

Unit 5

Technology, Energy Management

Technological Environment

- Among PEST factors, technology is the fastest changing environment. It brings greater revolution in business environment.
- Technology is the practical aspect of science. Change in technology leads to change in business strategy. It translate scientific knowledge into method of production.
- There is two types of technology, hard technology and soft technology. Plants, machines, tools and equipments are hard technology whereas theory, principles, process, procedures, methods are soft technology.
- Also capital based technology and labor based technology on the basis of capital and labor.

Components of Technological Environment

1. Levels of technology

- **Manual technology:** ancient, primitive period of technology, all functions are performed manually, not developed tools, equipments and machines
- **Mechanical technology:** it is outcomes of industrial revolution, developed tools, equipments and machines for performing many tasks in organizations
- **Automated technology:** developed form of mechanical technology, machines are operated automatically
- **Computerized technology:** different computer programs and software performs the function in organizations, it brought great change in business. Internet, e-mail are outcomes of computerized technology.
- **Robotized technology:** all functions are performed by robot, not necessary to involve human beings

2. Pace of technology change

- Speed of changing technology is very fast than other. IT sector has the greatest pace of change among others. Pace generally categorized into three stages; high, moderate and low pace of technology change

3. Technology Transfer

- Transferring modern and advance technology from home country to host country. MNCs are major means of technology transfer from developed country to developing and underdeveloped countries.

4. R & D budget: it is key factor of technology development. Allocation of sufficient budget in R & D help to innovate, investigate and explore new technology.

Business and Technology

- Obviously business and technology can not be make apart from each other. Technology is key factor of business growth and expansion
- Many business activities like production, marketing, distribution, accounting, human resource, R & D etc. are completed only with help of technology
- Technology support to perform any business activities effectively and efficiently
- However technology has both positive and negative impacts in Nepalese business

Impact of Technology in Nepalese Business

1. Positive Impacts

- **Productivity:** modern, advance and suitable technology increase productivity of an organization, the ratio of input and output shows the productivity
- **Competitive advantages:** by using latest and advance technology, organization can gain competitive advantages over competitors by producing and innovating new product as per customer demands
- **Innovation:** new product and service can be easily produce if an organization has required latest technology, new idea, knowledge can converted into innovation through technology
- **Increase in profit:** with the help of technology, organization can obtain mass production which minimize the cost and increase profit
- **Customer value:** technology increase the different utility value of product, time utility, place utility etc.

2. Negative Impacts

- **Capital burden:** huge capital investment is required to install technology, small organization can not afford it
- **Threats of quick replacement:** technology is fastest changing environmental factors, so there is threats of quick replacement, it is continuously changing
- **Increase in cost:** different cost is increased as technology is installed, repair, maintenance, servicing, parts, equipments are high cost, even can not available easily
- **Need of skilled manpower:** to operate technology skilled manpower is required, training and development cost is increase to get skilled manpower, sometimes they should be hired from abroad, which is very expensive

Elements of Technology Transfer

- Need Assessment
- Characteristics and types
- Socio-cultural environment
- Economic/finance resource
- Timing
- Education, training & HR
- Communication channel
- Target group
- Government and politics
- Infrastructures

Problems of Technology Transfer

- **Limited general understanding:** not only hard technology but also there soft technology
- **Lack of planning:** orderly and systematically transfer plan is always lacking
- **Lack of bilateral R & D:** before transferring home country and host country should have bilateral talk and research/development
- **Lack of socio-culture approach:** technology must be socially viable and feasible, it should not harm social norms values of host countries, it must be accepted by society.

- **Lack of attention of environment:** eco friendly and environmental friendly technology is preferred
- **Failure to determine national priorities:** national priorities including its status, position, economic condition, literacy rate, population etc. should be considered before transferring technology
- **Failure in feasibility analysis:** feasibility in every aspect like finance, market, industry, product/service etc. should be analyzed. Financial feasibility is major among others
- **Failure in education of technology:** well educated and trained skilled manpower is required before transferring technology.

- **Environment and Energy Management in Business Context**
- In business firm, environment and energy management is the process of monitoring, controlling, and conserving energy and nature around organizations. Business products have significant adverse impact to environment. A business organization should develop a well and efficient plan to use the natural energy efficiently and control adverse impact of business to environment. It is advisable to establish a separate organizational unit as “***Environment and Energy Management Section***” especially in large manufacturing companies, who consume energy intensively and produces elements that may damage natural environment.

- For efficient utilization of energy and preservation of the environment, business organizations should make efficient plans and policies focusing on:
- Maximum utilization of available resources
- Reduce of waste and pollutants Restore and preserve the environment
- Educate the public about environmental conservation,
- Collaboration for the development of environmental laws and regulations

- Managing and reducing energy consumption not only saves money but also helps in reducing environmental pollution. The primary objective of energy management is
- To achieve and maintain optimum utilization of energy throughout the organization.
- To minimize energy costs (materials or labor)
- To mitigate environmental effects
- The government should also play a vital role in Environment and Energy Management

Natural Environment and Pollution

- **Natural environment** includes all living and non-living things that are naturally on the Earth
- It **consists** of climate, weather, and natural resources that affect human survival and their economic activity.
- The built environment is the contrast of natural environment.
- **Nepal** is a small country but it is rich in natural environment, which are gifts of the nature. Some of the important natural environments of Nepal are as follows:
 - forest,
 - mountains,
 - water resource rivers, (lakes, rain and snowfall),
 - atmosphere, climate and weather,
 - ecosystems,

Supply of Energy

The **major sources of energy** supply in the world are:

1. **Oil:** petrol, diesel, jet oil, kerosene crude oil etc.
2. **Natural gas:** Natural gas occurs deep beneath the earth's surface representing 22 % of energy power globally. Basically, it consists of LPG gas.
3. **Hydropower:** Hydropower is electricity power derived from the energy of falling water or fast running water. In Nepalese context, hydropower is the main source of energy produced within the country. It has the potential of energy export to earn foreign currency for a developing and poor country like Nepal.
4. **Wind:** Wind power is the use of air-flow through wind turbines to provide the mechanical power to turn electric generators.
5. **Coal:** Coal production is declining in global energy market. Although, coal still provides around 40% of the world's electricity.

6. **Solar:** Solar power is the conversion of energy from sunlight into electricity using photovoltaic (PV). Solar-powered electricity has been reached around up to 227 Gig watt electricity in 2015, producing 1% of all electricity used globally.
7. **E-storage:** Batteries can store electric energy. when disconnected from its charging circuit, it can be used like a temporary power supply. As of end-2015, the global installed storage capacity was 146 GW.
8. **Uranium and nuclear:** A nuclear reactor produces and controls the release of energy from splitting the atoms of uranium.
9. **Bio-energy:** Bio-energy is the renewable energy produced by living or organic materials such as wood, leafs, dunks etc. It is the largest renewable energy source used specifically in remote areas.
10. **Waste-to energy:** It is the process of generating energy in the form of electricity heat and fuels from the treatment of waste.

- **The basic issues in managing environment and energy in Nepal are:**

1. Inadequate effort
2. Insufficient energy
3. Firewood
4. Growth of energy demand
5. Hydropower development
6. Solar energy
7. Bio-gas
8. Wastage of energy
9. Unmindful use of resources
10. Energy loss

Information Technology (IT)

- It is the application of computers and telecommunications equipment to store, retrieve, transmit, and manipulate data
- IT policy **facilitates** the management and development of information technology and its applications.
- The **objectives** of Information Technology Policy of Nepal are as follows:
 - To make information technology accessible to the general public and increase employment through this means
 - To build a knowledge-based society, and
 - To establish knowledge-based industries

The **major provisions** and strategies of IT Policy of Nepal are:

- To declare information technology sector a priority sector,
- To adopt one window system for the development of information technology,
- To prioritize research and development in the field of information technology,
- To create an atmosphere conducive to attracting investment in the private sector,
- To provide Internet facilities gradually to all Village Development Committees of the country,
- To assist educational institutions and encourage domestic and foreign training to fulfill the requirement of appropriate manpower at various levels pertaining to information technology,
- To computerize the system in all government offices and build their websites for the flow of information,

- To encourage the use of computers in private sectors,
- To use information technology to promote e-commerce, e-education, e-health among others, and to transfer technology to rural areas.
- To establish a National Information Technology Centre,
- To establish a venture capital fund with joint participation of public and private sectors,
- To include computer education in the curriculum starting from the school level and broaden its scope,
- To establish Nepal in the global market through the use of information technology,
- To enact necessary laws for providing legal sanctions to the use of information technology,
- To use information technology gradually in all government activities and provide legal sanctions to them

- **The Electronic Transactions act, 2006 (2063)** is expedient to make, legal provisions for regularization of generation, production, processing, storage, communication and transmission of electronic records. The major provisions and strategies of **Electronic Transaction Act, 2006** are:

1. Definitions
2. Authenticity of electronic record
3. Legal recognition of electronic record
4. Legal recognition of digital signature
5. Electronic record to be attributed to originator
6. Procedure of receipt and acknowledgement of electronic record

7. Appointment of the controller and other employees
8. License to be obtained
9. Renewal of license
10. Provisions relating to digital signature and certificates
11. Functions, duties, and rights of subscriber
12. Government Documents may be published in Electronic Form
13. Liability of Network Service Providers
14. To pirate, destroy or alter computer source code