Indian institute of science
Bangalore

NPTEL
National Programme on
Technology enhanced learning

Global Supply Chain Management

Lecture-36
Smart villages and cities-part2

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Yeah so what we have looked at is a smart village ecosystem framework and we are going to apply it is to a village called pochampally village.

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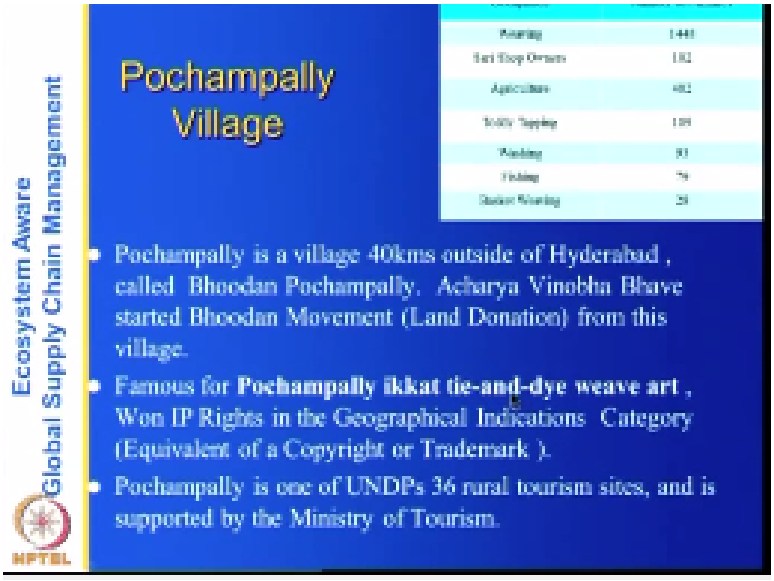

Which is in on the state of Andhra Pradesh which is nearer Hyderabad and it is a village it is a model village will look at what it is it is a village with the occupants of leaving and they have saree shop is upon us they basically produce sarees which are women clothes and they are directly shop owners were marketing this we have whatever is woven and there is of course agriculture and tardy tapping and washing and fishing and basket weaving.

So it is basically there if you look at the ecosystem of this just this SME metro system in other words that you have basket weaving do washing and toddy tapping and so on so basically it is a its agriculture but the agriculture is not rice or something it is different so the pochampally is a village 40 kilometers outside of Hyderabad called butan pochampally and there is a great person called Acharya you know the Vino Babave and we started both on moment.

That ale and donation from this village that is why it is called Bhutan Pochampally and so famous for pochampally you cut tie and dye be one so there is a North this is a dye of this one and it is very famous for making sarees using this and one IP rights from jag refer in the geographical indications category equivalent of copyright or trademark pochampally one of UNDP is 36 rural tourism sites and is supported by Ministry of Tourism so you can see that the villages is basically a model village and it does it is famous for this weaving of the sarees which are basically died on this Alan tick and tie.

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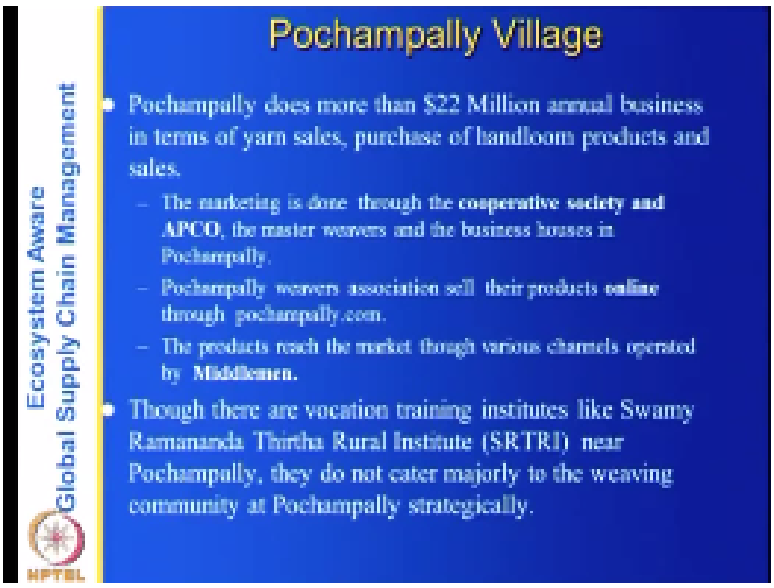

So pochampally as a does more than 22 million annual business in terms of yarn sales purchase of random products and sales and the marketing is done through cooperative society APCO andrapradesh cooperative organization and the master waivers and the business houses in pochampally and pochampally there was Association and their products online through pochampally.com so there is a website called pochampally.com and the products reach.

The market through various channels operated by the middleman so you can see that the pochampally village is well connected through the internet it has online marketing and so on and it has a cooperative society though were a occasion all training institutes like swami ramanandha tirtham rural institute near pochampally.

They do not get a majority to the weaving community at pochampally logically so basically there this is one of the problems with all the occasional training that one may have is a generalized training they may try something but it is not particularly suitable for to Train waivers in the in the cover what is needed.

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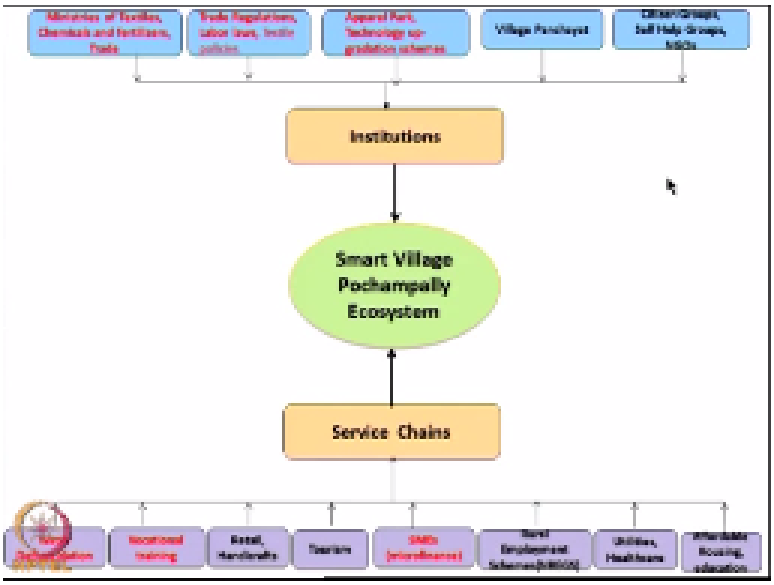

So if you get a smart village pochampally here you have various service chains you can which way mapped water the water has the problem of the de fluoridation and the occasional training which is required for weaving it is not done and retail and handicrafts tourism service there is no microfinance and rural development schemes because utilities a health care affordable housing and education.

Is it is not very good so if you look at the institution's Beastie of textiles chemicals and fertilizers and trade that is because these SMEs which develop is sad there basically can export and trade regulations labor laws and so on textile as applicable to text apply a napral park technology up gradation schemes they are not whatever I have put in the right here there that means they are not being done and there is a village Syrians self-help groups and so on.

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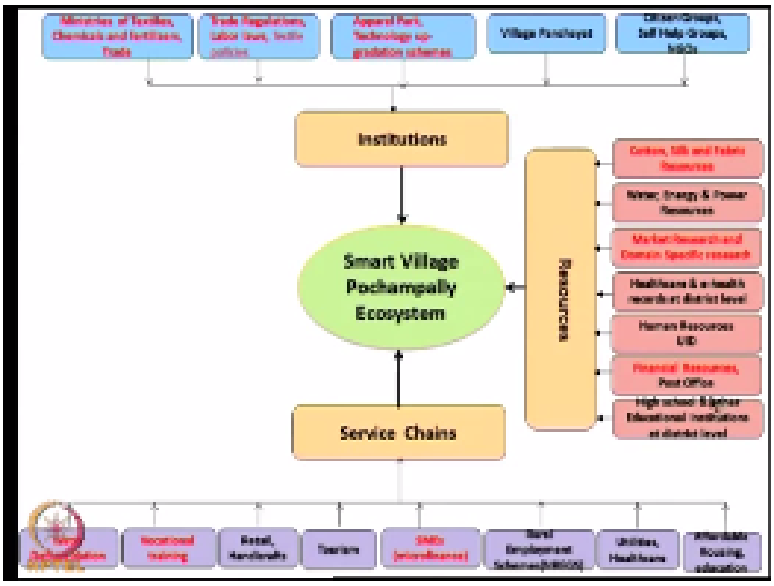

So here if you look at what are the resources that are needed cotton silk fabric resources and they have in short supply water energy power resources and market research on domain specific research not much health care And health records a district level of course that is not human resource a TYD financial resources post office high school and other education levels.

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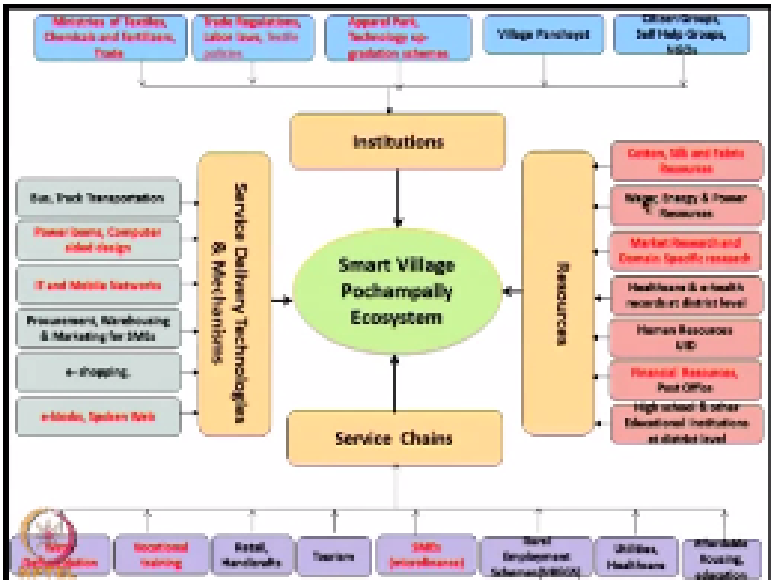

At the district levels so you have power rooms computer-aided design is absent power rooms computer-aided design is absent the hand waving ITI mobile networks are absent eaks mobile networks were absent procurement warehousing marketing for SMEs something happens you shopping happens so you can see that our original ecosystem is after all that abstract.

You can see a thing like wash up early which is a module village has most of these attributes that we have I mean their deficiencies and so on I mean one I will I would expect these deficiencies because it is not strategically planned now if you write a balanced scorecard for pochampally early as an exercise and look at what are all the strategic objectives of Pochampally you do not say that pochampally.

Should become there is no objective that it should become the best saree for this particular art in the world and it should not be they do not follow the gain strategies here that is because the water because of the died the water gets spoiled and also is this going to be some art which they are going to distribute it to the world and so on and try to take the responsibility it become an Orchestrator and ask other villagers also villages are also follow.

This and also the current generation of the people are interested in the hand beaming and all that what about the next generation the next generation may not be interested in weaving and even if they are interested then I want to make it big with power looms and computer-aided design and so on so in other words it is an art which is this one how long when the last large are lost to be this today it is it is a very good village but what about the future.

So how do you want to keep whatever is the place that pochampally village has in the future as well that is the big question that we have so that kind of thing is not answered and people are happy with what it is today so but I mean there are two points is that I want to make from this one thing is the ecosystem map of smart village follows our a ecosystem map that we have already so this example substantiates that our ecosystem map is not as abstract as we think and also there are some the daily red marks indicate that these things should be strategically planned and that is the deficiency in the pochampally system now.

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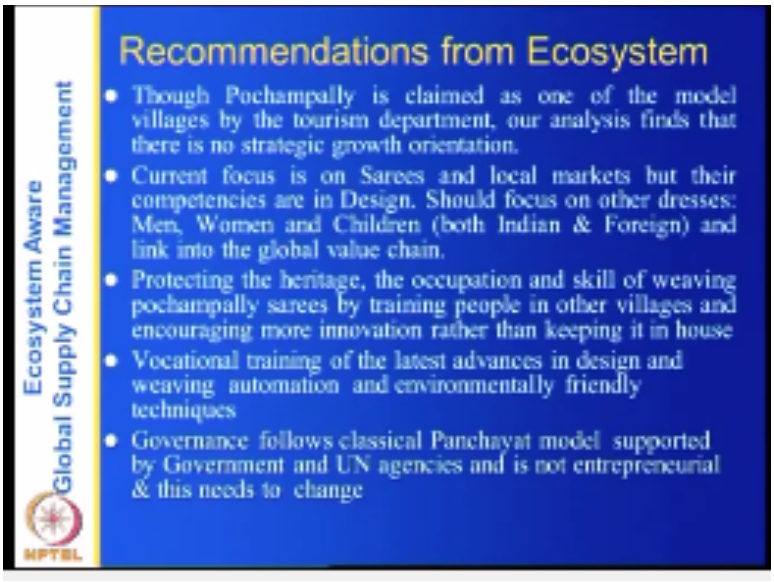

So what are the recommendations from the ecosystem the possibility is claimed as one of the model villages by the tourism department our analysis finds that there are no strategy growth orientation that is the big thing that we find so what if they strategies what is that you want to make it out of this village current focuses on serees and local markets but that competencies are that their competencies are in design so please understand that you have competency.

In design what should you do you should spirit the design and get it to their markets in other places so that is your competence you should start and the several different villages and now pointed stick into one village so focus on other dresses men women and children both Indian and foreign and link to the global value chain that does not exist so they make sarees and sell it in all retail places and through intermediaries and so on.

And that is one of the things so there is no growth plan second thing we are at protecting the heritage the occupation and skill of waiving pochampally sarees by training people in other villages and encouraging more innovation rather than keeping it in house so this is one of the things that you know why should you make only this sarees in those villages what is your competency or what is that you want to protect you want to protect.

The design but not the manufacturer not the weaving so you can keep the design to yourself let us spread it to other villages and so that you have more marketing occasional skills are the latest advances in design and weaving automation and environmentally friendly techniques so

here when you are using guys one has to be careful it basically the ruins all the water levels in the ground governance follows classical franchise model supported by the government.

And Eugene's agencies and is not enter Polly land this need to change so these have summary very high level recommendations that we have by looking at the pochampally ecosystem.
So I then this particular case study we did is it shows us two things one is the applicability of our ecosystem approach to a village and second thing is you know can it can it make recommendations to them looking at their existing ecosystem what they are doing at so and so that is this basically you say is the thing that we have.

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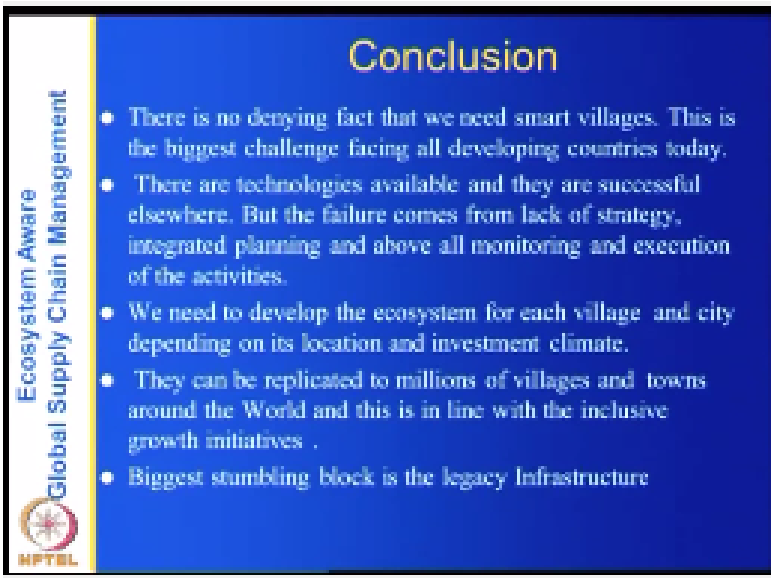

So let us look at the village ecosystem and what are the conclusions that we have before we proceed to the city ecosystems there is no denying fact that we need smart villages I mean you have 6000 of them and to 100,000 of them or backward and so on so basically the making the village is smart this is the biggest challenge facing they all developing countries today I mean it not only in India it is that is true which I know it is true with china.

This one but if you can have a very popular easy way of developing this with technologies and make the villagers independent republics according to mahatmasasion I think that will lead to the prosperity of the world where technology is available I mean if you look at what is that that they are asking we are not asking big things yes technology is available and they are successful as well now particularly in the cities but the failure comes from lack of strategy.

Integrated planning and above all monitoring and execution of the activities so in other words what are the technologies we have which is applicable we are not asking for new technology development and so on but we want to apply these technologies and so on but it has to be applied strategically we need to develop ecosystem for each village and city depending on its location and investment climate this is one of the strategic exercises.

That one need to do they can be replicated to millions of villages or towns around the world and this is in line with inclusive growth initiatives so if you are talking of inclusive growth see one thing is to transfer all the people from the villagers to the world to the urban areas but then that will crowd the urban areas and this one but another thing is to move the work or move the improvements to the village where people live that is what it is and because stumbling block is the legacy infrastructure so basically they change challenge that everybody faces in the in terms of this is the problems with the legacy infrastructure and also the attitude of the people to live with what we have and so on.

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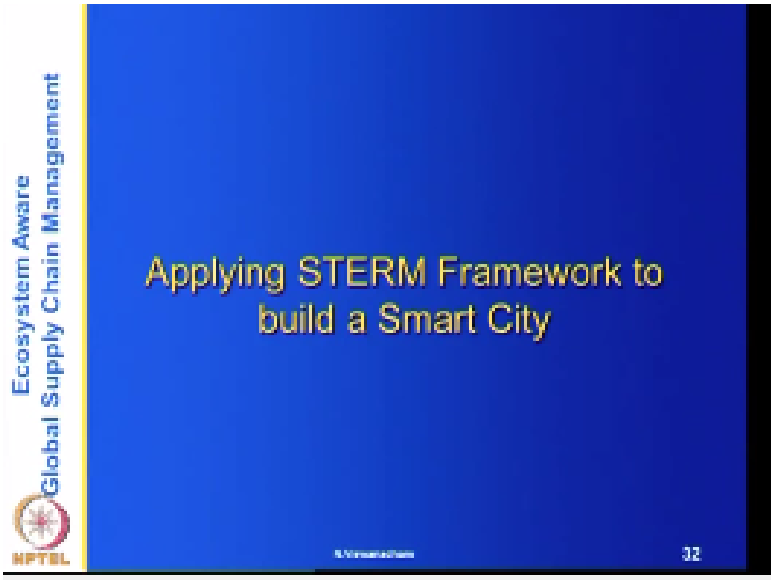

So having done this let us look at now by the Smart City applying the same kind of framework from the village in stuff village to a smart city.

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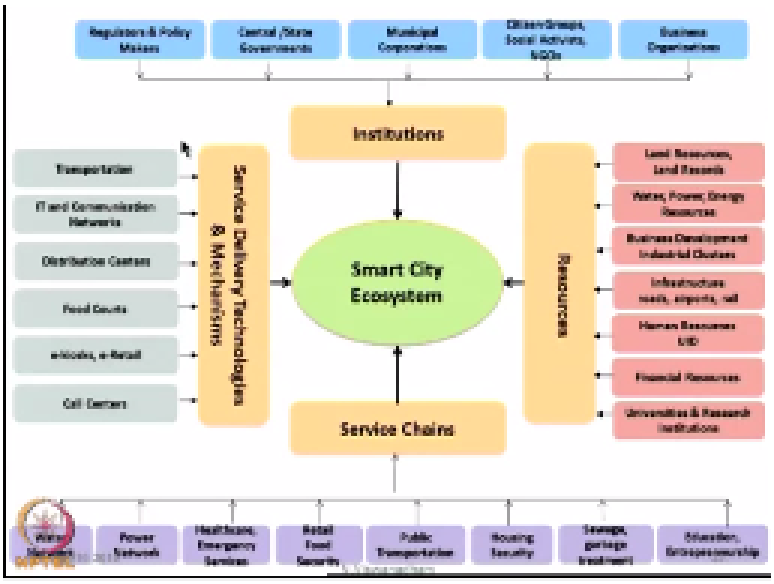

So let me look at this much they as we said not going through this one that we can wrap this like we do back the village the service chains the resources the institutions and service will deliver service delivery technologies here and the same kind of as in village we have water power health care retail and public transportation housing security sewage garbage treatment education and head up ownership and so on in the even in the city but in terms of resources.

You have this land water business development industry clusters so you have velocity industry clusters you have infrastructure roads airports and trains you have human resources financial resources like big banks and universities and research institutions you have universities and research institutions here so you can have hospitals you can have hospitals at the infrastructure here but if you look at the regulations the institutions of course there are regulations.

And policy makers I am in central state governments municipal corporations they are the ones rule the city citizen groups and social activities and other business organizations so the complexity here increases because you have the industry here you have research organizations and you have more infrastructure like airports and so on and of course the service delivery comes from call centers you to basically deliver either health or something EKS or E-detail.

That is one thing that you may not have in the villagers also pochampally has a retail but you can have it you should you can have food courts distribution centers IT communication networks and transport so here is the basic ecosystem is the same as in the village but it is more

complex so the complexity comes from a size because the size I mean it is several villages which are put together and second techniques.

It comes because there is industry in here and there are educational institutions which are big which where all the villagers and other small towns. People come here and of course they water network and the power that was the consumption in the city is much more so where the complexity of this utility networks so given this kind of structure that we have then you know what are the kinds of things that we can do in a village.

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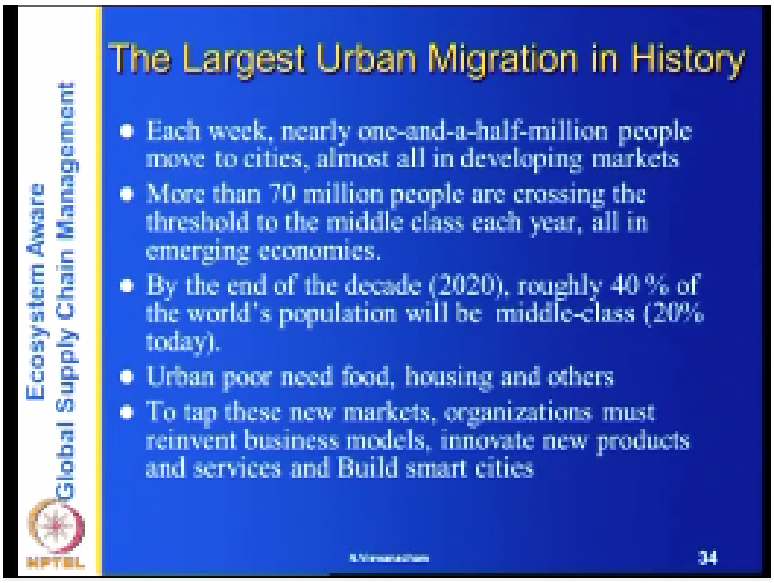

So the largest value of why are we talk about this so largest urban migration in history happens each week nearly one and a half million people Motor City's almost all in developing markets more than 70 million people are crossing the threshold video class each year all in a measurement so in the so called emerging markets big countries India, China, Russia and so on what is happening is the middle class range is increasing with the population.

And then you know middle class means transportation middle class means communication this is one middle class means retail all the services become huge requirements and also the other one is there is the urban migration people are moving for their jobs and so on so by the end of 2020 roughly 40% of the world population will be middle class today it is 20% so you can see the scale of services that are needed in the cities.

Because they because of this what is happening here so by the end of the decade roughly 40% of the world population will be middle class urban poor need food housing and others so you can have even in the urban areas in the city 25% of the people are poor people so there one nutritious food and they require housing and others and to tap the new markets organizations must reinvent business models innovate new products and services and build smart cities.

So the objective here is you know looking at the ecosystem you need to plan the ecosystem carefully all cities are not the same if you take some cities may have IT industry.

Some cities may have automobile industry and some cities may have some other kind of industries but whatever depending on that you have to plan and innovate.

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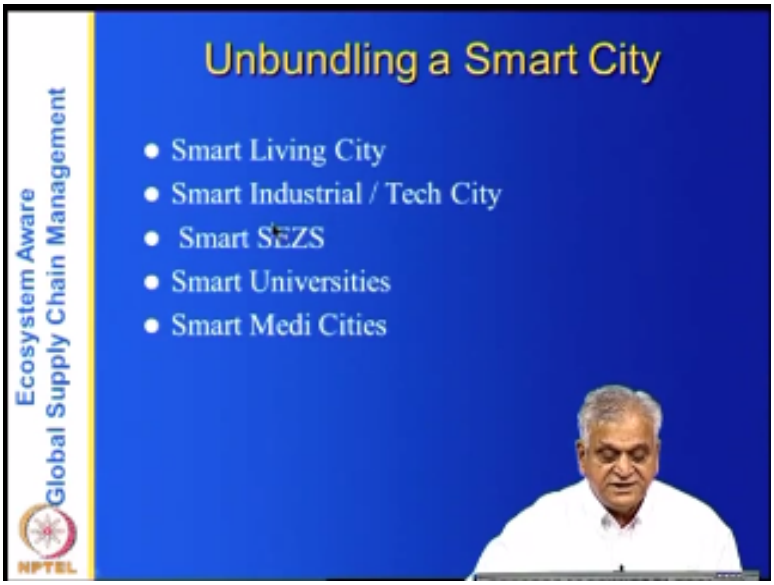

So if you one bundle a city into various parts there that becomes important for in terms of our design we have a smart living city in other words you have a living city where people live a minute it is only there with homes and so on and you have smart industrial tech city so it is industrial city if it is automobile or such kind of industries or biotech and so on or it could be a tech city like if you have only IT parks, smart SEZs , special economic zones.

So these are the innovations of the government's where they get the people get a lot of shops when they organize this and if you are smart in universities education institutions where a lot of people come and they stay and they need accommodation they need the classrooms and so on and they are smart many cities you know medical this one hospitals and so on so basically the

village contains all this so today you know things grow at a ad-hoc manner and so on is it possible to unbundle the smart city.

And you have to basically looking at each of them you have to they have their ecosystem and industry has its own ecosystem se jet has its own ecosystem universities have their own ecosystems and many centers have their own ecosystems you have to design all of them properly each of the above in a smart city can be considered as a smart village and can we develop using the above-mentioned ecosystem.

So what I am saying is you know look at what we did earlier and can you develop these as I there is an ecosystem that so what we have here is the smart city and start smart city development is other like a village we treated as a bundle of services so we are treating a smart city as a bundle of villages now each village is need that have to be the same thing as a village earlier it can be a living village it can be an industrial village.

It can be a smartass eject it can be University and so on how do you plan all this and of course later you have to integrate all this together into a big industry so sterm frameworks and analyzed through grip models so you have to apply this sterm framework that is the science technology engineering regulations and policies and management that framework you apply and analyzed through using grip framework you can basically analyze you like we analyzed.

The village using grip framework you can analyze a city using the grip framework so if you look at what do we have here what we have is the ecosystem of a smart city and then now we are unbundling the city into several smart parts smart villages kind of thing and depending.
On their characteristics and one is a living one another one is an industry another one is a special economic zone another one is a university another is one is a hospital and all and so on so depending on what you have here you can basically it is fine now you can have the grip framework and all that so we should see how this analysis the ecosystem analysis helps in terms of building a smart city so ecosystem need to be built for each of these services.

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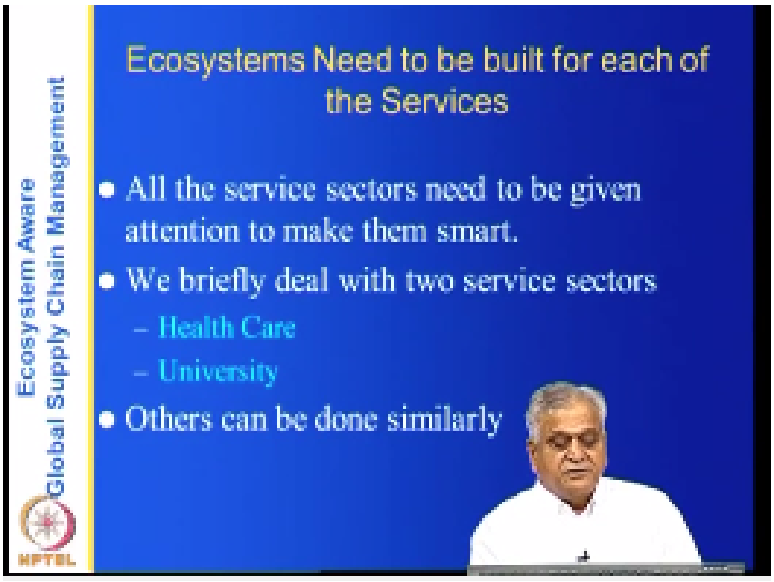

All the service sectors need to be given attention to make them smart and we briefly what we do here is to is to talk of 2 ecosystem of 2 sectors one is health care enough into the university and others can be done similarly so we are going to talk about the smart health care and smartly universities and leave it to that and you can do is an exercise smart Jets smart living cities and smart industrial cities and so on.

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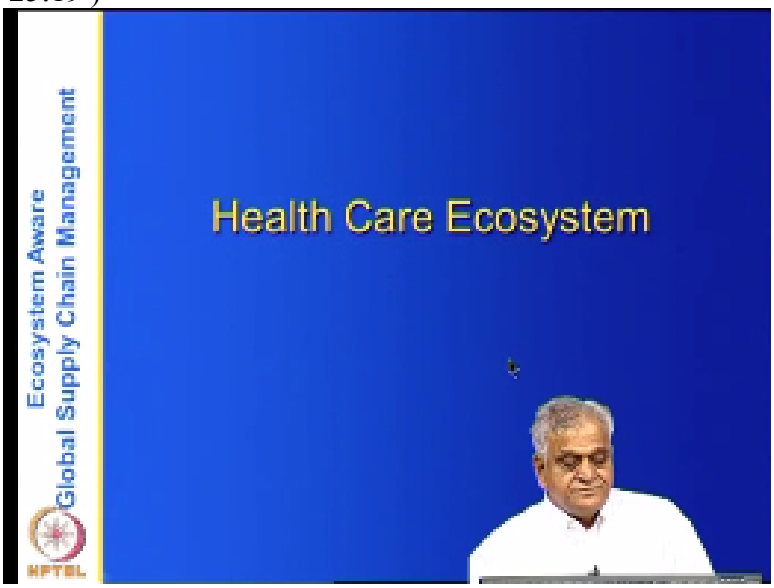

So what is the healthcare Ecosystem?

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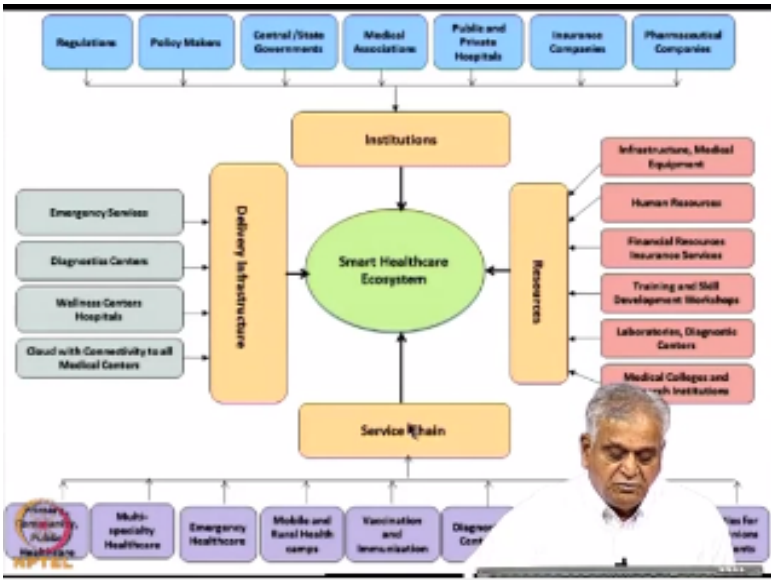

This so if you look at smart healthcare ecosystem this what are the service chains that are involved in a healthcare ecosystem that is for example primary community public health care right so this is the cough cold and then getting vaccinations and so on and all that and that is multi specialty healthcare cardiac problems and other surgeries that is the emergency healthcare where of course they are also done by the heart care but you should have vehicles to transport patients in case of accidents in case of any emergencies.

That our eyes like cardiac arrest and so on so mobile and rural healthcare caps with other words you have to conduct the camps in the in the in the rural areas or nearby to the city to conduct these caps vaccination and me generation this is a big thing but because the first children the vaccination is a big camps or a big thing and of course they are diagnostic centers where you conduct various tests blood tests ECGS and all that teddy telemedicine medical tourism and then there is a lot of people to the villages particularly.

You know in emerging markets because the health care costs are cheaper than the then the developed markets there is the medical tourism that happens and a lot of patients from advanced countries they come to India Singapore and so on for getting medical health and medical insurance schemes yes and then first mile in countries like India ninety percent of the people pay for themselves but in most countries human in India the middle class and others were working their medical insurance schemes.

So this is one of the big issues that about the insurance and so on facilities for companions of patients see if you have a child hospital the child's children would not come alone they come with the parents so basically you have to provide service facilities or for the for the parents and so on supposing the world people come they come with their children so the issue is that the patient never comes alone he comes either with a spouse or he comes with his parents or children so basically it is the better to serve all that so you can see the number of service chains when you are talking of a smart health care.

It is not just having a having a hospital all right or a clinic and then just doing this but you have to basically have several clinics from there are multiple specialties that are possible so if you were having HCT and within the city there are several people of various kinds with various industries with varies under various insurance schemes then there are several hospitals which are providing is kind of care and several diagnostic centers and so on so that is one thing and then if you get what are the resources that are needed general for this the medical colleges and research institutions.

So usually because bottles have medical colleges so the students are trained and also the other research institutions for this the laboratories on diagnostic centers training and skill development workshops so because as things change I mean the this these workshops are it becomes financial resources of course these financial resources they could be finding the following the hospital's they can be finding the sum of the equipment that they have and also the insurance services and this infrastructure or medical equipment they become this so if you take a typical fake hospital and almost like eighty percent.

Goes into the hospital building and about ten percent goes into the medical facilities so infrastructure and equipment or the big cost and of course you should have the trained manpower which are the human resources one adopters that says and so on so once you have all this then you know retraining for all this you can see the cosmic video of for all these kind of services what are the kinds of resources that you need and of course in the health care is one of the highly regulated industry very right there are lots of regulations the regulations.

In terms of what information can you share without you can and of course they are the policy makers this and the central state governments medical associations public private hospitals insurance companies pharmaceutical companies and so on so the medicines ultimately have to

come from the pharmaceutical companies so to have you have to basically have this so you can see how many associations are involved and they have rules regulations for all this and if you are basically dealing with patients from other countries.

In a country then these regressions multiply and the delivery services emergency services emergency vans and so on and diagnostic centers wellness centers and hospitals cloud with connectivity to all the medical centers you know the data records that has to be have a connectivity or knocks telemedicine and so on the telemedicine could be a delivery service which here so you have to have the various kinds of delivery services that are there so this is the cosmic view of the big picture off for a smart healthcare ecosystem.

Now then you can see that the smartness of the healthcare system comes from several factors here one thing is it can be in terms of the cloud and connectivity of all the medical centers it can be then be the diagnostic centers there when you take x-rays each and so on instead of taking the paper copies most of them have e copies and which can be emailed and stored and so on instead of emailing the year instead of studying the physical copies and these always for a particular patient you can have health records so all these can be stored.

In a health records and you can have regulations on these health records when they occur should be shared and where when they can be taken out and when they cannot be when they cannot be given and so on so if the issue here is how do you make it smart the insurance companies when they now today physically too then somebody is sick to get the permissions you could do it almost by phone or by sending whatever it the initial estimates of the health care and get permissions from the insurance companies.

So in other words you could the part of it is these implementations the smart implementations are happening even today there is no doubt about that but if you want to make them better and then transfer it is across board to other hospitals other this one and creating a universal health care record system where all the patient requires our this one they are accessible at these points of time and that is the one that one should one should have to end here so if this is an in very interesting and I and very useful and very important subject which is the smart health care building a smart health care so then I think of course there are initiatives from several people like you know in the in the US there is the e records health records and so on but health records is only a part of this exercise that we are dealing with here.

In this we are we are talking of not only creating the records not only but their accessibility and also the delivery I mean ultimately it is not the record count counts if they have to care that the patient gets at the time of emergency this one why do you want to create a record you want to create a record so that in an emergency situation of a hot or an accident so the patient's background can be checked and it can be accessed so that the correct kind of service is given in the emergency situation so for that kind of thing. You know one has to have a unified view of the entire ecosystem of the health care.

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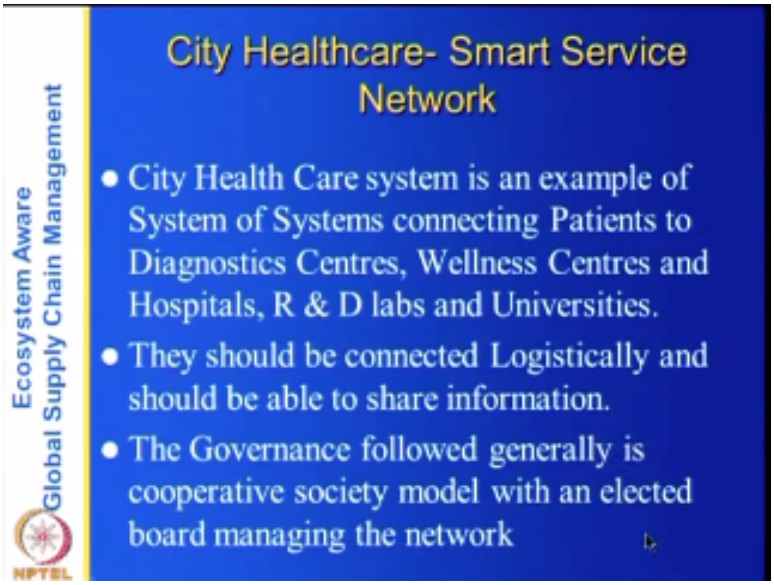

So city health care system is an example of system of systems so let us get into some theory here it is patients to diagnostic centers wellness centers hospitals R&D labs and universities and so on it uses a system by itself what is a system has an input and output I did it has some people and I government mechanisms and so on and you have a system of systems which are basically from patient when she enters till he comes out with the diagnosis uncured then he goes through this system of subsystems.

And they are all connected and if these connectivity of these systems of systems is the one that is very important here that is what the ecosystem is saying that ecosystem has all these facilities diagnostic centers to everything or in the labs the universities and so on as the patient enters now he has if he has the patient has a disease which is not known today is it possible for

the lab centers something like h1n one or a different virus that that hits the patient this then it has go to R&D labs if the patient tells some kind of a peculiar DNA and some medicines do not work and is it possible to get into personalized medicines and so on.

So basically it is a the city health care system is a system of systems should be connected logistically and should be able to share information in other words it is possible from the patient should be able to move from one place to another and patients files should be able to move share and information from one to other so today the connection is done by the patient he goes to the diagnostic center gets the diagnostics and then he takes it to the array to the doctor again and he did write the prescription.

He goes to the pharmacy gets the medicines and so on and then which is good Emily as long as is the streamline but is it possible that the information is also shared in a unified this one and the government should be followed generally is a cooperative society now when you have Hospital of this kind of the healthcare system what is the kind of governance model that we talked about the village we talked about several things what is the governance model that is in other words is there a lead player.

I mean if it is a big Hospital one of those Apollo or something then it can be a lead player but all others are also this one but leaves are all shared services and each is an independent diagnostic center is independent telemedicine is independent and the pharmacies are independent so there will be concerned at work and this network what is the kind of governance model we have considered three kinds of governance models one is the orchestrator this one second one is elite player this one a third one is a cooperative society.

So in the health care sector the most popular model is the co-operative society model that means all the players inside they basically form a network a cooperative society and they elect a board and as a chairman and so on and this keep changing I mean the elections could be every year able two years or whatever so that is but the health care system let us look at another important service that the city provides that is.

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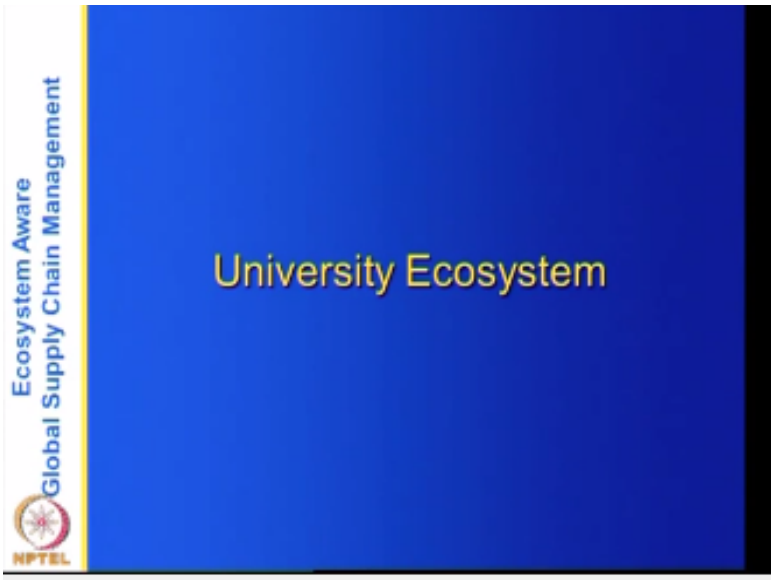

The university ecosystem now in the university ecosystem.

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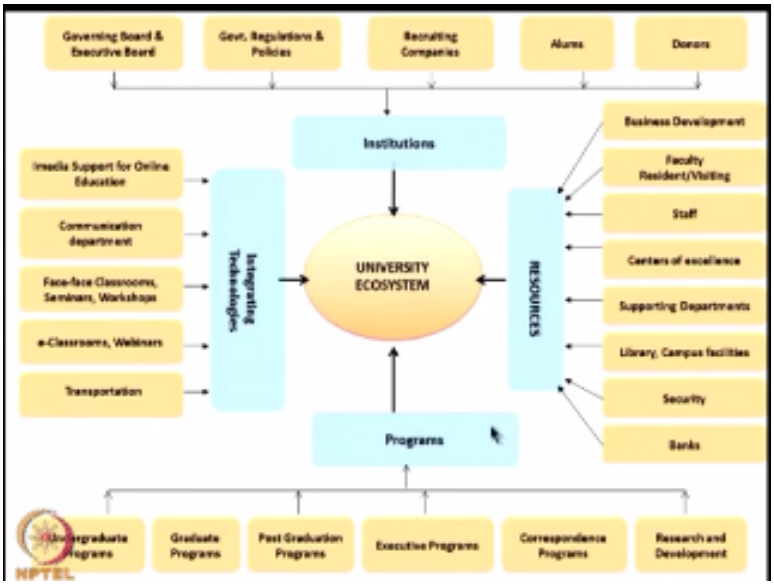

What we have is again for this one. I am looking at University which has undergraduate programs the programs or services or the offers graduate programs postgraduate program executive programs correspondence programs research turned out now tell them you can have several others here but this is a typical now if it is an undergraduate programs it can be undergraduate in science in accountancy in arts it can be in engineering it can be in medicine

depending on the kind of university system you have if you have a NH university called engineering like Indian Institute of Technology and so on.

Then you have only undergraduate engineering but if you have a university which is white university you have all kinds of programs and similarly you have graduate programs that is the Masters in Science masters in engineering and so on you have postgraduate programs for PhDs we actually in engineering PhD in science PhD in accounting whatever and you have executive programs for you have depending on the connections that you have room in the industry you want to run executive training programs these are the short program say one week to week one month to month depending on .

What it is or it can be one day to day there are programs for the executives in industry this one these are training programs to keep in touch with what is happening in the destroy other correspondence programs that is people need not have to attend the college but they can come and write the exams but the registered partners here and that one line training through post postal this one or online they attend online programs there could be the search on there is research or development.

I mean this could be research universities there are several research universities who does not teach at all so but on the other hand research is an integral part of any university whether it is an engineering university or it is a medical university and other it is social sciences research or engineering research whatever you have research as an integral part of this so we have various kinds of programs in the research and most of the big universities they have they have social sciences they have engineering they have medicine they have science and so on everything is integrated under one.

Now if you look at what are the kinds of resources that you need of course you need faculty which are resident and visiting and you need staff to take care of the administration when it centers of excellence if basically you know if you are having a research and development program and if some industry has a center then Centers of Excellence formed and basically to conduct the research using niche research for those I mean this can be for example, the research and cancer in the medical this one or it can be research on cloud computing.

In the computer science or it can be a new materials centers early for the material science departments so determined on that you can have centers of excellence and you can have these supporting departments or supporting universities which this one university ecosystem is not to just the same universities you can be mentoring supporting other universities you can be having links with other universities you can have faculty which are who are visiting who are taking Sabot verticals and so on .

So it becomes our you can go to Scan to an agency department to for combined finding and so on so they are basically supporting library of course camper facilities now all I libraries or welcome of course there is security that it backs banks are important ta for giving loans to the students and B of course for any cash transactions that happened on the facility so they are basically the resources that are needed this and you have governance board and executive board that the university has every university has a governing board government regulations.

And policies these are policies for each of these undergraduate postgraduate and so on if you view the undergraduate programs how many years of program is if it is in a discipline how many courses and so on say there are several things which are rote as well as special if you are running a PhD program what should it be what should be the kind of assessment of the PhD program or not there are recruiting agencies ultimately universe to producers people and these people have to be employed and in fact one of the measures that that people employ.

To find out the greatness of a university how good a university is the employment character or the employment history of its graduates so you have olives this one particularly if you have management institutions the olives play a big role and also the management institutions they are ranking they are ranking by the companies it depends on how well your and alums are doing and also there don't ask for the universities because it is easy it is not easy to get owners but sometimes you can get donors or alums.

If they are doing very well have big industries to get the money for the university so but then all of them have a say in the university ecosystem and of course there are integrating technologies or delivery technologies this is media support for online education this is one thing you can you use TB to support online and there is a communication department face-to-face classrooms seminars workshops and so on and we classrooms webinars and of course inter-university transportation inside and outside of this so what we have here is a big ecosystem.

That of the of the university that we have now this is as I said this is the university all-encompassing University it is not an itchy University it is not a business school it is not a medical school it is not an engineering school it is the one that that compels us all this kind of thing so let you have such a such a University of this what is the difference why do you make it as smart University well you can see the smart media support for online education you can have all the transactions that happen through this one all the class notes are given.

Our Ipads or computers online and all the library is online so he classrooms webinar so you need not have to attend the class you can watch this using TV near your house so this provides lot of this one to the correspondence programs if you are working and you want up doing a part-time degree then it will commute may be difficult so that is what you do here.

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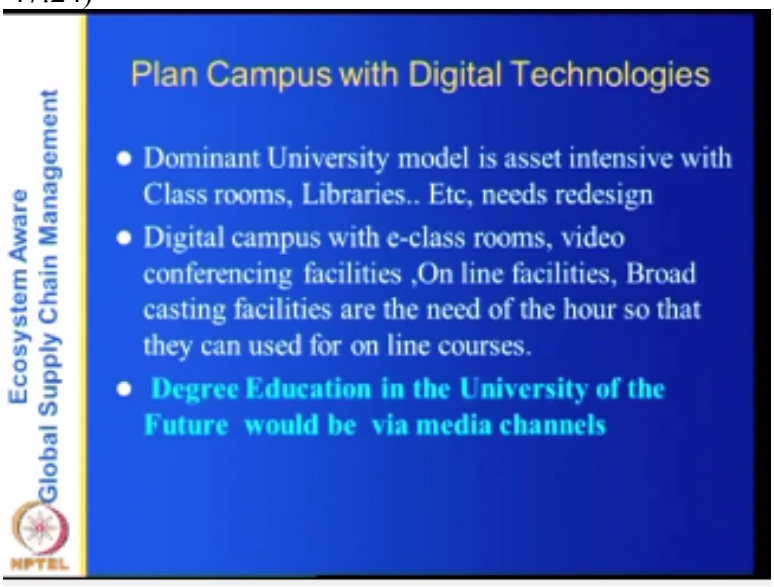

So plant campuses with digital technologies dominant University model is a set intensive classrooms libraries etc and this needs a redesign. Now if you look at a very dominant university model they have classrooms what is the occupancy of these classrooms how long what is the percentage of uses of these classrooms not very much ten percent twenty percent and so on but each classroom is an asset and they spend a lot of money in this the other hand you know can you make each classrooms digital campus with each classrooms video conferencing facilities online facilities broadcasting facilities or the need of their work.

So that they can be used for online courses Degree education in the University of the future would be why emerging media channels so this is this is going to be one of the big changes that happens so other work there could be several percussions of this how do you see a student in the class day in and day out you teach him you know him you know his behavior and so on but if you are doing in classrooms then of course you see him from a distance the other side of the channel and you correspond with him and so on.

But then at the end of the day you see him and there is an examination or something and then you have to SLC so this is the kind of thing is changing in this one.

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And also the universities have to integrate with the university so ultimately who are the employers of our university I mean the university is not an independent think by itself although the government gives you governments may give you money and so on the top tier University should be breeding wrongful technology innovations Nate to whole build significantly deeper relations with industry and organize higher degree research programs in partnership with industry so two things should happen to the University .

It should be the starting point and also you should be the end point for its three students it should be the starting point for innovation and commercialization can become a core strength a source of funding for the university programs that logically innovative socially relevant

research is in need of the hour and this and encourage startups with industry mentoring so that is the integration in the universities that we have.

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And of course you know to end this lecture. I would like to talk about the third service revolution. In this in other words what we are trying to do here is to redesign villages redesign the cities and redesign the university systems redesign the healthcare systems so I have I have taken two important services of healthcare and university inside the city and i wrote the how to how to do this so if you want to design as a smart city you could use this and then and then design the smart city now on this lead to what is called third service revolution.

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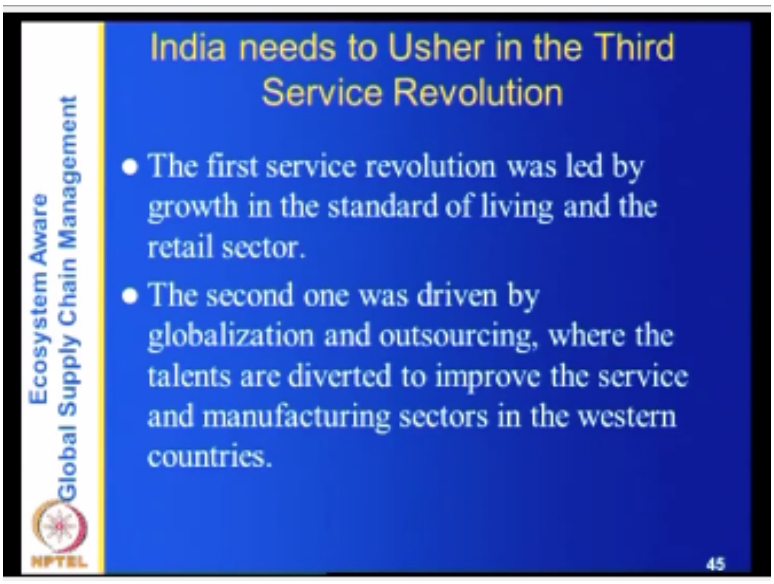

What is the first the first service revolution was led by growth of standard of living and the retail sector in other words people who have increased this status this one and then they wanted more products they wanted more communication they wanted telephones they wanted protein-rich food and all that and that is how the third first revolution and the retail has been a big hit also differs the second one was given by globalization and outsourcing where the talents and dive are diverted to improve the service and manufacturing sectors of the Western countries.In other words people wanted this globalization to improve their one.

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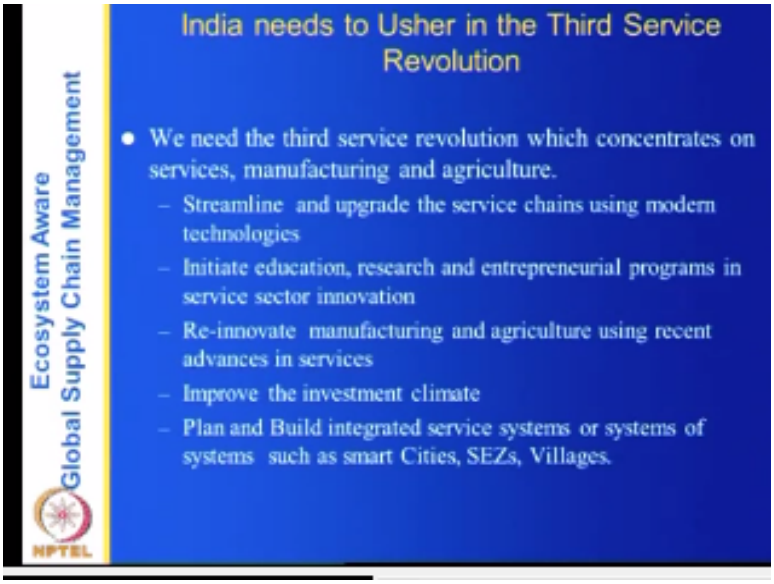

So the third one is we need the third service revolution which concentrates on services manufacturing and agriculture in emerging markets streamline uprooted service change using modern technologies make them smart initiate education research and entrepreneurial programs in service sector innovation well you cannot just make them smart you have to re-engineer what is the existing so that requires research we innovate manufacturing and agricultural use and recent advances in services this is a very important thing because now for example.

In the manufacturing and agriculture the services that are needed in terms of power what are human lab a man and so on or are immense they are not independent of the services marketing to do retailing everything if you make them if you want to reinvent them to make be using the recent advantage improve the investment climate plan and Bill integrator service systems of systems such as smart cities se jets and so on.

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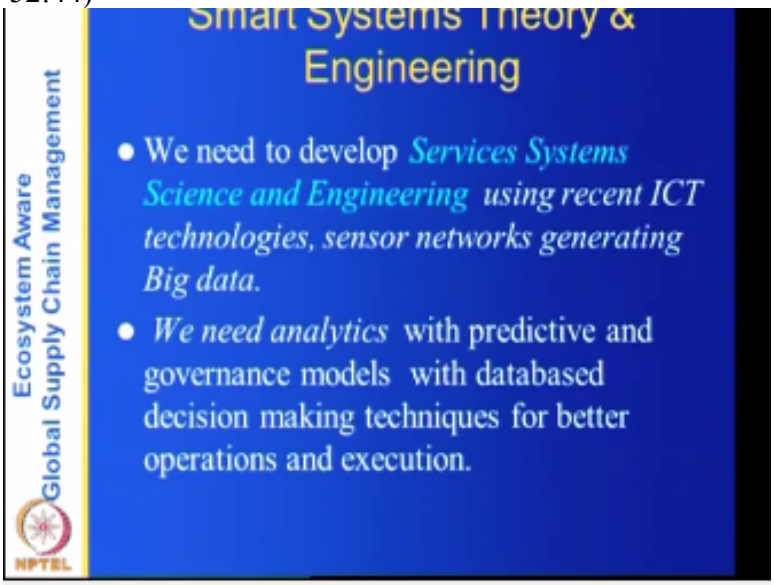

So basically we need to develop services systems science and engineering using ICT technologies. And so that was generating big data and we need analytics with predictive and governance models with data base station making techniques for a better operations and educated so ultimately whether it is a village whether it is health care whether it is a city or something what is that that bit was you have to analyze the service system you had to engineer the system using ICT technologies and use this uncertain this one and improve the system using the using the data base station making technologies and use the governance models for plan and execute the systems.

So that is what it is so I think in this two lectures what we did was we have applied whatever we have learned for industry supply chains do in a larger context of villages and cities healthcare and universities that is where, I think this lecture gains lot of importance in terms of the generality of the ecosystem approach that we have developed so you should be able to use this information to map your own your own industrial eco system over on village eco system your own City ecosystem are service eco system orient and then see how you can improve them.

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