C-1 (W-1)

HUM 2109

4/4/24

Technology

[1] What is Technology?

Ans. Sociologist Gerhard Lenski has defined technology as "information about how to use the material resources of the environment to satisfy human needs and desires"

According to Horton and Hunt, "Technology is the use of scientific discoveries to solve a practical problem"

* "Many people regard technology as simply applied science" — Do you agree?

Ans. Material 1 after the line until the next point

* Most Importance of Science and Technology (might be altered)
* DO NOT write past essays

Ans. Material 1: describe the point

[Most people would . . . and of ourselves]
↳ skip all examples are not needed

+ [In the nineteenth . . . the drugs themselves]

C-3(w-2) 17/04/24

[Check sheet]

-The origin of science and technology
-Impact of politics in science and technology

C-4(w-2) 18/04/24

[Check sheet]

Leniski's Sociocultural Evolution

↳ American sociologist

* evolution → long time to change state
revolution → short " " " ; long time, to build up
change → its change (idk how to explain)

"As technology advances . . . post industrial society"

-Explain.

Ans. Everything before

* → Miss said
# → Imp

17/04/24

scientific knowledge, and new products and processes. For nations, it is a measure of the effort being put into science and technology.

A key point in Science, Technology and Society studies is that these activities are not isolated. They are all carried out in social, political and economic contexts. Therefore, if we are to understand what is happening in the modern world, we must understand how science influences the larger society. We must also understand how the larger society influences science.

In addition, there is another way in which the word *society* can be applied to science and technology. Scientists and technologists do not work in isolation. They work in universities, firms or research groups, and the functioning of these groupings is also a legitimate focus of study. Questions about ethics and conduct within these groupings, how they should be financed and how they are best organised, are also matters which researchers in Science, Technology and Society can ask about. You will notice this division in the book: Part One deals with matters pertaining to scientific and technological communities, the second part with relationships between science and technology and the wider society.

* Knowledge spreading was discouraged before

The origins of Science, Technology and Society studies

Any discipline has a history, involving founders and important scholars, and Science, Technology and Society is no exception. Although most work has been done since World War II, views of the relationships between science, technology and society go back for many centuries. Some of these are only incidental. For example, Plato, in the fourth century BC in the *Gorgias*, recognised the value of engineers, but went on to protest about their low status in ancient Greek society (Salomon 1973:6). Probably the first attempt to outline the ideal relationships between science, technology and society, though, was published in 1527 by the British lawyer and thinker Francis Bacon, in his book *The New Atlantis*. Bacon told of an imaginary voyage to a small island in the South Seas, where a civilisation was based upon science and technology. 'The end [i.e. goal] of our foundation is the knowledge of causes, and secret motions of things; and the enlarging of the bounds of human empire, to the effecting of all things possible' (quoted in Salomon 1973:7). In Bacon's imagination, scientists are accorded the same honours as royalty, and carry out their work in an organisation (called 'Solomon's House'), making scientific discoveries, and turning these discoveries into technology. This was a remarkable vision, long before science had demonstrated that it could influence technology in major ways (see Chapter 7 for more details). It is not surprising, therefore, that the

* One of the main factors of social change is Technology / Engineering
* Bacon did not do shit for his ideology

*Asian people dont think development science and technology
#1. Impact of Politics for
* Confucious was dumb - Not his fault, people didn't take his words correctly

vision had some important omissions. For example, Bacon did not provide any finance for his scientists and technologists. In modern terms, the R&D budget was zero!

It took many centuries for events to catch up with Bacon's vision. Thinkers in the Enlightenment, during the eighteenth century, laid out a program for extending knowledge and repelling superstition (Goodman and Russell 1991). Scientific academies were founded in Europe, many with the aim of promoting the useful advancement of knowledge (e.g. Merton 1968). During the French Revolution, the philosopher Condorcet advocated the realising of Bacon's vision on democratic lines (Salomon 1973:13). However, it was not until the present century, under the stimulus of war and political upheaval, that the discipline of Science, Technology and Society was launched.

Politics has played a crucial part in the Science, Technology and Society movement. One of the earliest efforts arose out of the experience of the 1917 revolution in Russia and the establishment of a (supposedly) socialist state. Marx and Lenin argued that a socialist state like the Soviet Union represented a higher stage in social development than the liberal democracies of the West. One part of this theory was the materialist interpretation of history, which held that all significant social and intellectual change is caused by change in the productive forces of the economy. Of course, this places technology at the very heart of historical change.

This approach was also applied to science, and the Marxist view of science became known to scholars in the West through a conference on the history of science, called Science at the Crossroads, which was held in London in 1931. Notable among the Soviet delegation was a historian named Boris Hessen, who gave a paper entitled 'The Social and Economic Roots of Newton's *Principia*' (Hessen 1931). The *Principia* is Sir Isaac Newton's famous book, in which he put forward his three laws of motion, his law of gravity and much more. Hessen argued that Newton was led to address certain sorts of problems because their solution would lead to advances in technologies that were important to the dominant social forces of the time. These technologies included advances in navigation, mining, and the development of weaponry.

Although the Soviet Union collapsed in 1992, for a long time many Western thinkers were impressed by the communist experiment. In particular, it was noted that science and technology were an important part of communism: the state financed large scientific and technological projects and did not leave developments to chance.

Perhaps the most influential of these thinkers was the physical chemist J. D. Bernal, of London University. After visiting the Soviet Union in 1934, he concluded that science in Britain should be

= Globalisation bring you to the world
Trade and commerce
18/04/24
* 1917 - 1992 SU was able to develop a lot. This proves politics is v. imp. for science and technology.
* South Korea is epik

organised, like that in the Soviet Union, to solve pressing economic problems. He wrote a book called *The Social Function of Science*, which appeared in 1939. The key point of this book is that science is not primarily a search for the understanding of the universe; rather, it has a social function. This function is the improvement of the lot of humanity. Much of the book—naturally, with many references to the Soviet Union—is a plan for the direction and use of science in the national interest. There was a fierce reaction to this: many scientists felt strongly that science could not be directed, and in the United Kingdom after World War II (1939–45) the Society for Freedom in Science was formed to combat what they called 'Bernalism'.

War has also had a major impact on the analysis of the role of science and technology in society. Of particular importance was the development of the atomic bomb. As Chapter 3 recounts, the American Manhattan Project was set up in 1942, in conditions of complete secrecy, with the aim of making the first atomic bombs. Late in the war, the Japanese cities of Hiroshima and Nagasaki were destroyed by these bombs, forcing Japan to surrender. Many scientists who were engaged on the project later expressed regret at their involvement in the Manhattan Project. For the next fifty years, too, the rest of the world saw the production of huge numbers of nuclear weapons in the Cold War arms race between the United States and the Soviet Union, and lived with the prospect of total destruction.

Thus, at the end of World War II, Bernal's argument was clearly true, at least in its essentials. Governments knew that, for their countries to progress, they had to support scientific research and technological development. As a result of this, governments began to plan for science and technology.

Perhaps the most dramatic of these developments took place in the United States. A distinguished scientist, Vannevar Bush, was asked to report on a suitable plan for science after World War II. Bush recommended the setting up of a National Research Foundation—which later became the National Science Foundation. He also wrote a report, *Science, The Endless Frontier* (Bush 1945), which advocated the setting up of a national policy concerned with science.

The development of government science policy (as it came to be called) was mainly concerned with the use of limited funds for the best effect. After the war, spending on science was growing exponentially, with the money spent doubling roughly every fifteen years. This could not continue, as eventually science would consume all of the government's budget. Governments had to make choices about what to fund and what not to fund, and they had to develop criteria to help them make choices. They also needed to be able to measure the effectiveness

#3. Technology Assesment → Economic feasability
→ Social Acceptability
→ Engineering constraints
→ Previous experience
(do we have the right conditions)

of their decisions. This has restarted the debate about the freedom of science which first surfaced as a response to 'Bernalism'. Two key questions are whether governments or scientists are best equipped to decide what should be funded in science, and how 'success' is to be judged. → results define selection

More recently, Science, Technology and Society has come to embrace another area of study, known as technology assessment, and concerned with the impact of large-scale technologies on society. As technology becomes bigger and more complicated—with nuclear power stations, jumbo jets and supertankers—it follows that the impacts are felt far and wide if something goes wrong, even if it is only a minor problem. The nuclear disasters at Chernobyl (1986) and Three Mile Island (1979) are good examples. It is now clear that the likely impact of technologies should be assessed before they are introduced. Researchers in this field look at emerging technologies and try to ensure that positive outcomes are exploited and negative effects avoided. An extension of this is environmental impact assessment, which examines the effects of major developments on the physical environment.

[] → must
{} → okay if you'd don't remember but you shall

From this brief discussion of how Science, Technology and Society arose, you will see that the discipline has emerged as a composite of a number of study areas. Some of these have been briefly discussed, and others, such as 'Ethics and Science' and 'Science and the Economy', are discussed elsewhere in this book. All the different approaches have some things in common: they are all concerned with science and technology in a social context, in which science and technology both shape, and are shaped by, the society in which they are performed. This basic approach is reflected throughout the book, and in the themes which arise from it.

Themes

This book is organised round two major themes. As you read each chapter, you should think about what has been said, and how it illustrates and extends the ideas implicit in the themes.

The first theme is this: *Science and technology are important in the world, and growing more so, and this presents both problems and opportunities to humanity.* The brief outline of Science, Technology and Society, above, shows how science has increased in importance. Chapter 6 on the Industrial Revolution discusses the importance of technology in this monumental event. The first part of Chapter 7 shows how science for the first time began to influence industrial technology. The discussion of science policy in Chapter 9 examines the ways in which governments have sought to use science.

Q. * Discuss the scholar's view about ~~social~~ science, technology and society (i)
* ~~#1~~ + [#2]
* #2
* "What do you understand by Bernalism? / Social Function? (SQ - (i))
* #3

C-5 (W-3) 24/04/24

1st Quiz — 02/05/2024 ↑ Use material for descriptions and definitions

Lenski's Sociocultural Evolution Approach

→ Not sociotech because tech is part of culture.

* Relation between technology and society

* Society —Technology→ Improved Society

+ As technology advances, Lenski writes, a community evolves from a preindustrial to an industrial and finally a post industrial society. (Justify this statement)

Ans. explain all 3 & social structure, & technology

Preindustrial : i) Hunting and Gathering society (Nomadic society)

Start of capitalism ← ii) Horticulture society (settled society) — 12000 years ago

integration of capitalism ← iii) Agrarian — 5000 years ago

Industrial : Manufactured base (1760 - 1830)

Post industrial : i) Post industrial : Service based economy

ii) Post modern → consumer goods, media images

Technology Assessment → Economic Feasability
→ Social Acceptability

25/04/24

Q(a) 3)

Influence of Society and Cultural Issues on Technology Development in Asian Countries

[Check - sheet]

* It is now - - - - global technological transformation.
* Initially, we shall briefly focus on the relationship between culture and technology in order to identify in general terms some of the negative elements in the socio economic systems prevailing in the regions which are believed to have acted as road blocks for developments

[1] Technology Culture:

[Check sheet]

[1] 6 Road Blocks:

i) Traditional Value System and Orthodoxy
ii) Ancient Habits of Resignation
iii) Stratified and Exclusive societies
iv) Highly Centralized Bureaucratic Decision-Making systems Discouraging Diffusion
v) Education System Discourages Nurturing of Questioning Minds and has Inadequate
vi) Poor Connectivity with world Systems and Inadequate communication
Focus on Tertiary Education
Tools

C-6 (L to W-3) Mat-3 → *imp *Miss said 25/04/24

Influence of Society and Cultural Issues on Technology Development in Asian Countries

* All modern inventions and technology depended pioneered by western

Iqbal Mahmud

#1. Examine them reasons which have been responsible for keeping - #2. Technology Culture; #3. 6 Roadblocks/Negative elements

1. Introduction and Background

In the last few decades the development and application of science and technology has affected in fundamental ways the whole range of activities in manufacturing, services and agriculture. The "technology content" is significantly increasing in all products and services which an businessman/industrialist/agriculturist wishes to produce and provide. Technology is often credited with being the single most important factor, which has facilitated development in the modern Western/European industrial world. In the two and half centuries between 1473 and 1727, one of the greatest intellectual revolution in human history occurred — **the Scientific Revolution** —"initiated by the work of a relatively small group of geniuses working in the universities of Western Europe. This was obviously the early beginning of the technological revolution and development of scientific knowledge that has taken place in recent times.

However, the progress of material and intellectual development that is currently assumed to be the product of Western Civilization only was actually the end product of knowledge and major inventions made by older civilizations like Chinese, Indian, Islamic etc. For instance, it is also now common knowledge that Indian mathematical and scientific accomplishments of the earlier era went to Europe almost entirely through the works of Arab and Iranian mathematicians and astronomers (Sen, 2005). There are other examples, which will be mentioned later in these notes.

The earlier scientific and technical development of the three regions referred to above and the civilizations which developed there should be considered as a complex whole, whose various elements which lead to development of a scientific environment have been in continuous action. However, in recent centuries the Western one has influenced us all. Yet, these other cultures have preserved, for better or worse their individuality. *The notion of all civilizations and cultures of the world converging to the greater glory of Western civilization, "implicit in the metaphor of different cultures as tributary rivers that converge on the sea of Western culture", merits re-examination (Sagasti, 1998).*

The regions selected for the purpose of this article, viz., China and East Asia, South Asia and the Middle East, are now referred to as developing regions and are currently at various stages of transition with respect to accumulation of scientific and technological knowledge and capabilities. As mentioned earlier, these seats of civilization did demonstrate some elements of "creativity" and "innovation" centuries before the relatively recent scientific and technological revolution and consequent dominant position of the West. During the second half of the twentieth century there has been a general awakening in the developing countries on the need for 'catching up' with the West with respect to science and technology (S & T) and removing the "cultural road blocks". However, some of these regions have fared better than others in their policies and plans for adoption of scientific methods of inquiry, creation of a climate for creation and adaptation of modern technology.

Given the higher technological complexity in the industrial and business enterprises in new century, the urgent need to bridge the "knowledge divide" that separates the developed from the developing countries and create the right S & T environment, it is now necessary to examine the reasons which have been responsible for keeping some countries behind others in catching up with the current global technological transformation. As mentioned earlier, the developing region chosen for these discussions in this article were not devoid of scientific knowledge and technological developments. Yet, as it shall be demonstrated that some social, cultural, political events and economic problems during subsequent periods of history caused a shift towards orthodoxy and negative policies which forced these countries to remain backward with respect to scientific and technological developments. Initially, we shall briefly focus on the relationship between culture and technology in order to identify in general terms some of the negative elements in the socio-economic systems prevailing in the regions which are believed to have acted as road blocks for development of technology.

The discussion on the cultural dimension is followed by a section, which presents the current status of some selected countries in these regions in respect of specific indicators. These are considered important to the development of S & T development. The objective is to highlight the differences between the regions in achievement of technology-friendly development in recent years.

In the subsequent sections each region is discussed separately to highlight the recent developments and an attempt is made to link their historical scientific achievements and the social and cultural traditions inherited from earlier generations which may have either restrained or facilitated the necessary courage to build a knowledge society capable of developing their own S & T.

2. The Cultural Factors

Throughout history new technologies have been developed taking into consideration the social and cultural environment of the country in question. Introduction of any new technology — either developed locally or through cross-border diffusion — is a cultural phenomenon. It has been said that all technologies develop in a particular cultural context as the result of changing needs or constraints (Cravens, 2003). When a technology diffuses to another society/culture, the local cultural environment affects the speed or manner in which the technology is adopted or adapted (on occasions rejected!).

Thus, introduction of a new technology may be considered as a cultural phenomenon, which affects the value system of the society. According to one observer (White, 1959) technology not only determines the direction of cultural development but *"it also determines the need for building social foundation"*.

Europe was the technological, cultural and economic backwater of Eurasia for most of history, importing virtually all of its ideas and technologies from the Middle East and Asia. The Age of Discovery in Europe permitted the diffusion of technologies and ideas, creating an open, innovative atmosphere there and a decentralized, competitive environment that further stimulated innovation and growth (Weisenfeld, 2003). Since modern technologies are products of the Western industrialized societies, they seem to carry "the genetic codes of cultures" where they have been produced. This process led to the emergence of the culture of scientific inquiry and entrepreneurship in the west and created the environment for innovation that ultimately transformed European society and culture and its North American "cousins" into the dominant economic powerhouses of today.

During the later half of the 20th century various attempts to transfer technology to non-western countries (with the exception of Japan) have met with widely varying degree of success. Efforts to identify the causes of failure in the developing regions have seriously focused on the social and cultural factor. However, we are conscious of the difficult task of correlating the development of science and technology in a given region or country with its particular social and cultural environment.

Technology Culture: Before going into the identification of the specific elements or factors which result in the vicious circles in the developing regions, perhaps it would be wise at this stage to briefly introduce the concept of "technology culture".

Technology culture refers to an attitude of individuals in a given cultural environ. The spirit of inquiry, the degree of acceptance of the right to question and be questioned is to be considered fundamental to the development of technological temper. It calls upon one to seek the "how", "what" and "why" of everything that goes on in the society. The existence of a technology culture is complementary to the initiative taken by a country in the introduction of productive forces, which can lead to technological development.

A socio-economic entity may decide to develop the "technoware" part of technology based on its relevant factor endowments existing at a given period of time. However, simultaneous development of the other three components i.e., "humanware", inforware" and "orgaware" of technology constitute the more innovative and intellectual aspects and presupposes existence of a technology culture in the country. For the sake of simplicity it is assumed that such a culture exist in a well developed form in all leading industrial countries and developing countries are currently at various stages of acquiring it. However, in this mission to develop a technology culture, they are also engaged in the process of removing some "road blocks". We discuss below some of those "road blocks" or "negative elements" in the society which probably are more significant than others among the different causes of uneven progress in developing a technology culture:

(a) Traditional Value System and Orthodoxy

Distrust of new technologies is deeply rooted in most cultures with old value systems because people in general do not want to change. The fears of changes that usually follow introduction of new technology results from the belief that these changes are likely to be adverse. New technology, be it the product of local development, a transfer from abroad, or some combination of the two may not agree with existing traditional values. Scientific and technological changes can undercut systems of belief.

In our later discussion on these issues relevant to particular regions we shall look at some historical events of technological change and their relationships to other issues of culture and try to understand the nature of the process and the range of possible results of introduction of a new technology. It will seem that there is always a fear in a society steeped in orthodoxy (evident even in western cultures during earlier centuries) that something important (e.g. religious belief, family values, social equilibrium among classes, etc.) would be lost as a result of the new technology (DeGregori, 1989).

(b) Ancient Habits of Resignation

Many people in developing regions continue to believe that there is a limited quantity of resources and attempt to expand resources through some form of technological innovation.

*we live in an open class society

likely to result in a smaller share for them. Increased productivity can increase the sha everyone, yet in many countries people do not believe this and are resigned to the o modes of production.

↳ systems involved with production

(c) Stratified and Exclusive Societies

↳ leveled contains level

Two persons in a society may possess identical material and intellectual resources and yet treated as unequal because of social stigma. Many countries in the developing regi selected for discussion here still retain stratified social structures that resist change continue with rigid class or caste systems. Such exclusive societies restrict social mobility which is considered fundamental in building a dynamic society. In some areas the colonia legacies and in others ancient pseudo-religious practices and beliefs intensify their problem.

People from lower classes or castes who attain high levels of educational and intellectual success are often prevented or debarred by social practices in their desire to technologically move forward. Culturally rigid social classes in such exclusive societies artificially reduce the availability of appropriate human resource for development. Meritocracy is not encouraged and the excluded section of the society (wrongly called the "lower class") is resigned to the rule of the ruling classes. Thus, the urge to excel is lost and the spirit of competitiveness is discouraged.

2/05/24

(d) Highly Centralized Bureaucratic Decision-Making Systems Discouraging Diffusion of Ideas and Technologies

* Centralized decisions limit knowledge flow

Almost all cultures in the world have been borrowers of technology throughout history. A vast majority of the technology in a culture was, in all probability, developed by others. Most innovations are borrowed from other societies and improved upon. In fact, for several centuries there was a continuous and fruitful (occasionally not so fruitful!) exchange of tools and diffusion of ideas in the area that included South Asia on the east and stretched to Europe in the West. Useful technologies spread, either through migration of populations or by diffusion of techniques to neighboring population both within and outside geo-political (Cravens, 2003). The diffusion of technology is critical and often more important than its invention, because most complex technological advances depend upon previous mastery of basic problems. Thus technology develops in a cultural environment which welcomes cross border diffusion and exchanges.

Unfortunately, however, in the developing regions there have been periods when some ruling classes or powerful centralized bureaucracies intentionally decided to resist S & T interchange and diffusion process thus stopping local innovation activities. Such policies can be adopted and implemented only when a ruling elite or highly centralized bureaucracy in a country exists. Such negative decisions are taken out of fear of "corrupting" influence of new technologies. In general, centralized systems discourage innovation. The movements and expeditions for political unification over large areas in Asian regions in the past resulted in centralization of decision-making in vast eastern empires. Wrong decisions taken by such centralized bodies negatively influenced vast populations. In contrast, decentralized environment in Europe (with its small states and principalities) stimulated innovation.

(e) Education System Discourages Nurturing of Questioning Minds and has Inadequate Focus on Tertiary Education

* Importing technology won't do anything, we need local talents to use them creati

Since the later half of the last century the products of scientific research and technological innovation have given rise to a "knowledge society". According to Peter Drucker, "The emerging [knowledge] society is the first society in which ordinary people — and that means

ost people—do not earn their bread by the sweat of their brow" (Drucker, 1968). Presumably he was referring to "knowledge workers" in the industrialized nations. Given the knowledge "explosion" that is taking place in this century it is important to note *"it took from the time of Christ to the mid eighteenth century for knowledge to double. It doubled again 150 years later and then again in only 50 years. Today it doubles every 4 or 5 years. More new information has been produced in the last 30 years than in the previous 5000 years"* (Elliowes, 1990).

The above quotes clearly establish the strong reasons for a massive shift towards higher education in S&T in developing countries. The response of a majority of countries to the need for S&T modernization has been to import technology to meet the knowledge gap. Plans for education reforms often lead to proposals to import computers, involve foreign experts/consultants (encouraged by donors), fund health care diagnostic laboratories etc. We do not deny that some of these are necessary technologies (mostly in the form of technoware). However, creating an environment that inspires local talent to innovate requires additional efforts in terms of openness to cross-border exchanges of teachers and students, creating atmosphere for interdisciplinary dialogue and debate, and the deliberate promotion of questioning minds and creativity in the school curricula. Such determined and purposeful initiatives are seen only in a few countries of the developing regions.

No one denies the fundamental and basic need for a sound primary and secondary school system in a country. But it is the system of tertiary education that plays the key role in generating and applying knowledge in this new age that can help produce new technologies and narrow the ever widening technology gap.

The following table (Table 1) shows the progress on the educational level of labor force in newly developed as well as developed countries. The figures demonstrate the validity of the arguments made earlier in favor of tertiary education for a developing country. The low figures for China and India (in 1992) reflect the lower levels of their achievement during the nineties in narrowing the knowledge divide. However data for 2010 (not shown in Table 1) show that tertiary education has progressed very rapidly even in China and India in recent years. Remarkable strides made by Korea (Rep. of) and Taiwan in this respect are quite evident from the following table.

Table 1: Adjusted years of education per person aged 15-64, 1950-92

Year	Korea	Taiwan	China	India	Japan	UK	USA
1950	3.36	3.62	1.60	1.35	9.11	10.84	11.27
1973	6.82	7.35	4.00	2.60	12.00	11.66	14.58
1992	13.66	13.83	8.50	5.55	14.86	14.09	18.04

Source: Maddison 1998:63, Primary education is given a weight of 1, secondary 1.4, and higher 2.

As will be elaborated further in later sections of this paper, in several developing countries tertiary educational institutions do not encourage students to develop questioning minds which could challenge the "business as usual" environment. In most causes the students during their primary and secondary stage go through a poorly designed assessment procedure and find it convenient to depend on rote learning. Twelve years of rote learning can easily kill the natural creativity in a young mind.

Poor Connectivity with World Systems and Inadequate Communication Tools

The use of communication tools has been critical in enabling some societies to develop complex organizations, which in turn create the correct social environment for technology to grow. These tools are a medium for the spread of technology and ideas, which help develop an innovative culture. Societies which did not welcome early adoption of communication tools failed to adopt technological advances and were unable to make them available to the population. Even before the advent of modern hi-tech devices, earlier communication tools had lowered the cost and increased the speed and number of exchanges that encourage innovation.

For instance, the printing press had its positive effect in Medieval Europe (Wright, 2000). Europe's adoption of this advance greatly facilitated cross-border exchange of technology and ideas. In contrast, by banning printing press due to its fear of corrupting Western influences, the Ottoman Empire hastened its own technological and economic decline (Weisenfeld, 2003).Rapid development of modern cutting edge communication technology allow for quicker and extensive diffusion of existing technology and ideas than ever before (internet, video conferencing, etc.). However, only those who have "plugged in" can take advantage of this worldwide interconnectedness. **This also requires broad literacy, investment in information and communication technologies and shift towards openness to the free exchange of ideas.**

3. Ranking of countries in three developing regions in terms of Composite Indices

In this section we shall endeavor to rank the three Asian regions, chosen (and the countries within each region) for discussion in this paper, in terms of some generally accepted composite indices. We think the numbers shown in the tables will provide a rough idea of the level of achievement and current trends for accumulation of intellectual capital in the regions. The differences in levels will be evident from the tables. The two composite indices used for the purpose are as follows:

a. *Human Development Index (HDI) published by UNDP*
b. *Technology Achievement Index (TAI) developed by Desai, Sagasti and others (Desai, 2001) for the Human Development Report 2001.*

The HDI is based on three indicators: longevity, as measured by life expectancy at birth; educational attainment as measured by a combination of the adult literacy rate and the combined gross primary, secondary and tertiary enrolment ratio; and standard of living, as measured by GDP per capita (Purchasing Power Parity, US $).

The TAI (Technology Achievement Index) focuses on four dimensions of technological capacity that are important for reaping the benefits of network age. The methodology used to calculate the TAI is similar to the human development index: a simple average of the dimension of the index, which in turn are calculated based on the selected indicators. The TAI has eight indicators, two in each of the four dimensions:

- Technology creation measured by the number of patents granted to residents per capita and by receipts of royalties and license fees from abroad per capita.
- Diffusion of recent innovations, measured by the number of Internet hosts per capita and the share of high-and medium-technology exports in total goods exports.
- Diffusion of old innovations, measured by telephones (mainline and cellular) per capita and electricity consumption per capita.
- Human skills, measured by mean years of schooling in the population aged 15 and above and the gross tertiary science enrolment ratio.

TAI estimates have been prepared for 72 countries for which data are available and of acceptable quality. For others, data were missing or unsatisfactory for one or more indicators, so the TAI could not be estimated. For a number of countries in the developing world, data on patents and royalties are missing. Because a lack of data generally indicates that little formal innovation is occurring, a value of zero for the missing indicator was used

C-7 (w-4) Influence (Contd.) 02/05/24

d) Highly Centralized Bureaucratic Decision-Making System Discouraging Diffusion of Ideas and Technologies.

- Centralized authority has always discouraged technology and closed off
- Technologies were borrowed and ideas were exchanged for development
- Technology spread through migration and/or diffusion
- Diffusion is harder than inventions
  - ↳ a social system already exists.
  - ∴ Adapting is hard
- Centralized decisions hampers development

e) Education System Discourages Nurturing of Questioning Minds and has Inadequate Focus on Tertiary Education

- post industrial = knowledge
- we are still not in knowledge society

f) Poor Connectivity with World Systems and Inadequate Communication Tools

C-8 (10-5)

08/05/24

Theories of technology society and innovation System

Sociology of Technology:

How social structures and technology are related

#Explain Technological Determinism:

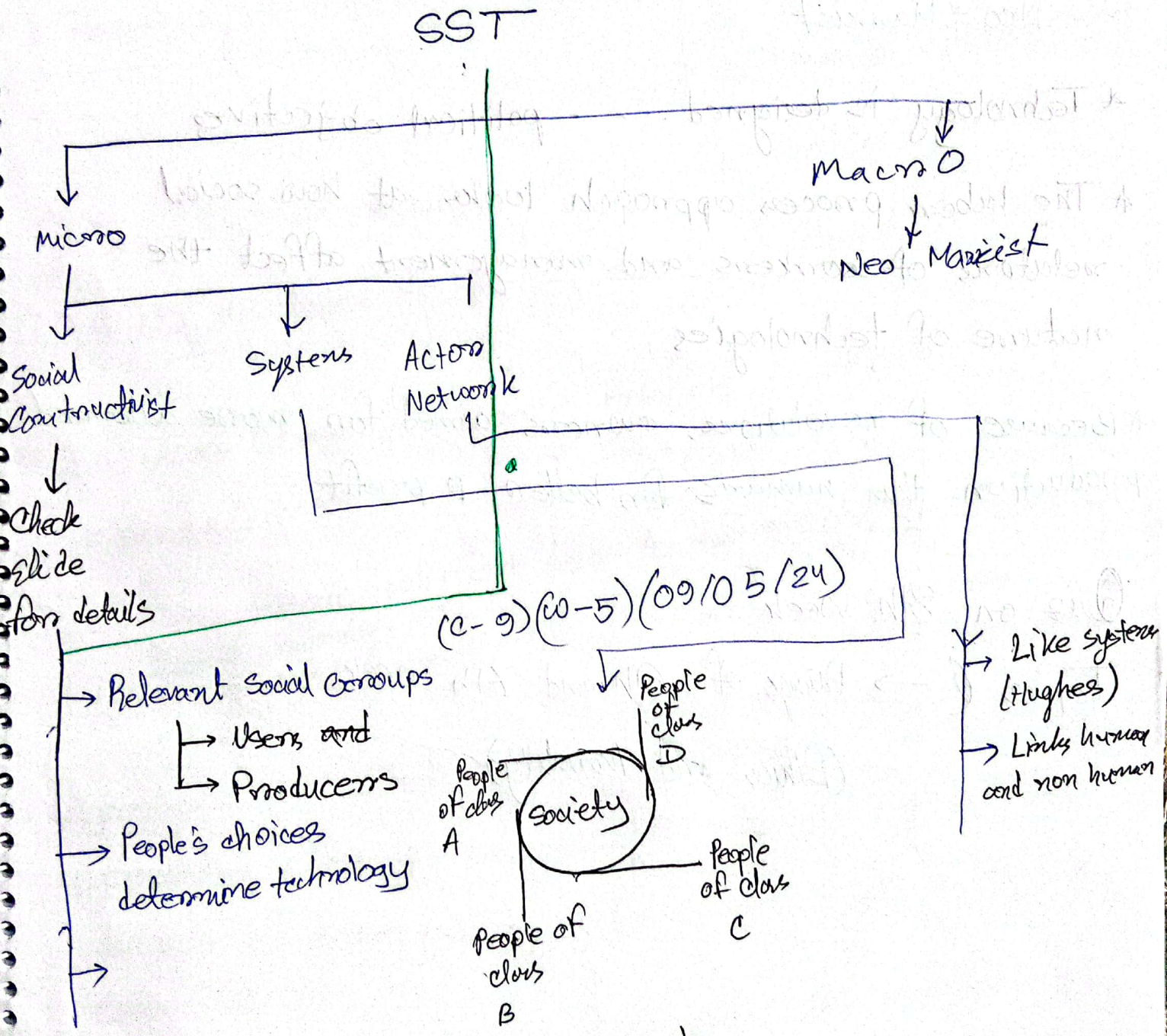
* Technological Determinism: ⟶ Technology shapes society
* Coined by Thorstein Veblen in 1920s
* Technology is agent of social change
* Technological development is autonomous
* Technology shapes society but is not reversely influenced.
* Agency (in this course) ⟶ people who can decide and work
* Hard determinism ⟶ disagree (impute) with agency
  Soft " ⟶ recognize human agency
* Unsatisfactory because technology does not follow any predetermined course of map of development

#. Explain why technology determinism is unsatisfactory

↳ Defn → [ ] → Write points of SST → Explain

* Social Shaping of Technology (SST):

* Connection and antidote to Technology ~~develop~~ Determinism
* Does not deny technology influence.



Macro

Neo - Marxist :

* Expansion of Marx's ideology
- . Neo - Marxist

* Technology is designed . - - political objectives
* The labour process approach looks at how social relations of workers and management affect the nature of technologies
* Because of revolutions, owners aimed for more automated production than humans for better profit

Quiz on 8th week

Topics → things of 6th and 7th week

(Ethics and Morality)

24/04/24

Theories of technology, society and innovation systems

(How social Structures and technology are related)

1 * Explain Technology Determinism

The **sociology of technology** is an emerging but as yet embryonic field. It is concerned with explaining how social processes, actions and structures relate to technology.

Does technology shape society, or does society influence our technological choices? Is technological determinism a theory of society or a theory of technology? The debate on Science, Technology and Society (STS) studies has been animated by two opposite views on technology: one that affirms that technology shapes society, and the other that society shapes technology. The former, is commonly associated with the notion of **technological determinism;** while the latter could be labeled **'social shaping of technology'** which covers various approaches, such as social constructivism and actor-network theory.

→ Technology shapes society

Technological Determinism

1. Explain Technology Determinism ; 2. Why is Technological Determinism considered unsatisfactory ?

1

Technological determinism is coined by Thorstein Veblen in 1920s. (It belief that technology is the agent of social change. Technology moulds society and change our behavior. It is the notion that technological development is autonomous with respect to society; it shapes society, but it is not reciprocally influenced. It exists outside society, but at the same time influences social change. In technological determinism, the technology is seen as the most significant determinant of the nature of society.) Simply we can say that it refers to the idea, " We have no choice but to adopt this technology."

1 There are various views on technological determinism and how to classify it; the most common labels being hard and soft determinism. According to Marx and Smith (1994), on the one hand, hard technological determinists impute agency (the power to produce change) to technology, and imply that technological development is inescapable, inevitable. Marx said , "The windmill gives you society with the feudal lord: the steam mill with the industrial capitalist."

On the other hand, soft determinists recognize human agency, and that changes in history are due to various and complex social, economic and cultural factors. 1

- According to some sociologists-
- Technological determinism is unsatisfactory because technologies do no follow some predetermined course of development. Research and development are the significant determinant of the sorts of technologies to develop. Its development is also depends on broad range of social, political and economic factors. It is clear that culture play a role in shaping the history of technological development, and that societies do not develop along a unique, fixed path.

The actor network approach is opposed to the social constructivist agenda in that it collapses any distinction between the technical and the social. The development of a technology is seen in terms of the relationships formed between human and nonhuman elements of the 'actor networks'.

2. Explain Macro- The neo-Marxist approach → Expansion of Marx's ideology

The second broad approach is the neo-Marxist. It examines how wider 'macro' socio-economic forces affect the nature of technological problems and solutions. Technology is designed, consciously to secure particular social or political objectives. The labor process approach looks at how the social relations of workers and management affect the nature of technologies.

1 1

* Revolution of workers = Automation of work

Problems Arising Out of Lack of Systematic Control Over Scientific and Technological Innovations

+ Three Main Problems:

i) Problems related to nature and qualities of environment
ii) Distortion of priorities of research matters and efforts
iii) Highly developed technology can be a threat to democracy

i) a) Excess chemicals (Greece, Palestine, Egypt and Monaco)
b) Food additives
c) Atmospheric pollution leads to climate change (Global warming)
d) Gas sprayed through planes harm ozone layer

ii) a) producing more effective life saving drugs
b) predicting effectively and well in advance the probable dangers of earthquakes, cyclones and such other natural calamities
c) producing more effective instruments to increase the efficiency of physically and mentally handicapped children

C-10 (W-6) 15/05/24

Ethical Perspective of Technology

Ethics : → belief about if right or wrong
→ ethos (Gr.)

A brief history of ethical thoughts

Western Cultural Tradition

→ Origin ~~of~~ in Middle East
→ From Judaism and its foundation
→ Spread during Roman Empire
→ Thinking of Locke, Kant and Mills
→ Applicable in secular settings

Four Ethical Theories :

i) Utilitarianism : well being of maximum people. (collective approach) balances needs of society and individuals

ii) Duty ethics

iii) Right ethics

iv) Virtue ethics

* Main criticism of Utilitarianism.

Ethical perspective of technology

* 1. What is ethics? ; 2. Difference between morality and ethics ; 3. What is Engineering ethics?
4. Morality Based

what you should do in any scenario

Ethics is a set of beliefs about right and wrong behavior within a society. Ethics is derived from the **Greek ethos**, and the term morality has its roots in the ***Latin mores. Both the Greek and the Latin terms refer to notions of custom, habit, behavior and character.*** Although ethics and morality are often used interchangeably in everyday discourse we draw some important distinctions between the two terms.

Morals are the welfare principles enunciated by the wise people, based on their experience and wisdom. They were edited, changed or modified or evolved to suit the geography of the region, rulers (dynasty), and in accordance with development of knowledge in science and technology and with time. Morality is concerned with principles and practices of morals such as: (a) What ought or ought not to be done in a given situation? (b) What is right or wrong about the handling of a situation? And (c) What is good or bad about the people, policies, and ideals involved?

Morality is different from Ethics in the following ways:

Morality (More basic) [Source]	Ethics [Derivation]
1. More general and prescriptive based on customs and traditions.	1.Specific and descriptive. It is a critical reflection on morals
2. More concerned with the results of wrong action, when done.	2. More concerned with the results of a right action when not done.
3. Thrust is on judgment and punishment in the name of God or by laws.	3. Thrust is on influence, education, training through codes, guidelines and correction.
4. In case of conflict between the two, morality is given top priority, because the damage is more. It is more common and basic.	4. Less serious, hence second priority only. But relevant today, because of complex interactions in the modern society.
5. Example: Character flaw, corruption, extortion and crime.	5.Example: Notions or beliefs about manners, tastes, customs and towards laws.(Naagarazan, 2006)

peer pressure from wise people

More dependent on spiritual results

More dependent on practical results

Thinking on spot

* Tools to use morality is ethics

What is engineering Ethics? ≠ what is ethics?

3 Engineering ethics is (1) the study of moral issues and decisions confronting individuals and organizations engaged in engineering and (2) the study of related questions about the moral ideals, character, polices and relationships of people and corporations involved in technological activity. 3

Moral dilemma:

A dilemma describes a situation where one is confronted with two choices, neither of which is desirable.

Q type:
+ Gives an example
→ Give YOUR moral

Imagine that you are driving a trolley and that all of a sudden you realize that the trolley's brake system has failed. Further imagine that approximately 80 meters ahead of you on the trolley track (a short distance from the trolley's station) five crew men are working on a section of the track on which your trolley is traveling. You realize that you cannot stop the trolley and that you will probably not be able to prevent the deaths of the five workers. But then you suddenly realize that you could "throw a switch" that would cause the trolley to go on to a different track. You also happen to notice that one person is working on that track. You then realize that if you do nothing, five people will likely die, whereas if you engage the switch to change tracks, only one person would likely die.

C-11 (W-6) 16/05/24

~~Utab~~

Utilitarianism

* Maximum ~~profit~~ benefit ~~for~~ maximum people

* Criticisms of Utilitarianism :
  - → Ignores individuals needs
  - → ~~Cost~~ Unforeseen consequences. (when humans are involved)

Utillitarianism

Act
- → focuses on individuals actions
- → John Stuart Mill
- → guidelines from previous experience
- → if good can brought, then rules are meant to be broken

Rule
- → Rules may not be good but it is good to always follow

#1. Utilitiarianism tries to balance individual and maximum benefit. [Until criticism]

#2. How do you solve engineering problem using utilitarianism [Add criticism]

Cost-Benefit Analysis

* Assessing a profit where benefit > cost
* Lots of factors are not counted
* Almost same as utilitiarianism but its not.
  Cost-Benefit is ethical analysis

Duty Ethics and Right Ethics

* By Immanuel Kant
* Be honest

Rights Ethics:

→ By @ John Locke

→ Right to life, liberty and property

Performing ~~right~~ duty

↓

Ensures other's right

Criticism:

* Rights of one group may conflict with another.

Virtue Ethics

* What kind of people we should
* Responsibility, honesty, competence and loyalty
* Includes trustworthiness, fairness, caring, citizenship and respect
* Ask three questions:
  i) Is this action honest
  ii) Will it demonstrate loyalty?
  iii) Have I acted in a responsible fashion?

+Criticism:

+ ~~Can~~ Virtue can be converted to vice

How to solve problems using ~~engineering Ethi~~ Virtue Ethics?

(1) Code of ethics (*1)
(2) Explain 'n' codes of ethics

6. to maintain and improve our technical competence and to undertake technological tasks for others only if qualified by training or experience, or after full disclosure of pertinent limitations;
7. to seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others;
8. to treat fairly all persons regardless of such factors as race, religion, gender, disability, age, or national origin;
9. to avoid injuring others, their property, reputation, or employment by false or malicious action;
10. to assist colleagues and co-workers in their professional development and to support them in following this code of ethics.

Approved by the IEEE Board of Directors, February 2006

23/05/24

NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS* (NSPE)

Code of Ethics for Engineers

Preamble *1. Write about Code of ethics

* has environment as well

Engineering is an important and learned profession. As members of this profession, engineers are expected to exhibit the highest standards of honesty and integrity. Engineering has a direct and vital impact on the quality of life for all people. Accordingly, the services provided by engineers require honesty, impartiality, fairness, and equity and must be dedicated to the protection of the public health, safety, and welfare. Engineers must perform under a standard of professional behavior that requires adherence to the highest principles of ethical conduct.

I. Fundamental Canons

Engineers, in the fulfillment of their professional duties, shall:

1. Hold paramount the safety, health, and welfare of the public.
2. Perform services only in areas of their competence. → has skills
3. Issue public statements only in an objective and truthful manner.
4. Act for each employer or client as faithful agents or trustees.
5. Avoid deceptive acts.
6. Conduct themselves honorably, responsibly, ethically, and lawfully so as to enhance the honor, reputation, and usefulness of the profession.] 1

Basically: Sit gud Ste gud

II. Rules of Practice

2 1. Engineers shall hold paramount the safety, health, and welfare of the public.
   a. If engineers' judgment is overruled under circumstances that endanger life or property, they shall notify their employer or client and such other authority as may be appropriate.
   b. Engineers shall approve only those engineering documents that are in conformity with applicable standards. → maintain quality
   c. Engineers shall not reveal facts, data, or information without the prior consent of the client or employer except as authorized or required by law or this Code. → dont be a snitch
   d. Engineers shall not permit the use of their name or associate in business ventures with any person or firm that they believe is engaged in fraudulent or dishonest enterprise. → dont sell-out (especially to scammers)

*NSPE CODE OF ETHICS FOR ENGINEERS. Reprinted with permission of the National Society of Professional Engineers (www.nspe.org)

e. Engineers shall not aid or abet the unlawful practice of engineering by a person or firm. → dont be a criminal, dont help a criminal

f. Engineers having knowledge of any alleged violation of this Code shall report thereon to appropriate professional bodies and, when relevant, also to public authorities, and cooperate with the proper authorities in furnishing such information or assistance as may be required. → let the PROPER authority know

2. Engineers shall perform services only in the areas of their competence.

a. Engineers shall undertake assignments only when qualified by education or experience in the specific technical fields involved. → places without skill issue

b. Engineers shall not affix their signatures to any plans or documents dealing with subject matter in which they lack competence, nor to any plan or document not prepared under their direction and control.

c. Engineers may accept assignments and assume responsibility for coordination of an entire project and sign and seal the engineering documents for the entire project, provided that each technical segment is signed and sealed only by the qualified engineers who prepared the segment. → sign on contributions

3. Engineers shall issue public statements only in an objective and truthful manner.

a. Engineers shall be objective and truthful in professional reports, statements, or testimony. They shall include all relevant and pertinent information in such reports, statements, or testimony, which should bear the date indicating when it was current. → document activities

b. Engineers may express publicly technical opinions that are founded upon knowledge of the facts and competence in the subject matter. → dont speak if you dont know

c. Engineers shall issue no statements, criticisms, or arguments on technical matters that are inspired or paid for by interested parties, unless they have prefaced their comments by explicitly identifying the interested parties on whose behalf they are speaking, and by revealing the existence of any interest the engineers may have in the matters. → dont be a sell-out (2)

4. Engineers shall act for each employer or client as faithful agents or trustees.

a. Engineers shall disclose all known or potential conflicts of interest that could influence or appear to influence their judgment or the quality of their services. → couple therapy with your employer

b. Engineers shall not accept compensation, financial, or otherwise, from more than one party for services on the same project, or for services pertaining to the same project, unless the circumstances are fully disclosed and agreed to by all interested parties. → দুই জায়গায় খা দেয়া যাবে না

c. Engineers shall not solicit or accept financial or other valuable consideration, directly or indirectly, from outside agents in connection with the work for which they are responsible.

d. Engineers in public service as members, advisors, or employees of a governmental or quasi-governmental body or department shall not participate in decisions with respect to services solicited or provided by them or their organizations in private or public engineering practice.

e. Engineers shall not solicit or accept a contract from a governmental body on which a principal or officer of their organization serves as a member. → Problems in X causes compromises a position in Y

5. Engineers shall avoid deceptive acts.

a. Engineers shall not falsify their qualifications or permit misrepresentation of their or their associates' qualifications. They shall not misrepresent or exaggerate their responsibility in or for the subject matter of prior assignments. Brochures or other presentations incident to the solicitation of employment shall not misrepresent pertinent facts concerning employers, employees, associates, joint venturers, or past accomplishments. → exaggerating skills and qualification

DONT work where you have skill issue
Work where you dont have skill issue

b. Engineers shall not offer, give, solicit, or receive, either directly or indirectly, any contribution to influence the award of a contract by public authority, or which may be reasonably construed by the public as having the effect or intent of influencing the awarding of a contract. They shall not offer any gift or other valuable consideration in order to secure work. They shall not pay a commission, percentage, or brokerage fee in order to secure work, except to a bona fide employee or bona fide established commercial or marketing agencies retained by them.

2

↳ dont bribe, dont be bribed

III. Professional Obligations

C-12 (W-7)

23/05/24

National Society of Professional Engineers

1. Write about code of ethics? → Preamble + 6 points
   Serial and wording CANNOT be changed

2. Write about the m-nth code of ethics → Serial and wording can be changed (but original headings have to be same)

C-13 (W-8) 29/05/24

Impact of IT on standard of living and workers productivity

* Standard of Living : Materialistic luxury and comfort
* ~~One of~~ One of the most important measures of standard of living is GDP
* Natural disasters impact the ~~st~~ improvement of standard of living
* One of the greatest recessions ~~happened in~~
  - happened in 1929 to 1932
  - GDP droops by 50-1. (US)
  - Unemployment increases to 25 1. (US)
* Another happened in 2010 (find details)
* Use of IT lessened the impacts of recession

IT investment and productivity

* Productivity: Amount of output received per unit of input.

* Measures of Produity: Amount of goods produced by time required to produce one worker.

* Production was increased by increased efficiency instead of ~~doub~~ increased input

* Innovation is one of the key reasons of increasing productivity
- IT is used in innovation.

#1. Impact of IT and in investment and productivity

Telework → easier to answer

* Telework ≠ means work management where employee can work from anywhere

* Factors that have increased the prevalence of telework:
  - ~~Technot~~ Internet has made home and retail connected
  - Traffic jam
  - Rising fuel price
  - Growing concerns of CO_2 emissions
  - Demand for more flexible schedule

* Advantages and Disadvantages from perspective of employee.

Advantages:
1 - people with disabilities can work from home
2 - less time on commutes
3 - can stay home to take care of sick family
4 - family-work balance
5 - less add-on and disruption from fellow workers

Disadvantages:
1 - less productive away from office
2 - may feel isolated not part of the team
3 - out of sight, out of mind
4 - work is always there
5 - cost of equipment may be considerable

* Advantages and disadvantages from perspective of employer/organization

Advantages:

1 — Less office and parking
2 — ~~less~~ morale boost of employees
3 — productivity during natural disasters and pandemic
4 — more employment is possible
5 — organization's carbon footprint can be reduced
↳ per person carbon emission

Disadvantages:

1 — ~~seen~~ potential security issues
2 — informal and spontaneous meetings become hard
3 — hard to monitor quantity and quality
4 — managing tele and ~~no~~ regular workers becomes hard
5 — support equipments may be costly
6 — potential for lost or broken equipment

C-14 (W-8) 30/05/24

Digital Divide

* Factors of Indicating Standard of Living:
- Average calories consumed
- Availability of clean drinking
- Average life expectancy
- Literacy rate
- Availability of basic freedoms
- Number of people per doctor
- Infant mortality rate
- Crime rate
- Rate of home ownership
- Availability of educational opportunities

* Another indicator is availability of ICT

*Digital Divide:

to describe the gulf . . .

+ add explanations

* digital divide within a country:

- among age groups
- economic classes
- living areas

*Find BD rural and urban citizens

*Bridges ~~to~~ to Digital Divide:

-Mobile phone

#1. What is Digital Divide? Why does it persist everywhere?

#2. How can we ~~divide~~ bridge digital divide

Impact of IT on healthcare costs

* To really gain . . . in a number of ways.

Tele health

* ~~prov~~ employe electronic information . — .

#What is telemedicine?

* Telemedicine:

medical care to people at another location

* Three methods:

(i) — store and forward : Store data → Send to doctors

(ii) — Live medicine : Video call your doctors

(iii) - Remote monitoring : watch the patient's vital signs

* Dont trust every mobile app medicines

Globalization and Human Rights

#What is Globalization?

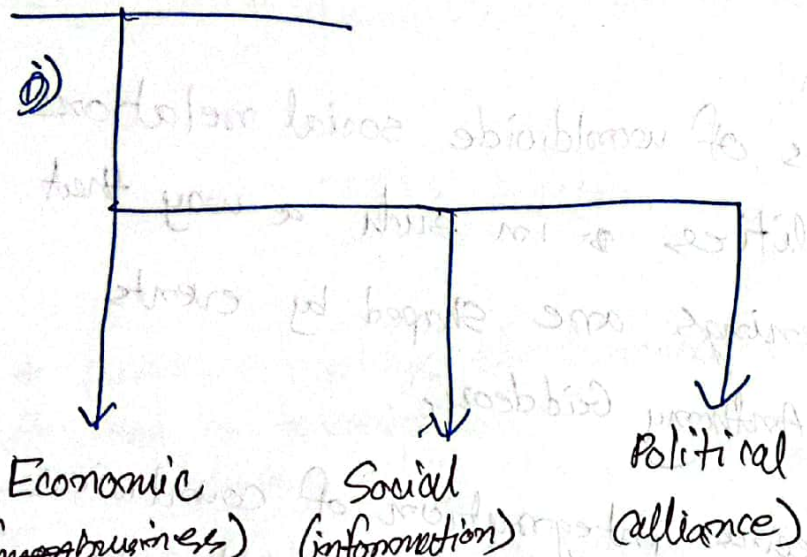
*Globalization:

"the intensifications of worldwide social relations which link distinct localities in such a way that the local happenings are shaped by events occurring miles away" ~ Anthony Giddeons.

Globalization means integration of countries through commerce, transfer of technology, and exchange of information and culture.

C-15 (W-9) 05/06/24

Globalization :



3rd Quiz → IT
10th week
4th Quiz → Globalization
13th week

JED
SD
PA
HPIAAC

Causes of Globalization :

i) Improved ~~Globalization~~ Communications :

- MNCs (Multinational ~~Companies~~ Corporation)
- Telecommunication (TV, wireless)

ii) Improvement of ~~Transportation~~ :

iii) Free Trade Agreements :

- MNCs trade
- IMF loans

iv) Global Banking :

- Free flow of money across countries

v) The Growth of MNCs:

- Growth of MNC
  - Advantages of MNC

*Multi National Corporations:

Organizations who have established business in more than one country, are called multinational corporation.

- HQ in home
- Business extended ~~upto~~ many host country.
- Western ones do business in less economically developed countries

Advantages:

i) Inexpensive labor
ii) Availability natural resources
iii) Conductive - tax atmosphere
iv) Virgin market for products

Benefits:

i) Fresh job opportunities
ii) Jobs with higher remuneration and challenges
iii) Transfers of technology

C-16 (W-9) 06/05/24

#Conceptidlize ~~Huma~~ Globalization and Human Rights.
#Rights MNCs have to think about

Human Rights: (Fundamental Rights / ~~Bir~~ Birth Rights)

Human rights is defined as all those rights which are essential for the protection and maintenance of dignity of individuals and create conditions in which every human beings can develop his ~~pro~~ personality to the fullest to the fullest ~~extent~~ extent may be termed as human rights

*State's ~~right~~ duty to protect human rights

International Human Rights:

At international level, the orgaizations are expected to ~~the m~~ to adopt the minimum levels of

a) values, such as mutual support, loyalty and reciprocit
b) the negative duty of refraining from harmful actions such as violence and fraud
c) basic fairness and practical justice in case of conflicts.

*International Rights:

i) Freedom of movement
ii) Ownership of properties
iii) Freedom from ~~from~~ torture
iv) Fair trial on products
v) No discrimination
vi) Physical Security
vii) Freedom of speech
viii) ~~Right~~ Education
ix) Political participation
x) Live and exist

Technology Transfer

- Moving technology to a new setting and implementing it there
- hardware and techniques.
- May mean moving the technology applications from laboratory to the field/factory or from one country to another
- affected by governments, organizations, universities and MNCs.

Appropriate Technology:

- Identification, transfer, and implementation of the most suitable technology for a set of new situations is called appropriate technology.

Factors:

Economic: Can we afford it?

Social: Is it socially acceptable?
will it be able to fit in the climate conditions?

Engineering Constraints:

Accessibility > Latest Technologies

- The term "appropriate" is value based and it should ensure fulfilment of the human needs and protection of the environment.

C-16(10-9)

05/05/24

*Powers make speaks the truth

MNCs and Morality

The economic and environmental conditions of the home and host countries may vary. But the multinational institutions have to adopt appropriate measures not to disturb or dislocate the social and living conditions and cultures of the host countries. A few principles are enlisted here:

1. MNC should respect the basic human rights of the people of the host countries. → respect people

2. The activities of the MNC should give economic and transfer technical benefits, and implement welfare measures of the workers of the host countries. → help workers

3. The business practices of the multinational organizations should improve and promote morally justified institutions in the host countries. → morally justification

i. What morality do MNCs have to follow?

ii. Case study of Bhopal

4. The multinationals must respect the laws and political set up, besides cultures and promote the cultures of the host countries.
↳ respect laws

5. The multinational organizations should provide a fair remuneration to the employees of the host countries. If the remuneration is high as that of home country, this may create tensions and if it is too low it will lead to exploitation. → pay people

6. Multinational institutions should provide necessary safety for the workers when they are engaged in hazardous activities and 'informed consent' should be obtained from them. Adequate compensation should be paid to them for the additional risks undertaken. → save the people