



**COURSE TITLE: BIT 211**

**COURSE CODE: TECHNOLOGY AND INNOVATION MANAGEMENT**

**COURSE UNIT: 2**

## **MODULE 1: INTRODUCTION TO TECHNOLOGY AND INNOVATION MANAGEMENT**

### **Lesson 1: Meaning and Types of Technology**



#### **Introduction**

Technology plays a crucial role in shaping industries, economies, and daily life. Understanding the meaning of technology and its various classifications helps in appreciating its impact on society and business. This lesson explores the definition of technology, its classifications, and its evolution over time.

#### **Learning Outcomes for lesson 1**

At the end this study session, you should be able to:

1. Define technology and explain its significance in various fields.
2. Identify and describe the different types of technology, including hardware, software, and emerging technologies.
3. Evaluate the impact of various types of technology on innovation and economic growth.

#### **1.1 Definition of Technology**



**Figure 1.1:** Technology

Technology can be defined as the application of scientific knowledge for practical purposes, particularly in industry. It includes tools, machines, techniques, and systems used to solve problems and improve efficiency. Technology enables advancements in communication, transportation, healthcare, and numerous other fields, facilitating progress and innovation.

## **1.2. Classification of Technology**

Technology can be classified into different categories based on its purpose and characteristics. Two primary ways to classify technology are:

### **1. Product vs. Process Technology**

#### **Product Technology:**

- Product technology refers to the design, development, and improvement of goods or services.
- It focuses on creating tangible products such as smartphones, automobiles, and medical devices.
- Companies invest in product technology to enhance quality, functionality, and market competitiveness.

#### **Process Technology:**

- Process technology involves methods and systems used to produce goods and services efficiently.
- Examples include manufacturing techniques, automation, and supply chain management systems.
- Businesses adopt process technology to increase productivity, reduce costs, and maintain quality control.

### **2. Soft vs. Hard Technology**

#### **Soft Technology:**

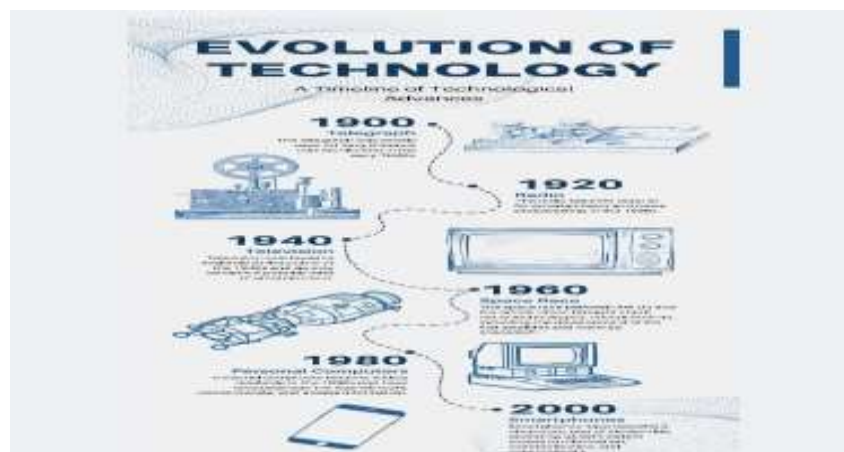


- Soft technology refers to methodologies, knowledge, and intangible aspects of technological applications.
- It includes software development, management techniques, and digital algorithms.
- Soft technology plays a crucial role in fields like artificial intelligence, education, and business processes.

#### **Hard Technology:**

- Hard technology consists of tangible, physical tools and machines that facilitate various industrial and commercial operations.
- Examples include robotics, mechanical equipment, and infrastructure development.
- Hard technology is often combined with soft technology to enhance functionality and efficiency.

### **1.3 Evolution of Technology Over Time**



**Figure 1.2:** Evolution of Technology

Technology has undergone significant transformations, progressing from basic tools to advanced digital innovations. The evolution of technology can be divided into several phases:

#### **1. Prehistoric and Ancient Technology**

- Early humans developed primitive tools made from stones and bones for hunting and survival.
- Agricultural advancements, such as irrigation and plowing, enabled the growth of civilizations.
- The invention of the wheel, writing systems, and metallurgy laid the foundation for modern technological developments.

#### **2. Medieval and Renaissance Technology**



- The Middle Ages saw improvements in architectural techniques, navigation tools, and mechanical devices.
- The printing press, invented by Johannes Gutenberg, revolutionized communication and knowledge dissemination.
- Advances in medical knowledge, clock-making, and military technology emerged during this period.

### **3. Industrial Revolution Technology**

- The 18th and 19th centuries marked the rise of mechanized production and industrialization.
- Steam engines, textile machines, and railroads transformed manufacturing and transportation.
- Scientific discoveries led to the development of electricity, telegraphs, and early automobiles.

### **4. 20th Century Technological Advancements**

- The 20th century witnessed rapid technological progress in communication, healthcare, and computing.
- Inventions such as the telephone, radio, television, and personal computers changed how people interacted and worked.
- Space exploration, nuclear energy, and medical breakthroughs further expanded technological possibilities.

### **5. Modern and Emerging Technologies**

- The 21st century is defined by digital transformation, artificial intelligence, and the Internet of Things (IoT).
- Smartphones, cloud computing, and automation have revolutionized industries and lifestyles.
- Future advancements, such as quantum computing, biotechnology, and renewable energy innovations, continue to shape global progress.

### **Summary**

Technology encompasses the tools, systems, and processes that drive innovation and efficiency. It can be classified into product vs. process technology and soft vs. hard technology, each serving distinct purposes. Over time, technology has evolved from basic tools to sophisticated digital solutions, impacting all aspects of life. Understanding these



classifications and historical advancements provides insight into how technology shapes the modern world and future possibilities.

### **Self-Assessment Questions (SAQs) for Lesson 1**

Now that you have completed this study session, you can assess how well you have achieved its Learning Outcomes by answering these questions. You can check your answers with the Notes on the Self-Assessment Questions at the end of this lesson.

#### **SAQ 1.1 (Testing Learning Outcome 1.1)**

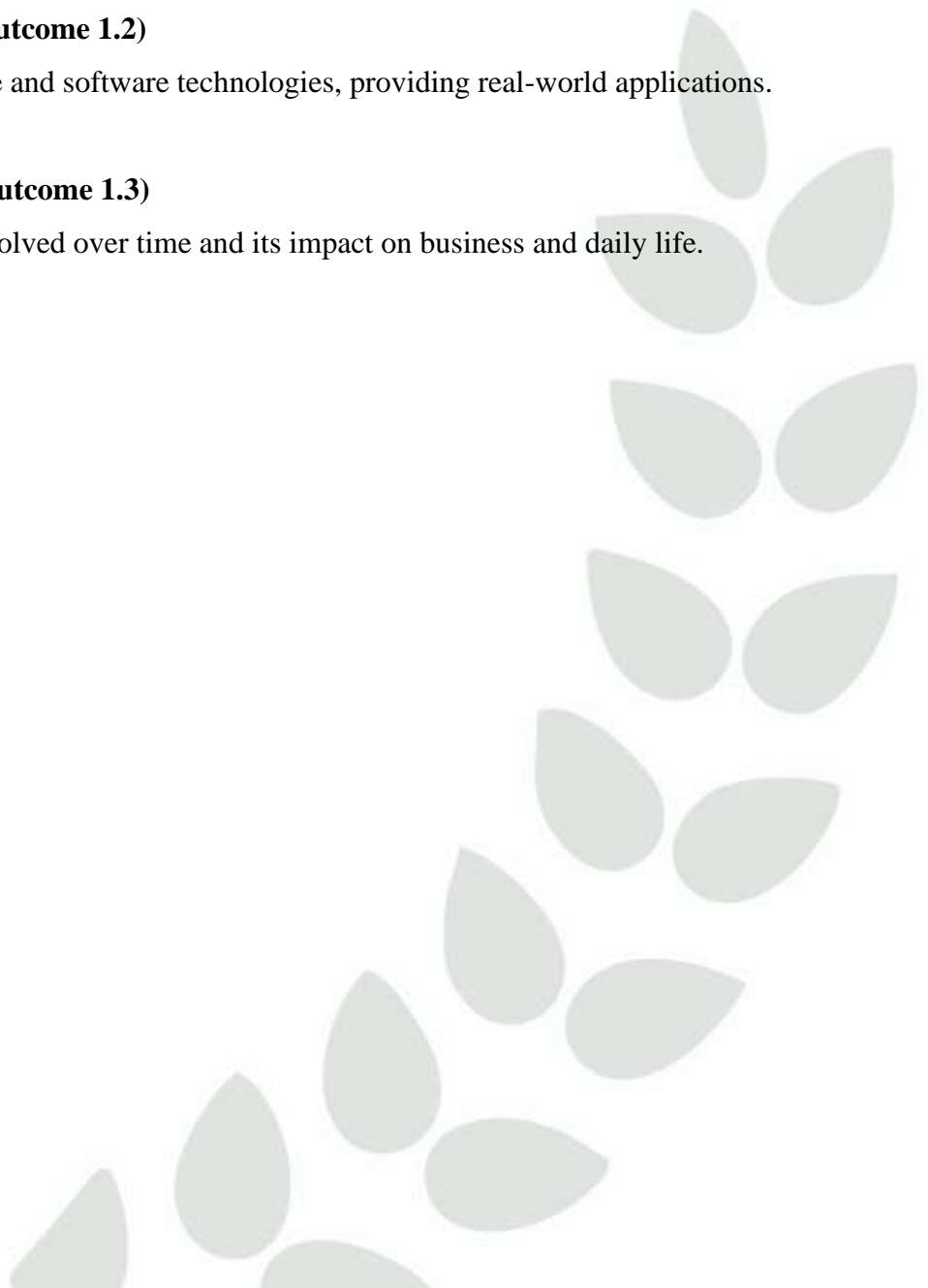
How would you define technology in your own words, and why is it essential in modern society?

#### **SAQ 1.2 (Testing Learning Outcome 1.2)**

Compare and contrast hardware and software technologies, providing real-world applications.

#### **SAQ 1.3 (Testing Learning Outcome 1.3)**

Discuss how technology has evolved over time and its impact on business and daily life.





## Notes on SAQs for Study Session 1

### SAQ1.1

Technology refers to the application of scientific knowledge to create tools, systems, and processes that enhance efficiency and solve practical problems. It is essential in modern society because it improves communication, healthcare, transportation, education, and business operations, fostering economic growth and a better quality of life.

### SAQ1.2

Hardware refers to the physical components of technology, such as computers, smartphones, and networking devices, which enable digital systems to function. Software, on the other hand, consists of programs and applications that run on hardware, including operating systems, mobile apps, and business management tools. For example, a smartphone (hardware) relies on an operating system like Android or iOS (software) to perform functions, while a company may use computers (hardware) with accounting software (software) to manage finances efficiently.

### SAQ1.3

Technology has evolved from basic tools in ancient civilizations to sophisticated digital and automation systems. The Industrial Revolution introduced mechanization, followed by the Information Age, which brought computers and the internet, transforming communication, commerce, and productivity. Today, innovations such as artificial intelligence, cloud computing, and smart devices continue to reshape industries and daily life, making processes more efficient and accessible while enhancing global connectivity and economic progress.