Project Management
Prof. Raghunandan Sengupta
Department of Industrial and Management Engineering
Indian Institute of Technology-Kanpur

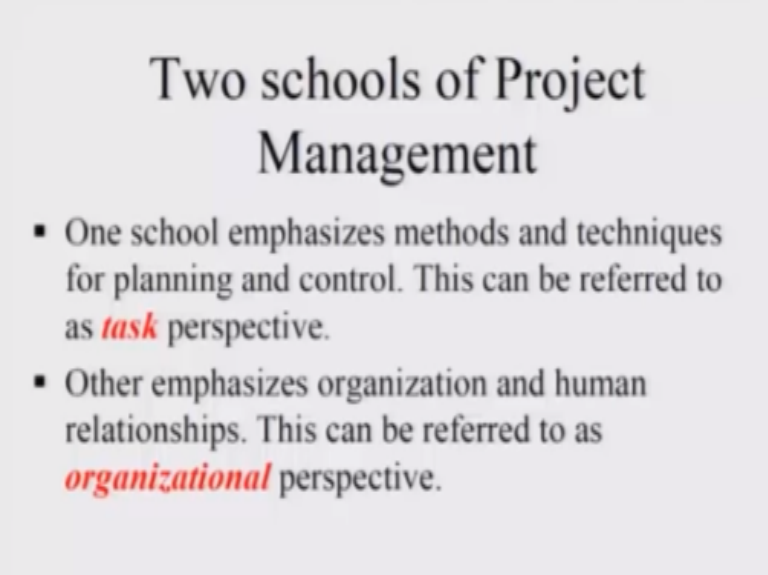
Module No # 1
Lecture No # 02
Introduction to Agile Project Management

A warm welcome to all my students this is the second lecture in for the topic of the subject in NPTEL which project management and as you know I am Raghunandan Sengupta trying to cover all the details of project management as a course. So continuing from the last lecture where we left? We discussed different types of books we are going consider.

We very briefly even though I did not show in my slide we consider the different type of concept we will cover then we went into the definition of what is a project and how it is different from production concept of view from the engineering point of view. Where the main emphasis in the project was one of its kind only concept the work has to be done and I did give feel of to the audience that what can be the different type of projects related to the building a dam, related to building a bridge trying to come up with the marketing strategy so on and so henceforth.

And then also I mentioned that to two different concept of PERT CPM just mention the names. Obviously that I come to those later on and then when told that how Q-GERT concept of loops which is basically queuing GERT would be used in trying to basically find out the concept of how projects which are complicated can be done. So continuing with that same flavor so I will go into the more details of theory and then come into the problems later on.

(Refer Slide Time: 01:55)

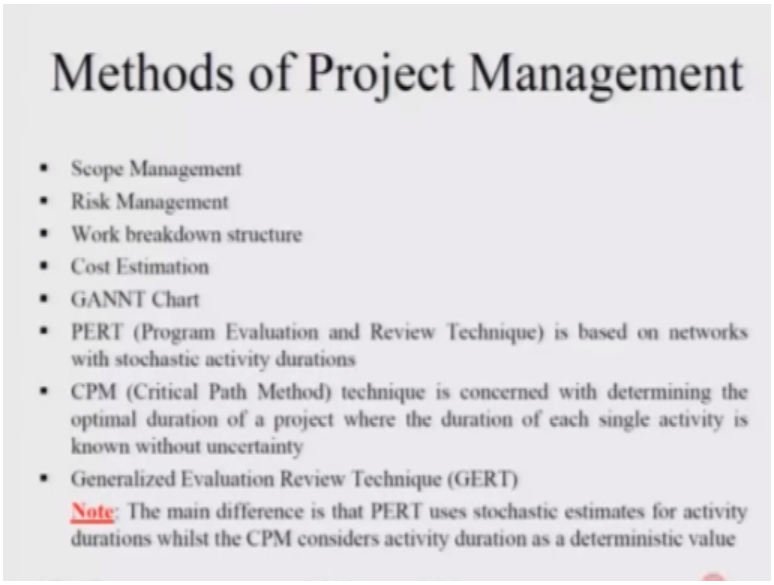


The two schools of projects managements are basically one school emphasizes the methods and techniques for planning and controlling a project. So planning and controlling the project if you remember in my first class it was basically mentioned I did repeat it quiet few number of times is that a main concern is try to finish the project within a stipulated time. And so your time concept is important and then later on if we consider the concept of resource and budgetary constraints it has also separate implication for the project.

So this can be referred as I mentioned for the first school where emphasizes on methods and techniques this is can be referred to the task prospective way of trying to handle and the other emphasis is basically trying to analyze the human relationship and this can be referred to as the organization prospective. So our main focus is not from the second point of view is mainly from the first point of view.

Where it is most focused and how the tasks for the activities are related and we try to basically utilize different type of simple quantitative technique in order to solve the problems in the area of project management and try to understand our project management can be utilized.

(Refer Slide Time: 03:15)



So the method of project management from the point of view of the first concept where the activities task are more important or the focus. So we will consider what is the scope of the project management and the concept of the risk how risk concept is brought into the picture I did mention in the first class the concept of risk which is there. Then we will consider the work breakdown structure or rather than considering the overall micro level of each and every activities.

We will consider the overall picture on a micro macro level we will consider the cost estimation how internal rate of return how the expected values are considered. We will consider the Gantt chart and then later on as I mentioned that we will go into the concept of PERT. Now here is the first time that I am basically going into the details of what PERT is. The PERT basically means the program evaluation review technique and is based on the network with some concept of stochastic activity duration.

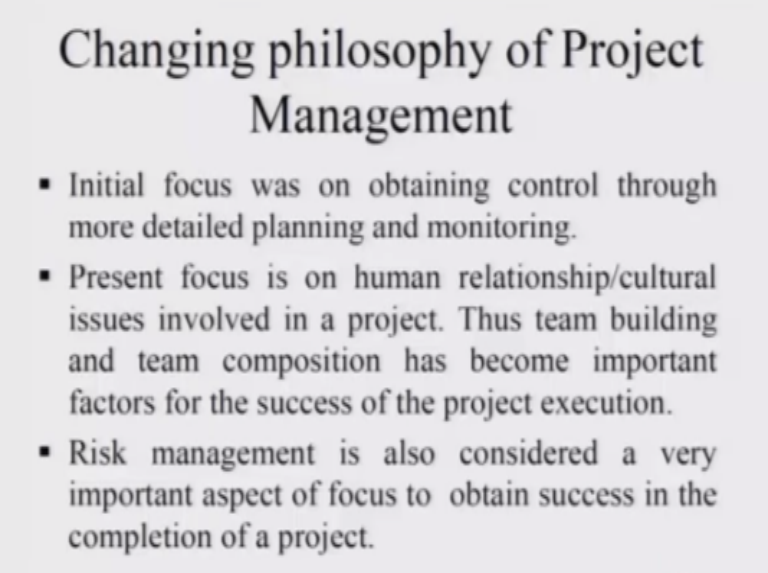
Stochastic activity duration means the time duration is not fixed so there is a pessimist time there is an optimist time there is so called median and mean time and we try to basically analyze the overall project time duration from the PERT perspective and what is the duration of the time we will also consider that and how it is brought into picture we will consider that also.

In the critical path method it is basically concerned with determining the optimal duration of the project where the duration of each single activity is note with certain with without any uncertainty so there is a fixed time. So obviously there would be some difference in the PERT and the CPM concept but we will slowly consider that how the concept of PERT and CPM can be utilized separately depending on time or for the activities or time for the set of activities are non – deterministic or stochastic and deterministic.

After you finish the PERT and CPM if you remember I did mention about Q-GERT, GERT and the name of ALLEN PRITZKER I did mention just once in my first class as a as I was going through the syllabus. So basically we will consider the generalized evaluation review technique and how generalized evaluation review techniques is different from PERT and CPM I hope we will highlight that also so and I try to solve symbol problems.

So now what I want to mention before I go into the next slide is that I did mention few minutes back is that in the concept of PERT and CPM the concept of time duration means stochastic and deterministic is one of the main difference between the concept of PERT and CPM. Such that once we consider they will understand what is the differences and how they can be taken into consideration for different projects where time duration is deterministic or whether the time duration is non-deterministic from point of view of the project.

(Refer Slide Time: 06:20)



So they as been a changing philosophy of the concept of project management starting from when it was basically conceived. So in generally we will just go through the flow of the discussion and then come into the problem solving of project management assess. So initial focus was on trying to obtain a control through more detail planning and monitoring of each and every activities of the projects or the project is such and trying to be serious the project within time without laying much stress on.

Say for example what would be the or what were the implication of trying to basically finish the work on time and his and its in implication on the budgetary and the resource constraint which the set of persons or the project manager did face when he or she tried to finish of the project within a stipulated time.

So the project present focus has changed from more from you into the area of human relationship cultural issues but as I mentioned we would not consider those for our Astrid is because our main focus would be to try to understand the different type of quantitative technique which I utilized in the area of project management mainly in the area of PERT and CPM.

Risk management is also now a days considered in a very important and aspect of project management and it is considered that the risk management can be one of the main tools on how you try to analyze different type of projects as such that you can have a perspective that for different type of quantitative techniques which you use to solve the project if you can basically more stress on the area of trying to analyze the risk from the perspective of the project.

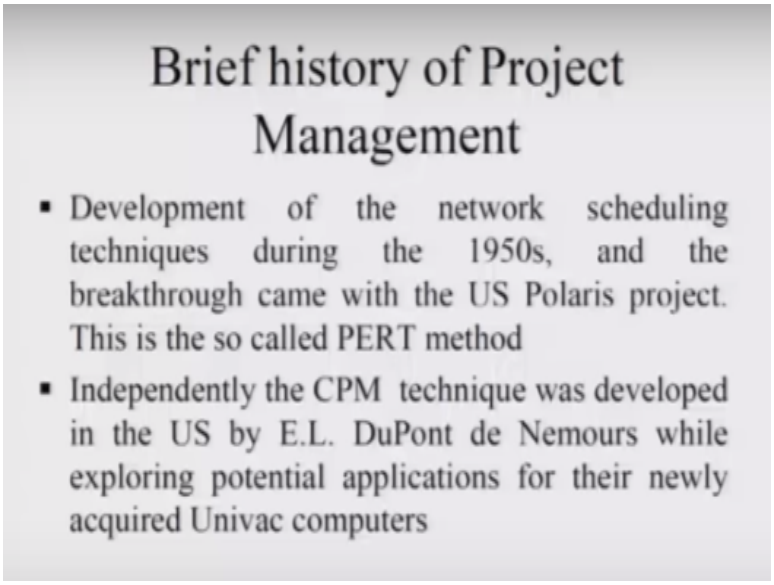
It basically gives you much better picture and how thing can be planned to basically meet the requirement on the project in the best possible way. Now the concept of risk which I mention that you may have learnt risk from the from the point view of statistics probability you may have learned the risk from the finance perspective whatever it is. But generally the risk is considered as some sort of loss or a negative worth which basically accrues from taking the decision.

So our main focus would be to reduce the overall risk of the negative work to the maximum possible extent such that we are inclined to take that decision where the risk for the project or

where the risk for the decision gives is the least such that when we can consider different type of the projects from the point of view of the maximum return that gives us certain result which is fine because we I want to get the maximum what is definitely a very good policy.

Another way of trying to analyze our decision making process or trying to compare different projects would be basically rather to concentrate on the projects such that we are able to take a decision on a projects as such that the overall risk is minimized. So it is basically there are two different ways how you try to analyze the problem.

(Refer Slide Time: 09:23)



So brief history has I mentioned for the project it was basically in the area of space craft design where the concept of project management came out but to give a very brief outline of that. I would definitely request the readers to have a look at the history of project management. Because it may not be possible for me to go into the details of what are the historical perspective of the project management.

But I will just give you two or three bullet points in this area. So development of the network of the scheduling techniques or the precedence diagram and this concept started in the nineteen fifties and the big breakthrough came through developing of US Polaris rocket. So basically if you go into the YouTube or basically go into the Polaris study of Polaris how it was developed

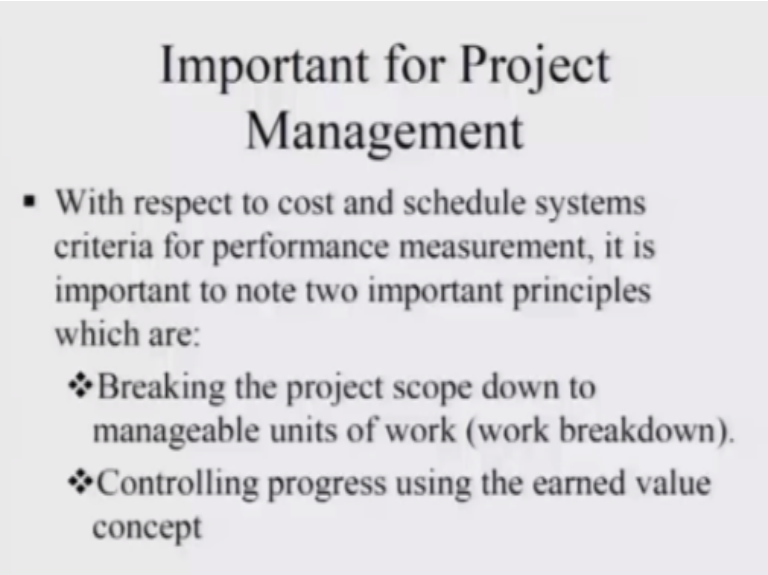
you will consider you will understand that how project management was used in the development of Polaris rocket in very big way.

So basically that can be considered as the work or as the project based on which project management as a concept basically came into the focus. Independently the critical path method, so if you remember just in the last slide I mentioned about PERT and CPM so independently CPM technique was developed by in the US by Dupont while exploring potential applications their newly acquired Univac computers.

So basically where different type of computers have to be scheduling in such a way that the processing part can be utilized where that in different type of series or parallel combinations they are the concept of project management critical path method came into the picture. So critical path method is a type of project management such that independently through the concept of Polaris rocket or independently through that work of of Dupont.

This concept of project management really came in the forefront so where it net worth of utilizing a project management concept was really be appreciated quite by both the scientific community as well as by the people who are trying to utilize that in the practical scheme of things.

(Refer Slide Time: 11:38)

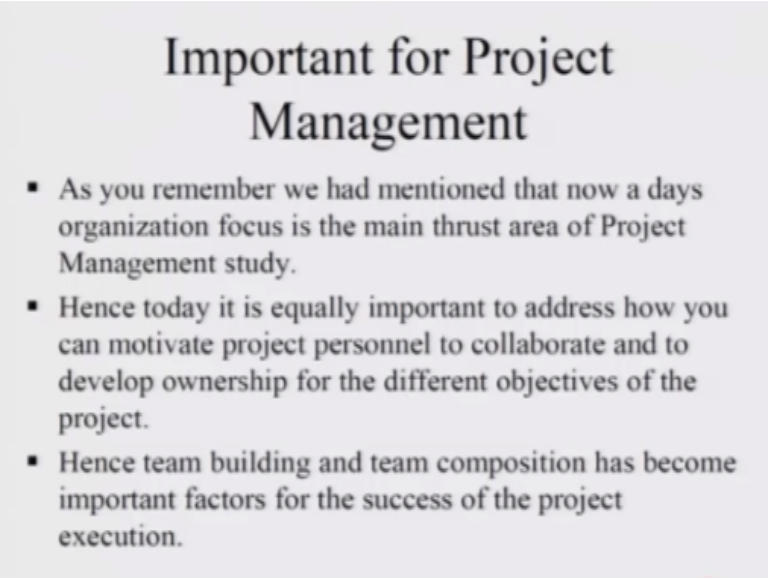


So importance of the project management with respect to the cost and schedule systems criteria for performance measurements it is important to know two important principles for project management which are basically breaking the project scope down to the manageable unit or the units which you can manage such that you can either look into the micro level of things or in the macro level of things and controlling the progress using own value concept.

So the on value concept to be very simple we will try to basically find out that what is the net worth or what is the value which is basically being accrued based on the decision you are going to take. So it is basically we need not be the only the expected value it can be basically the expected value considering all the different scheme of things how you try to analyze the cost perspective considering the rate of returns which are there considering the time value of money.

So all these things would be considered but in a very simplistic notion so as I mentioned in the first class the concept of expected value and the time IRR's those would be considered either on a standalone basis or collectively such that they give you much better view of how the project management concept can be utilized to get the maximum benefit.

(Refer Slide Time: 13:02)



Another important achievement for project management community was the development of PMI or the project management scheduling concept. So the first (()) (13:08) which was published in nineteen eighty seven and later revised in in two thousand eight. So their they try to consider a

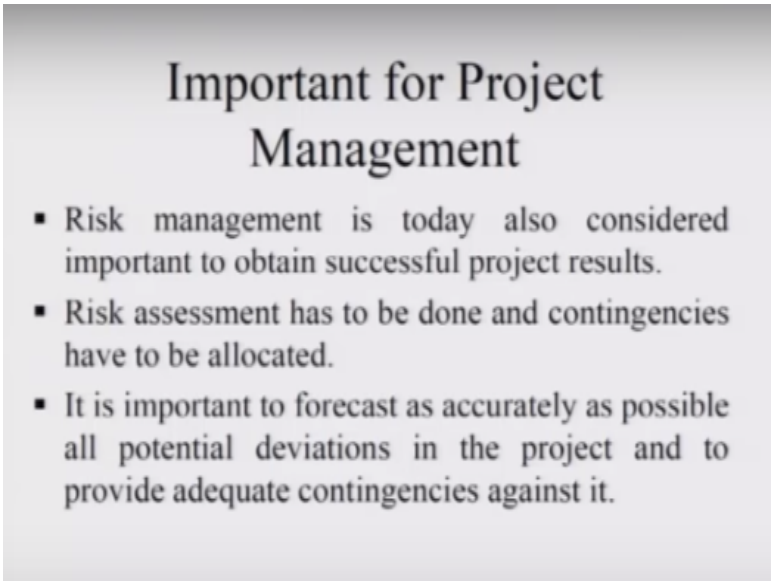
different concept of project management technique such that they give you a very simple way of how you try to analyze a project rather than going to the detail quantitative techniques of trying to solve it using optimization tools and so on.

And henceforth to me in the ANSI standard and serves it as a major reference document for good practices in the project management and all the different ideas which are discussed in that book are considered as the tool or based on which the project projects or project management can be analyzed So obviously rather than going to the detailed quantitative techniques I will try to basically analyze the problem from the quantitative technique as such.

So as you remember we had mention that now a days organization focus is the main thrust area but will try to minimize it to the maximum possible and try to basically cover the project management from the point of view of the quantitative concept say hence today it is equally important to address. How can you motivate the project personnel to collaborate and to develop ownership of those set of persons?

Who are trying to basically work on the projects as that overall contribution of those set of persons if the maximum says that considering utilization on the project management concept from the quantitative view. You can also align them in the idea of how the human beings can basically be motivated to give the maximum benefit. Hence team building and team composition has become an important factor in trying to analyze different areas of project management as such.

(Refer Slide Time: 14:59)



Continuing with my main emphasis of risk management so why risk management is important this management is today also is considered important for a successful implementation of project from the project management perspective. So risk assessment has to be done and contingencies have to be allocated such that if any concept or techniques which is being utilized for the project management point of view if it gives you a huge amount of risk from the point of view of so call loss.

I am using the word loss in very general sense if it is use then one can be sure that those concept of risk management which is trying to utilize. Where the risk management concept can be used to decrease the overall risk perspective of a project? So those techniques would definitely be used much in a much better way than those techniques where the risk perspective is not considered in that big way.

It is important to forecast as accurately as possible all the potential deviations in the project and to provide the adequate contingencies against them such that the overall variations. So again I am using the word variation for the first time which we generally known is basically the standard deviation in from the very simple concept of probability and statistics.

So we try to basically find out how the deviations and the overall the movement from the so called mean value of median value of the idea of the projects what we want to implement it can

be the resource allocation it can be the time allocation. They are considered in such a way the variations or minimized then may not be zero but they are minimized to the maximum possible extreme. In spite of efforts from our side cost and schedule over and still happen.

So obviously if cost schedules budget there and if there are overflow based on that. So obviously it has a negative impact on the project which you are trying to implement so obviously trying to find out what are important whether the cost are important? Whether the scheduling of the jobs are important? Whether the time factor is important? Whether the resource is important? So once we decide how you are going to do obviously we will try to utilize different techniques accordingly.

Now having said that let us a little bit more practical that trying to analyze a project from all the point of view at the same time may not be possible. So what is best is that trying to basically utilize the concept of project management where time constraint is more important and we try to basically find an optimal time based on the which we can finish of the jobs and how they can be rescheduled or crashed such that the overall perspective are trying to finish the project is done in minimum possible time.

So as we do that obviously which (()) (18:02) we then come bring into the picture the concept or resources concept. So obviously resource concept could have also been taken as the first priority and then considering the cost perspective we could have taken that but we generally would follow the principle which is generally studied in the books and try to basically analyze the problem from the point of view of time then the cost structures would be coming into the picture.

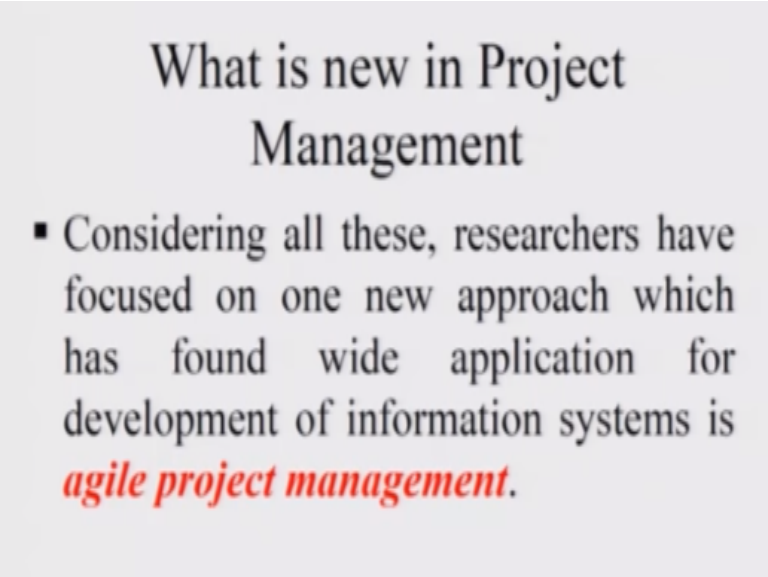
Thus rather than focus contingency planning is more important so contingency planning in the sense that if time is the constraint that how the resources can be utilized can be placed in different sequences that we get the maximum benefit from that and there you will see that how the risk perspective would come into the picture.

So reason being as I mentioned that risk being a risk and variations are normal and cannot be fully done away with so avoided thus is important that we develop project management

competence manage the risk and variations as they occur and try to reduce them to the maximum possible extent.

So hence many organization have realized that too tight control prevents creativity. So trying to basically give some cleavage also gives you some leverage of trying to basically reduce the time as well as trying to basically reduce the cost in doing it in such a way that the overall risk perspective would be taken into consideration rather than only concentrating on the time or only concentrating on the budget constraint. So thus less focus on detail plan can encourage creativity and lead to better and more effective project education and project management techniques being utilized.

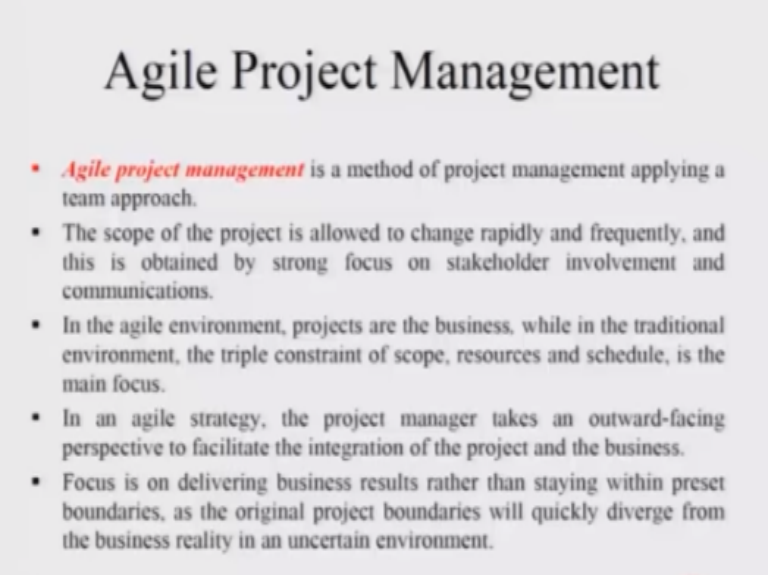
(Refer Slide Time: 19:43)



So what is new in project management we will consider later on but I just wanted to mention it considering all these researches have focused on new approach which has found wide applications in the development on information systems in trying to basically find out the concept of agile project management.

But obviously that would come in later part in our discussion basically consider more the concept of project management as a such and the techniques which we are going to consider such that it gives a overall view that how project management can be done.

(Refer Slide Time: 20:17)



So agile project management is a method of project management applying a team approach so basically the input of different individuals are collectively considered such that the overall creativity is increased to the maximum possible extent. The course of the project is allowed to change rapidly and frequently and this is obtained by the strong focus on the stakeholders in involvement and communications.

So in agile project management or environment projects or the business so while in the traditional environment the triple constrain of scope resources and schedule is the main focus. So basically consider in agile project management concept in a very broad focus the concept of project in such a way that the concept scope or the times of the resources and the schedule which are there in the initial discussion of project management which would be our main focus.

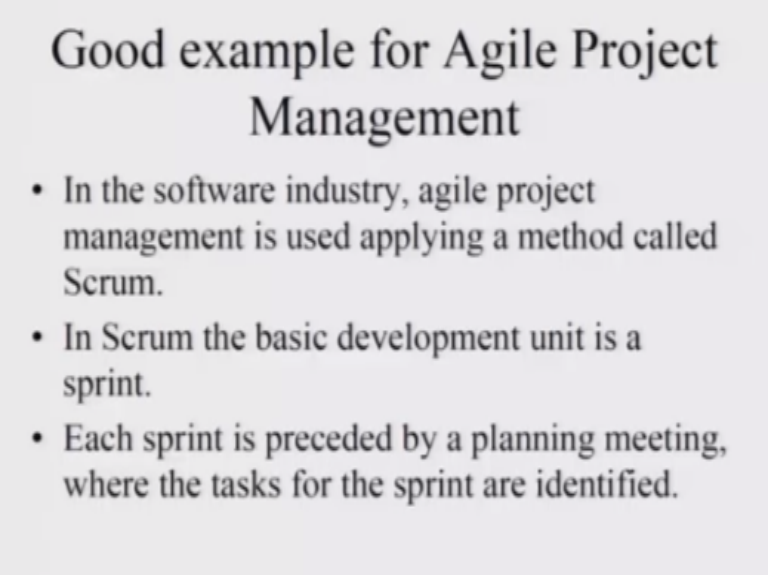
So that is done away with so we collectively considered in such a way the concept of project is basically considered from a holistic point of view where it is more of a business and all this things are considered in an agglomeration fashion. In an agile strategy the project management takes on output facing perspective to facilitate the integration of the project to the business such that the overall focus is the business such that the project is dovetail into overall scheme.

Focus in agile project management is on delivering business results rather than staying with present boundaries as the original project boundaries which is quickly diverse from the business

reality as uncertainty environment becomes much more relevant as days goes. Which means that concept of risk should be taken in such a way that will consider the risk to be an intermediate part of the overall system.

And try to analyze the project from the risk perspective from the business perspective considering everything is dynamics such that not only cost not only schedule not only resources are considered. But more rather than all the things are considered in a one go as relevant for the project from the business perspective or the project as a standalone basis which we are trying to work.

(Refer Slide Time: 22:45)



So good examples of agile project management would be in the software industry agile project management is used applying a method called scrum in scrum the basic development units is sprint. So basically we consider different type of agile project management concept in technology development in trying to basically for the software development but rather our focus would be for the solving problems would be more on the project management from the manufacturing perspective.

So in agile project management from the software industry each sprint is preceded by a planning meeting where the task of the sprint is determined and they are basically identified and they are clubbed together in such a way the overall project is met from the business perspective as such.

During the sprint the project team will create parts of the finished product scrum team consists of three core rules.

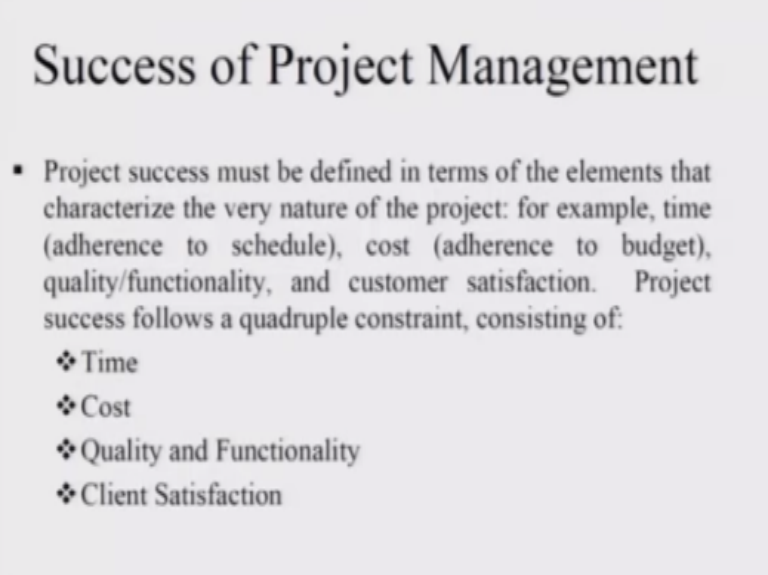
So what are the core rules are? The product owner representing the voice of the customer so he or she gives his feedback what the customer wants and based on the overall development of the project is done. You see for example if the project a customer wants cost reduction or if the customer wants more different type of facilities different type of add-ons to be there or say for example different type of functions to there.

Obviously the manager who is looking after the overall project from the point of view a customer would give his or her feedback such that they are considered into the project in a very realistic sense. So there is a development team result there is a responsible for delivering the finished parts to the final products. So obviously the development team would get the feedback of the customer and they would basically act as (()) (24:32) team such that they would get the feedback from the customers as I mentioned.

And they would try to basically get the feedback from the production line on their from the technology development line and try to basically brief bridge the gap between the customer and the main supplier on the main product development such that the mismatch is reduced to the possible extent considering or overall business perspective such that the cost perfect perspective, the time perspective, the schedule perspective everything can be taken at one go.

The scrum master basically facilitating the process and is given in in charge of trying to basically bring a semblance in how the customer focus and the technology focus can be bring into the picture. Such that I mentioned that he or she as team leader trying to basically ensures the dovetailing of the customer the government and the technology team leader development team which is there.

(Refer Slide Time: 25:37)



So project success must be defined in terms of elements that characterize the very nature of the project for example time and adherence to schedule, adherence to the deadlines which are there are met. So adherence to budgets to the resource constraints which are there are also met as that we are able to take both the time and the cost perspective the quality functions what are the quality features of the product the functionality of the product and how each and every part of the product meets the demand of the customer and that have to be looked into.

The concept of customer satisfaction from the point of view of utilizing their product from the point of view of trying to get the cost of the product transferred and being less as if the customer is able to buy or whether the customer is able to get the feedback from the customer service personal in case of any problems and are also taken into consideration.

Project success follows a quadruple constraint consider basically from the point fine agile and production or agile project management being time. So time is important as time was the only focus in in the area of PERT and CPM. Then the second point is basically the COTS perspective so the COTS perspective is done in such a way that is also considers the concept of crashing of jobs as will consider more in the area of a PERT and CPM.

The quality and the functionality which may be very qualitative in nature still is it brought into the picture so that is basically the main focus of the customer because customer may be willing

to pay some extra amount of money for a future which is very important for him or her and main and then the further and the last part is basically satisfaction level.

So rather than basically able to deliver a product it also means that what is the qualitative feature such that the customer satisfaction is met to the maximum possible extent is also considered. So at one go we are able to consider the agile project management the concept of time cost the quality and functionality and the client satisfactions such that if you are able to consider all of the them the project can be implemented in the best possible manner.

So with this I will end the second lecture and as we proceed so I would request my students and the people who are taking this course to please refer to the books which I was referred because as such it would be very difficult for me to basically give in each and every point from the book.

But I will definitely will request them and if they go through this concept given in the book from all the reference which are there it will definitely give them a very good feel that how project management was taking up in early years and how as to how it has developed such that he or she in a much better frame of mind as we start the discussion for the problem in that later classes thank you very much