Software Project Management
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Lecture - 40
Project Monitoring and Control
(Contd.)

Good afternoon to all of you. Now let us start the some other aspects Project Monitoring and Control.

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We will first see how to collect the progress details of the project, then we will see a special technical called as partial completion reporting, then we will see about the project review.

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So, there is a need to collect the data about the progress details, may be the achievements that you have made, the costs that have been incurred in the project etcetera that we have to collect the data regarding these details, but a big problem is how to deal with the partial completions; that means, the 99 percent completions syndrome. So, some what activities are there, they are always when we will see 99 percent complete, still 1 percent remaining.

So, how to deal with this partial completion problems. There are that some possible solutions to these problems; number one we have to control the products, control of the products, we should control the products not the activities. We should have controls on the product not the not on the activities. Similarly, if larger complex activity are there we should sub divided these complex activities into a number of sub activities.

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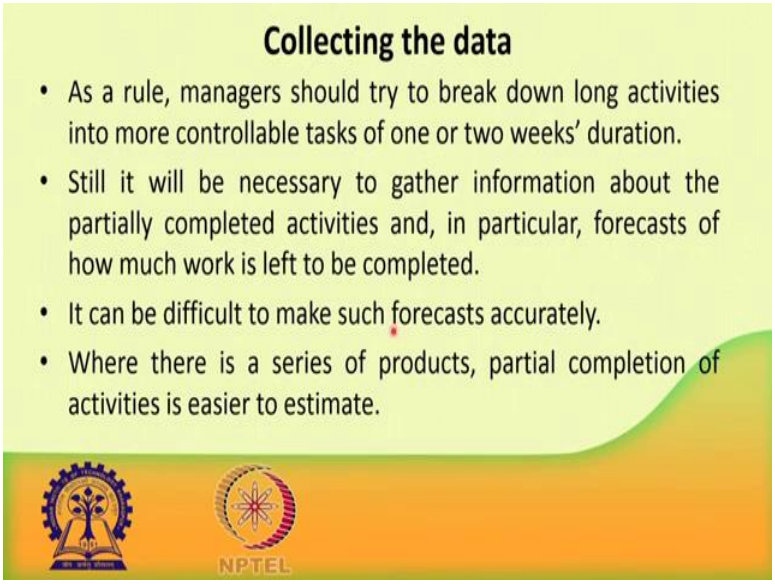

Now, let us see how to collect the data. Normally the managers should try to break down the long activities, complex activities into more controllable tasks of 1 or 2 weeks of duration, still it will be necessary to gather information about the partial completed activity. That means, the activities which are not fully completed they are partially completed, we should collect the data regarding these activities. In particular we should collect the information regarding the forecast of how much work is still left that has to be completed, but it is very difficult to make such forecast accurately in advance. So, where there is a series of products partial completion of activity is easier to estimate.

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So, where there is a some series of products then partial completion of activity is easier to estimate. Now let us see counting the number of records specifications or screen layouts produced for example, it can provide a reasonable measure of the progress. So, if you can count that what is the total number of records and how many records you have specified. The counting the number of records specifications or what is the total number of screen layouts and how many you have produced so far. Those things also can give a reasonable measure of the progress, but in some cases intermediate products they can be used as inactivity milestones ok.

So, in some cases some intermediate products can be used as inactivity milestones. For example, the first successful compilation of a program, even if it is not the completed one, but first time the first successful compilation of a program which is an intermediate, what result it can also be considered, it can also be considered as a milestone, even if it is not the final product is it is an intermediate product, but it can be considered as a milestone.

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So, now let us see about the partial completion reporting, we have to collect data regarding the partially completed activities, we have to report the status. Many organizations they use standard accounting systems. Several organizations are there they use standard accounting systems with weekly timesheets to charge stop time to individual jobs. So, they use something a timesheet, weekly timesheet in order to

determine what will the charge, what will the, what salary that the staffs they have to be paid on weekly basis. The staff time booked or to a project indicates the work carried out and the charges to the project ok.

The staff time booked to a project, it will indicate the work carried out by the staff and the charges to be to the project, but it does not what tell the project manager what has been produced or whether the tasks are on schedule or not. These weekly timesheet, it will not give any information regarding that whether what has been produced or what has been what or whether the task or on schedule or not, so that is why it is common to adopt or we can enhance the existing accounting data collection systems to meet the needs of the project control. We have, we should enhance or extend the existing accounting data collection systems.

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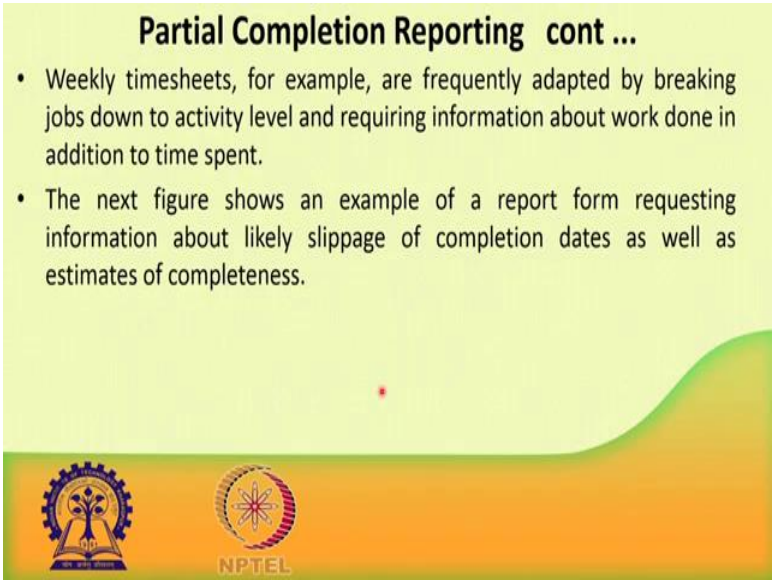

So, let us see how these weekly timesheets look like. The weekly timesheets are frequently adopted by breaking job or the task, breaking down the jobs or task to activity level ok. So, in timesheets the, what the jobs or the tasks they are broken down to activity level and they require information about work done in addition to the time spent. So, we also, they also, so it also requires information about the work that has been done in addition to the time that has been spent.

So, in next slide you will see an example of a what weekly timesheet, where we can see that this example, this figure, we will see one example of this weekly timesheet. So, here what is being shown.

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So, this figure is shows an example of a report form requesting information about likely what is the slippage, what is the likely slippage of the completion dates as well as the estimates of completeness. You can see in the timesheet is there what is the staff name the for which week you are preparing. Then mainly two types of charges are there the rechargeable hours and the non rechargeable hours, then for which projects he has worked, then what the activities he has performed, the corresponding activity codes and the description of the activities like coding and documenting etcetera, then how much hours in this week he has worked for this activity.

Like in the coding activity he has spent 12 hours, so and also it shows what is the percentage of the work completed, 30 percentage completed and what is the schedule completion, say 24 April, but what is the estimated completion same 24 April.

But for the next activity document take on hours this week he has worked 20 hours and percentage completed 90 hours. As a result the schedule completion was 6th April, but it was see it will be estimated early before 2 days before, so it 4th April. So, because 90 percent of the work have been done and it will, so that the total rechargeable hour is 32. There are some non rechargeable hours, because he has done in lieu or something, so

hours 8 week, this 8 hours, this is what you can say this is non rechargeable. So, now, this is rechargeable hour 32, if you know per hour what is the price multiply by 32. So; that means, this much what amount you have to pay, you have to pay to John Smith. So, this is how a times sheet looks like.

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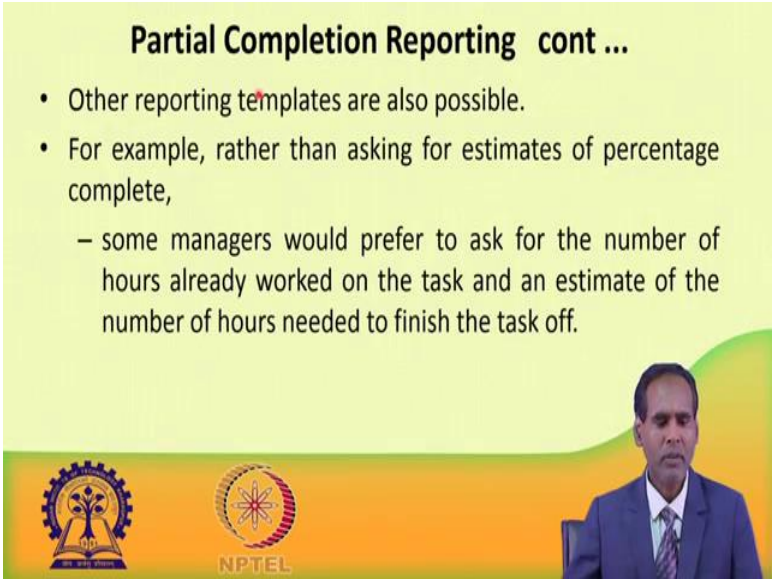

So, other reporting templates are also possible people are using. For example, rather than asking for the estimates of the percentage complete some managers may prepare to ask for the number of hours, already worked on the task and estimate and an estimate of the number of hours needed to finish the task off. Just like as here your saying 30 percent is complete, so 70 percent is left and 90 percent is complete, 30 percent is left. Instead of asking that, so the manager may ask in terms of hours, how much hours you have spent and how much hours still required to finish the tasks of.

These are alternatives to this reporting method, this what timesheet or this weekly timesheet form, there are this is this can be another alternative. Now, let us see a particular technique called as read amber green reporting method for this partial completing work, for this partial completion reporting aspect.

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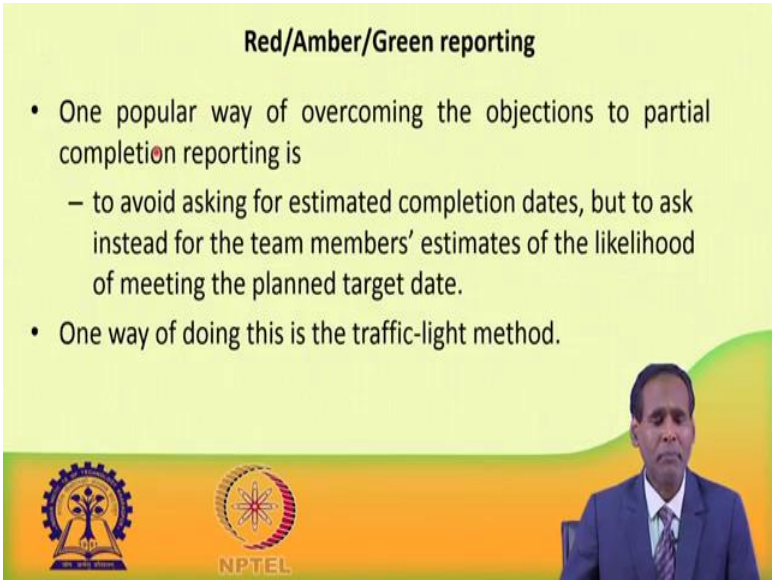

One popular way of overcoming the objections to partial completion reporting is, to avoid asking for the estimated completion dates. So, we can avoid asking the estimated completion dates, but we can ask the team members about the estimates of the likelihood of meeting the plan target date.

What is the possibility, what is the probability or what is the likelihood of meeting the plan target date? So, one way of doing this is by using a traffic light method. As you know in traffic light there are three lights are there; red, green and amber or yellow. So, those kinds of things also be used here for overcoming the problems of partial completion reporting. So, this approach works as follows, the steps are followed in this way.

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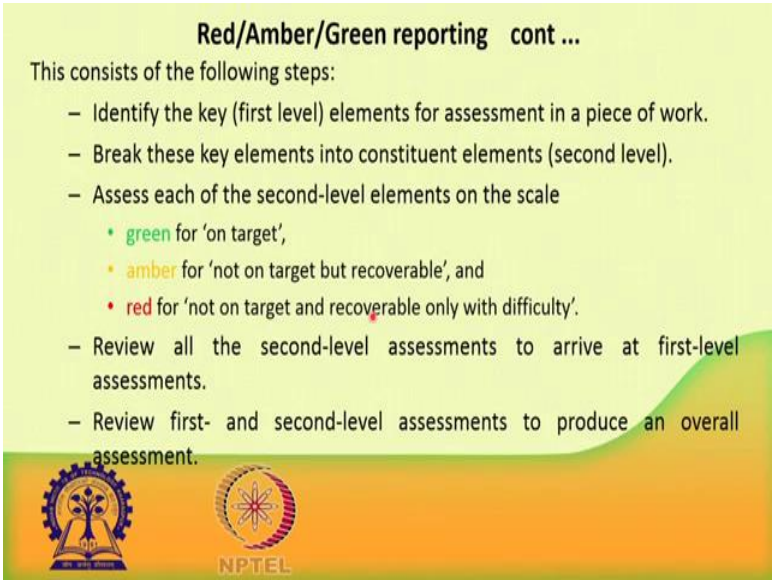

First step is identify what are the key elements or the first level elements for assessment in a piece of work. Then break these key elements which are the higher level or the first level into some constituent elements, we will call them as a second level elements. Now we have to assess each of the second level elements on the scale of these three colors; one is green color for on target; that means, the activity is on target ah. So, no problem.

So, second one is amber; that is for not on target, the activity currently it is not on target, but it is recoverable. If we can take some remedial actions we can recover, we can meet the target and the last, the final colour is red which is represents that not on target right now and recoverable only with difficulty. If we will put much more effort then it may be recovered, but it may be recovered with a difficulty. So, these are in this way we can assess each of the second level elements on these the on the three color scale

Then after assessing each of the second level element we should review all the second level assessment to arrive at the first level assessment and then we have to review the first level and second level assessment to produce an overall assessment; that means, overall assessment for the project. So, this is how we can overcome some of the problems of the partial completion reporting.

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So, following completion of assessment forms for all activities, the project manager uses these as a basis for evaluating the overall status of the project. As I have told you in the critical activity, normally it is as is classified as amber or red will require further consideration. As long as it is green no problem it can meet the deadline, it can meet the target, but any critical activity which is classified as amber or red it will require further report further consideration and often leads to a revision of the project schedule. In this case we might have to require to revise the project schedule.

Non-critical activities, they are likely to be considered as a problem if they are classified as red. So, if the non-critical activities, see critical activities amber or red means we have to reconsider, we may have; we may have to revise a project schedule, but the non-critical activities if they are green or amber, no problem so, but if they are red then also problem might be there. So, in this case we have to what, we have to revise the plan because, so this they are float they are free or the slack time may be consume. So, after some time again they may be they will be termed as critical activities.

So, non-critical activities they are also like to be considered as a problem if they are classified as red. Especially, if they are float or slack is very less and likely to be consumed in near future, so that again they will be converted to critical and then it will difficult to what meet the target lines. So, also we have to take remedial actions to bring the project, to get the project to the right track to the schedule.

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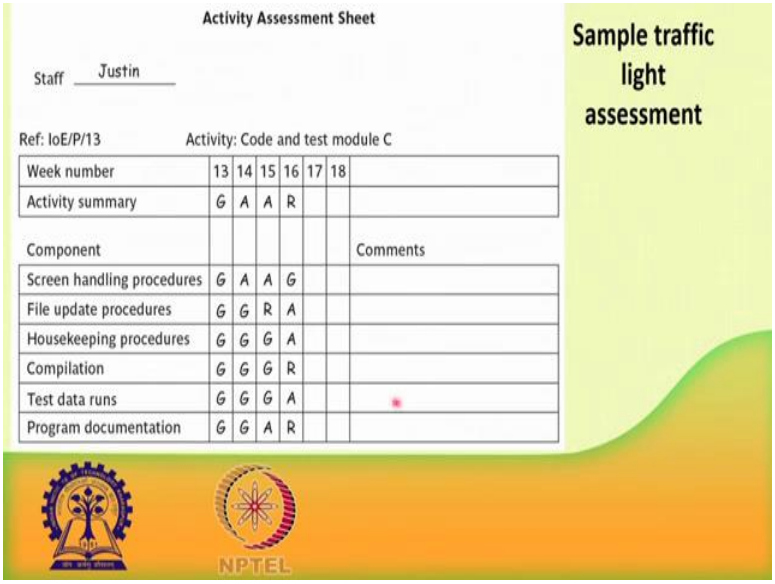

This is a sample traffic light assessment you can see here. So, its that the name of the staff say Justin and reference number which project, activities per code and test module of C. These are the week number 13, 14, 18 etcetera, you can see that. Let us see first the components first component is screen handling procedures, its you can see this in what green and also file update procedure also green, so these are all green. So, we can say that activity summery at the end of 13th week its green.

But at the end of 14th week this screen handling procedures it is amber; that means, what amber means we have already told you. Amber means it is not on target, but it is recoverable. So, it shows that it is amber, so it can be recovered, but file update procedures it is red, again these are green and program documentation is amber. So, overall assessment is that it is. Sorry this is overall assessment here in this case is, at the end of 14 it is amber. Similarly or end of 15, at the end of 15th week you can see different components of different values green, amber or red accordingly the activity summery is rated as is assessed as A.

And for this you see which is one of the main important thing is compilation, this is a critical activity, this is red also program documentation is red. So, as a result at the end of 16th week the activity summary is assessed as the red. That means, now we have to do something; otherwise it will go beyond the what schedule, so we have to take some remedial actions, so that we may what revert back, we may meet the what target lines,

but with lot of difficulty. This is how the sample light asses assessment based on the red, amber, green scales this works.

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Then we will take another important technique called as review. So, from a managers perspective review of work products is very much important, it is an important mechanism for monitoring the progress of the project and ensuring the quality of the work products. Every project each developed through iterations over a large number of work products. What could be the work products? The work products could be requirement documents, design documents, project plan document, code documents, test plans etcetera.

So, each of these work products they can have large number of defects in them, because human beings are preparing this thing, so there is a possibility that each product may contain a large number of defects in them due to mistakes committed by the development team members which are human beings. That is why it is necessary to eliminate as many defects in this work products to realize a product of acceptable quality.

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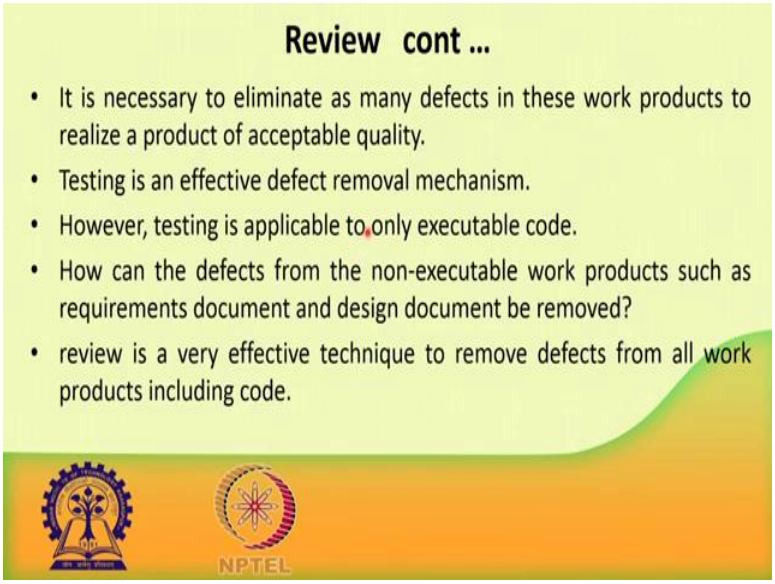

Testing is an effective defect removal mechanism no doubt, but; however, testing is applicable to only executable code. Very much difficult to apply this testing to this requirement documents or the design documents. So, how can the defects from the non executable work product such as requirement documents, design documents be removed. So, for this review comes to be very much handy, its an useful technique for removing and this defects. So, review is a very effective technique to remove defects from all work products even including code.

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In fact, review has been acknowledged to be more cost effective in removing defects as compared to testing. Early review techniques they focused on code and systematic review techniques were developed for this specific purpose, but over the years the review techniques have become extremely popular and have been generalized for the use with other work products also.

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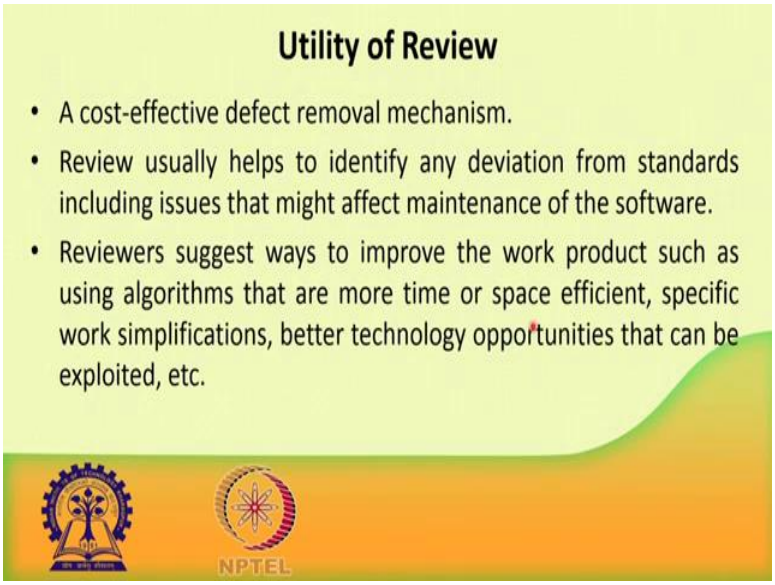

This is a very cost effective defect removal mechanism. Review usually helps for what? review usually helps to identify any deviation from the standards including the issues that might affect maintenance of the software. So, anything else, so this for review it can be used to help identify any deviation from the given standards. Reviewers suggest ways to improve the work product such as using, so these the persons associated with the review, normally we call them the reviewers.

The reviewers they suggest different ways to improve the quality of the work product; such as using efficient algorithms which are more time and space efficient using specific work simplifications, using better technology opportunities that can be explored etcetera. So, these reviewers can suggest during the review process and hence the quality of the product may be improved.

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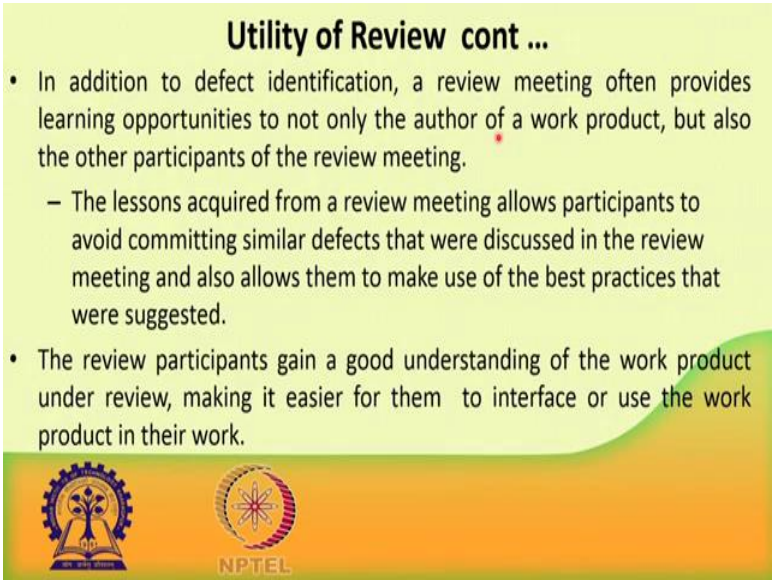

So, in addition to defect identification a review meeting upon provides learning opportunities to not only author of the work product, but also the other participants of the review meeting, it can give good experiences, it can give you good lessons. So, the lessons which are acquired from a review meeting, it will allow the participants to avoid committing similar types of defects, when similar types of what projects will come in near future. The review participants also gain a good understanding of the work product which is under review, making it easier for them to interface or use the work product in their work with other components.

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So, now let us see candidates work products for review. What things can be what reviewed? So, all interim and final work products they are usually candidates for review, they can be reviewed. Usually the work products considered to be suitable candidates for review are as follow, let us see what work products, what products can be sent for review. So, like this SRS document, software requirements specification documents, user interface specifications, design documents.

Then different types of design documents; such as architectural design documents, high level design documents and this detailed design documents, test plans and the what test cases those have been designed, then project management plan, configuration management plan. All those things can be reviewed, these are the possible candidates for review.

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Now, let us see what is the review roles what are, which persons are associated in review, what roles are given during the review process. In every review meeting a few key roles are needed to be assigned to the review team members. So, the some of the review are these roles are moderator, recorder and reviewer. So, some, so for a work product, so the project manager will assign one person as the moderator, maybe one person as the recorder and there can be a group of persons they will be designated as reviewers.

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So, let us see what will the role of the moderator what he will do, what is the job of moderator. So, moderator he plays the key role in the review process. The principal responsibility job moderator, it include scheduling and convening the different meetings, distributing the review materials to the reviewers, leading and moderating the review sessions and ensuring that the defects are tracked to closure. So, these are so; that means, whatever the suggestions are given by the reviews they have been addressed ok. So, he ensures that the defects are tracked to closure. So, these are the responsibilities of the moderator.

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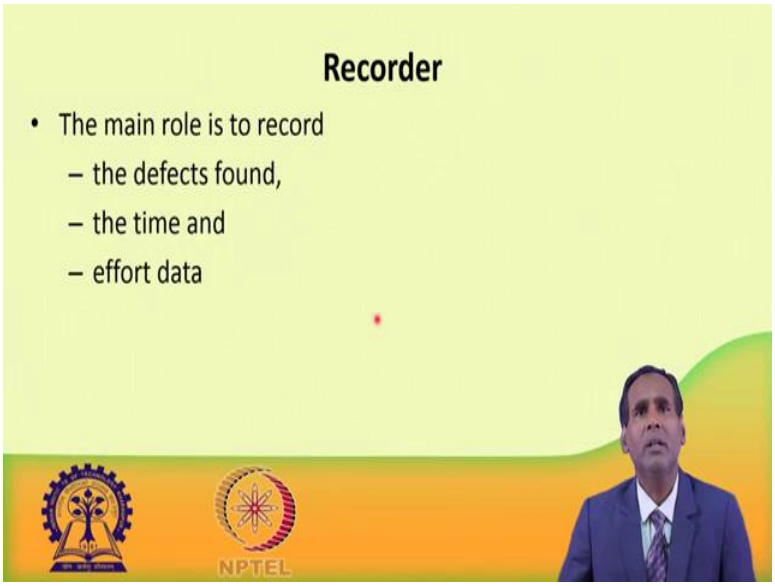

Similarly, the jobs of; the jobs of recorder are like this the main role is to record as a names of the recorder, he will record the following things, he will record the defects found, he will record the total time spent and he will record the effort that they have put in conducting this review.

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And reviewer what is the role the. So, we have already seen about the moderator, we have seen this recorder then the role of the reviewer. The review team members normally they review the work product, as their names are review. So, these review team members will review the candidate work products and they will give specific suggestions to the author of the work product about the existing defects and also they will also point out how to improve the work product, how to eliminate the defects, how to improve the work products.

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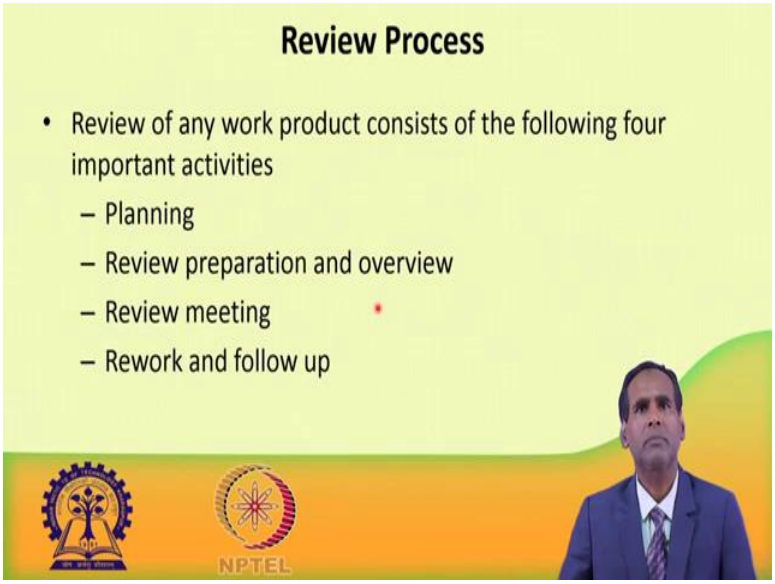

Now, let us see how the review process works? The review of any work product consists of the following 4 important activities. First you have to do the planning, then review preparation and an overview, then usually review meetings and finally, you have to rework on the suggestions and follow up. These steps, these activities can be put in the form of a figure like this.

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So, the candidate work product it will be supplied at the input. Then first activity is planning, you have to prepare the planning. In planning stage the project manager will

appoint one moderators and one recorder, as well as you will form a committe of what review members. Normally 5 to 7 members of the members will be selected as the in the review team. Then the output will be this what review learn on the schedule and then it will be a preparation meeting. The review moderate, the moderator appointed by the project manager, he will what convene a brief meeting for preparation, he what documents has been submitted by the author, the work product or the author of the work product first submit some documents.

So, these documents in this first brief meeting the moderator he circulates among the review team members. The review team members individually they carry out review for on this submitted work product, then they whatever the outputs it is mentioned in a document called as the reviewers log, then the actual review meeting takes place. Here the reviewers give the suggestions on the work products to the what author, then the author responds to the issues raised by the reviewers, other reviewers also participate here, then describe write down all the details.

And finally, the document prepared its called a defect log and this defect log has been will be handed over to the author. Then the author sees what are the issues raised, then he will rework he will revise the work product, he will address all the issues raised by the reviewers then he will prepare a rejoinder a review, saying what are the points raised by the issue what reviewers and how he has addressed all those things.

Then again a final meeting will be convened, the reviewers will investigate, they will look what whether how the author has addressed the issues, how he has corrected, how he has incorporated the suggestions he will check. The moderator will finally, see that yes all the defects which have been there in the earlier version now they have been removed they will, then they will prepare the summary report. In the summary report they will see the details of the defects, the time spent etcetera that will be that will mentioned in the summary report.

So, in this how, you know in this way the review process model works. These are the different activities carried out in the review process and these are the interim or intermediate products and the summary reported the final product of this review process.

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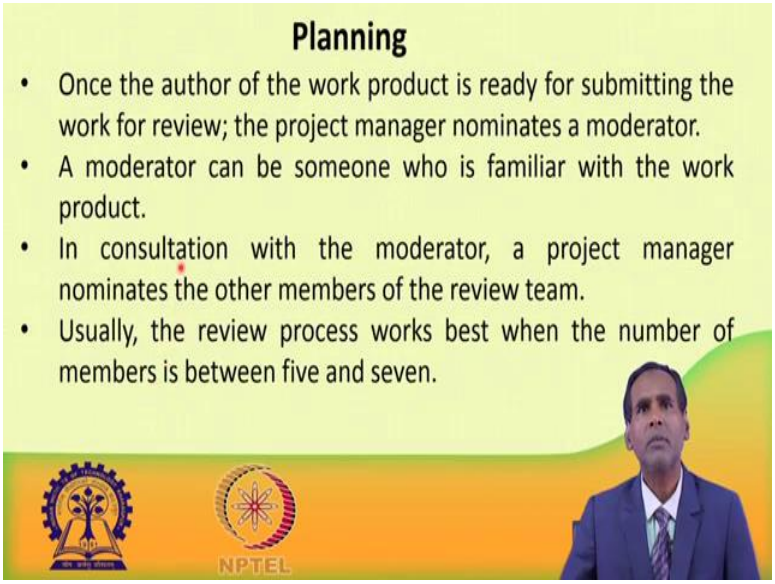

So, what I have already told that has been explained here all these stages like planning and this preparation, review meeting, rework, I have already explained in the diagram, they have been mentioned here.

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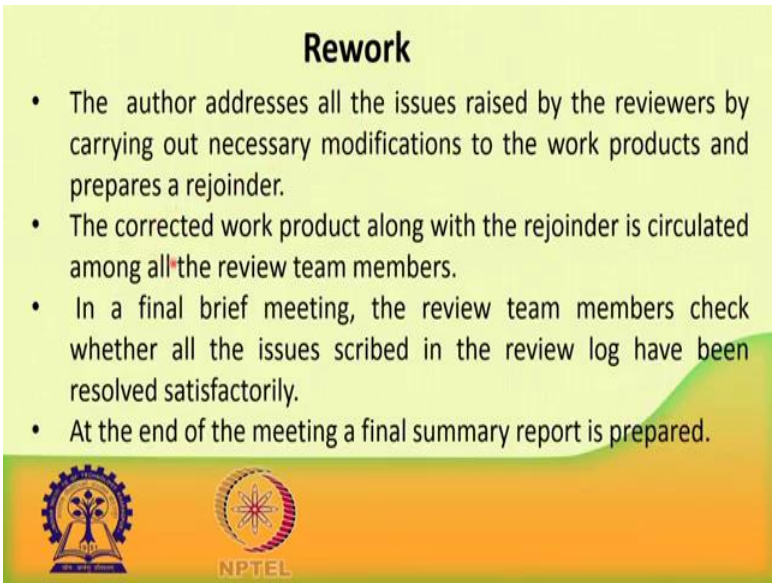

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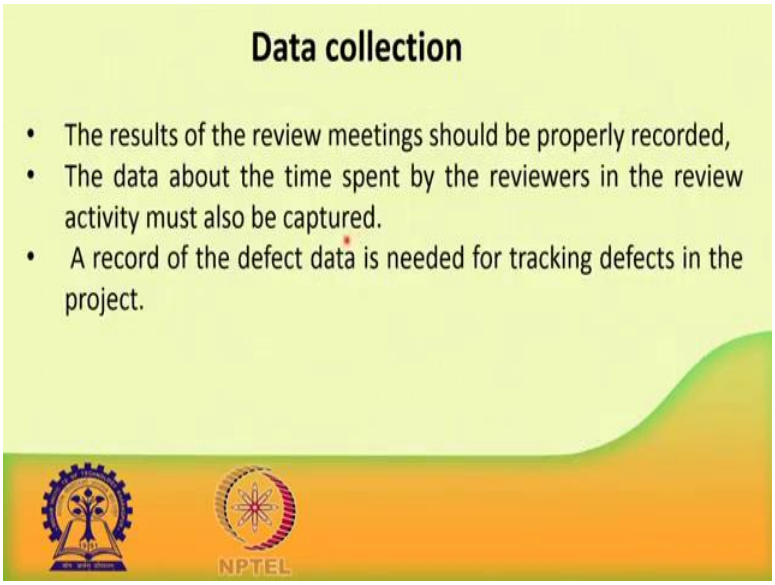

And then final step is data collection. In data collection what we are doing, the results of the review meetings should be properly recorded. So, because we are human beings after some days we may forget everything else, the documents may be or they discussing, the results of the discussion may be lost. So, the results of the review meeting this should be properly recorded. Not only that the data about the time spent, how much time you have spent by the reviewers in the review meeting that also have to be captured.

A record of the defect data is needed for tracking defects in the project. Why will record all the details of the defect data? Because a record of the defect data is needed for tracking the defects in the project. So, in order to what material, what error free, defect free the product, so this record of the defect data it will be needed, it will be helpful for tracking the defects in the project.

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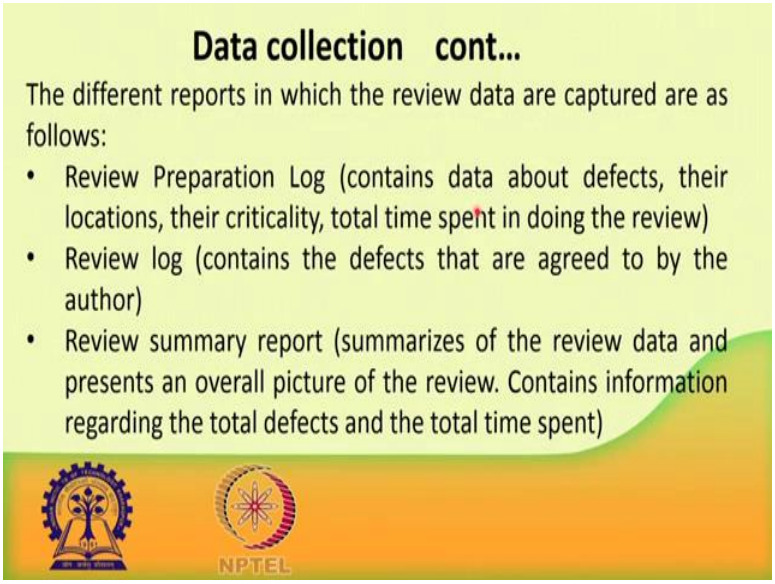

So, now, let us see what kind of reports are prepared the during the review, the different reports in which the review data are captured as follows; first one is review preparation log, which contains the data about the defects, their locations at which point they are identified they are located. Their criticality how much critical they are, whether they are very much serious or they are what normal or things like that they are criticality, the total time spent in doing the review etcetera.

So, all those things are mentioned in the review preparation log. So, then the review log, it contains the defects which are agreed to by the author. The author has agreed that yes these defects are there and I will remove in the next revision. So, review log it will contain the defects that are agreed to by the author, then the review summary report as its name suggest summary. So, this report it is summarizes the review data and it represents an overall picture of the review.

So, the outcome, the summary of the outcome of the review meeting is documented here. It also contains the information regarding the total defects present into our product and how much time its spent, the total time spent in this review process. So, these are the different documents, these are the different reports they are prepared during the review process, may be review preparation log and review log are intermediate what documents report or reports or as the review summary report is the final report.

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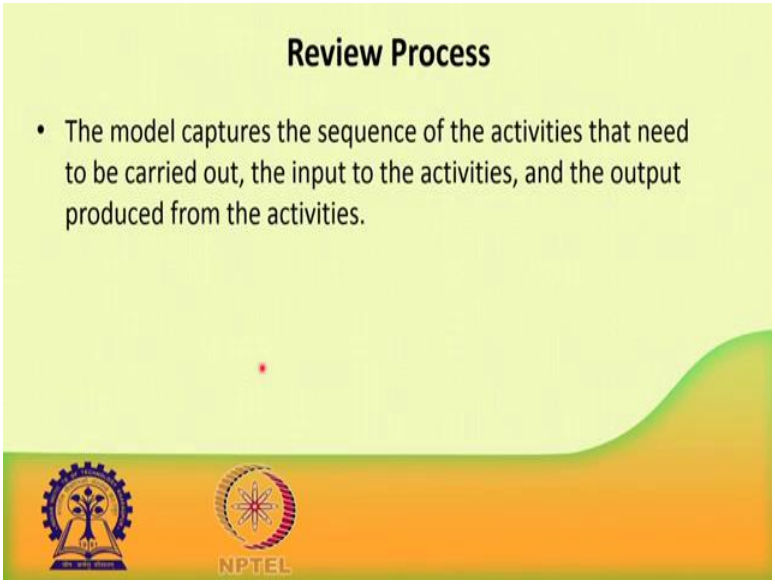

So, the model that we have proposed it captures the sequence of the activities that need to be carried out and the input to the activities and the output produced from activities, so everything. So, we have shown what is the input to this process. So, inputted the work product, these are the intermediate products such are the review team and the this schedule, this reviewers log, the defect log these are the intermediate products and the final product is the summary report ok.

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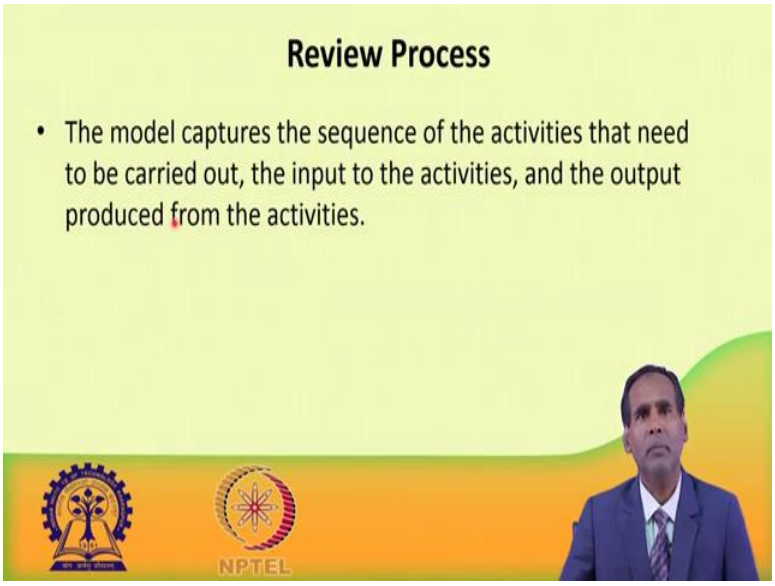

So, here we have seen that this. So, this review process model, it captures the sequence of the activities. 4 activities we have shown here that need to be carried out for the review process. Now the input to the activities that is the candidate work product and the output produced from the activities. So, there are some intermediate outputs as I have already told you and that is the final output that is the summary report.

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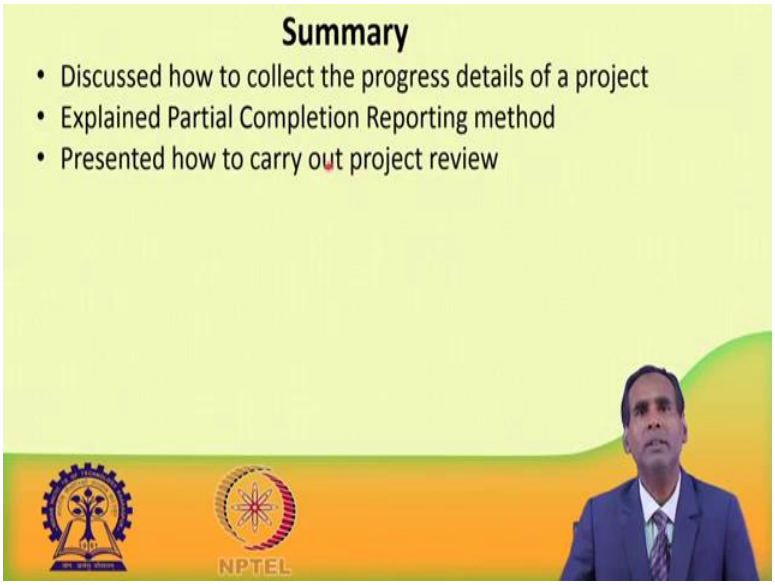

So, in this lecture we have discussed how to collect the progress details of a project. We have also explained the partial completion reporting method. We have seen how the drawbacks of the partial completion reporting method can be overcome using the what the red, amber, green method. Also we have presented how to carry out to the project review, what are the activities of project review, what are the input and outputs of this project review. We have seen the some of the logs that will be used like project review.

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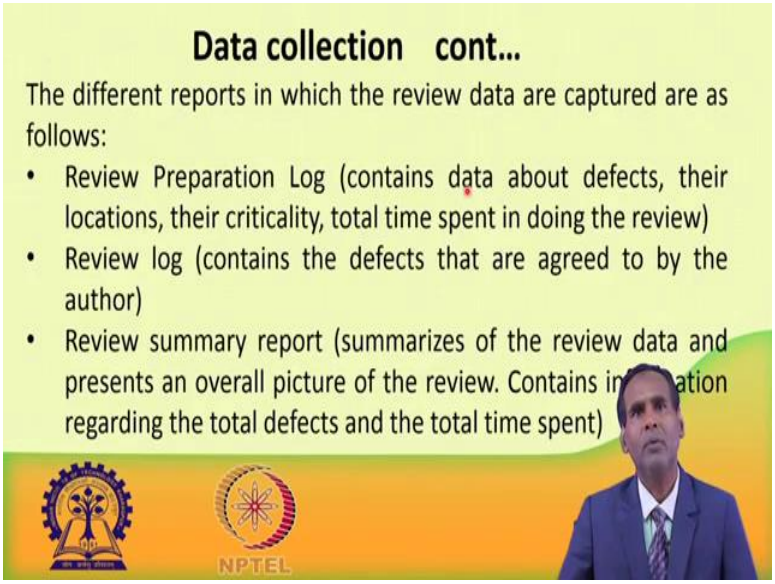

We have seen some of the what logs like review preparation log, review summary report log which are the intermediate outputs of this review process and the final output of the review process in the review summary report. So, these are the outputs of the review process. So, we have seen how to carry out the project review. So, this is all about this project review.

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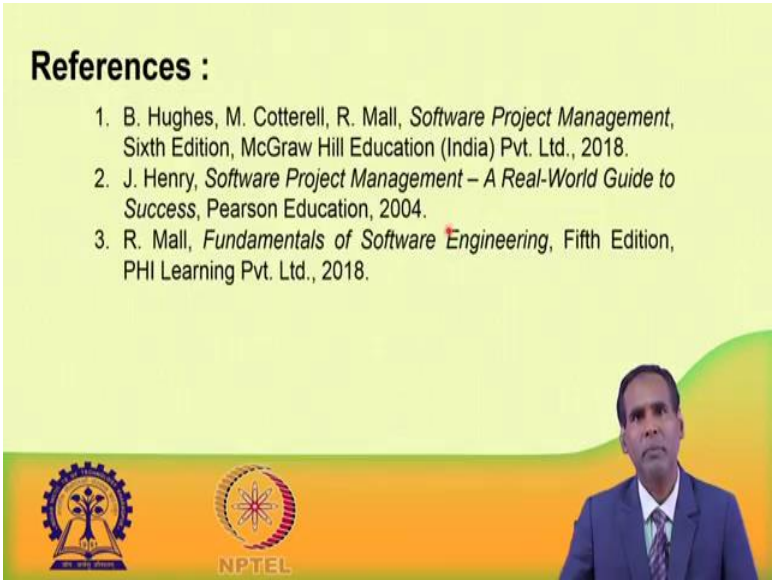

These are the references.

Thank you very much