INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

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NPTEL ONLINE CERTIFICATION COURSE
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Science, Technology and Society

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In this lecture we will move upon from reception of modern science in India to the post-colonial science policy journal and we will end our lectures in this course itself in the section on science policy Jimmy initial evaluation of Western science as a journalist system.

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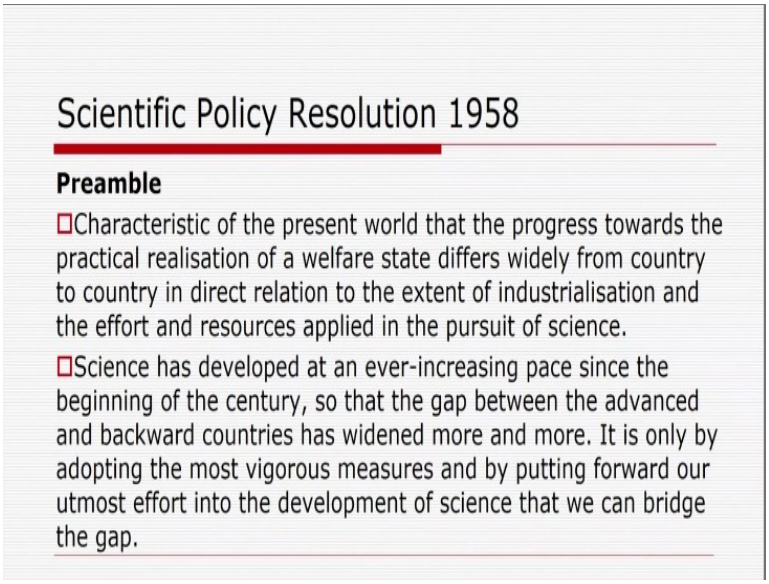

In relation to an Indian culture influenced the perspectives on modern science and technology that the Indian intelligence he had developed that we have seen in the context of building scientific institutions in India. I mean in the context of reception of modern sciences okay one

can refer to one can infer two paradigms of thought as to the question of the implantation of modern science in technology in India during the common.

One was led by no less a person than Gandhi not morality which is vision of kadhi homespun taught the other stream was led by Nehru that is Jawaharlal Nehru along with moxuan Domatiums Raya Subash Chandra Bose and eminent scientists like Meghan Saga an Omaha with a vision of rapid in astrology as original 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 kadhi versus modern manufacturing industries indigenous technology versus imported technology for manufacturing agriculture versus industry centralized versus decentralized planning in a small scale versus large industries do research versus applied research and so on and so 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, clear that modern science and technology had to be given prominent place in, in the process of nation-building in the realms of economic culture and quality the debate was however on the relative importance to be given to agricultural and industry and the scale on which modern science and technology had to be deployed one see the 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 English in modern science and technology nation building itself in the reasons of most of the nationalist political elites and scientific elites who said the view what science age and its open sea to transform consciousness and production systems and imperialist and anti-colonialist ideologies where the common elements that created the alliance between the scientific and political elites during the colony in the case of Western nations the alliance between science and politics was

forged in situations of war and imperialist expensive where edge in colonized nations such as India.

The this 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, imperialist exploitation which forced the alliance between political elites scientific elites and other sections of the Indian intelligence okay I mean industry lanes if you look at suppose the, the, the way four was built it was the reason of Nehru Babaand the Taj I mean the alliance between the scientific political and industry leaders of the country okay.

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The value system which placed modern science and technology on a higher pedestal visa then, the traditional systems of knowledge guided the science policy in post-colonial India as reflected in the scientific policy resolution of 1958 okay now from, from here onward what we will do we will discuss the scientific policy resolution of 1958then the technology policy statement of1983 and the science technology 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.

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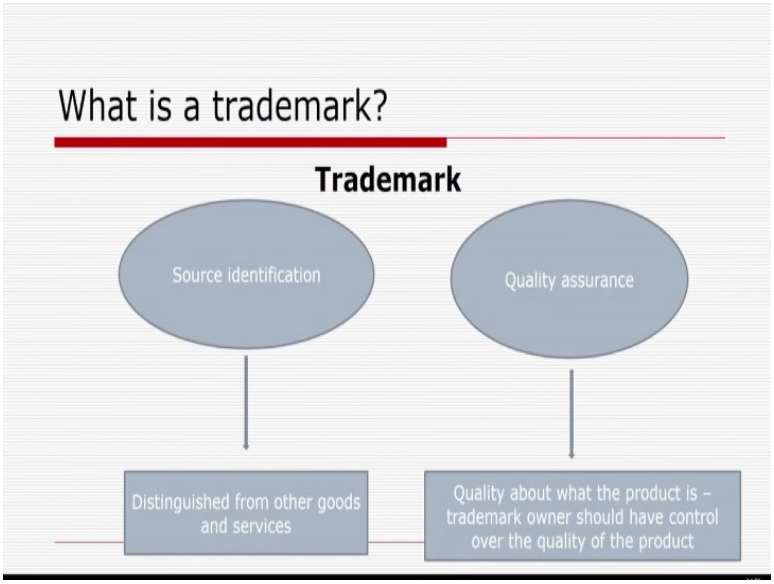

We will also discuss the question of IPR trademark copyright and so on okay.

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And then we in this course here okay after discussing the and then we will discuss only from the very beginning what we have already discussed okay now let us start with the scientific policy resolution the scientific policy resolution of 1958 which is which was a by-product of the alliance between the scientific and political elites in the post-colonial field which of course started in the prequel I mean in during the colonial period this, this SPR shortly I mean the scientific policy resolution of 1958.

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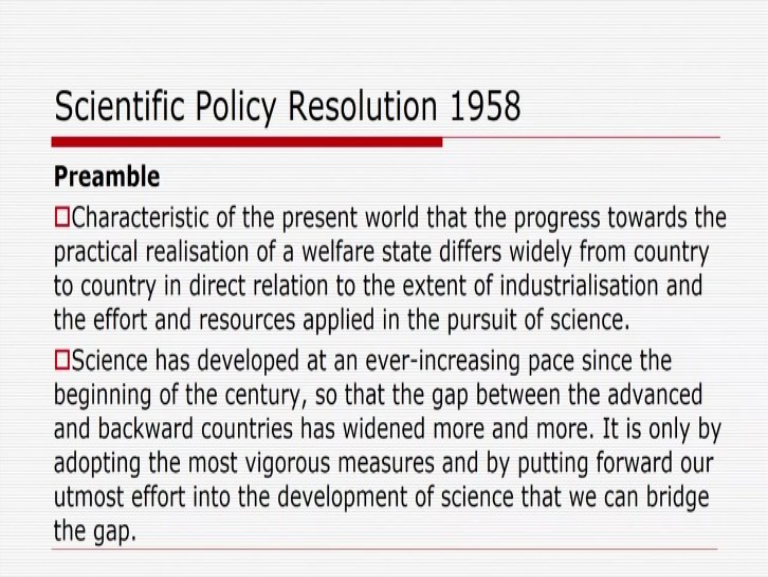

Indicates that the key to national prosperity apart from the spirit of the people lies in the modern age in the effective combination of three factors what are those three factors new technology raw materials and capital of which technology is perhaps the most important since the creation and adoption of new scientific techniques you can in fact make up for a deficiency in natural resources and reduce the demands on capital but technology can grow you can only grow out of the study of science and its application okay.

The dominating that the, 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 okay 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 population science has led to the growth and diffusion of culture to an extent never possible before.

It has not only radically altered individuals material environment but what is of still deeper significance it has in it has provided new tools of thought and has extended the individuals mental origins it has thus influenced even the basic values of life and given to civilization a new

vitality and a new dynamic it is only true 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 a recognition of this possibility that the idea a welfare state has grown it is characteristic of the present world.

That the progress towards the practical realization of a welfare state before widely from country to country in direct realists in the 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 in astrologists the huge 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 Indians enormous resources of manpower can only become an asset in the modern world when trained and educated.

And it is it is explicitly this policy which was one of the major reasons for the creation of IITs in the Indian Institute of Technology's and, and the end this, this policy 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, in astrology a country heavy price has to be paid in importing science and technology in the form of plant and machinery highly paid personal and technical consultants.

And an early and large-scale development of Science and Technology in the country could, could therefore not 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 country and the way it is 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 in essence.

It is, it is only by adopting the motion vigorous majors and by putting for who I am in 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 which 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 is greatest underpriced to the Government of India has I mean the Government of India in accordance with these formulations decided that the aims of the scientific policy will be first to, to poster promote and sustained by all appropriate means the cultivation of science and scientific research in all its aspects.

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It may be pure it may be I mean pure means basic it may be applied or it may be educational to 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 ours rewards recognitions they came up in Indian science okay among the scientific community in India to encourage thirdly to encourage and initiate with all possible speed okay 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 okay fourthly to ensure that the creative talent of both women and men is encouraged and finds full scope in scientific activity and finally not finally but last but one that to encourage individual

initiative for the acquisition and dissemination of knowledge for the and for the discovery of I mean I mean knowledge in an atmosphere of academic freedom okay this component of academic freedom is very important okay when academic freedom is, is under fire it is our most responsibility to rise to the occasion to, to, to give her a rebuff to, to give a rebuff to those who try to speech and, 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 okay.

The government of India decided to pursue and, and accomplish these aims by offering good conditions of service to scientists and according and, and, and, and provided them with honored positions by associating scientists now with the formulation of policies and by taking such other measures over a period of time but, but and, and this policy resolution was also framed if you look at BP the first Prime Minister of India Nehru he was also influenced by the way science and technology developed in the edge store in the erstwhile USSR okay so we model of science okay.

That is why you will find wherever the, the aim of science was meant the aim of science also was to maintain equality of opportunities to do science equality of opportunities to even wait on any knowledge form academic freedom, freedom to dissent and so on okay 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 1958 and then subsequently in 1956 that industrial policy resolution and we have also witnessed five-year plans starting from 1951, 1951 to 56 the first five-year plan emphasized on agriculture the second five-year plan emphasized on industry I mean 1956 to 1961 in the1960s India faced acute food shortages okay.

That is why you will find the plan holidays where there I mean for three years 1966 to 1969 India tried to build I mean in they try to apply all technical artifacts to increase agricultural productivity okay that is how we witnessed a phenomenon called the Green Revolution England and 60s and mid1969 and 1973 Green Revolution no doubt it increased agricultural productivity I mean hybrid seed was you know introduced for the first time in agriculture in India but it also as we all know that it also increased regional disparity and soon we but, but the context was to build more and more technology how to make science more and more applied okay.

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Then science for its own sake to science having applications had to be brought in this transition had to take place as a consequence of which in the nitrogen in the year nineteen hundred and eighty three the government of India tried to formulate a technology policy statement the preamble the preamble of the, 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 we have regarded science and technology as the basis of economic progress as a result of three decades of planning by 1953I mean 50s 60s and 70s three decades of planning and the scientific policy resolution of 1958 we now have a strong agricultural and industrial base and a scientific manpower impressive inequality 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 and in real-world problems the frontiers of knowledge are being extended at incredible speed it's opening up wholly new areas.

And introducing new concepts technological advances are influencing lifestyles as well as societal expectations the, the, the huge and development of Technology must relate to the people's experience our, our own immediate needs in India and 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 regions okay India.

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 okay the development must be based on our own culture okay cultural specificities the future depends on our ability to resist the imposition of technology which is obsolete and are unrelated to our specific requirements and policies which tries 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 they will intellectual which bind us to outmoded systems and institutions okay.

Technology must be viewed in the broadest sense covering the agricultural and the services sectors along with the Army's manufacturing sector then, 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 philosophy of a mixed economy involves the operation of the private public and joint sectors including those with of foreign equity participation their directives the, the directives must clearly define systems for the choice of technology taking into account economic social and cultural actors okay with technical considerations indigenous development and support to technology.

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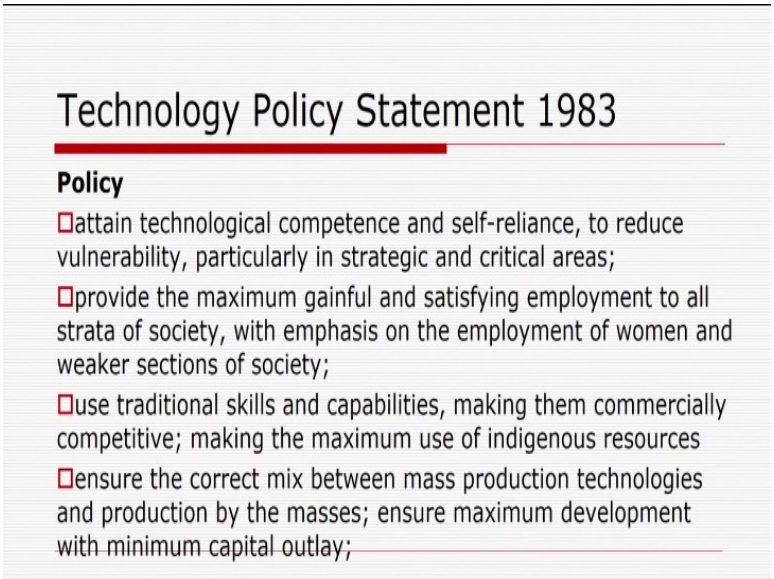

And the utilization of such technology acquisition of Technology through input and its subsequent observes an adaptation and a British and ensuring competitiveness at international levels in all necessary areas and establishing links between the various elements concerned with generation of technology its transformation into economically utilizable form the, the sector responsible for production which is the user of such technology.

I mean financial institutions concerned with the resources needed for these activities and the promotional and regulating now arms of the government okay and, 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 are as keeping in mind the capital scare character capital scores a 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.

If we sick with sick technological advancement not for prestige or aggrandizement but to solve our multi various problems and to be able to safeguard our independence and our unity our, our development far from diminishing the enormous diversity of our regional traditions should help us enrich them and to make the unsealed wisdom of all less and 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 an involvement of the India Indian population okay.

We must we must look particularly to young people to bring a scientific attitude of mind to bear on all our problems then, then if you look at the aims and objectives of aims and objectives of the technology policy statement of 1983 what we generally find is that the policy aim to attain ecological competence and self-reliance it aims to it aim to reduce vulnerability particularly in strategic and critical areas it aim to provide the maximum gain full and satisfying employment to all strata of society with emphasis on the employment of women and weaker sections of the society too huge traditional skills.

And capabilities making them commercially competitive making the maximum use of indigenous resources may be handled products to ensure the correct mix of the to ensure the correct mix between mass products and technologies and production by the masses to ensure maximum development with minimum capital outlay to identify offshore lenses of technology in use and.

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And arrange for the development of both equipment technology to develop technologies which are internationally computed competitive particularly those with export potential to improve products and spinning 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 the habituate to & two and finally to recycle waste material and make full utilization of my products.

Then what are the, the essential points of the technology policy statement of 1983 oneself-reliance strengthening of the technological base secondly thirdly need for prospective planning I mean in the case of employment energy efficiency and productivity environment I mean Environment Protection in sustainable development, development of indigenous technology I mean I mean 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 a I mean within that we try to cover I mean this policy statement technology policy statement tried 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 input of Technology foreign investment I mean which, which will continue to be permitted only on a selective basis okay.

Yeah 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 okay and there shall be of foreign commitment of our observes an adaptation and subsequent development of important know-how through adequate investment in research and development R&D to which importers of technology will be expected to contribute I mean absorption of technology was important was given prominence technological information technology transfer.

I meant the diffusion of technology international competitiveness and technology exports technical cooperation among developing countries was also required ok developing countries when I say I mean including and mostly color range nations I mean newly independent newly politically independent in essence okay legislative framework was developed to protect our own products and how to implement it and, and the way the technology policy statement of 1983envisioned 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 okay.

That was then what we saw after 1983there are at least two events 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 end and the 21st century at least l21 watch the debacle of socialism in the erstwhile USS in 1989 and in1991 India adopted the new economic policy of which I mean the principles of which were liberalization privatization and globalization shortly no net LPG in1995 India became signatory to the double documents negotiations agreements then what happened earlier.

I mean it does not imply that India became signature to WTO agreements in vacuum but it was also policy which was adopted by the Government of India in 1991 the new gun in 1970 India had its first Patents Act which suggests that one can arrive at the same product by using different processes again the 1971 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 okay I can produce this laptop or camera or refrigerator or television by using different processes okay.

And in 1995 when India became signatory to WTO document agreements as a part of that agreement after 10 years of that after 10 years of the compliance with the WTO agreements in 2005 India became I mean India entered the job product I mean 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 naturally you will find that them the prices of medicines the prices have increased by lips and mounts after India adopted the product patented in the entered into the phase of production introduced in 2005.

We will come to this point after discussing I mean this is also important I mean this is a background to, to initiate a discussion on the science and technology policy of 2003 by the Government of India whereby the Government of India wanted to integrate both science and technology you will find that in 1958and 1983 science and technology were treated as separate entities whereas in 2003 the Government of India wanted to integrate both sides and did okay in 2003 I mean the Science and Technology Policy.

I mean the preamble low rambled suggests that science and technology have, have profoundly influenced the course of human civilization science has provided us with remarkable insights into the a world we live in the scientific revolutions in the 20th century have led to many technologies which promised to herald wholly new eras in many fields as we stand today at the beginning of, of the 20th 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 that is what the, the document suggests okay 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.

I did not know how knowledge is be integrated as a commodity how knowledge has been transformed into power okay let say knowledge is power which and, and, and this led to increased restrictions on sharing of knowledge to new norms of intellectual property rights and to global trade and technology control regime scientific and technological developments have deep ethical legal and social implications when we when we look at the, the policy itself okay the Government of India enunciates certain objectives of its of this policy.

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I mean of this science, science and technology policy of 2003 I mean to, to ensure the policy maintains maintained that that I mean the policy aim to ensure that the message of science reaches every Indian citizen where a woman or man young hold so that we can wish we are one scientific temper emerges 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 to, 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 budget and regional imbalances both rural as well as urban and generation of employment by using scientific and technological capabilities.

Along with our traditional knowledge body this will call for, for the generational and, and screening of all relevant technologies their widespread dissemination through networking and support for the vast unorganized sector of Oregon to vigorously foster scientific research in universities and other academic scientific and engineering institutions and attract the brightest young person's to carriers 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 send centers of excellence which will raise the level of work in selected it is to the highest international standards to promote the empowerment of women in all science and technology activities and ensure their full and equal participation okay.

To provide necessary autonomy and freedom of functioning for all academic and R&D institutions so that and a means 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 civilization experience of India okay.

To accomplish national strategic and security related objectives by using the latest advances in science technology to encourage research and innovation in the areas of relevance of the economy and society particularly by promoting closed 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 T leverage technologies such as information technology bio technology material science and technology nanotechnology would be I mean nanotechnology came up later.

I mean at that time it was mentioned it would be given special importance to establish an intellectual property right regime IPR regime which maximizes the incentives for the young generation and protection of intellectual property by all its inventors the this IPR regime the this policy maintained would also provide a strong supportive and comprehensive policy environment for, 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 and a coordinate at affordable costs and also create digitized valid and use 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 at the goals of national development and security and make it a key element of our international relations.

And finally to integrate scientific knowledge within sights from other disciplines and ensure fullest involvement of scientists and technologists in national importance so that the spirit and methods of scientific inquiry were matron discipline to all years of all areas of public policymaking okay I mean this is where we got into I mean we were involved in this, this IPR regime I mean we must innovate and we are innovating not for public huge but to protect our innovation okay.

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I mean the, the commercial the political dimensions must be understood and by as a consequence of which okay we, we made a shift from, from the science and technology policy of 2003 to, to the science technology and innovation policy of 2013 and the background of innovation policy of 2013 and the background of innovation and the background that, that the context the background to the context of innovation must be understood in the context of the WTO provisions on the IPR intellectual property rights, which I mean World Trade Organization provisions on the intellectual property rights and India has been compliant with the US dictated IPR regime.

Precisely because will discuss how till now we have not yet been able to build an independent science policy in India okay, that is a different tutorial to it, either we are influenced by either we were influenced by the USA sir after India is independence and now and perhaps after Jawaharlal Nehru we are more and more influenced by the North American hegemonic science policies, before discussing the science technology and innovation policy of 2013 quickly we will discuss how, we are weird we have gotten into we have we are involved in this regime where trademark copy right patents okay.

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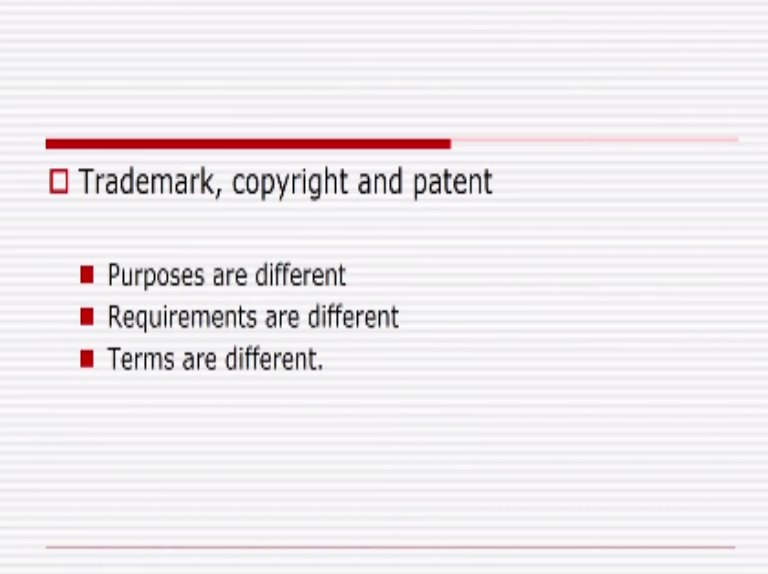

There now they have become the decisive factors for the way in which we must carry out our science we must practice our science we must practice our technology we must develop our technology okay. I mean when you look at a trade mark, I mean trademark can be discussed at two levels I mean one is source identification and the other quality assurance.

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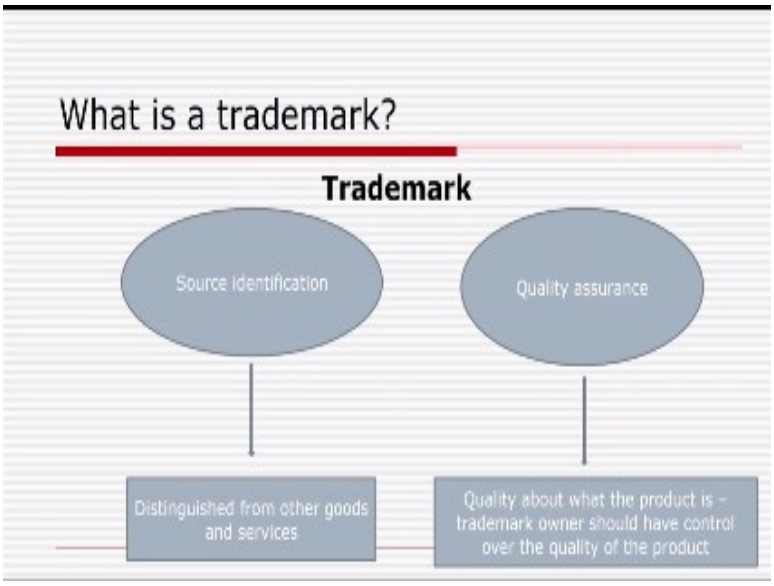

And when I say source identification it must be I mean it must be distinguished from other goods and services, when I talk about quality assurance I must look at the quality about what the product each trademark owner should have control over the quality of the product. Trademark copyright patent are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

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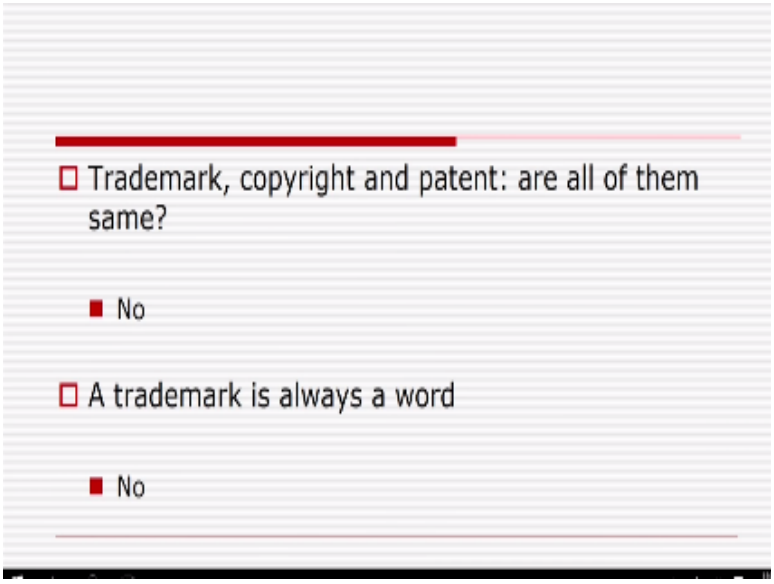

A trademark is always oh is I mean that is why I said are all of them said no, a trademark is always evolved, no.

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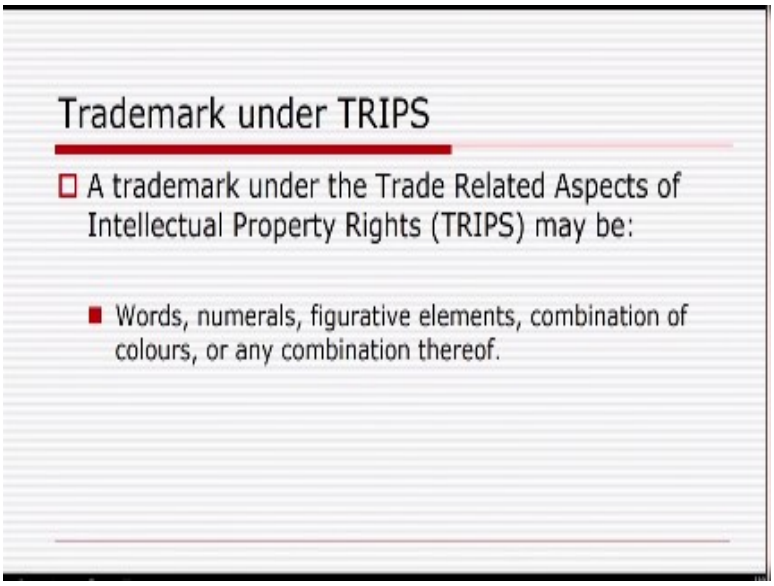

Then what is your trademark a trademark under the trade aspects, I mean done under the under the tricks I mean the trade-related aspects of intellectual property rights, a trademark may be words, numerals, figuratively, combination of burners or any combination thereof.

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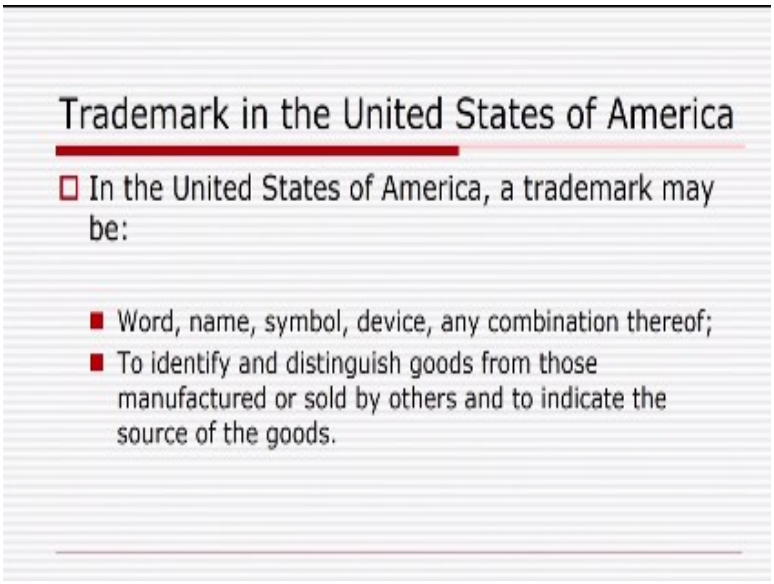

Trademark in the context of United States of America, it may be a word or name symbol device or any combination thereof, to identify and distinguish moves from those manufactured or sold by others and to indicate the source of the goods.

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Then what is a trademark in is you know any sign with distinctiveness which may consist of but not limit to want or letter or character device symbol called the three-dimensional shape 3d shape motion, hologram sound or any combination thereof.

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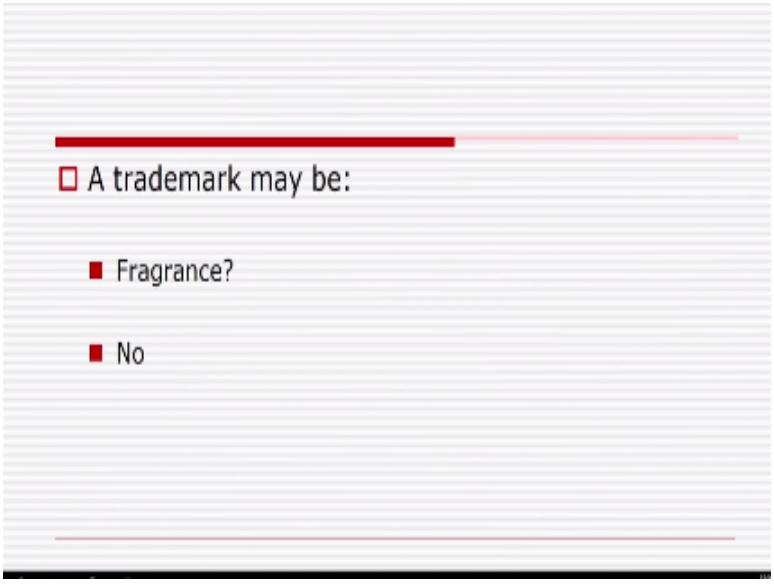

A trademark may be do you think a trademark will say fragrance of perfume okay, fragrance cannot be a trademark okay.

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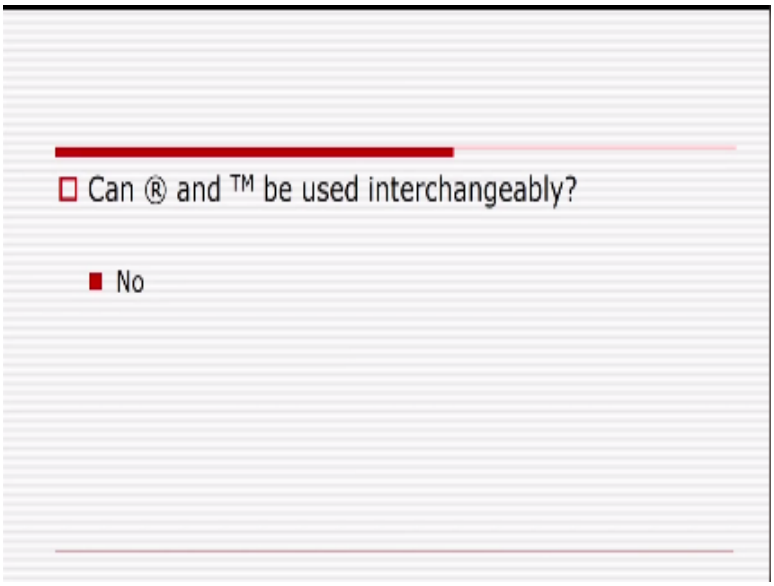

Can registered mark and trademark be used interchange no, because trademark is intended to be used as a trademark I mean trademark is a generic term.

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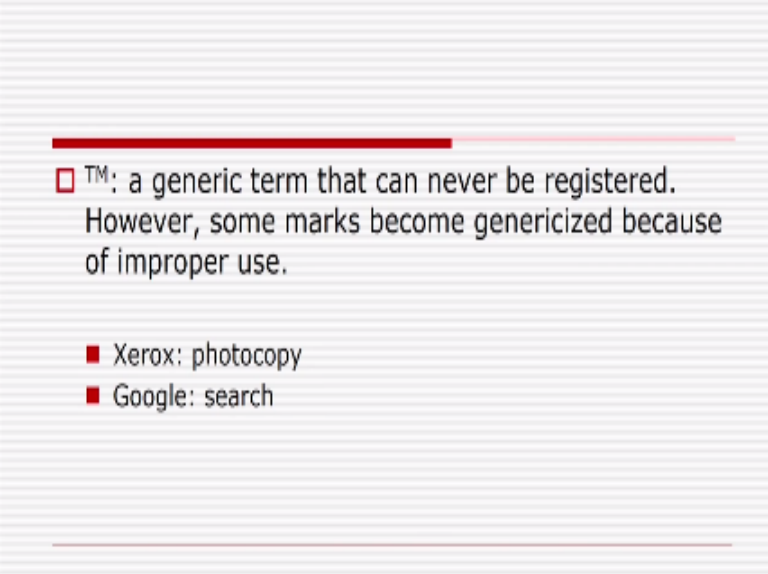

That can never be registered, however some marks become generalized because of improper. Suppose I want to make a photocopy of what study material, but we generally say please do the Xerox please get upset but that is wrong Xerox is the name of a company okay. We must say that we can you we want to make photocopies okay. We very often say you Google it but actually Google is a company okay. We must say search it that is why we all ways say that some marks have become generalized because of improper use.

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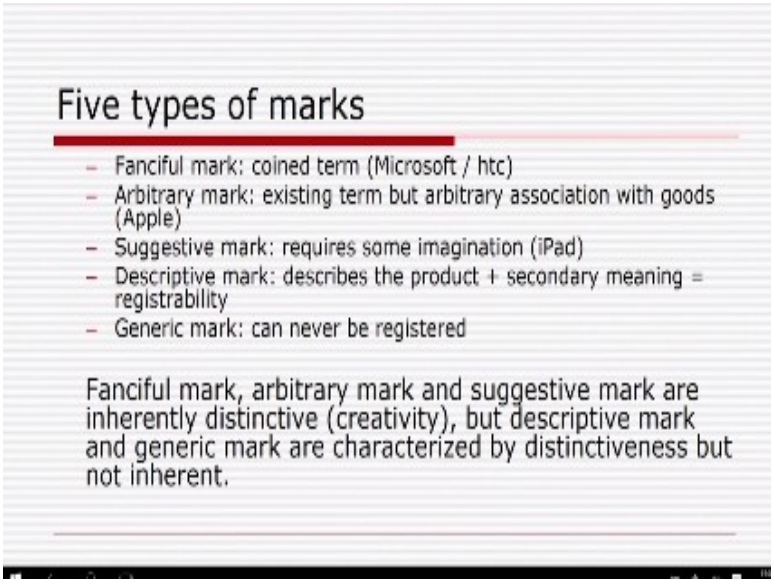

There are five types of marks fanciful mark, arbitrary mark, suggestive mark, descriptive mark generic mark. Fanciful mark is a coined term, I mean Microsoft HTC and so on, arbitrary mark existing term but arbitrary association with modes, like Apple net Apple, suggestive mark which requires some imagination I mean I back descriptive mark, which describes the product plus secondary meaning is equal to register image, where as generic mark can never be registered.

That say initially I said registered mark and Trademark cannot be used interchangeably fanciful mark arbitrary mark and suggestive marker inherently distinctive I mean some creativity is involved in, but descriptive mark and genetic marker characterized by distinctiveness but not inherent.

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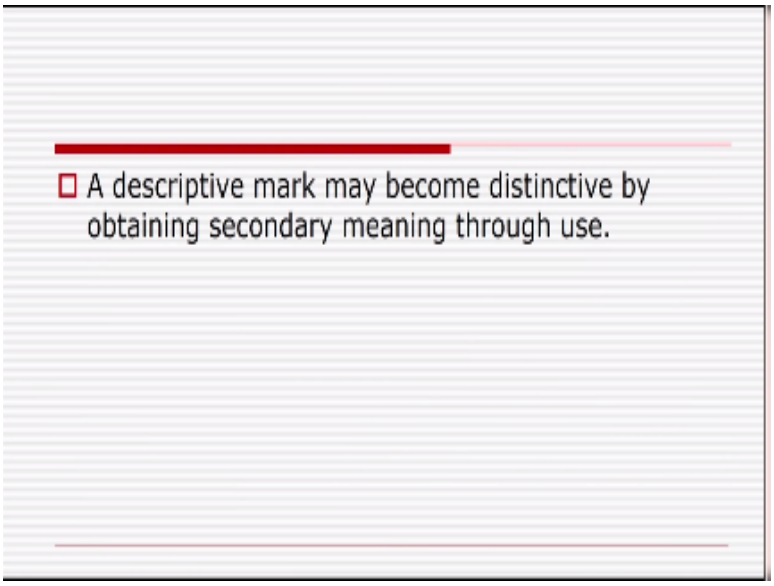

A descriptive mark may become distinctive by obtaining secondary meaning through huge.

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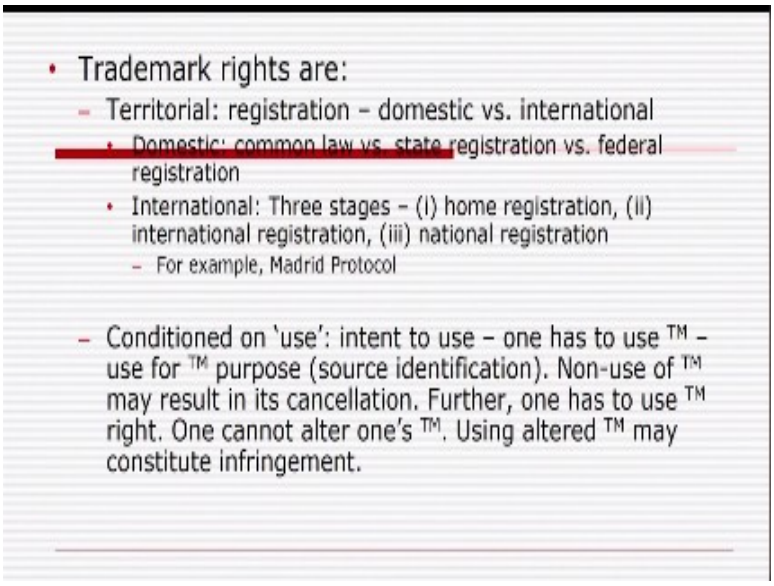

And trade mark rights, I mean one inch territorial okay, I mean when you register your trade mark I mean it may be domestic may be, international under domestic there are common laws versus, state registration versus, federal registration and so on. When you come to International registration there are three stages, home registration, International registration, national registration, for example Madrid Protocol in Spain okay.

Trademark, rights are conditioned on use what is your intent to use, what is the purpose to use, one has to use did work I mean used for trademark purpose, I mean the source identification and non new job trademark may result in its cancellation. Further one has to use trademark right one cannot alter one state one using altered trademark may constitute infringement okay, having quickly browsed the essential components of trademark copyright in patents okay.

What are the essential characteristics of what are the criteria for attaining Pettit, novelty one, non-obviousness two and industrial utility applicability three okay. Well when we discuss these aspects we must keep this in mind I mean when we when we when we move on to discussing the science technology and innovation policy of 2013 by the Government of India, we must keep

these technicalities in mind WTO provisions on IPR, how India has become a signatory to WTO 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.

In 2010 at the Indian Science Congress Association Congress conference, the then Prime Minister of India declared 2010 to 2020 as the decade of innovations and formed the National innovation Council okay. They this HDI policies the science technology and innovation policy of 2013 has emerged as the major, I mean it is these three aspects in fact science, technology and innovation, they have emerged as the major drivers of socio-economic development globally.

India of the 21st century is an aspiring country faster sustainable and inclusive growth is in SPD science, technology and innovation leading to applications of products of research and development I mean R&D, I mean which will need to play defining roles the larged demographic dividend and talent pool okay of the country offered unique opportunities the national science technology and innovation enterprise for earning for itself or central position in national development through it is excellence relevance and performance.

Then what is innovation? Okay scientific I mean innovation is all about I mean 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 Science and Technology it implies a science and technology solution, that is successfully deployed in the economy or society and the India has either to accorded little importance to this aspect.

There is now an urgent need to invigorate, this aspect of the national you know science technology and innovation undercurrent okay. That was, 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 does seek to focus on both people for science and science for people and combine the benefits of excellence and relevance.

India is 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 key elements of the science technology and innovation policy are to promote proliferation of scientific temper amongst all sections of the society to an unskilled for applications of science among the young from all social to make carriers in science research and innovation attractive to the brightest minds to establish world-class R&D, infrastructure for gaining global leadership.

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In some select frontier areas of science to petition India to situate India to look at 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 combined priorities of

excellence with relevance to migrate R&D output into commercial applications by replicating the by replicating hitherto successful models analyze the establishment of new structures.

To facilitate science and technology based high risk innovations through, new mechanisms and to trigger changes in the mindset and value systems to are cognized respect and dual performances, which create wealth from science and technology derived knowledge okay. Now what we have learned 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 that how the way science technology innovation policy of 2013 by the government of has been prepared, it is only higher hopes but it is not it is not sustainable, precisely because of the way in which they have been designed okay. If it will give you the links to these lectures and in the next lecture, what we are going to do?

We are going to discuss I mean we are going to have a brief overview of the entire course starting from the cognitive questions, ethical questions, methodological questions, politics I mean as technological shaping of society social shaping of Technology, the reception of modern science in India and science policies in India in the next lecture and there we will end the course thank you.

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