Infrastructure Planning and Management
Successful Project Delivery Strategies Part 1

So we basically talked about most of the things that I wanted to about with regards to infrastructure right, so we have talked about sectors, we have talked about challenges, we have talked about strategies, we tried to use few case studies to put them altogether and there is really no way you can finish this discussion right, the idea behind this class is to expose you to a bunch of ideas, you know, what is happening on the ground, tools and frameworks and these are things that hopefully you will apply in infrastructure and as you would have noticed some of this is even generic enough that you do not have to be or infrastructure to apply some of these concepts right, you might be other sectors and negotiation and flexibility and all of those are reasonably portable.

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On today's thing in the idea is we are trying to put this together, so let me sort of, maybe, so will talk about the of these things, but from what you have learned, if you want a now put a successful infrastructure project together, what would you do? Right, what are some key steps that you think you want to take to put an infrastructure project together again, the stakeholder management is something that hopefully come out as part of this course is being critical right, the effect of the stakeholder management and we have talked about a number of tools and techniques and will sort of you know, maybe revisit a few today, that was a how to do that right, okay.

So good, so you know you need to do effect of stakeholder management right, what else would you like to do? To whether sustainability analysis right, okay so sustainability analysis focused on socio-economic costs, okay, so again relating somewhat to stakeholder management, so you sort of bringing a quantitative approach right, do more of socio-economic kind of analysis, yes, Jayesh.

Student Jayesh: (()) (1:53)

Professor: Okay, so the financing structure important, so we know we need to sort of focus on that alright, but okay, so incomplete design is something that may be compelling a concept because things change over time right, so what it design for todays need may not necessarily be applicable in 5 years, 10 years, 15 years down the line and so certainly I want to sort of think very carefully about incomplete design, proactively while it to my design, allow my design to change or things to be added right, as times goes back, if required, okay, good.

What else would you do right, just think about yourself as a project manager right, so there are some analysis that you would do, some financial structuring that you would do, maybe sort of think about incompleteness in your design fantastic, yes, so very often, very realistic and pragmatic about future, the amount you have got also therefore, question very critically and harshly our projections, very easy to say today and say economic growth will lead to, a demand increases 3%, 4%, 5% whatever it is but is that necessarily realistic and that might be true over the short term right.

So 3, 4 years, it might increase over a 30 year period, how do we, you know how can we be a realistic and of course is it is a easy question to ask not such an easy question to answer right, because all of this is data analysis, it is predictions the end of the day right, so it is very difficult to really predict the future accurately right, as very easy for us to predict the past

right, so it is easy to sort of look back and say yes, this is what we should have done, it is always difficult to predict the future right and yes.

Student: (()) (3:28)

Professor: Yes, so goes back stakeholder management right, so we need to ensure the people participate right, so we need mechanisms to do that, yes.

Student: (()) (3:36)

Professor: Ensuring transparency in the project right, through all stages, through design, through procurement, through execution, et cetera okay, so we have list of things that you guys have put in, to some extent my expectation is that you would sort of, those of you voice an opinion, a probably sort of pick the part of the class that you felt was most, you know critical or whatever it is right.

Now the next question is when right and what stage of the project would you try to enact all the ideas that you came out with, whether it is a stakeholder management, associate, yes, Pawar, right, so in the predesign phase right, so essentially the idea is you want to try to think about these things as early as possible on the project right, so if you go back to in the last few readings are also from the same book that we looked at earlier, which is this sort of yellow book called strategic management of large engineering projects written by Don Lessard from MIT at Roger Miller was from Canada and essentially they have termed there, I am not sure they coined the term possibly others did, but it is a very popular term, it is call the project, shipping phase right.

So essentially when you divide the project in 2 phases, clearly it is a design phase, there is a construction phase, there is an operation and maintenance phase and this phase that Bhavani just talked about which is the predesigned phase right, it sort of a another term it is given to that phase is a project shaping phase because that is the phase where you can really, I mean the project is a lump of clay at that point right and you can actually shape it the way you want, so that in many ways becomes the most important part of the project, it is the part way you can actually take all of this decisions right.

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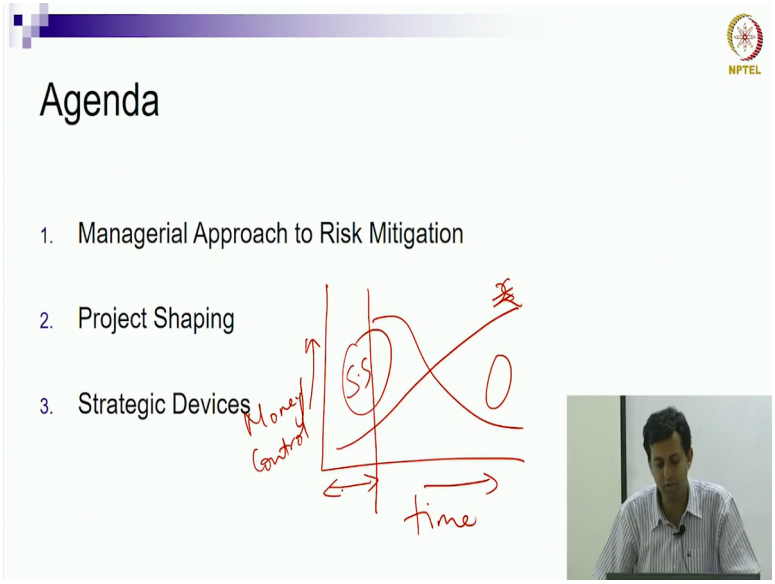

So we talked about all of these curves earlier, where over the life cycle of a project right, this is time right and this is money, money or control right, over the lives cycle of the project you start spending more and more money right, but your level of control keeps coming down because once you made decision, once you have design, you have tendered out, your procured material, you spend money, very difficult to go back on these projects right, so over a period of time, your level of control comes down and the amount of money you spend increases right.

So this is in many ways your sweet spot, you spend very little money right and you actually have it made finalize decisions, you are when you actually make decisions to engage stakeholders, there is no point engaging stakeholders somewhere here right, your projects already built, you cannot really go back right, if stakeholders sort of want 180° return, it does not really happened and this happens right here at the beginning of the project right, so this is I think the important phase that want to really focus on, it is called the project shaping phase right, so let us talk a little bit about the project shaping phase today as sort of see what needs to be done.

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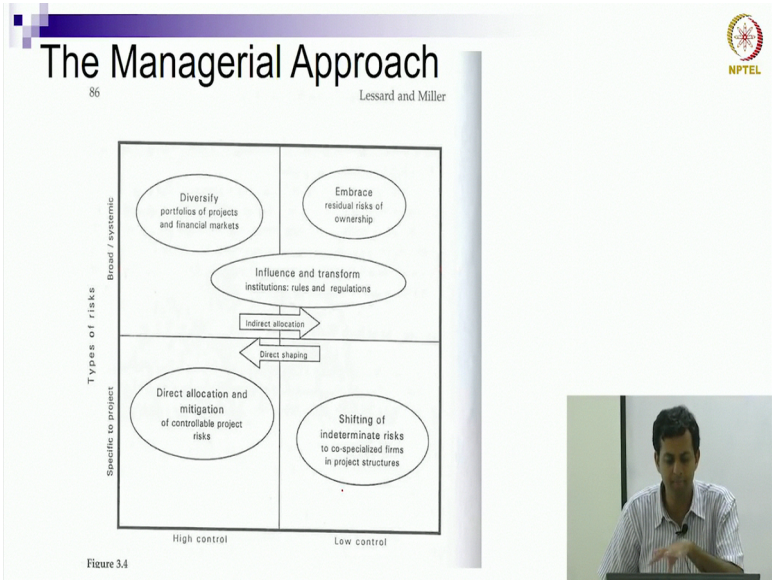

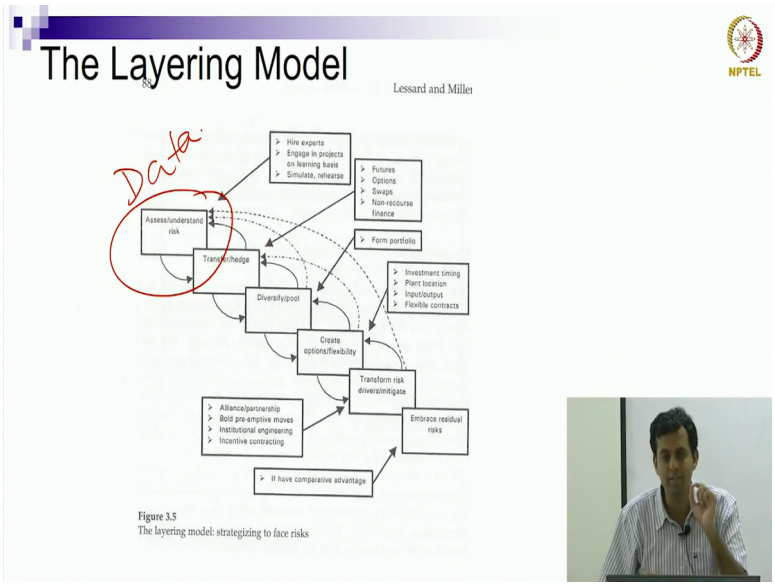

I believe I might even have showed, we might have discussed this earlier right, which is how do you actually mitigate risk on projects? What you do during that project shaping phase? There are number of, you know things that you might do, I think the next line more or less are like similar, but the first thing, I think we need to do in this project shaping phase right, which is right here, not sure how visible it is what it says assess and understand the risk right.

So not about we have got to sort understand what are the challenges that this project is likely to face? What are the needs? What are the requirements of that project, etc? To do all of that, what do we need? To do a really good job of understanding what are the risk, what are the needs, how should this project, we develop, to answer all of that, all of those questions what do we need? Okay, idea previous similar projects, experiences etc right, but essentially what

you guys are talking about right, another term for what you are talking about is a essentially you need data right, you need data okay.

The more data I have on what people want, the more data I have on what has happened on previous projects, the more data I have on land transactions, the more data I have on what are some key, economic decisions that might be undertaken and the way the economy will grow, the more data I have, the more likely I am to come up with a project that is likely to meet the needs of people right, so essentially and is this data likely to just land up on my lap right.

If somebody just going to give me a folder, that his data for this project, magically has everything I have, obviously not right, so data collection right becomes a very, very important, very time-consuming and very intensive process right and as you can tell the data is huge, there is all kinds of an environmental data, you might want to collect, what kind of species live your that I might be destroying right, if actually build you know something here, what kinds of people lives here, what are their occupation, how many of them are legal, how many of them are illegal right, how long will this take to build, how much will it cost, what are the kinds of technologies available right, what other kinds of technological changes that are likely to come in the market.

So lots and lots of questions it, so the point is, you need to invest in this projects in some kind of a data analysis, data collection, data analysis kind of phase, which has to be a phase that is given a little bit of time right and this is very run into the traditional problem, where people like to get things started. Okay, because you do not measure you know a leaders success based on how long it took them to right the first request for proposal.

You sort of measure it, in terms of how quickly that they get the project executed, so this is always a push towards a come on, let us you know do a detail project report or whatever, let us get it out into the market, let us have people bit for it, let us try to select a winning bidder and 6 months let us see if you can push this project forward right, which goes completely at torch with the fact that we need to spend a lot of time collecting data right, but I think one of the things which we really need to think about is how do we collect data right and how do we allocate time to collect data.

So Miller and Lessard in their book will tell you things like for a project that takes X years to construct right, almost 3X of that time need to be spent prior to design and construction right, in terms of figuring that, that sort of a rule of thumb, so if it takes 2 years to construct, the

project needs to have been at least 6 years in the making right, for you to have reasonably acquired a data and made good decision, whether that is possible or not sort of depends okay.

Can you think of strategies to make that possible? Given that people do not want to spend so much time, 6 years is a long time right, it is, you know by 6 years next government will come in and who knows where that will go right, how do you actually solve this problem, I need to collect data, it needs to be step number 1, but it takes time and we do not often have time, particularly in the country like India.

Those are correcting people getting informations is how I get data right, but that is the long drawn-out process right, point is, if I start doing that it take me along time sort of collect datas, synthesize, sympathetic, etc, so is there a better way of doing it, yes, so I think you know what you are suggesting is along the lines of you know what I was thinking of as well, in the sense, you may be one strategy is to disintegrate the data collection with the actual project right, so if you say okay, now this project has been announced.

So, Tamil Nadu has water shortage I need to be built a desalination plant, now let start collecting data right, I think you are probably a bit too late right, I think the data collection process in some ways needs to sort of go on parallel, so in some states in India we used to have something called the shelf of projects right, where at some point we keep collecting data and we put this sort of project up on a shelf.

Now they may not necessarily be taken up right away right, but all the data collection and analysis is done, you know paralleling as an when government choose to so, at the moment water may not even be on the radar right because we have adequate water supply whatever it is, but still there is a shelf of projects that is being built up right over type, so when water becomes critical right now you know no longer have starting data collection because there is already a lot of data that has been collected on this projects that been put up and all you have to do is probably define the data collection, a little bit.

So I think one strategy there from a government prospective is try to see how we can disengage data collection with project execution, another strategy that people have sort of also suggested along similar lines, the timing of your data collection right, so in some cases the best time to sort of dos studies okay is often in say the last year of an elected governments run right because the last year they are not really looking at executing projects right, because now there are already in the election mode.

So typically if you look at this five-year cycle you are over the first year, you know, a lot of policies are set then years, two, three and four are where you really want to ramp up, you know implement your policies and last and year five you are trying to really consolidate so that you can present a good picture to the elect it to see if you can get re-elected right, so somewhere in that year 2 to year 4 project is whether projects really take off right.

You have 2, you have 4 life-cycle, which means somewhere year 5 to year 1 period right, when things are a little bit, you know, there is a bit of a null when people are doing sort of more taking stock, try to be figure out policy is when a lot of these studies data collection need to be done right, so if you start say I will do a study in year 2 of an elected governments regime then perhaps it is a bit too late right because year 2 you want things on the ground, so that by year 3, year 4 the construction is finished and I can actually show, if at that point you are starting to do a study probably you are too late, so disintegrating this process, try to maybe phase shifted with election cycles etc are things that, kinds of the strategies that we need to think about right, so that is one.

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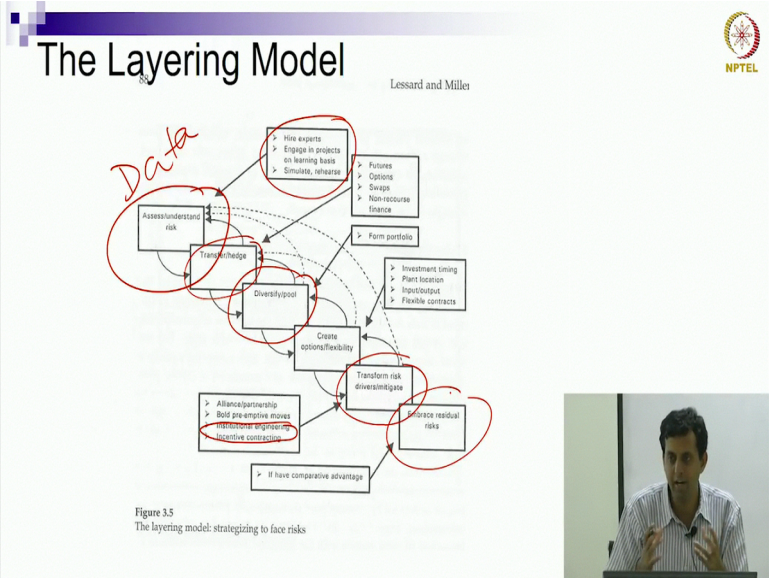

So one is, the first important thing we understand the data, that we can once we analyse the data, there are all kinds of things that you know we try to do right, how do you transfer or hedge these risk right, should I just give this risk to over to somebody, can I come up with, say, a flexible design or something that can hedge this risk, do I diversify this risk by building a number of assets, so that even if one of them does not work as a portfolio right, my assets work, do I put in flexible options, do I you know transform risk drivers, do I find a ways to mitigate this risk or transform this risk completely right.

So there is, for instance, you know, I am not quite sure if people will pay for the service. Okay, so I built a toll road, but how do I know people are actually going to be right, one way to enforce it is, if I actually get legislation right on tolling right, once its legislation then really no question of agreeing or disagreeing because it is the law of the land, you implement it, if people do not pay, it is not your problem, you can take straight to the High Court, Supreme Court or whatever right, so that is a way in which you are actually transform or mitigate risk.

So once you have the data then we can see sort of what we need to do about right, but step one really needs to be data collection and then you have all of these and how do you collect data, you hire experts, engaging projects learning, simulations right, the kinds of analysis we did on excel the other day, we all of these are ways in which we collect and analyse data and then there is all kinds of ways in which we can transform risk.

Institutional engineering is what I talked about just now right, in terms of can be re-architect the rules, regulations, et cetera, so that this project has a higher chance of being successful. Okay, partnerships all of that, will talk about this a little bit more and then finally, of course, you have to take some risk okay, but at least you have data driven model of how to proceed with this projects okay.

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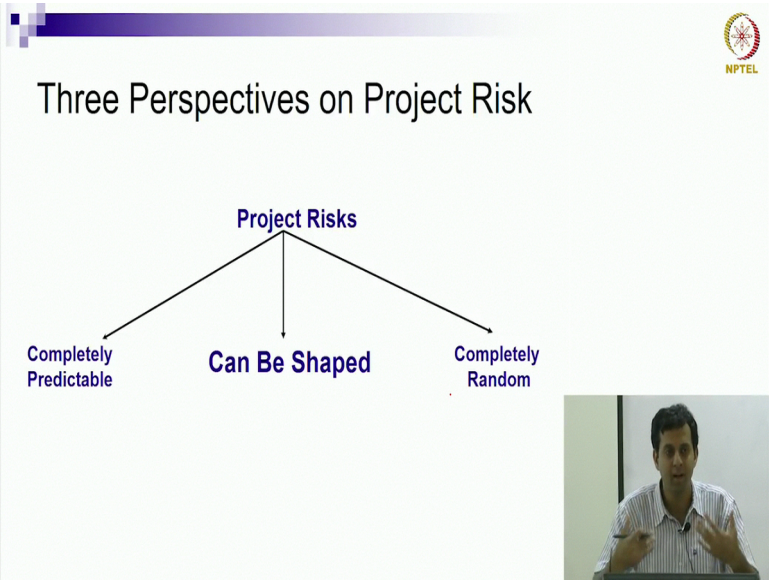

We have talked about how there are these three prospectives on project risk, one prospective is, oh everything can be mathematically model, the other prospective is like this completed random up right but the middle prospective that I like all of us to take away from this class is

that yes, there is some data that can help, yes, there will be some randomness but let us understand that we can actually share projects, these risk are not sort of just given that cannot be modified, yes, people may not want to pay for this asset for whatever reasons, they think it ought to be free, they do not trust the government, they do not trust being the private operator, all of that might be true right.

But does not mean that the risk just has to be dealt with as it is right there are ways in which one can try to persuade and convince people right, though in other words these the projects can be shaped and I think that is the most important part, lesson here is there is no such thing as prima facie a that project will work or will not work right, prima facie, you have some data and some assumptions and it is up to you based on all of these things that we have learned and your ability to design, to financially model, to negotiate all of that, to make this project as successful as possible right.

So if there is a need for that project, then the onus is on that project developer to use the ideas we have talked about this course right, to come up with the configuration that can be successful, whether that is persuading people, whether that is offering financial incentives, whether that is the kind of leadership that Exxon channel Cambodia demonstrated, so many options out there right, but projects fundamentally can be shaped right and that is the positive outlook with which I think we should be approaching this projects right.

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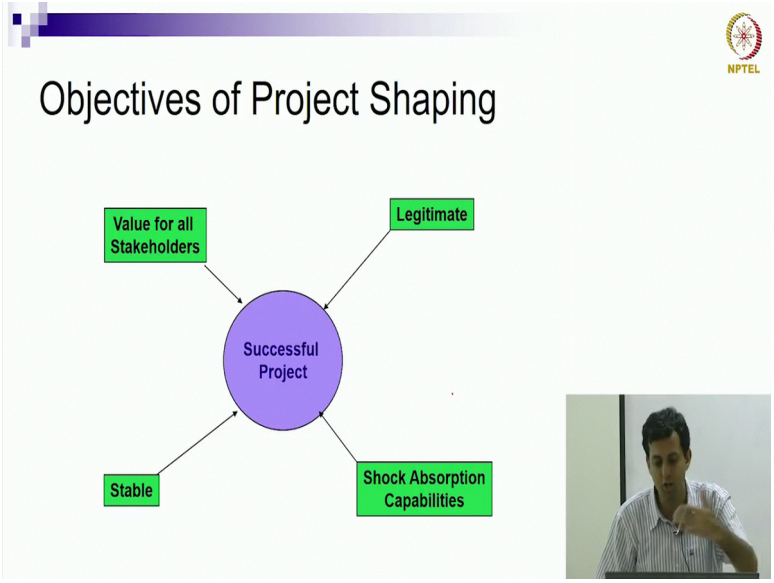

So what do we want to achieve? Okay, by all the shipping you know using all this strategies right, what do you want to achieve? So you want to complete on time. Okay, good. What

else? On time, on cost, etc right, so you want the project to be done on time, on cost, what else? Is that all, you want the project to be generating some, let say value. Okay, revenues if you are paying for it, if you are not paying for it, some values being generated right. Okay, what else? It to satisfy all the stakeholders right, which is government, private operator, financiers, people who are using it, people who are leaving around the project, all of that right, it should be satisfied what else?

Sure, that is a process that you will take for an outcome right, what we are doing is talking about outcomes and the outcome is on-time, on budget, everyone satisfy all of that, what other outcomes that you are looking for? Can be inspiration for other projects. That is probably an outcome, excuse me as well. Okay, so clearly and I think you guys have read most of the main points, you need to create the value for all stakeholders, it needs to be viewed as legitimate, in other words, people need to sort of like it, appreciated, being you willing to use it right, rather than sort of saying, oh this project was built because this person just wanted to sort of you know bring this project to their constituency and it is generally required or people say, oh, there was no need to charge me 30 rupees for this, it could easily have been done much less right.

So you wanted to legitimate right, people need to have that sense of legitimacy whether it say yes, of course, that is very logical that this project was done, it is very logical that I need to pay 20 rupees or 30 rupees to use this service or whatever it is I am paying because that is the way this project can be maintained and I will have a better user experience right, so legitimacy becomes important.

Shock absorption capabilities is that a sort of the flexibility, maybe a little bit of process, but you want that on projects but essentially you want projects also to be stable and for them to run over a long period of time, particularly if you are building these large expensive assets, if you are building this roads, this power plants, this bridges, etc you want some of this projects are stable that there are being used over a long year of time, in addition you want them to finish on time, on budget all of that.

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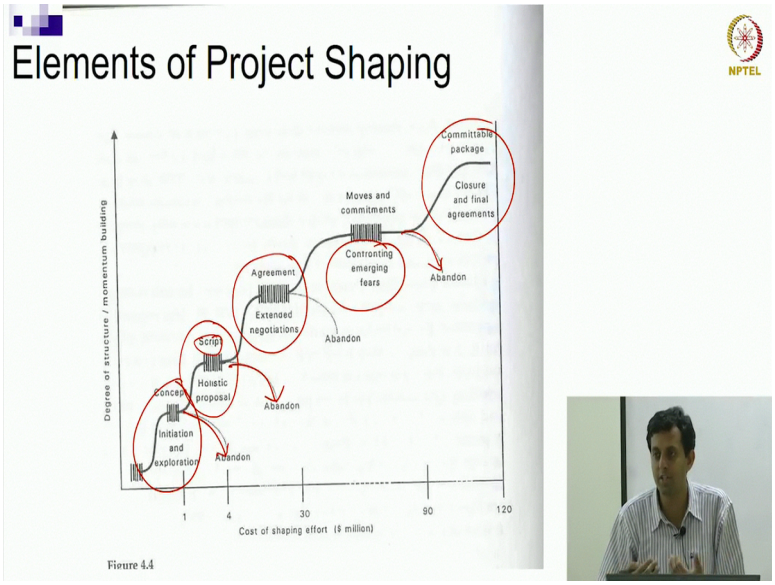

Okay, so those are your objectives. Okay, so how do you then achieve those objectives as we have talked about project shaping part is sort of picture familiar, unless it is a bit over quick sort of primer on project shaping, so bunch of faces that you essentially go through. I think we have might talked about it, so again we go back to the initial phase where there is a lots of exploration right, a lot of data is collected and we try to sort of acetate, is this project were necessary right and the answer might be no right and in many projects often are abundant right at that point okay.

But if there is a need for the project right, one needs to actually try to come up with the holistic proposal and the word here that I am circling, that I do not know how clearly you can see, it is the words script right, so an essence you are creating a narrative out of this project right, you have to justify this project on a number of grounds, you have to justify and economically, you justify socially, you got to justify the politically and so essentially you are trying to create a narrative on this project and come out with a holistic proposal that hopefully we will speak to of your stakeholder groups right and sometimes maybe that is not possible or you do not have the time in which case again, you can abandon right.

But at that point is not as if just because you come up with a proposal, everyone start saying wow wonderful proposal lets go-ahead right, you have got to start looking at negotiating with people right, to try to understand how you can strengthen a proposal so that as many people as possible are satisfied, during this process you have something, something that we call emerging fears right, so people start questioning the motives behind this project, you know

are you really in it socially, are not you sort of really trying to do this more economically, you are trying to improve GDP, your trying to ensure that a private operator gets a good internal rate of return, but at the same time, you seem to be overcharging us.

So all of this sort of fears come in that you have got to, you know work with or abandoned and if you can move through that negotiation phase then you might actually get to a point where you can actually get into the details of design right, of contract right, of implementation and so on and so forth right, so the whole point again on project shaping is we need to spend enough time to design doing all of this right, you need to spend enough time collecting data, coming up with this proposals and those proposals may have flexibility embedded them etc, working very closely with stakeholders, confronting their fears, etc, to get to a point where you have a project which that people will view as a legitimate, that people will view as value, great.

To be very honest in a 30 year project if you have little bit of time overrun or cost overrun. That is back, we do not want time overrun or cost overrun by is not a deal breaker. Okay, so yes, the project sort of you know, it is a 30 year project, but the construction was first two years, it was two months late, does not really matter as much, you have got 27 years and 10 months still to run the project right, but what you do not want is to make sure you are on time, on budget, etc, but people do not value the project, they does not add value to all your stakeholders right.

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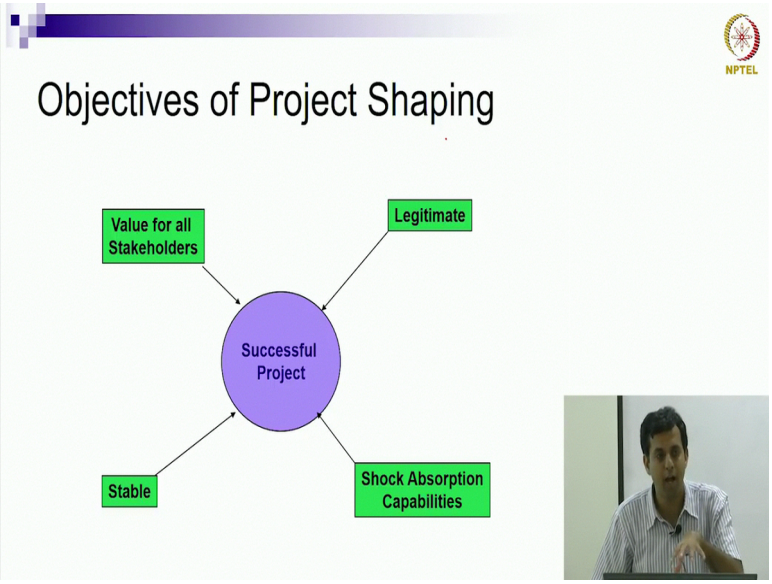

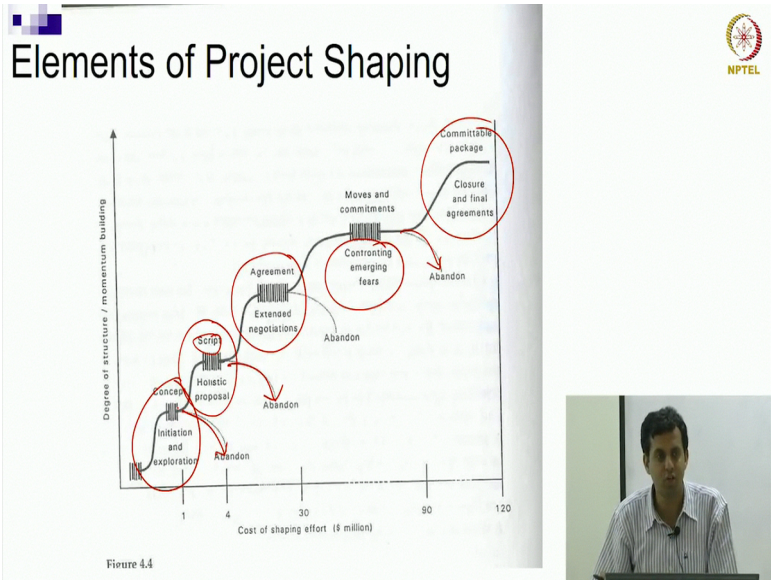

So the stability of the project, the ability for it to be use which is what we have talked about here right, the value that is create it is important and in order to ensure that it creates value, you need to spend a lot of time ahead of the project, doing all of the things that we have talked about the class right, doing all your stakeholders mapping, stakeholder management this that bringing in governance principles all of those kinds of things right, working with people to see if we can get a projects story straight.

And if you can get a project story straight, then I think you have a really good chance of, not only implementing the project on time and on budget, which are important but also a project that over a period of time will last and by the way, you can even apply this kind of thinking to things like our academic complex coming up at IIT, which I am not sure if people in this room will enjoy, I mean some of you will, if you are sort of here for a longer run, but some of you are graduating at the end of this year, I thought you will get ever to get to take a class in that classroom.

But the point is, it is exactly the same idea look so, we feel we need to build a new classroom, how do we build it? What do we have? How do we anticipate teaching-learning needs in the future? How do we sort of financial it? All of this are open questions right, so when BSB was build nobody envoy surge projecters and mirror PowerPoints and all of that right and therefore we have to retrofit a lot of what we have done and therefore it is not as smooth as, for instance, this room right, which was clearly built or remodeled with the fact that we will do this kinds of electronic video capturing etc and mind.

From the acoustics, from the seamless way in which sort of all of this integrates etc, so you have difference, so how do we estimate is this kind of trends 20, 30 years down the line, so you got to sort of think about all of this, so you need a lot of data collection, what is happen on previous projects, what if we need, what are the trends, what are the education is saying, we need to come up with a proposal that meets the requirements of the planning unit at IIT, the administrative unit, the director, the students, faculty were going to be teaching, staff were going to be maintaining a etc, etc.

So there we have to sort of clearly negotiate, researchers might say look, we need more research space, students might say we might need more you know better classroom space, there is only fixed amount of space, you know what do we do by the way and also you know last year we having discussion on bringing down C5 and rebuilding it much larger right, same kind of negotiation that different groups in C5 or larger economy ecosystem, they have their own sort of pet views on what they need to have, others look at it differently, alumina are looking in terms of how to find this right, you put it on your belts and whistles it becomes explosive right, might be difficult to raise funds.

So there are all of this negotiations that will have to sort of a take and when people starts sort of you know confronting their fears or expressing their fears saying look is this really, are you guys really going to favors teams like Raftar as opposed to other groups within C5 and how are you guys going to be sure this is done equitably, so take so long time to come up to a commendable package which you can tender out the confidence that this academic complex or this innovation hub or whatever it is will at least last for the next 10 to 15 years, otherwise, the easiest thing in the world is just call somebody put a design and direct.