**Technological Environment**

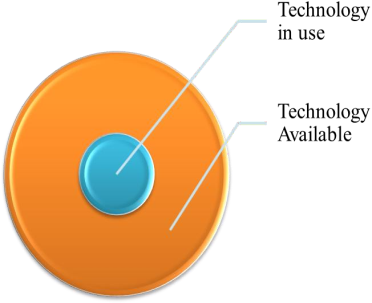
## Learning Outcomes

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# Introduction

Technology can be defined as the method or technique for converting inputs to outputs in accomplishing a particular task. Technology can also be defined as branch of knowledge that deals with the creation and use of technical means and their interaction with environment, lives and societies. For a firm involved in production, technology in use and technology available both are important. Technology available refers to technology all those technologies about which country is aware and also could acquire it on the other hand technology in use refers to subset of technology available i.e. techniques that country/firm has already acquired it and using for the production.

To judge the global competitiveness of a country technology is one of the essential factors to be considered by World Economic Forum. Technology is one of the important factors in economic development. Technology has had an immense impact on marketing and advertising methods also. It has been observed that countries having superior technology are having better growth rate and per capita income. Superior technology enables their people to earn better because of high productivity and provides them a higher standard of living. On the other hand countries having inferior or outdated technology earn less income and live a lower standard of living.



### Figure 1: Technology in use and Technology available

1. Technology and Business
   1. **a. Innovation**

Innovation in technology is one of the most important factors that provide competitive advantage. As per Joseph Schumpeter significant advances occurs by disharmonious leaps and spurts as entirely new investment horizons are exploited. In the analysis given by Schumpeter, entrepreneur who is the innovator is the central figure. Innovation can take following form:

* + - Introduction of new product;
    - Re-orientation of an industry;
    - The conquest of a new source of raw material supply. Innovation can be of following types:

**Radical Innovation:** Refers to innovation that establishes a new functionality. When something very new has been invented by challenging conventional mode of production and significantly changes expectations of customers that innovation is known as radical innovation. It is also called breakthrough or discontinuous or disruptive innovations.

For example online education has been a great radical invention for all those students who cannot attend regular classes. Some people may argue that e-learning lacks the rich discussions possible in class room education but still it is a boon for those people who can’t spare the time to attend classes or busy in their jobs.

**Incremental Innovation:** Refers to small modifications in existing technology that doesn’t alter the main functionality but marginally improves performance, features, quality or other parameters.

For example I phone can be a recent incremental innovation. Before the introduction of I phone smartphones were available in the market but after small alterations like touch screen, the app store etc. enabled I phone to be the first of its kind in smartphone mainstream.

**Next-Generation Technology Innovation:** Refers to modifications in existing technology that doesn’t alter the main functionality but dramatically improves performance, features, quality, lower cost, new applications or other parameters.

For example improvisation of technology from 2G to 3G and now 4G shows the drastic improvement in the performance of internet access.

## Technology and Competitive Advantage

Michael Porter introduced the concept of competitive advantage. In the words of Porter “Technology can alter the nature and basis of rivalry among existing competitors in several ways. Technology alters competitive advantage if it has a significant role in determining relative cost position or differentiation. It can also alter the bargaining power of supplier and buyers. Technology in several instances is an entry barrier.”

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It is essential to understand that technology may destroy competitive advantage if it has not been tested before launching in the market. According to Porter before the commercialization of technology testing of technology is prerequisite. A firm may find itself in apposition where a technological change may meet one test but fails in other. Therefore, checking the viability of technology to achieve competitive advantage is essential.

## Sources of Technological Dynamics

Technological dynamics depends on number of factors. Technological dynamics can be determined by either internal factors or external factors. Following factors are considered as sources of technological dynamics:

### Competitive Dynamics:

Lack of competition makes technology backward and stagnant. Absence of competition means no urge to change the technology or product or production process. Presence of competition creates an environment for technological development.

### Demand Conditions:

Demand conditions affects scale of technology. For example if demand for a particular product is strong and fast growing then favourable trend in demand would encourage adoption and development of technology at large scale and also create favourable environment for R&D.

### Supplier’s Offerings:

Sometime technological development is initiated by supplier of a company. To make production process easier and efficient continuous development in technology is pre-requisite. To create competitive advantage it is necessary that technology is regularly updated.

### Customer Expectations:

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If consumers’ expectations are very high and demanding then it is a pre-requisite for companies to develop technology according to needs of customers. In several cases suppliers and customers have collaboration to develop a product or solution or service.

### Substitutes:

Substitutes can be compelling factor for technological development. Emergence of new substitutes or technological development in one substitute may force producer to introduce changes in the product through technological innovations. Technological changes can produce entirely new product as substitutes. For example fiber glass was created as a substitute of glass, microwave oven for commercial oven etc.

### Social Factors:

Certain social factors are also present that forces technological changes. Social concerns towards environmental pollution, ecological balance and health consciousness has given birth to many new products and technological developments. For example due to excessive pollution created by petrol consumption CNG was developed.

## Contribution of Technology in the Development

Technology has always been a driving force in the process of development. The credit for shaping the lives of people can be easily given to technological progress. Transformation in the day to day lives of people can be easily seen. Now people can take the benefit of e-education without moving out of their house and 24X7, cure for many deadly diseases has been found out, longevity of people has increased, and many more benefits has been possible due to technology only.

For businesses technology has been a blessing as it has provided following benefits to businesses:

* + 1. Reduction in cost through new and efficient equipments of production,
    2. Quality of the products available in the market has increased which has in turn increased the profits of businesses,
    3. Technology has enabled businesses to increase the productivity i.e. either same product can be produced at less cost or more products can be produces at the same cost,
    4. Decision making has been improved due to sophisticated sources of communication,

But overall technology has been a mixed blessing for world. Some of the dreadful effect of technology is unemployment, inappropriate use of technology to spread terrorism etc. Technology requires less manpower and therefore in the long run demand for labour decreases with the development in technology.

# 4. Impact of Technology

## a. Globalization

Use of technology was necessary to enable globalisation and this technology emerged from developed countries in the form of information technology. It changed the economic relationship between countries because it made knowledge an increasingly important component in the production of goods and services. Knowledge and high tech industries are the fastest growing in the world today and for countries to compete in these sectors they need to invest substantially in education and training. For the successful implementation of globalization technological development works as main facilitator.

Digital technologies have created favourable environment for the creation of global networks. Internet and e-commerce has played an important role in the establishment of techno-globalism.

**b. Developing Countries**

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The adoption of technology by developing countries has had profound effects on their economies, like reduction in the costs of production, increased standards for quality, and providing access to individuals to communicate from a distance. Unfortunately, the current process remains one of adaptation, rather than innovation. In addition, the need for technologies appropriate to the capabilities of a developing country's poor has only recently been recognized. The rapid spread of technology triggered by the internet has led to positive changes in developing countries. Easier, faster communication has contributed to the rise of democracy, as well as the alleviation of poverty. However, the adoption of technology by developing countries must be carefully controlled to prevent negative cultural consequences.

## c. Marketing

Communication helps businesses grow and prosper, creates relationships, strengthens the effectiveness of organizations, and allows people to learn about one another. Technologies, such as the Internet, mobile phones, [social media,](https://www.boundless.com/definition/social-media/) and [customer relationship management](https://www.boundless.com/definition/customer-relationship-management/) systems greatly affect the way companies communicate with prospective customers. These new forms of communication are changing the media landscape and the type of messaging [strategy](https://www.boundless.com/definition/strategy/) organizations use.

Many consumers and business professionals seek information and connect with other people and

businesses from their computers and phones. With access to many sources of information and an interest in interactive media, consumers may collect more product information on their own. Work environments are also changing, with more people having virtual offices, texting on their cell phones, or communicating through social media sites such as Facebook, LinkedIn, Pinterest, and Twitter.