way to thank dependable employees. You can work with reputable insurance providers to provide group insurance for selected workers. Since it's a significant incentive, you can only give it to top workers or staff members who have worked for you for the required amount of time. When attempting to increase employee engagement, it occasionally may even be more effective than a financial reward.

8. **A gym subscription**

Taking good care of your workers' physical well-being can greatly improve their productivity and mental well-being.

9. **Dinner with the boss**

In a large business, only an exclusive group of people has access to the CEO or president. This is why spending time with such top executives is a tempting opportunity for the future leaders of your business. They can use the meal to catch up with their superiors or to talk about their professional plans.

10. **Tickets for special events**

Some of the best music performances, food festivals, and other events are just around the bend, along with the holiday season. And if these are unavailable in your region due to the pandemic, there are a ton of virtual events available, such as virtual tours and cooking competitions.

- **Knowledge Check 2**

  Answer the following statements with True (T) or False (F):

  1. The ERG theory permits the simultaneous pursuit of multiple categories of needs.
  2. According to Herzeberg, work satisfaction and unhappiness are on the same continuum.
  3. McClelland used the TAT, a projective exam.

4. Safety is a social need that must be met.
5. Being liked and accepted is a major worry for people who have a strong need for affiliation.

- **Outcome-Based Activity 2**

  Prepare the PPT on the theories of motivation with suitable examples.

5.14 Summary

- The interior state of motivation energizes and guides behaviour toward goals by activating and directing it.
- Creating a work environment where people are motivated about job priorities is a challenge.
- Organizations too frequently ignore the concerns that affect employee relations, communication, recognition, and participation the most.
- The first step in creating a workplace that motivates employees is to cease doing things that are sure to demotivate them.
- Finding and implementing the behaviours that will motivate people is the next stage.
- There are numerous ideas for inspiring employees.

5.15 Self-Assessment Questions

1. Discuss the subject, or do you need theory?
2. Describe the distinctions between Maslow's and Alderfer's beliefs.
3. Go over the idea of goal setting.
4. Describe the attribution theory's guiding principles.
5. Talk about Herzeberg and McClellands' hypothesis.

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UNIT : 6

CONCEPTS, DEVELOPMENT AND STRUCTURE OF GROUPS

Learning Outcomes:

- Students will learn about the concept of group and the nature of group dynamics.
- Students will understand the individual and group, group formation and group cohesion and development.
- Students will also learn about group structure and sources of influence.

Structure:

6.1 Concepts of group
6.2 The nature of group dynamics
6.3 The individual and the group
6.4 Group Formation
- Knowledge Check 1
- Outcome-Based Activity 1

6.5 Group cohesion and development
6.6 Group structure: role, norm, status, Group influence, Social loafing
6.7 Sources of influence
- Knowledge Check 2
- Outcome-Based Activity 2

6.8 Summary
6.9 Self-Assessment Questions
6.10 References

6.1 Concepts of Group

Individuals make up groups of people. Simply combining two or more people does not create a group; relationships are necessary to turn them into a group. Twenty people travelling in a van, for instance, do not constitute a group; rather, they are merely an aggregation. However, if the bus breaks down and everyone has to push it to get it to a mechanic nearby, a group will naturally form under the guidance of, say, the bus driver. The group chooses its own leader, establishes clear goals, and offers members ideas for achieving those goals. The characteristics of the organization are quite distinct from those of the members who make up the group. Individual group member behaviour does not always reflect the behaviour of the entire group and vice versa.

Characteristics of Group

- ✓ **Size:** A group consists of 10 to 20 people.
- ✓ **Goals:** Each group has specific objectives for justification.
- ✓ **Norms:** An organisation has several principles and guidelines for a group.

6.2 The nature of group dynamics

Group dynamics refers to the adaptive changes that take place in the group organized as a result of changes in any one of its constituents. The ability, desire, and degree to which a member will engage with the other members of the group will all depend on factors such as his physical attributes, mental aptitude, aptitude, and personality. The interaction between various groups is known as intergroup behaviour, and it is affected by factors such as task knowledge, targets, and reliability. When groups are conscious of their roles and the motivations behind them, they are likely to perform better. The intergroup relationships in any company are further governed by the division of labour principle, rules, and protocols. Some departments might have operational authority, while others might only have advisory standing.

(i) Level of group in terms of organization and management. This calls for collaboration and guidance.

(ii) It investigates the inner workings of groups, including their formation, operation, member interaction, and effect.

(iii) It is study of changes that occur within groups and is focused on the forces that interact and arise among group members in a social context.

6.3 The individual and the group

Individual conduct can also be influenced by a number of variables. Social scientists may examine a group's formation, what defines a group, or how a group achieves its objectives. Individually, each of your track teammates acts in a distinct way.

Individual behaviour might also adjust in order to fit in with what is considered appropriate collective behaviour.

6.4 Group Formation

The following are challenges with group formation:

i) How the groups are formed
ii) The group's frameworks and procedures
iii) The role the group plays in various circumstances.

The five main steps in a group formation were created by Tuckman. Group growth typically occurs in five stages:

i) There is a certain amount of ambiguity and confusion during the formation phase.
ii) When there is the most strife and disagreement, it is known as storming. Members now mainly voice their objections and criticism. In fact, this is the moment where interpersonal conflicts and disagreements over the group's goals begin to surface. It's critical to settle any disagreements.
iii) Group members communicate with one another and tolerate different expectations from one another.
iv) The group can act once it has matured and found its identity. At this stage, group members make decisions logically, focusing on relevant goals rather than emotional considerations. Concerns about roles, expectations, and norms no longer hold a monopoly on importance. The team is effectively focusing on its responsibilities and accomplishing its goals.

v) Adjourning implies that group members frequently experience sorrow and closure as they prepare to leave. At this point, the organization has achieved its original objectives and is starting to disintegrate gradually.

We can fulfil important societal and psychological needs with the help of groups. Numerous people perform different kinds of tasks. A company may elect one person to be the leader and the other members to be followers. Participants are linked together.

- **Knowledge Check 1**

  Fill suitable word in the following:-

  1. There is a widespread belief that organizations go through a set order of ___________ stages.

- **Outcome-Based Activity 1**

  Form a group and discuss the challenges faced in its formation.

6.5 Group cohesion and development

Group cohesion is the level to which members of an entity are associated to one another and remain loyal to it. It usually shows itself as a reluctance to be perturbed by outside forces. A group becomes cohesive as a result of the members' actions, relationships, and emotions. Cohesiveness makes everyone in the organization cooperate in order to accomplish the goals.

Along with group norms, group cohesiveness is a significant element that influences group behaviour. The level of a member's attachment to their organization is referred to as group cohesiveness. High levels of group cohesion also indicate high levels of individual interaction and consensus among the group's opinions. Typically, united groups have the following characteristics:

1. The group members have similar backgrounds, shared interests, and objectives.
2. There are not many users.
3. Interpersonal communication among the members is very efficient and occurs frequently.
4. The group members hold solidly together in the face of any perceived external threats.

The level of group cohesiveness is influenced by a number of variables. They include the following.

1. **Group dependency:** The more attractive the group will be, and as a result, the more cohesive the group will be. According to some theories, a group's attractiveness and cohesiveness increase with the number of individual needs it can or does fulfil.
2. **Size:** Size and group cohesiveness have an inverse relationship, other factors being equivalent.
3. **Homogeneity and Stable Membership:** Organizations with a diverse range of members' hobbies and backgrounds frequently do less to advance their goals. In a similar vein, solid interpersonal bonds strengthen group cohesion. This is the case because a relationship must last for a while in order for people to get to know one another and develop a common grasp of shared values and goals.
4. **Group Location:** Group location has two effects on group harmony.
   There would be strong social cohesion. Second, cohesion is strong if the group is cut off from other groups.
5. **Group Status:** Members are more drawn to a group with a strong reputation and a track record of achievement. As a result, they are very cohesive as a group and exhibit unity with one another. Contrarily, a group that is disparaged by everyone has a tendency to be less cohesive.
6. **Group Leadership:** The characteristics of the group leader decide how closely the group members are bonded. If the group leader is vivacious and enthusiastic, he or she inspires the members to work fervently toward achieving shared objectives. He works to foster and sustain strong group devotion among the participants.
7. **External demands:** Group members frequently band together to meet external demands. Members of a group often minimize their personal differences when under external pressure to defeat a shared foe. It is also possible that the group will not be able to withstand the excessive pressures and that group cohesiveness will not be possible to obtain in order to withstand such pressures.
8. **Competition:** Varying kinds of competition have varying effects on a group's cohesiveness. There is a rivalry between group members (intragroup competition) and competition between groups (intergroup competition). Competition among group members typically undermines the unity of the group.

9. **Behaviour of management:** The boss can hinder interpersonal relationships by inciting unhealthy competition in the workforce. On the other side, by praising cooperative behaviour, he can foster solidarity. If the group members are properly motivated by the boss, the cohesive group can aid in more effectively achieving the group goals.
10. **Member Turnover:** A organization needs some level of stable relationships among its members in order to be more cohesive.

6.6 Group structure: role, norm, status, Group influence, Social loafing

Group Roles

Roles are a collection of expected behaviour patterns connected to a person holding a particular place within a social group. People in small groups typically perform one of three broad categories of roles:

✓ **Task roles**

Task positions concentrate on achieving the group's objective. The list below includes each task position for a group.

1. Coordinator −Statements made by one group member are connected by the coordinator.
   "Gita's comment relates well to what Ram was saying," for instance.
2. Energizer: Encourages collective participation.
   How many of you would be prepared to bring in a video on the dispute for the following session, for instance?
3. Elaborator −Extends upon another's concepts as an elaborator.
   Example: "I believe Niki and Anni are suggesting that we first clarify through nonverbal communication before moving to verbal communication."
4. Evaluator-critic −Assesses the group's effort in comparison to higher standards.
   "This is fine, but I believe Shree needs to provide more feedback," as an example
5. Information-giver − Provides pertinent knowledge.
   Example: "Rohit has some conflict-related books we could use."
6. Information-seeker − Questions for the explanation.
   Example: "Could you please tell me what you said about disconfirming responses, Richa or Trishala?"
7. Recorder: Records gathering information.

Example: "A-P's talk was not covered during the previous session. Just now, Rohit and Rahul had completed theirs.

8. Procedural Technician −Technician in procedural law Accepts responsibility for work.

   I borrowed the VCR to watch Nigaar and Neha's talks, for instance.

   - Building and maintenance roles
   - Self-centred roles

✓ **Group-Building / Maintenance Roles**

It concentrates on fostering communication and upholding peace. A group's various maintenance responsibilities includes:-

1. Encourager – Offers supportive criticism.

   Example: "I think Shyam was entirely correct in what he said."
2. Follower: Gets suggestions from other group members.

   "Let's follow Adi's plan—he had the right idea," as an example.
3. Compromiser −A compromiser tries to come up with an answer that is acceptable to all parties.

   Example: "Pratik, Sid, and Nimmi have each provided three excellent answers. Why not incorporate them?
4. Gatekeeper: Encourages everyone in the community to participate.

   Example: "I don't believe Madhuri has contacted us yet."
5. Harmonizer − Reduces conflict and stress with the Harmonizer.

   "After that test, we deserve a free meal," for instance.
6. Observer: Watches how the group is doing.

   Example: "I believe we've already learned a lot. Mona and Monica provided us with useful knowledge.

✓ **Self-centred Roles**

The purpose of these roles is to prevent the group from achieving its objectives. The following are some examples:

1. Attacker – Displays hostile behaviour toward other group members and their opinions.

   "Playing desert survival is the best idea I've ever heard," for instance.

2. Dominator: Controls the flow of group discussion.
3. Blocker − Blocker Refuses to work on other people's plans.
   Example: "I won't participate in Family Swap."
4. Help-Seeker – Presents a weak, unfocused demeanour.
   "I don't think I can put together a summary," for instance. Why not carry it out for me?
5. Loafer −Loafer Avoids working.
   Why don't we just go get coffee instead of finishing this job, for instance?

Norms:

The common standards that each member of the organization is required to abide by. Norms are the accepted guidelines for conduct that all members of an organization adhere to. Every organization creates its own traditions, beliefs.

Types

- ✓ **Performance Norms**

  These are concentrated on how diligently a person should labour in a specific group. They are informal cues that help a person choose how hard to work and what kind of product to produce. For instance, a team leader might hang up different posters around the office to motivate employees to work hard and perform at their best.

- ✓ **Appearance Norms**

  Appearance standards provide us with information or guidelines about how we should dress, style our hair, and a host of other aspects of how we should look or behave physically.

  For instance, we must follow a professional dress code while working for an organization; we cannot show up to a board meeting in a bridal gown.

- ✓ **Social Arrangement Norms**

  This norm basically focuses on how we should behave in social contexts. Again, there are cues we need to watch out for that will make us blend in and feel more a part of the group when we are out with peers or at social events.

  For instance, we cannot finish our official job while attending a friend's birthday party.

- ✓ **Resource Allocation Norms**

  This standard concentrates on the allocation of resources in a corporate setting. This can include raw materials, additional labour, and any other resources a business discovers or needs.

  For instance, if the client requests that the task be finished by tomorrow, it must be finished with the resources at hand or over time.

Conformity

"Accommodating to group pressures" is a definition of conformity. It is also referred to as group pressure or the impact of the majority.

Types

- ✓ **Normative Conformity**

  It is caving into social pressure in an effort to blend in. People generally conform out of a sense of community acceptance or absence thereof. This type of compliance typically involves compliance, where an individual publicly accepts the opinions of a group while privately rejecting them.

- ✓ **Informational Conformity**

  This usually happens when someone asks for help from the company because they are lost. This type of conformity is internalization, the process by which a person adopts the opinions of the organizations as their own.

- ✓ **Ingratiation Conformity**

  It is where someone acts in a conformist manner to win the approval or respect of others. Although it is influenced by norms, it is motivated more by the desire for social approval than by the fear of being ignored.

Status :-

The classification of group members.

A status is a place or rank that is assigned to groups or group members by others and is socially defined.

Social loafing –

When people labour in a group rather than alone, they tend to put forth less effort to accomplish a task. In spite of the fact that groups occasionally experience accidental coordination issues, this is one of the major reasons why they are occasionally less productive than the sum of the individual contributions of their members working together. Many of the reasons why people engage in social loafing are brought on by the belief that their efforts will be in vain.

Cohorts —

Groups that exhibit similar behaviours. Cohorts are people who belong to a community and have something in common.

Group Demography –

The degree of shared conduct.

Group demographics are the extent to which a group member can share a particular demographic characteristic with his or her teammates. Long-term team effectiveness can be increased through the use of group demography.

Cohesiveness-

The degree to which members of a community feel a sense of belonging.

The level of attraction between group members and encouragement for them to stick together. Instead of one single element, the interaction of several factors is what causes group cohesion. Group performance may be impacted by group cohesion, but the performance itself may also encourage or enhance group cohesion. Therefore, a lack of group harmony may actually prevent a group project from being successful.

6.7 Sources of influence

As a starter list for considering the six forms of influence, consider the following:

Source 1: Your own motivation or your desire to do it.

Source 2: Your own ability to perform the action.

Source 3 : Social motivation, or source three, asks whether other people support the correct behaviours.

Source 4: Social ability; whether or not others are able to offer assistance, knowledge, or resources.

Source 5: Structural Motivation examines whether the world supports the desired behaviours.

Source 6: Structural Ability; How well the world promotes the desired behaviours.

- **Knowledge Check 2**

  Check whether the sentence is true or false:-

  1. Man is a wild beast at heart.
  2. Organizations are collections of experts who cooperate to accomplish various objectives.
  3. To work on a project, aim, or objective, various departments form smaller groups.
  4. According to our definition, a "group" consists of more than two workers who regularly interact and have an impact on one another's performance and behaviour.

- **Outcome-Based Activity 2**

  Prepare the presentation on Group Formation.

6.8 Summary

- A person's performance will be impacted equally if the group they are working in is conducive to work, and vice versa.
- Man is a sociable animal by nature. He cannot function independently from the other individuals in his environment.

- Working in harmony with other professionals is practically required in today's society for a professional.
- Organizations are nothing more than a collection of numerous professionals cooperating to accomplish a common objective.
- Smaller groups are formed within various divisions to work on a project, goal, or objective.
- When people act in groups, it goes beyond each person acting in their own manner individually.
- To put it another way, people behave differently in organizations than they do on their own.
- The organization forms a formal squad to carry out tasks in support of its objectives.
- Informal groups are associations that are neither officially organized nor predetermined by an organization.
- People occasionally compare individuals within a group when coming to conclusions or developing opinions. A group is a reference group when it is utilized in this manner.
- The five phases of a typical group process are: Forming, Storming, Norming, Performing, and Adjourning.

6.9 Self Assessment Questions

1. List the traits that make up a group of people.
2. Describe the various group types, their responsibilities, and their purposes.
3. Define formal and informal groups and provide instances.

6.10 References

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UNIT : 7

SOLID WASTE MANAGEMENT

Learning Objectives:

- Learn the process of solid waste management
- Know about sanitary landfills
- Understand solid waste disposal
- Learn about Composting

Structure:

7.1 Collection and Conveyance

Flush management is the procedure of collecting the lots of garbage. It includes further the production waste and disposed off to fill it . A driver and two loaders are needed for each collecting vehicle and, typically, enclosed compacting trucks with a maximum volume of 30 cubic metres (40 cubic yards).

The best collection waste is not easy to refill where as in large populated areas and cities it is best calculated.

Solid waste collection is divided into two categories:

- **main group:** This group collects the hard trash and transport that trash into the final place.
- **Secondary Collection:** It is the process of gathering waste from communal trash cans, holding facilities.

7.1.1 Basic Collection Scheme

Based on the availability of service

1. Communal system
2. Block Collection
3. Kerbside/alley
4. Door-to-door collection

1. **Communal System:** Since this system depends primarily on public cooperation, improving a communal system's design, operation, and maintenance practices is essential.
2. **Block Collection:** Garbage must be transported to collection vehicles by garbage generators. This technique minimises the distribution of waste on roadways while having low to medium labour and vehicle productivity.
3. **Kerbside :**Most industrialised nations and the affluent regions of some developing countries use this form of collection. On a set day (or days), waste producers leave their trash cans or bags (sacks) on the curb or in the alley for collection by outside

parties. Regular and well-planned pickup services are necessary so that generators know when to place their garbage outside.

4. **Door-to-door Collection:** This is more usual in industrialised nations, although in many developing countries, more and more wealthy groups are founding micro-enterprises and community-based organisations to carry out this function. Although this technology is still relatively unknown to the general public, it maximises crew efficiency by eliminating the need to retrieve containers, just like when waste is bagged.

7.1.1.1 Methods Based on Mode of Operation

1. **Hauled Container System:** To replace the full garbage container being transported to the processing point, transfer station, or disposal site, vacant container (sometimes called a go to sleep spar) is transported to the cargo space location.
2. **Stationary Container System :**In this method, containers used to store waste stay at the collection point. Typically, collection workers carry waste from storage containers into collection vehicles when they arrive beside the storage containers. They take the material to the processing, transfer, or disposal facility.

7.1.2 Conveyance

About 60 to 80 per cent of all costs paid in solid waste management go towards transporting the garbage gathered in the numerous community bins. Every day, the vehicles travel many routes to the removal place.

Types of Transport vehicles used:

- Mammal wagon
- Short-term motor medium
- Motor truck
- Tricars rickshaws
- Voltaic vehicles
- Railing move

Planning a route for a vehicle can be facilitated by the following methods:

- Heuristic
- Deterministic
- Deterministic-Heuristic

1. **Heuristic Approach :** he development of a few straightforward principles systematised the outdated practice of allocating routes based on prior knowledge and intuition. However, how effective they are depends on the user's background. Route balancing and micro routing should be completed after macro routing.
2. **Determined Approach :** These procedures employ cutting-edge mathematical methodologies. a great deal of the data about the locations of collection area, procedure facilities, and the amounts of waste collected at individual collection bins would be accessible under the current system. This information must be estimated while designing a new system, which calls for using simulation techniques.
3. **Heuristic-Deterministic Approach :** In the heuristic-deterministic technique, a computer program assesses many potential solutions before selecting the best one.

7.2 Disposal of Solid Waste

Municipal solid waste disposed of improperly can lead to unsanitary conditions that pollute the environment. They may also provide various administrative, social, and economic issues.

7.2.1 Methods of Disposal

Some methods that are incorporated for the disposal of solid waste are mentioned below:

1. **Landfill:** The wreckage that cannot be second-hand or reused is pulled out during this process and dispersed as a thin layer in low-lying areas across a metropolis. A layer of soil follows each layer of trash. However, after this procedure is finished, the region is deemed inappropriate for building construction for the next 20 years. It can only be used as a park or a playground instead.
    - **Sanitary landfill :** In a sanitary landfill, garbage is often buried in layers and crushed into a solid mass in a pit with a covered bottom. To hasten decomposition, waste is alternatively covered with dirt. Methane, a dangerous gas produced by decaying, is

collected at the landfill and used to make power rather than released into the sky. At the sanitary landfill, a clay lining keeps the environment and rubbish separate.

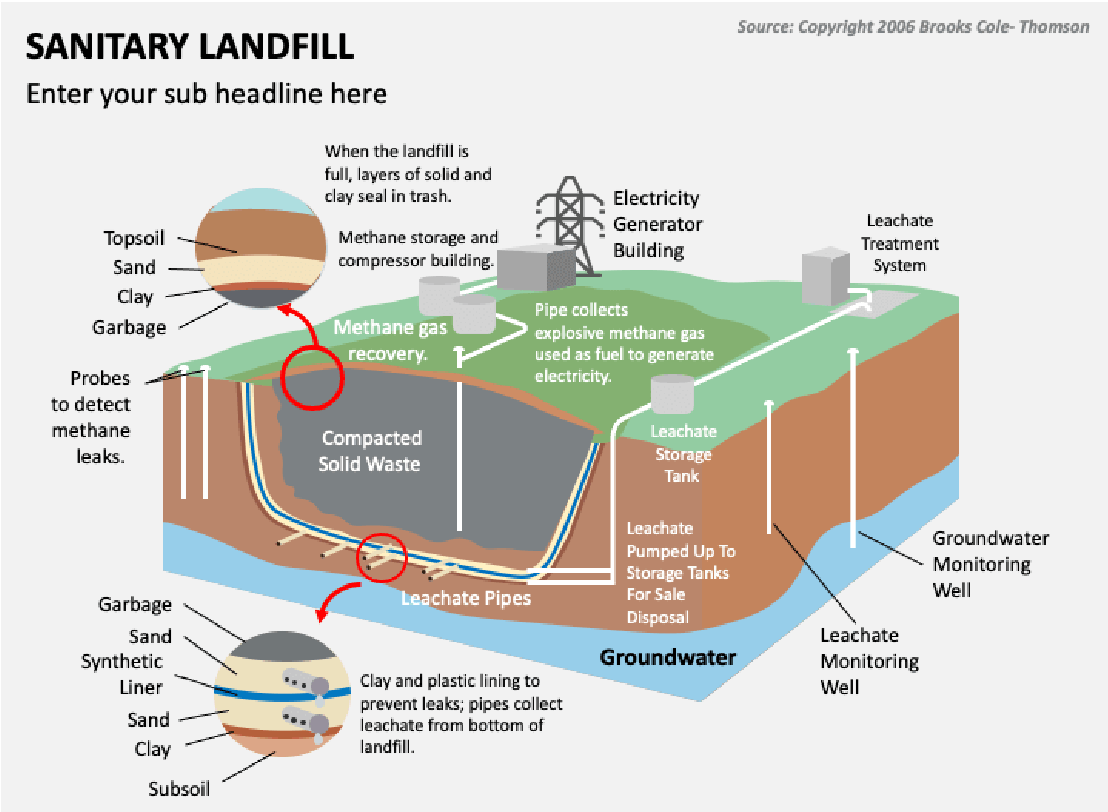

Figure 7.1: Sanitary Landfill System

Source: Brooks Cole-Thomson: These gases have the potential to be harvested, cleaned, and used to produce energy. The nation's landfills create about 95.6 million tonnes of carbon dioxide annually. The sanitary landfills were designed with engineering technology in mind; a leachate control system and good soil liner ensure minor seepage or damage. However, the fundamental problem with a sanitary landfill is that it potentially harms the environment and requires a lot of area and resources to store the rubbish. Also, Leachate, a foul-smelling liquid waste produced by rainwater soaking into the landfill, can leach chemicals from the garbage into the groundwater. This is why it's essential to line the landfill correctly and keep it away from a river, stream or lake.

2. Open Dumps

Potential concerns of open dumping include releasing harmful chemicals and heavy metals into the atmosphere and irrigate, the growth of unhealthy-carrying small cactuses, and bodily threats from hypodermic needles, unpleasant odours, and piercing devices. Additionally, the sector that produces energy uses open dumps.

3. Incineration Plants

Incineration involves burning garbage at high temperatures in large furnaces. There are 2,500 incineration facilities worldwide. They can dispose of over 420 million tonnes of waste annually. Organic materials are transformed into bottom ash, flue gases, particles, and heat.

It is a landfill reduction strategy that cuts the amount of rubbish by 95–96%. Incinerating or thermally treating trash is highly frequent in places like Japan, where there is a lack of available land. Some countries did not always have a system for separating things before burning poisonous, bulky, or recyclable objects when incinerators were erected just a few decades ago. However, burning trash is terrible since it pollutes the air and water, produces tons of hazardous ash, and releases ashes. Incineration is now mainly used to control infectious waste as a last resort.

4. Composting

The biological process of composting enables the organic component of garbage to decompose under tightly regulated conditions. Microbes break down the organic waste, which can result in a volume reduction of up to 50%. The term for this stabilised product is compost or humus. It can be used as a mulch or soil conditioner and has the texture and smell of potting soil. Waste and sewage sludge can be digested and recycled simultaneously by composting.

5. Vermicomposting

Vermiculture is the intentional cultivation of a particular type of earthworm that actively breaks down organic waste into nutrient-rich compounds (manure). These earthworms can collect degrading organic stuff and expel it as nutrient-rich worm dung. Producing vermicompost is the primary goal of vermiculture. Technically referred to as worm excrement, worm castings are a fine, nutrient-rich organic soil additive. Castings, leftover bedding, and other organic materials make up vermicompost.

Although the titles are frequently used interchangeably, both are worm dung and suitable for soil health. The use of earthworms for composting, soil bioremediation, and other purposes is called vermitech.

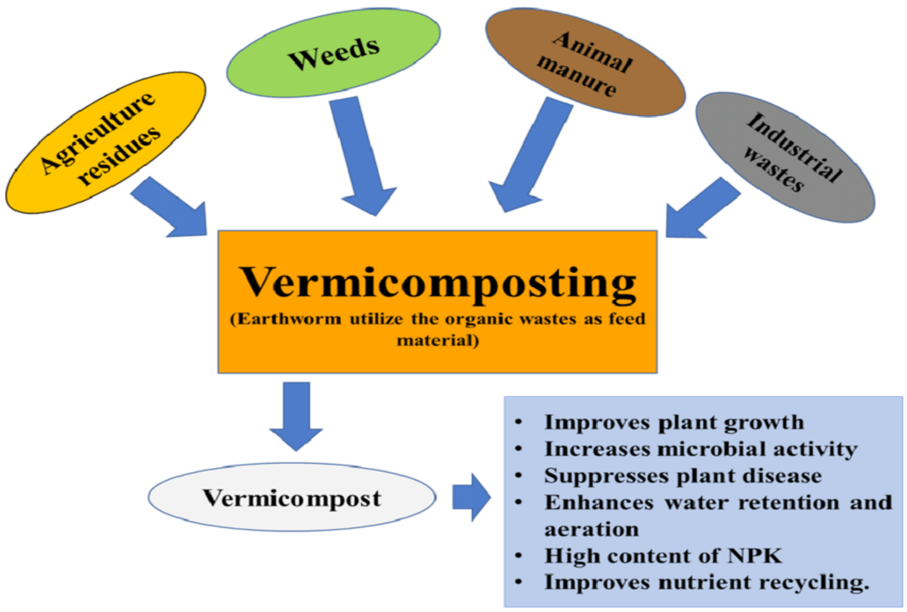

Figure 7.2: Vermicomposting

Source: Research Gate

7.3 Resource Recovery

Utilising the hierarchy will decrease production-related resource consumption and solid waste.

7.3.1 Sources of Resource Recovery

- **Solid Waste:** It is the process where we gathered the large bulk trash and then recyclke that product into a good item. The raw resources used to create the things can be used to develop new goods. It is directly been taken from mixed trash streams or ordinary rubbish using designated bins and collection vehicles. Many items used by customers which is been recycled and it is consumed in a very good way that is water bottle, cans, polythene, news paper etc .
- **Wastewater and other excreta :** Sewage sludge, faecal sludge, wastewater, and human excrement all contain valuable resources that can be recovered. These include organic matter, water, energy, the fertilising nutrients potassium, phosphorus, nitrogen, and micronutrients like sulphur and nitrogen. Other raw materials, such as bioplastics and metals like silver, can be recovered from wastewater with growing interest.

- **Organic Matter :** This is used by recomposing using biological composition and it can reused thru by making paper products. Waste gases, including methane, can also be recovered to increase combined heat and power (CHP)/cogeneration efficiency.
- **Industrial Waste** Recovering wastes from industries in terms of defective or damaged machine parts can be recycled and reused instead of entirely new raw material in its place. Similarly, some waste products can be upcycled to create a new product.

7.4 Summary

- It is a process of collecting many waste products and then manage it by making many good products out of waste one.
- Incineration involves burning garbage at high temperatures in large furnaces.
- Vermiculture is the intentional cultivation of a particular type of earthworm that actively breaks down organic waste into nutrient-rich compounds (manure).

7.5 Keywords

- **Heuristic-Deterministic Approach:** It is a technique where a computer program assesses many potential solutions before selecting the best one.
- **Solid waste management:** It is the process of transforming waste into a valuable resource.
- **Open dumping site:** It is one where solid waste is dumped in a fashion that does not protect the environment, is subject to open burning, and is out in the open where pests, scavengers, and the elements can access it.

7.6 Self-Assessment Questions

- What is the main reason of waste organization?
- What is the process involved in waste collection?
- What is the drawback of the communal waste management system?
- Evaluate the pros and cons of incineration as a method of solid waste disposal.
- Discuss the process of vermicomposting and its significance in solid waste management.

- Analyse the practice of incineration as a method of solid waste disposal. Describe the technology and equipment used in incineration plants and the environmental and health considerations associated with this method. Discuss the potential for energy recovery through incineration.
- Compare and contrast the environmental impacts and resource recovery potential of sanitary landfilling, vermicomposting, and incineration.
- What do you understand by Resource Recovery?
- Differentiate between Sanitary landfills and Open Dumps.

7.7 Case Study

Adopting resource recovery practices transformed the solid waste management system in a small municipality suffering from constrained landfill space and rising trash generation. The community saw impressive results by taking a comprehensive approach to prioritise recovering priceless resources, including metals, polymers, and biological debris. Modern sorting technologies were installed at an established recycling facility, effectively separating recyclable materials. An anaerobic digestion facility was built concurrently to transform organic waste into nutrient-rich compost for use in agriculture and biogas for electricity production. In addition to reducing the amount of garbage dumped in landfills, these resource recovery programmes also produced economic opportunities and environmental advantages. The success of the municipality is a testament to how resource recovery can be used to create waste management systems that are resilient and sustainable.

Questions:

1. What were the main goals of the resource recovery initiatives implemented in the small town's waste management system?
2. How did the recycling facility contribute to separating recyclable materials in the town's solid waste management system?

7.8 References

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UNIT : 8

BIOMEDICAL WASTE MANAGEMENT

Learning Objectives:

- Know about Biomedical Waste
- Learn about its generation
- Learn the process of collection
- Become aware of its disposal

Structure:

8.1 Biomedical Waste

The waste that has harmful and contagious substances are considered as a biomedical waste. When human beings and animals are treated or immunised, then this type of waste is produced. The amount of medical waste produced in India each year is approximately three million tonnes, and it is anticipated that this number will increase by 8% yearly.

Biomedical waste includes:

- The waste that comes from human anatomy i.e. organs, tissues and other body parts.
- Animal waste produced.
- Biotechnology and microbiology waste
- Waste sharps, including scalpels, syringes, hypodermic needles, and broken glass
- Cytotoxic substances and abandoned medications
- Contaminated waste.

The items mentioned above are classified into various categories by WHO.

8.1.1 Biomedical Waste Types

WHO divides biomedical waste into eight categories.

Figure 8.1: Categories of Medical Waste (Source: SEPCO Environment)

- Infectious waste: Any biological waste that is infected.
- Sharps –things with sharp edge, such as razors, scalpels etc.

- Pathological Waste: components of human and animal body i.e blood, tissues and other fluids.
- Pharmaceutical waste: It comprises unused medications, lotions, and pharmaceuticals.
- Hazardous toxic waste and geotaxis waste: These include poisonous substances.
- Substance Waste: Chemical or substance waste is liquid from batteries, machines, and disinfectants.
- Other toxic garbage.

8.2 Generation of Biomedical Waste

Biological and medical processes produce biomedical waste, such as illness identification, treatment, or prevention. Nursing homes, medical services, medical research labs and health clinics are some of the few examples of bio medical generators. Trash having these qualities may also be referred to as medical debris or clinical waste in healthcare facilities.

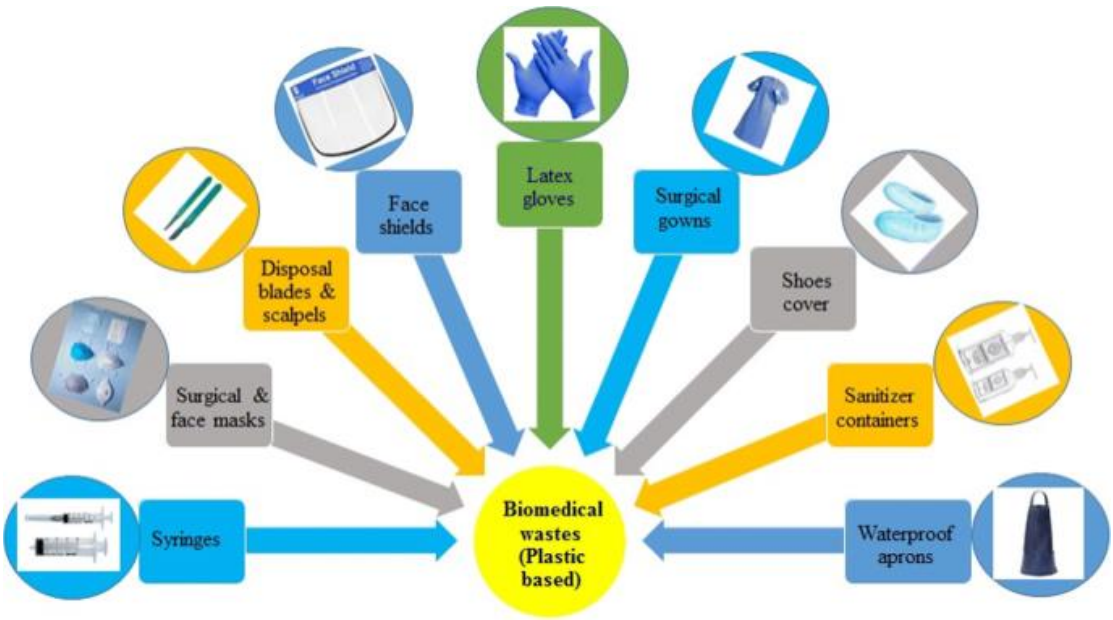

Figure 8.2: Examples of Biomedical Wastes (Source: Springer Link)

8.3 Collection of Biomedical Waste

Utilising various sorts of containers to collect biological waste from places like operating rooms, labs, wards, kitchens, and hallways is part of the process.

It is essential to arrange the bins and containers such that 100% collection is obtained. Sharps must always be housed in puncture-proof containers to protect the workers handling them from harm and infection.

Biomedical waste is stored correctly after collection has taken place. Wastes from different types must be collected separately in recognisable containers.

Storage times should be 8 to 10 hours in large hospitals (those with more than 250 beds) and 24 hours in nursing homes. Labelling each container with the ward or room it is kept in is possible.

Segregation of biomedical waste during collection is vital in proper treatment and disposal. For instance, CPBC has established distinct, colour-coded bins for disposing of different types of biomedical waste.

- Yellow Bin: For laboratory waste, anatomical waste, chemical waste, filthy waste, waste from chemotherapy, and waste from abandoned clothes and medications.

- Red Bin: For contaminated plastic waste.

- Blue Bin: Glass garbage and metallic implants.

- Black Bin: For hazardous and other waste.

- Green Bin: For general wastes.

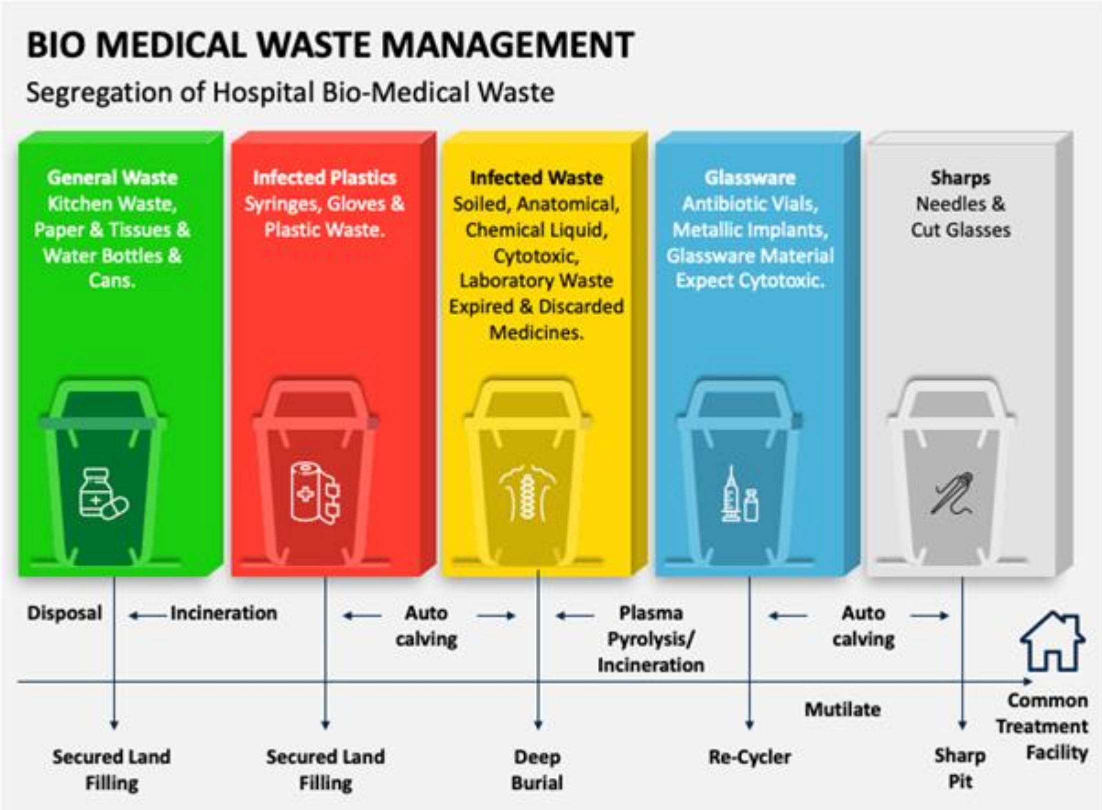

Figure 8.3: Segregation of Bio Medical Waste

Source: Clutch Health

8.4 Disposal

Not all biological waste is disposed of in the same way; various disposal businesses employ multiple techniques. These methods are mentioned below.

- **Autoclaving: In** the autoclaving procedure, steam sterilisation is used. Autoclaving merely introduces scorching steam for a set period instead of expensive incineration. After the process, all germs have been removed.
- **Incineration: It** is rapid, simple, and straightforward. It eliminates bacteria while removing trash. Emissions can be harmful when burning toxic materials. Materials must be checked before starting the process.
- **Chemicals :**The method, in which chlorine is used to kill microorganisms and it is added to the liquid waste is called chemical disinfection and it is a biomedical waste management methods.

- **Microwaving:** Waste is broken down into small pieces, combined with water and then is heated to kill the bacteria. This is one of its key advantages. Like autoclaving, it can be used for about 90% of biomedical wastes, though not all.

Figure 8.4 demonstrates a complete process of managing biomedical waste.

Figure 8.4: Treatment and Disposal of Biomedical Waste

Source: IWMI

8.5 Summary

- The amount of medical waste produced in India each year is approximately three million tonnes, which is anticipated to increase by 8% yearly.
- Biomedical waste's infectivity and other toxicity are the first of its main hazards.
- Segregation of biomedical waste during collection is vital in proper treatment and disposal.

- In the autoclaving procedure, steam sterilisation is used. Autoclaving merely introduces scalding steam for a set time as opposed to expensive incineration.

8.6 Keywords

- **Pathological Waste:** It is the waste from tissues, blood and other fluids of human and animal body.
- **Genotoxic waste:** This includes poisonous substances.
- **Incineration:** It is a process that safely eliminates bacteria while completely removing the trash.

8.7 Self-Assessment Questions

- How would you define biomedical waste?
- What are the critical hazards associated with biomedical waste?
- Why is proper collection and disposal of biomedical waste important?
- What examples of infectious or contagious elements may be present in biomedical waste?
- What are the different types of biomedical waste commonly found in healthcare facilities?
- Compare and contrast biomedical waste's infectivity and toxicity hazards.
- Explain the process of autoclaving in the context of biomedical waste management, and discuss its advantages and limitations compared to incineration.
- Describe the chemical disinfection process as a technique for managing liquid biomedical waste.
- Discuss the potential environmental implications of improper biomedical waste management and the importance of adopting appropriate disposal practices.
- What are the key benefits of using autoclaving instead of incineration for biomedical waste treatment?

8.8 Case Study

Introducing an effective biomedical waste management system in a nearby healthcare facility changed how medical waste was managed. The facility successfully separated waste categories, such as sharps, infectious materials, and medications, by introducing colour-coded bins, holding routine employee training, establishing designated storage spaces, and outfitting them with suitable containers to ensure safe containment and avoid leaks.

A licenced waste management business was recruited to handle the transportation and treatment of the garbage and guarantee adherence to environmental requirements. The institution lowered its environmental impact, decreased the risk of infection, and promoted a safer and healthier environment for patients, staff, and the community through this improved waste management system.

Questions:

1. Based on your reading, point out how colour-coded dustbins segregate waste.
2. Explain the methods used in the disposal of biomedical waste.
3. Mention the types of biomedical waste.

8.9 References

1. “Types of Biomedical Waste Disposal: BWS.” *BWS - Biomedical Waste Services*
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UNIT : 9

RENEWABLE ENERGY

Learning Objectives:

- Learn about renewable sources of energy
- Understand their Potential
- Become aware of their use
- Get known to the possibilities

Structure:

Non-Conventional Energy Sources

9.1 Introduction

The term "conventional sources of energy" refers to sources naturally found on or beneath the Earth that take a long time to develop or replenish. These energy sources are typically non-renewable as well. Commercial and non-commercial energy sources comprise the second division of traditional energy sources.

Non-conventional sources of energy, also referred to as renewable sources of energy, are natural resources that may constantly provide helpful power for a long time and are still usable after they have been used up. Sunlight, wind, river flow, and the ocean are examples of non-conventional energy sources.

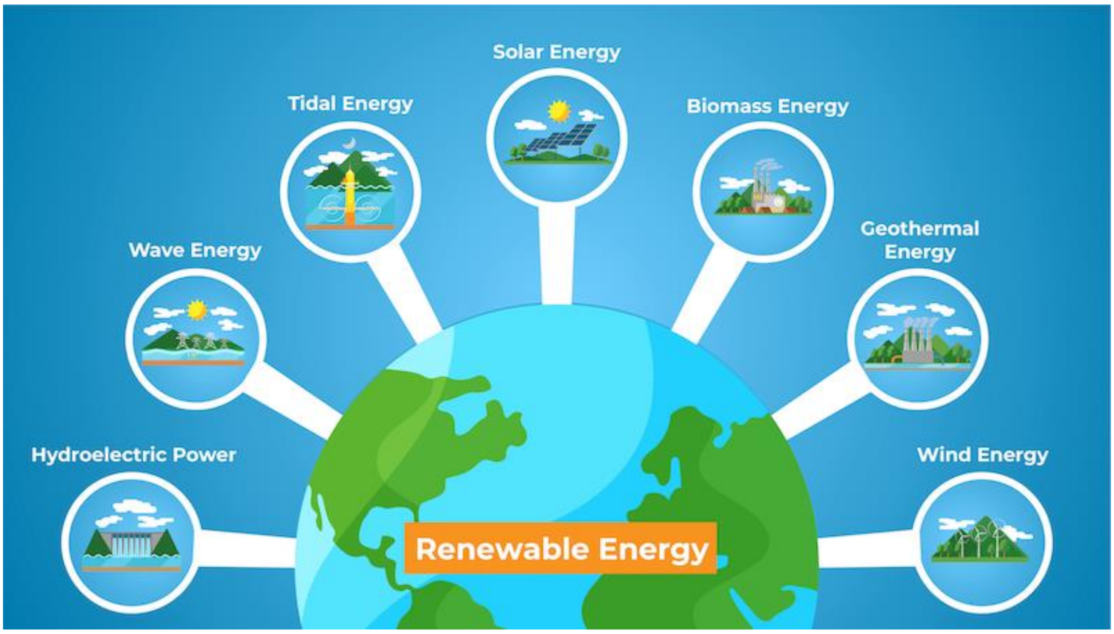

Figure 9.1: Renewable Energy Examples

Source: Greenesa

As energy demand rises, the population becomes increasingly dependent on fossil fuels like coal, oil, and gas. The necessity to ensure the energy supply for the future arises from the fact that the cost of petrol and oil is increasing with each passing day. The government of India has established a distinct department called the "Department of Non-Conventional Sources of Energy" for the efficient use of non-conventional sources.

9.1.1 "Difference between Conventional and Non-conventional Sources of Energy"

Conventional sources of energy	**Non-conventional sources of energy**
Fossil fuel, CNG, coal, oil, and natural gas are conventional energy sources.	"Solar Energy, Wind Energy, Bio Energy, Hydro Energy, Tidal Energy, and Ocean Energy are examples of non-conventional energy resources."
"Conventional sources of energy are non-renewable by any natural process."	"Non-conventional energy resources are renewable."
"These resources are available in a limited quantity."	"Non-conventional energy sources are eco-friendly."
"Conventional resources can also be classified as commercial and non-commercial energy resources."	"Non-conventional energy sources do not increase pollution."

9.1.2 Renewable Sources of Energy: Types

- **Solar Energy :**It is the energy generated by the Sun. It is created inside the Sun due to nuclear fusion and fission. Electromagnetic waves are radiation that this energy takes to travel. Some photovoltaic cell panels that gather this energy use it to generate power for household appliances by absorbing solar energy. The water in the solar heater is heated using solar heating panels.
- **Wind Energy :**The mechanism by which wind is used to produce power is known as wind energy. Power output rises with increasing wind up to the maximum output of the specific turbine. Wind farms favour locations with more robust, more consistent winds. These are typically found at elevations above sea level. Wind turbines use the wind to produce power. Since no fossil fuels are burned to produce energy, there is no pollution.
- **Tidal Energy :**Tidal power is a type of hydropower that produces electricity by utilising the power of tides. Tidal power produces electricity in regions where the sea

has waves and tides. India may implement "ocean thermal level conversion," enabling it to create 50,000mW of electricity to meet the demand.

- **Geothermal Energy** The heat energy from hot rocks in the planet's crust is known as geothermal energy. Since this energy saves 80% on fossil fuels, it often has cheap operating expenses. The utilisation of geothermal energy has increased as a result. It does not produce pollutants and aids in mitigating global warming.
- **Biomass Energy** Organic material that comes from plants, animals, timber, and sewage is known as biomass which is then converted into electrical energy. Additionally, cooking, lighting, and the creation of electricity are all possible with biomass energy. A valuable source of manure is the residue that remains after removing the biogas. More than 14% of the world's energy is produced by biomass, making it a significant energy source.
- **Hydro Energy** Rivers in motion typically have access to this energy. To hold river water in a convenient area, a dam is constructed. By providing a restricted path for the flow, the potential energy contained in this stored water can be transformed into kinetic energy. As a result, a fast-moving water stream is created, which powers massive turbines to generate electricity.

9.2 Potential of India in Renewable Energy

One of the most critical factors in determining a country's economic development and welfare is power, that is, energy. For the Indian economy to thrive sustainably, a sufficient electricity sector must exist and be developed.

In terms of installed hydroelectric power capacity, India is placed fifth. India had installed a utility-scale hydroelectric capacity of 45,699 MW as of the end of March 2020.

9.2.1 Need for Renewable Energy in India

Due to the historical and ongoing continuous use of fossil fuels for most electricity generation globally, including in India, there is an increasing climate issue. Renewable energy can lessen the effects of climate change and improve energy security. The 21st century's peace strategy is renewable energy.

There are unstable non-renewable energy supplies due to regional conflicts and restrictions on the supplying countries. For instance, the two largest energy producers in the world, Iran and Russia, are subject to several international sanctions, which lowers the supply of energy products in global markets.

To encourage a green economy and sustainable development by lowering pollution's negative externalities.

India has pledged to increase its share of renewable energy capacity to 450 GW by 2030 as a signatory to the Paris Climate Agreement. Therefore, switching to renewable energy is required to uphold our obligations to the global community.

Using renewable energy sources to generate electricity:

Renewable energy can replace conventional fuels in specialised applications, including power production, etc. The following are some of the significant renewable energy sources that India can use to produce electricity: Solar energy (direct) includes solar thermal and solar photovoltaic (PV) energy. Solar power (indirect) also includes hydroelectric energy (big and small units), wind power (on land and at sea), biomass energy, wave power, marine energy, and the conversion of ocean thermal power.

- **Solar thermal power and PV power:** The electrical energy needed for localised usage in the outlying areas of India is predicted to be over 11,000 MW; a significant portion of this is anticipated to come from PV systems that are not connected to the grid. Solar thermal power and PV electricity. These devices may be placed as far up on rooftops to use no land space. Grid-connected PV power systems in India have a combined installed capacity of over 4101.68 MW despite their modest capabilities.

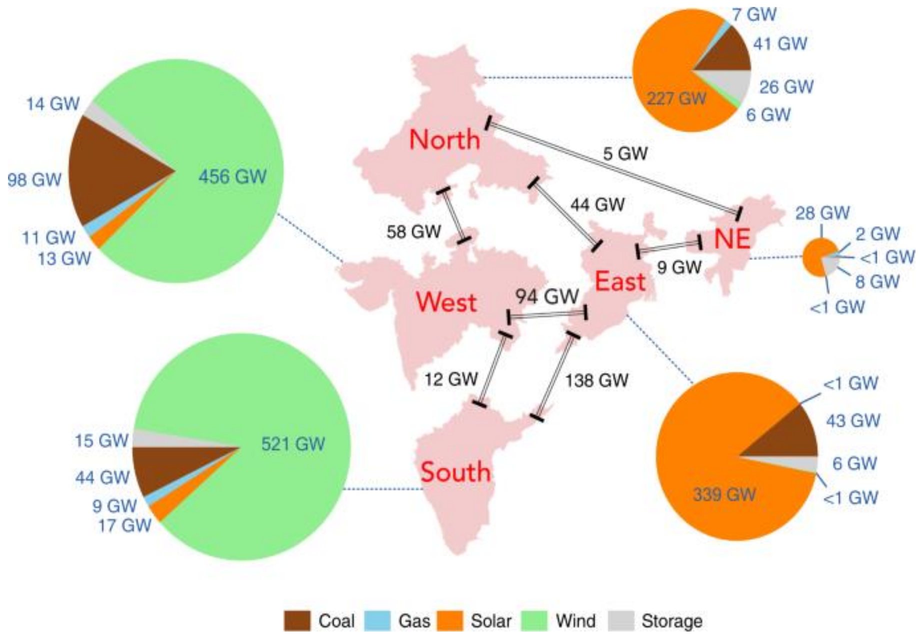

Figure 9.2: India's Potential in Solar and Wind Energy

Source: Nature

- **Water-based electricity :** India has a lot of potential for producing hydroelectric electricity; it is now the sixth-largest hydroelectric power generator in the world. The majority of our nation's renewable energy comes from hydroelectric power projects. They also offer water for drinking, agriculture, flood control, and electricity production. India has enormous hydro potential, which may be economically utilised, amounting to around 84,000 MW at a 60% load factor. In India, about 49 sizable hydropower projects with a combined installed capacity of 15,006 MW are currently being built. Additionally, pumped storage projects with a combined installed capacity of 94,000 MW and small, mini, and micro hydel schemes with a potential installed capacity of 6,740 MW have been discovered.
- **Wind Energy :** Wind energy has much potential in India as a viable alternative energy source. Wind turbines can transform the wind's kinetic energy into mechanical energy, which can then be used to create electricity. Using the wind's energy to rotate rotors with blades like propellers, a generator can be spun to generate electricity when the generator is connected to the main shaft. Because the wind speeds offshore are typically more significant and more consistent, preliminary evaluations throughout the 7,600 km long Indian coastline have revealed promise for the development of offshore wind power.

- **Biomass Energy :** Over 70% of the nation's population relies on biomass, making it a significant alternative energy source. The most effective way to use biomass fuels is to employ a combined heat and power (or cogeneration) system to produce heat and electricity.
- **Wave Energy: Because** of how the wind interacts with the water's surface, wave energy available at the ocean's surface is indirectly derived from solar energy. Wave energy converters can harness wave energy for electricity production and practical tasks like water desalination or water pumping. India's 7,500 km coastline has a 40,000 MW wave energy potential.
- **Tidal Energy :** The leading cause of short-term sea-level changes are tides, brought on by the interaction of the earth's rotation, the gravitational pull of the sun, and the moon. By building a reservoir behind a barrage and allowing tidal water to travel through turbines in the barrage, electrical energy can be collected from tides in many ways.
- **Geothermal Energy :** The thermal energy kept in the earth's interior is known as geothermal energy. In some locations, the ground naturally produces steam and hot water at high pressure and temperatures, which can be used for energy generation, heating homes and businesses. Estimates indicate that India possesses 10,600 MW of untapped geothermal energy potential, which must be realised.

If India abandons coal, oil, and natural gas, it is likely that by 2030, 70% of the country's electricity will come from renewable sources.

9.3 Summary

- The term "conventional sources of energy" refers to sources naturally found.
- “Non-conventional sources of energy, also referred to as renewable sources of energy,” are natural resources that may constantly provide helpful power for a long time and are still usable after they have been used up.
- The Indian government has set goals to achieve net-zero carbon emissions by 2070, “reduce the nation's projected carbon emissions by 1 billion tonnes by 2030, reduce the carbon intensity of the economy by less than 45% by the end of the decade,” and increase the installed capacity of renewable energy in India to 500 GW by 2030.

9.4 Keywords

- **Geothermal Energy:** Energy contained in the hot rocks on the planets crucst is called as Geothermal Energy.
- **Biomass:** Organic material from plants, animals, timber, and sewage is known as biomass.
- **Wind Energy:** The mechanism by which wind flow is used to generate power is known as wind energy.
- **Non-conventional energy sources:** These refer to renewable energy sources, natural resources that may constantly provide helpful power for a long time.

9.5 Self-Assessment Questions

- Name two renewable sources of energy commonly used today and briefly describe their sustainability.
- Compare and contrast solar and wind power's economic viability and scalability..
- Explain India's potential in Geothermal Energy in brief.
- Compare and contrast the advantages and limitations of biomass and geothermal energy as renewable energy sources.
- Evaluate the potential of tidal energy as a reliable and scalable renewable energy source, considering its advantages and technological challenges.
- Assess the potential of offshore wind energy in India, considering factors such as resource availability, technological feasibility, and policy support required for its development.
- What is India's current status in renewable energy sources?
- What is biomass energy?

9.6 Case Study

India relishes enough sunlight all year, making solar energy a perfect renewable resource. Due to this, India's solar power capacity has significantly increased, with large-scale solar parks and rooftop solar systems becoming more prevalent. In addition to lowering the nation's reliance on fossil fuels, this renewable energy source aids in reducing global warming and advancing sustainable development.

Questions:

1. What is one significant advantage of solar power as a renewable energy source in India?
2. How has the government of India contributed to the growth of solar power generation in the country?
3. What are some of the visible impacts of the increased adoption of solar power in India?

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