

Course: Science, Technology and Society

Professor: Sambit Mallick

Department: Humanities and Social Sciences

Institute: IIT Guwahati

Week: 12 (Science and Technology in India)

Lecture: 34 (Science Policies in India)

In this lecture, we will move on from reception of modern science in India to the post- colonial science policy engineering and we will end our lectures, end this course itself in the section on Science Policy Engineering. Initial evaluation of western science as a knowledge system in relation to Indian culture influenced the perspectives on modern science and technology that the Indian intelligentsia developed. That we have seen in the context of building scientific institutions in India.

I mean in the context of reception of modern science in India. One can infer two paradigms of thought as to the question of the implantation of modern science and technology in India during the colonial period. One was led by no less a person than Mahatma Gandhi, which is vision of Khadi, homespun cloth.

The other stream was led by , Pandit Jawaharlal Nehru, along with Mokshagundam Vishweshwaraya, Subhash Chandra Bose and eminent scientists like Meghnad Saha and Homi Bhava with a vision of rapid industrialism. As a result, there were tensions between the custodians of traditional knowledge systems in relation to modern science and the supporters of modern scientific knowledge, which gave rise to the debates over Khadi versus modern manufacturing industries, indigenous technology versus imported technology for manufacturing, agriculture versus industry, centralized versus decentralized planning, small scale versus large scale industries, pure research versus applied research and so on and so forth. Despite initial reservations about the transformative potential of modern science and technology epitomized by Gandhi's perspective and the possibility of promoting living traditions of knowledge in India, it became increasingly clear that modern science and technology had to be given a prominent place in the process of nation building in the realms of economic culture and policy.

The debate was, however, on the relative importance to be given to agriculture and industry and the scale on which modern science and technology had to be deployed. One sees a clear alliance between the political elite and the scientific elite drawn from different linguistic, religious and caste groups, most of whom were educated in western science and technology in conceptualizing the role of modern science and technology in India, in modern science and technology in nation building itself. In the visions of most of the nationalist political elites and scientific elites, who shared the view what science teach and its potential to transform consciousness and production systems, anti-imperialist and anti-colonialist ideologies were the common elements that created the alliance between the scientific and political elites during the colonial period.

In the case of western nations, the alliance between science and politics was forced in situations of war and imperialist expansion, whereas in colonized nations such as India, such alliance between science and politics was forced as a response to imperialism and colonialism and the urge to build an independent nation free from imperialist yoke, imperialist exploitation which forced the alliance between political elites, scientific elites and other sections of the Indian intelligentsia. I mean industrial elites. if you look at the suppose the way TIFR was built, it was the vision of Nehru, Bhabha and the Tatas, the alliance between the scientific, political and industrial elites of the country. The value system which placed modern science and technology on a higher pedestal vis-a-vis the traditional systems of knowledge guided the science policy in post-colonial India as reflected in the scientific policy resolution of 1958.

Now, from here onward what we will do, we will discuss the scientific policy resolution of 1958, then the technology policy statement of 1983 and the , science and technology policy of 2003 and then the Science Technology And Innovation Policy 2013 and within this policy of Science Technology And Innovation Policy of 2013, we will also discuss the question of IPR, trademark, copyright and so on. And then we will end this course here, and then we will discuss only from the very beginning what we have already discussed. Now, let us start with the scientific policy resolution.

The scientific policy resolution of 1958 which was a by-product of the alliance between the scientific and political elites in the post-colonial phase, which of course, started during the colonial period. This SPR shortly, I mean the scientific policy resolution of 1958 indicates that the key to national prosperity apart from the spirit of the people lies in the modern age in the

effective combination of three factors. What are those three factors? The technology, raw materials and capital of which technology is perhaps the most important since the creation and adoption of new scientific techniques can in fact, make up for a deficiency in natural resources and reduce the demands on capital.

But technology can grow, can only grow out of the study of science and its application. The dominating, feature of the contemporary world is the intense cultivation of science on a large scale and its application to meet a country's requirements. It is this which for the first time in human history has given to the common individuals in countries advanced in science, a standard of living and socio-cultural amenities which were once confined to a very small privileged minority of the populace.

Science has led to the growth and diffusion of culture to an extent never possible before. It has not only radically altered individual's material environment, but what is of still deeper significance, it has improved, it has provided new tools of thought and has extended the individual's mental horizons. It has thus influenced even the basic values of life and given to civilization a new vitality and a new dynamism.

It is only through the scientific approach and method and the use of scientific knowledge that reasonable material and cultural amenities and services can be provided for every member of the community and it is out of recognition of this possibility that the idea of a welfare state has grown. It is characteristic of the present world that the progress towards the practical realization of a welfare state differs widely from country to country in direct relation to the extent of industrialization and the effort and resources applied in the pursuit of science. The wealth and prosperity of a nation depend on the effective utilization of its human and material resources through industrialization.

Scientific Policy Resolution 1958

Preamble

□Characteristic of the present world that the progress towards the practical realisation of a welfare state differs widely from country to country in direct relation to the extent of industrialisation and the effort and resources applied in the pursuit of science.

□Science has developed at an ever-increasing pace since the beginning of the century, so that the gap between the advanced and backward countries has widened more and more. It is only by adopting the most vigorous measures and by putting forward our utmost effort into the development of science that we can bridge the gap.

The use of human material for industrialization demands its education in science and training in technical skills. Industry opens up possibilities of greater fulfillment for the individual. India's enormous resources of manpower can only become an asset in the modern world when trained and educated and it is, explicitly this policy which was one of the major reasons for the creation of IITs in India (Indian Institute Of Technology) , and this policy resolution suggests that science and technology can make up for deficiencies in raw materials by providing substitutes or indeed by providing skills which can be exported in return for raw materials. In industrializing a country, heavy price has to be paid in importing science and technology in the form of plant and machinery, highly paid personnel and technical consultants. An early and large scale development of science and technology in the country could, therefore, greatly reduce the drain on capital during the early and critical stages of industrialization.

Science has developed at an ever increasing pace since the beginning of the 20th century at least in the advanced countries and the way it has developed since the beginning of the 20th century, so that the gap between the advanced and backward countries has widened more and more. Because backward countries when I say, I mean, they are basically colonized nations. It is, only by adopting the most vigorous measures and by putting forward our utmost effort into the development of science, so that we can bridge the gap. It is an inherent obligation of a great country like India with its traditions of scholarship and original thinking and, and its great

cultural heritage to participate fully in the march of science which is probably mankind's greatest enterprise today.

Scientific Policy Resolution 1958

Policy

- to **foster, promote, and sustain**, by all appropriate means, the cultivation of science, and scientific research in all its aspects - pure, applied, and educational;
- to ensure an adequate supply, within the country, of research scientists of the highest quality, and to recognize their work as an important component of the strength of the nation;
- to fulfil the country's needs in science and education, agriculture and industry, and defence;
- to encourage individual initiative for the acquisition and dissemination of knowledge, and for the discovery of new knowledge, in an atmosphere of academic freedom.

The, government of India in accordance with these formulations decided that the aims of the scientific policy will be first to, to foster, promote and sustain by all appropriate means the cultivation of science and scientific research in all its aspects. It may be pure, , , pure means basic, it may be applied or it may be educational. Secondly, to ensure an adequate supply within the country, within India of research scientists of the highest quality and to recognize their work as an important component of the strength of the nation. That is why the system of awards, rewards, recognitions, they came up in Indian science among the scientific community in India. To, tencourage, thirdly, to encourage and initiate with all possible speed programs for the training of scientific and technical personnel on a scale, adequate to fulfill the country's needs in science, education, agriculture, industry, defense and so on. Fourthly, to ensure that the creative talent of both women and men is encouraged and finds full scope in scientific activity. And finally, that to encourage individual initiative for the acquisition and dissemination of knowledge and for the discovery of, , knowledge in an atmosphere of academic freedom.

This, component of academic freedom is very important. When academic freedom , is under fire, it is our utmost responsibility to rise to the occasion. To to those who try to squeeze academic freedom.

And, finally, in general to secure for the people of the country all the benefits that can accrue from the acquisition and application of scientific knowledge. The government of India decided

to pursue and accomplish these aims by offering good conditions of service to scientists and, and provided them with honored positions by associating scientists with the formulation of policies and by taking such other measures over a period of time. , and this policy resolution was also framed, if you look at deeply the first prime minister of India, Nehru, he was also influenced by the way science and technology developed in the erstwhile USSR, Soviet model of science and technology.

That is why you will find wherever , the aim of science was mentioned, the aim of science also was to maintain equality of opportunities to do science, equality of opportunities to evaluate any knowledge for academic freedom, freedom to dissent and so on. Then, what happened after the scientific policy resolution of 1958 and thereby we by the time scientific policy resolution was enshrined by the government of India in 1958, we had already seen one industrial policy resolution of 1948 and then subsequently in 1956, that industrial policy resolution. And we have also witnessed 5 year plan starting from 1951, 1951 to 56, the first 5 year plan emphasized on agriculture, the second 5 year plan emphasized on industry, I mean 1956 to 1961.

In the 1960s, India faced acute food shortages, that is why you will find the planned holidays were there, for 3 years, 1966 to 1969. India tried to apply all its technical artifacts to increase agricultural productivity, that is how we witnessed a phenomenon called the green revolution in the 1960s and mid 1960s and 1970s. Green revolution, no doubt it increased agricultural productivity, hybrid seed was introduced for the first time in agriculture in India, but it also, as we all know that it also increased regional disparity and so on.

, but the context was to build more and more technology, how to make science more and more applied. Then, science for its own sake to science having applications had to be brought, this transition had to take place. As a consequence of which in the year 1983, the government of India tried to formulate a technology policy statement.

Technology Policy Statement 1983

Preamble

- economic independence and the alleviation of the burden of poverty; immediate need of attainment of technological self-reliance; improvement in the conditions of the weakest sections of the population and the speedy development of backward regions
- Technology must be viewed in the broadest sense, covering the agricultural and the services sectors along with the obvious manufacturing sector
- mixed economy involves the operation of the private, public and joint sectors, including those with foreign equity participation.

The preamble, the preamble of the, technology policy statement of 1983 by the government of India, suggests that political freedom must lead to economic independence and the alleviation of the burden of poverty. We have, regarded science and technology as the basis of economic progress as a result of 3 decades of planning by 1983, I mean 50s, 60s and 70s, 3 decades of planning. And the scientific policy resolution of 1958, we now have a strong agricultural and industrial base and a scientific manpower impressive in quality numbers and range of skills, because by that time we had already witnessed the green revolution.

Given clear cut objectives and the necessary support, our science has shown its capacity to solve problems, I mean real world problems. The frontiers of knowledge are being extended at incredible speed, opening up wholly new areas and introducing new concepts. Technological advances are influencing lifestyles as well as societal expectations.

Technology Policy Statement 1983

Policy

- attain technological competence and self-reliance, to reduce vulnerability, particularly in strategic and critical areas;
- provide the maximum gainful and satisfying employment to all strata of society, with emphasis on the employment of women and weaker sections of society;
- use traditional skills and capabilities, making them commercially competitive; making the maximum use of indigenous resources
- ensure the correct mix between mass production technologies and production by the masses; ensure maximum development with minimum capital outlay;

The, use and development of technology must relate to the people's aspirations. Our, our own immediate needs in India in, 1983, when the technology policy statement was enshrined by the government of India, where the attainment of technological self-reliance, a swift and tangible improvement in the conditions of the weakest sections of the population and the speedy development of backward regimes. as India is known for its diversity, technology must suit local needs and to make an impact on the lives of ordinary citizens, technology must give constant thought to even small improvements, which could make better and more cost effective use of existing materials and methods of work.

The development must be based on our own culture, cultural specificities. The future depends on our ability to resist the imposition of technology, which is obsolete and or unrelated to our specific requirements and of policies, which tie us to systems, which serve the purposes of others rather than our own and on our success in dealing with vested interests in our organizations, namely governmental, economic, social and even intellectual, which bind us to outmoded systems and institutions. Technology must be viewed in the broadest sense, covering the agricultural and the services sectors along with the obvious manufacturing sector.

The, manufacturing sector stretches over a wide spectrum ranging from village, small scale and cottage industries often based on traditional skills to modern heavy and sophisticated industries. The philosophy, the, of a mixed economy involves the operation of the private, public and joint sectors including those with foreign equity participation. The, directives must clearly define systems for the choice of technology taking into account economic, social and

cultural factors with technical considerations, indigenous development and support to technology. And utilization of such technology, acquisition of technology through import and its subsequent absorption, adaptation and upgradation ensuring competitiveness at international levels in all necessary areas and establishing links between the various elements concerned with generation of technology, its transformation into economically utilizable form.

The, sector responsible for production, which is the user of such technology, financial institutions concerned with the resources needed for these activities and the promotional and regulating arms of the government. And, this technology policy statement of 1983 is in response to the need for guidelines to cover this wide ranging and complex set of interrelated areas. Keeping in mind the , capital scarce character of a developing economy, it aims at ensuring that our available natural endowments especially human resources are optimally utilized for a continuing increase in the well- being of all sections of our population.

We, seek technological advancement not for prestige or aggrandizement, but to solve our multifarious problems and to be able to safeguard our independence and our unity. Our, development far from diminishing the enormous diversity of our regional traditions should help us enrich them and to make the ancient wisdom of our nation more meaningful to our people. Our task is gigantic and calls for close coordination between the different departments of the central and state governments and also of those concerned at all levels with any sector of economic, scientific or technological activity and not least the understanding and involvement of the entire Indian population.

We must, look particularly to young people to bring a scientific attitude of mind to bear on all our problems. Then, if you look at the aims and objectives of the technology policy statement of 1983, what we generally find is that the policy aim to attain technological competence and self- reliance. It aims to reduce vulnerability particularly in strategic and critical areas.

It aims to provide the maximum gainful and satisfying employment to all strata of society with emphasis on the employment of women and weaker sections of the society to use traditional skills and capabilities making them commercially competitive, making the maximum use of indigenous resources, may be handloom products to ensure the correct mix between mass production technologies and production by the masses to ensure maximum development with minimum capital outlay.

Technology Policy Statement 1983

- ❑ identify obsolescence of technology in use and arrange for modernization of both equipment and technology; develop technologies which are internationally competitive, particularly those with export potential;
- ❑ improve production speedily through greater efficiency and fuller utilization of existing capabilities, and enhance the quality and reliability of performance and output;
- ❑ reduce demands on energy, particularly energy from non-renewable sources; ensure harmony with the environment, preserve the ecological balance and improve the quality of the habitat;
- ❑ recycle waste material and make full utilization of by-products.

To identify obsolescence of technology in use and, and arrange for the development of both equipment and technology, to develop technologies which are internationally competitive, particularly those with export potential, to improve production speedily through greater efficiency and fuller utilization of existing capabilities and enhance the quality and reliability of performance and output, to reduce demands on energy, particularly energy from non-renewable resources to ensure harmony with the environment, preserve the ecological balance and improve the quality of the habitat, and finally, to recycle waste material and make full utilization of by-products. Then what are the essential points of the technology policy statement of 1983? One, self-reliance, strengthening of the technological base secondly, thirdly, need for prospective planning, in the case of employment, energy, efficiency and productivity, environment protection and sustainable development, development of indigenous technology, importance of technology development, inventions, enhancing traditional skills and capabilities, ensuring timely availability, increasing the demand for indigenous technology, design engineering, fiscal incentives, engineering consultancy, in-house research and development and so on. And then technology acquisition, when we say, within that we try to cover, this policy statement, technology policy statement try to cover mix of indigenous and imported technologies, principles of acquisition and technology assessment. What do we mean by the acquisition of technology? The basic principles governing the acquisition of technology include import of technology, foreign investment, , which will continue to be permitted only

on a selective basis, I mean government from time to time may identify and notify such areas of high national priority in respect of which procedures would be simplified further to ensure timely acquisition of the required technology.

And there shall be a firm commitment for absorption, adaptation and subsequent development of imported know-how through adequate investment in research and development (R& D) to which importers of technology will be expected to contribute. absorption of technology was important, was given prominence, technological information, technology transfer, diffusion of technology, international competitiveness and technology exports, technical cooperation among developing countries was also required. Developing countries, when I say, I mean including and mostly colonized nations, newly independent, newly politically independent nations, legislative framework was developed to protect our own products and how to implement it. And, and the way the Technology Policy Statement of 1983 envisioned Indian science and technology that must unlock the creative potential of our people, of the Indian population and help in building the India of our dreams, that was the thing.

Then what we saw after 1983 there are at least two events, which are very important, but we must keep those two events in mind when we discuss science and technology of the 90s and the 21st century at least till today. One was the debacle of socialism in the erst while USSR in 1989 and in 1991 India adopted the new economic policy the principles of which were liberalization, privatization and globalization, shortly known as LPG. In 1995 India became signatory to the WTO documents, negotiations, agreements.

Then what happened earlier, it does not imply that India became signatory to WTO agreements in vacuum, but it was also a policy which was adopted by the government of India in 1991, the new economic policy. In 1970 India had its first patent act which suggests that one can arrive at the same product by using different processes. Then the 1970 patents act in India was subject to only Process Patents.

If I want to produce a refrigerator, if I want to produce this laptop, this camera, I can produce this laptop or camera or refrigerator or television by using different processes. In 1995 when India became signatory to WTO agreements as a part of that agreement after 10 years of the compliance with the WTO agreements in 2005 India became, I mean India entered the phase of product patent regime. now you cannot arrive at the same product also by using different processes.

That is why the New Patents Act of 2005 was subject to both processes as well as products. That is why you will find that the prices of medicines, the prices of seeds have increased by leaps and bounds after India adopted the product patent regime. India entered into the phase of product patent regime in 2005.

We will come to this point after discussing, this is also important, this is a background to initiate a discussion on the science and technology policy of 2003 whereby the government of India, wanted to integrate both science and technology. You will find that in 1958 and 1983 science and technology were treated as separate entities, whereas in 2003 the government of India wanted to integrate both science and technology.

preamble suggests that science and technology have profoundly influenced the course of human civilization. Science has provided us with remarkable insights into the world we live in. The scientific revolutions in the 20th century have led to many technologies, which promise to herald wholly new eras in many fields.

As we stand today at the beginning of the 21st century, we have to ensure the fullest use of these developments for the well- being of our people. Science and technology have been an integral part of Indian civilization and culture over the past several millennia, that is what the document suggests. Science and technology have had unprecedented impact on economic growth as well as social development.

Knowledge has become a source of economic might and power, that is what we discussed in the context of the information society, how knowledge is being treated as a commodity, how knowledge has been transformed into power. That is why knowledge is power. This has led to increased restrictions on sharing of knowledge to new norms of Intellectual Property Rights and to global trade and technology controlled regimes.

Science and Technology Policy 2003

Policy: Recognizing the changing context of the scientific enterprise, and to meet present national needs in the new era of globalisation, Government of India enunciates the following objectives of its Science and Technology Policy 2003:

- ❑ To ensure food, agricultural, nutritional, environmental, water, health and energy security of the people on a sustainable basis
 - ❑ To promote the empowerment of women in all science and technology activities and ensure their full and equal participation
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Scientific and technological developments have deep ethical, legal and social implications. When we look at the policy itself, the government of India enunciates certain objectives of this policy, of this science and technology policy of 2003. the policy aim to ensure that the message of science reaches every Indian citizen, whether women or man, young, old, so that we advance scientific temper, emerge as a progressive and enlightened society and make it possible for all our people to participate fully in the development of science and technology and its application for human welfare.

Indeed science and technology must be fully integrated with all spheres of national activity. To ensure food, agricultural, nutritional, environmental, water, health and energy security of the people on a sustainable basis. To mount a direct and sustained effort on the alleviation of poverty, enhancing livelihood, security, removal of hunger and malnutrition, reduction of drudgery and regional imbalances both rural as well as urban and generation of employment by using scientific and technological capabilities along with our traditional knowledge pool.

This will call for the generation and screening of all relevant technologies, their widespread dissemination through networking and support for the vast unorganized sector of our economy. To vigorously foster scientific research in universities and other academic, scientific and engineering institutions and attract the brightest young persons to careers in science and technology by conveying a sense of excitement concerning the advancing frontiers and by creating suitable employment opportunities for them. Also to build and maintain centers of

excellence which will raise the level of work in selected areas to the highest international standards.

To promote the empowerment of women in all science and technology activities and ensure their full and equal participation. To provide necessary autonomy and freedom of functioning for all academic and R&D institutions. So, that an ambience for truly creative work is encouraged while ensuring at the same time that the science and technology enterprise in the country is fully committed to its social responsibilities and commitments.

To use the full potential of modern science and technology to protect, preserve, evaluate, update and value to and utilize the extensive knowledge required for the over the long civilizational experience of India. To accomplish national strategic and security related objectives by using the latest advances in science and technology. To encourage research and innovation in the areas of relevance of the economy and society particularly by promoting close and productive interaction between private and public institutions in science and technology.

Sectors such as agriculture particularly soil, water management, human and animal nutrition, fisheries, water, health, education, industry, energy including renewable energy, communication and transportation would be accorded highest priority. Key leverage technologies such as information technology, biotechnology, material science and technology, nanotechnology nanotechnology came up later at that time it was mentioned would be given special importance. To establish an intellectual property right regime IPR regime which maximizes the incentives for the generation and protection of intellectual property by all its inventors.

this IPR regime, this policy maintained would also provide a strong supportive and comprehensive policy environment for speedy and effective domestic commercialization of such inventions as so as to be maximal in the public interest. To ensure in an era in which information is key to the development of science and technology that all efforts are made to have high speed access to information both in terms of quality and quantity at afford at affordable costs and also create digitized valid and usable content of Indian origin. To encourage research and application for forecasting prevention and mitigation of natural hazards particularly floods, cyclones, earthquakes, droughts and landslides.

To promote international science and technology cooperation towards achieving the goals of national development and security and make it a key element of our international relations. And finally, to integrate scientific knowledge with insights from other disciplines and ensure fullest involvement of scientists and technologists in national importance. So, that the spirit and methods of scientific enquiry permeate deeply into all areas of public policy making this is where we were involved in this IPR regime.

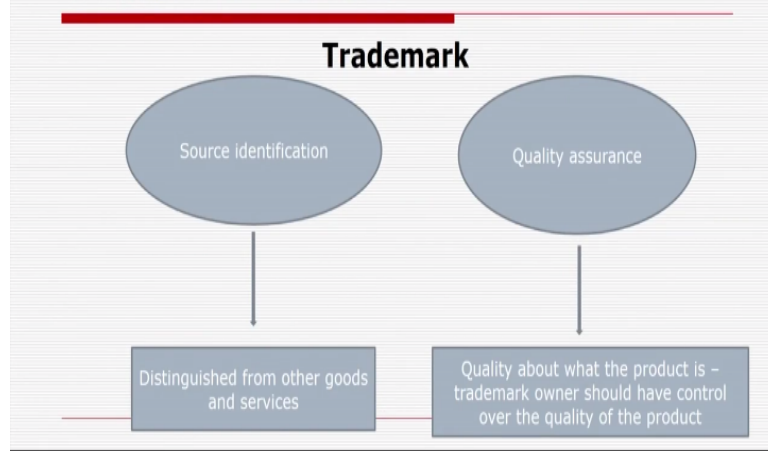
The Science, Technology and Innovation Policy 2013

- The Prime Minister of India, at the Indian Science Congress-2010 declared 2010-20 as the "Decade of Innovations" and formed the National Innovation Council.
- The STI Policy 2013 is in furtherance of the declaration and aims to bring fresh perspectives to bear on innovation in the changing context. The policy thus seeks to focus on both people for science and science for people and combine the benefits of excellence and relevance.
- India's STI system needs to deliver solutions to address the pressing national challenges of energy and food security, nutrition, affordable health care, environment, water and sanitation and above all employment.

we must innovate and we are innovating not for public use, but to protect our innovation. the commercial the political dimensions must be understood. As a consequence of which we made a shift from the science and technology policy of 2003 to the Science Technology And Innovation Policy of 2013. And the background to the context of innovation must be understood in the context of the WTO provisions on the IPR (Intellectual Property Rights Regime).

World Trade Organization provisions on the Intellectual Property Rights. And India has been compliant with the US dictated IPR regime precisely because we will discuss how till now we have not yet been able to build an independent science policy in India. That is a different story all together. Either we are influenced by the erstwhile USSR after India's independence. And perhaps after Jawaharlal Nehru we are more and more influenced by the North American hegemonic science policies.

What is a trademark?



Before discussing the Science Technology And Innovation Policy of 2013 quickly we will discuss how we are involved in this regime where trademark copyright patents now they have become the decisive factors for the way in which we must carry out our science, we must practice our science, we must practice our technology, we must develop our technology. when you look at a trademark trademark can be discussed at two levels one is source identification and the other quality assurance.

☐ Trademark, copyright and patent: are all of them same?

☒ No

☐ A trademark is always a word

☒ No

And when I say source identification it must be distinguished from other goods and services when I talk about quality assurance I must look at the quality about what the product is. Trademark owner should have control over the quality of the product. Trademark, copyright, patent are the same? No, their purposes are different, their requirements are different, r these

terms themselves are different.

❑ Trademark, copyright and patent

- Purposes are different
 - Requirements are different
 - Terms are different.
-

Then what is a trademark? A trademark under the trade aspects of Intellectual Property Rights. A trademark may be words, numerals, figurative elements, combination of colors or any combination thereof.

Trademark in the United States of America

❑ In the United States of America, a trademark may be:

- Word, name, symbol, device, any combination thereof;
 - To identify and distinguish goods from those manufactured or sold by others and to indicate the source of the goods.
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Trademark in the context of United States of America it may be a word, a name, symbol, device or any combination thereof to identify and distinguish goods from those manufactured or sold by others and to indicate the source of the goods.

Trademark under TRIPS

- A trademark under the Trade Related Aspects of Intellectual Property Rights (TRIPS) may be:
 - Words, numerals, figurative elements, combination of colours, or any combination thereof.

Trademark in Asia

- In Asia, a trademark may be:
 - Any sign with distinctiveness, which may consist of, but not limit to, word (letter, character), device, symbol, colour, three-dimensional shape, motion, hologram, sound, or any combination thereof.

Then what is a trademark in Asia? Now, any sign with distinctiveness which may consist of, but not limit to word or letter or character, device, symbol, color, 3 dimensional shape (3D shape) motion, hologram, sound or any combination thereof.

☐ A trademark may be:

☐ Fragrance?

☐ No

☐ Can ® and ™ be used interchangeably?

☐ No

Can registered mark and trademark be used interchangeably? No, because trademark is intended to be used as a trademark I mean trademark is a generic term that can never be registered.

However, some marks become genericized because of improper use. Suppose, I want to make a photocopy of a study material, but we generally say please do the xerox please xerox it, but

that is wrong. Xerox is the name of a company. We must say that we want to make a photocopies.

We very often say you google it, but actually google is the name of a company. We must say search it. That is why some marks have become genericized because of improper use. There are five types of marks fanciful mark, arbitrary mark, suggestive mark, descriptive mark and generic mark.

Fanciful mark is a coined term. Microsoft, HTC and so on. Arbitrary mark, existing term, but arbitrary association with goods like apple, apple mac, Suggestive mark which requires some imagination I pad. Descriptive mark which describes the product plus secondary meaning is equal to registrability. Whereas, generic mark can never be registered that is why initially I said registered mark and trademark cannot be used interchangeably.

Fanciful mark, arbitrary mark and suggestive mark are inherently distinctive. some creativity is involved, but descriptive mark and generic mark are characterized by distinctiveness, but not inherent. A descriptive mark may become distinctive by obtaining secondary meaning through use and trademark rights one means territorial. when you register your trademark, it may be domestic, may be international. Under domestic there are common laws versus state registration versus federal registration and so on. When you come to international registration there are three stages- home registration, international registration, national registration. For example, Madrid protocol in Spain trademark rights are conditioned on use.

What is your intent to use? What is the purpose to use? One has to use trademark use purpose that source identification and non-use of trademark may result in its cancellation. Further, one has to use trademark right one cannot alter one's trademark . Using altered trademark may constitute infringement. Having quickly browsed the essential components of trademark copyright and patents, what are the essential characteristics of, what are the criteria for attaining patents? Novelty one, non-obviousness two and industrial utility applicability three.

When we discuss these aspects we must keep this in mind. I mean when we are discussing the Science Technology And Innovation Policy of 2013 by the government of India. We must keep these technicalities in mind- WTA provisions on IPR, how India has become a signatory to WTOA agreements, what is a process patent regime, what is a product patent regime,

trademarks, copyright, patents and so on. Because innovation has become quite integral to, though innovation was very much integral was very much integral to the formulation of science and technology policy of 2003, but here innovation has been made absolutely explicit in the context of the Science Technology And Innovation Policy of 2013 by the government of India.

Scientific Policy Resolution 1958

Preamble

- Characteristic of the present world that the progress towards the practical realisation of a welfare state differs widely from country to country in direct relation to the extent of industrialisation and the effort and resources applied in the pursuit of science.
- Science has developed at an ever-increasing pace since the beginning of the century, so that the gap between the advanced and backward countries has widened more and more. It is only by adopting the most vigorous measures and by putting forward our utmost effort into the development of science that we can bridge the gap.

In 2010 at the Indian government Indian science congress association the then prime minister of India declared 2010 to 2020 as the decade of innovations and formed the national innovation council. This STI policies (the Science Technology And Innovation Policy of 2013) has emerged as the major these three aspects in fact- science, technology and innovation-they have emerged as the major drivers of socio economic development global.

India of the 21st century is an aspiring country. Faster, sustainable and inclusive growth is India's aspiration. Science, technology and innovation leading to applications of products of research and development R&D. which will need to play defining roles. The large demographic dividend and talent pool of the country offer unique opportunities. The National Science Technology And Innovation enterprise for earning for itself a central position in national development through its excellence, relevance and performance. Then what is innovation? scientific research converts money into knowledge and innovation converts knowledge into wealth.

Innovation is more than mere conversion of knowledge into a workable technology. it implies a science and technology solution that is successfully deployed in the economy or society and India has hitherto accorded little importance to this aspect. There is now an urgent need to

invigorate this aspect of the national science, technology and innovation enterprise. That was mentioned in the Science Technology And Innovation Policy of 2013. The Science Technology And Innovation Policy of 2013 is in furtherance of the declaration and aims to bring fresh perspectives to bear on innovation in the changing context.

The policy thus seeks to focus on both people for science and science for people and combine the benefits of excellence and relevance. India's science, technology and innovation system needs to deliver solutions to address the pressing national challenges of energy and food security, nutrition, affordable health care, environment, water, sanitation and above all employment. The the key elements of the Science Technology And Innovation Policy are to promote proliferation of scientific temper amongst all sections of the society, to enhance skill for applications of science among the young from all social strata, to make careers in science research and innovation attractive to the brightest minds, to establish world class R&D infrastructure for gaining global leadership in some select frontier areas of science, to position India, to situate India, to locate India among the top five global scientific powers by 2020, to link contributions of science research and innovation systems with inclusive economic growth agenda and combine priorities of excellence with relevance, to migrate R&D outputs into commercial applications by replicating hitherto successful models as well as establishment of new structures, to facilitate science and technology based high risk innovations through new mechanisms and to trigger changes in the mind set and value systems to recognize, respect and reward performances which create wealth from science and technology derived knowledge.

The Science, Technology and Innovation Policy 2013

- Linking contributions of science, research and innovation system with inclusive economic growth agenda and combine priorities of excellence with relevance
- Migrating R&D outputs into commercial applications by replicating hitherto successful models as well as establishment of new structures
- Facilitating S&T-based high-risk innovations through new mechanisms
- Triggering changes in the mindset and value systems to recognize, respect and reward performances which create wealth from S&T derived knowledge.

Now, what what we have learnt from the Science Technology And Innovation Policy, you can look at the reviews which were published in Economic And Political Weekly in Current Science and so on. I mean professor V. V. Krishna wrote the way Science Technology And Innovation Policy of 2013 by the government of India has been prepared. It is only high on hopes, but it is not sustainable precisely because of the ways in which they have been designed.

we will give you the links to these these lectures and in the next lecture what we are going to do, we are going to have a brief overview of the entire course starting from the cognitive questions, ethical questions, methodological questions, technological shaping of society, social shaping of technology, then reception of modern science in India and science policies in India in the next lecture and there we will end the course. Thank you.