

Project Management: Planning, Execution, Evaluation and Control

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Welcome to the course Project Management Planning, Execution, Evolution and Control. Today we will start a new module, module 9 that is Reducing Project Duration that is Crashing Activity. In this lecture we will be talking about Rational and Options for Project Crashing. So, the concept that will be covered in this lecture are what are the rational for reducing project duration, then what are the options for accelerating project completion. There may be two options one is when resources are constrained and the other is when resources are not constrained. In the rest of the module in subsequent lecture we will be covering the other topics under this module.

Now, to start with I will just put you two statements you have to fill in the blanks. Say first statement says critical path dash during duration using dash resources. This should be critical path is the longest duration using optimal resources. Second one crashing is the process of dash project dash time.

Crashing is the process of reducing project completion time ok. Now, we will be talking about what are the reasons for imposed project duration dates. So, why do you need to crash the project or reduce the project durations, the reasons may be many. We will be talking about some of these main reasons these are time to market pressure. All of us know that nowadays the intense global competitions and the technological changes are very rapid products become obsolescence very fast and also the fragmented market gives the customized product.

So, the all these needs the new products are to be coming to the market for competitive advantage. So, it has been empirically found and we have already discussed in our previous module we have seen that high-tech industries or the electronics industry the what happens if you delay a product launch by 6 months the company will lose around 35 percent of the market share. So, no company will want to lose the market share that is why they have a tremendous pressure time pressure to develop a new product. So, even if the product is not complete as per its specifications as per its scope what they do they bring out a product beta version or 1.

0, 1.1, 1.2 you have must have found out especially in software projects and other products also. So, there is a tremendous pressure to time to market that is why the projects are to be crashed are to be it completion time is to be reduced that is one. Then there is also unforeseen delay in a project always there are unforeseen delay that is a reality like there may be adverse weather there may be machine breakdown there may be resource crunches certainly the material has not come there may be many other reasons. So, design flaws so, these unforeseen delays could not have been anticipated before and that requires the if found it the midway that requires the later activities need to be crashed.

So, that project is completed within the time period-imposed time period then contract incentive you know a good contract must be having an incentive laden contract we say because suppose a contractor if the time is the essence completes the completes the project within the time and the ahead of time that they may be given some bonuses incentive. Similarly, if performance or the quality is the essence if the if the contractor does the quality job superiorly and exceeds the specification limit they may be rewarded. So, these are the contract incentive suppose a metro rail that is going on in many cities in India. So, metro rail if the contractor finishes are before say certain a completion target time say it is say one month before two months before they should be given an incentive because two months before the completion time it eases the traffic congestion it also improves the communities wellbeing. So, these have a tremendous goodwill.

So, they should be there should be contract incentive for completions early or even if they are they are delayed there should be provisions for penalty. So, that the imposed deadline supposes you're a politician or a minister announces that this community building this building will come up within next one year then it becomes an imposed deadline you have to complete the project within the deadline. Similarly, suppose the CEO or the chairman of the company announces in the annual general meeting that the new product will be coming in the market within the next 12 months. So, it becomes the project deadline for the project team to complete. So, these are the imposed deadline then there may be overhead cost you know that overhead cost is a project is when done there is a direct cost and indirect cost.

These indirect overhead costs are the suppose are the housing of the people in the far-off places say in the Siberia project is going on in Siberia, Alaska or in the deep sea far away from the shore deep sea say drilling. So, what happens there you have to house the entire project crew there and the cost of overhead cost may be huge. Now, if you reduce the project durations these overhead costs are directly proportional to the number of days you know durations of the project indirect cost. So, it will come down. So, you have these overhead

costs also sometime what you have to do like the direct the cost you try to reduce through that that is the critical activities also you try to reduce.

So, that the total project duration reduces and overhead cost also reduces. Then the public goodwill cost as I told you some projects and all if you are giving incentive to complete early it earns huge goodwill from the community from the society. So, that is an intangible cost and it is very valuable invaluable cost. So, you earn that then move resources suppose the company generally carry out the multi project they work out in the multi project environment. Now, there may be requiring your resources some your specialist some your design engineer your project specialist.

So, they may be or the equipment material they may that may be required in other projects also. So, now, what you do you make the cost benefit analysis the opportunity cost whether it is beneficial for the organization to move it to the other project or you crash the activities here. So, that opportunity cost you must weigh in. So, these are some of the reasons for imposed project duration dates you know you know dates. So, now, we will be talking about what are the options for accelerating project completion there are two options as I mentioned one is when your resources are not constrained and another is the when resources are constrained.

What you do first we will talk about when resources are not constrained in that what you do to complete the project early through you add resources means add manpower add equipment add material it will your projects will come down durations will come down. But it does not come down if you double the resources it not necessarily it projects duration will come down at a half it will come down some functions some functions will be there. But only if your if you if you partition the project because the project is segmented and the each segment are doing independently then may be that if you increase the resources say manpower the time durations may come down to half or substantially like I will give you the example harvesting crop by manually by hand or manually if you employ two workers it and it takes say 4 days. Now if you do it 4 worker add 4 worker then it will come down to 1 day 2 days. So, it may be half similarly manual worker repaving the road.

So, if you increase the increase the worker that will be proportionately your duration will come down, but otherwise when it is in a project it always works in a group. So, this group if you add people what happens the new people when it comes they require coordination they have to communication problem there are pair wise communications between the different people communication then on board they require the time for on board communication that takes time. So, it not necessarily it comes down half it follows some pattern. So, this is best known as the software project you know that there is a in software project there is a law

called Brooks law. Brooks law says if you add people to a late software project it makes the project later.

So, this Brooks was an IBM software project manager in 1960s he had observed this that adding people to a late project makes the project later. So, but and it has been found it has been found true, but there are critics also the further research shows the what are the reasons and if you take the take the precautions to prevent that that is you on board the people early. So, that those people additional people get accustomed to it early in the project. So, that is the one for adding resources another is resource when resources are not constrained you outsource the part of the project or the full project. Because, you are outsourcing to a party who are specialized in those job and who are much efficient and they can do it faster.

So, you outsource the project partly or fully then there is overtime this is the most popular or prevalent way for crashing a project you pay the overtime to the existing salaried people those who are doing the project work doing in the work. Here advantage is they do not require that on boarding time they do not require those they overcome that poor communications and all though the coordination is remain intact. Because, they are on the project you are paying them on for the extra time they are putting in usually you pay one and a half times of them of their daily salary. So, for a normal day and if it is on a holiday you pay double the thing that are the disadvantages, but it is the most advantageous to use them. But, it is another disadvantage is the is that the long durations of overtime it affects the productivity in the sense the worker cannot be as productive if it is going on as productive at the eleventh hour of his job as that of third hour of his or her job.

So, that productivity is affected also prolonged overtime generally are the causes of burnt out and this burnt out will result in family discord because everyday persons are reaching home very late and also expenditure on medicals this will come. So, as a result productivity will come down on the long run. So, it is suggested that prolonged overtime should not be the practice. Then the established project team, then if you established exclusively a project team we have seen it in dedicated project team what happens there are greater cohesion they are they are very focused all specialists are very focused to their job. So, distraction is less and they work together as a result the bondage is more and the it has been found that dedicated project team project completion time is much lesser compared to the other structures of project management team.

Matrix structure is best for the resource utilization less expensive, but the time for completions of the project is higher than the dedicated project team. So, you establish a dedicated project team for when your resources are not constrained and it will reduce your project duration. Then do it twice means first time you do it a quick job and dirty job then

you revisit and do a do the job correctly and rightly like for example, you know the pontoon bridge that is that is done when a bridge is damaged in a combat situation then you take time and repair the bridge. So, this is called do it twice. Then the when another options are the for accelerating project duration completion is resource when the resources are constrained, then when resources are constrained what happens you try to first track the project what a how do you first track a project? First tracking a project is generally done you have those critical activities if you reduce the critical activities then your project duration comes down.

So, the critical activities when they are in in sequence say it is generally finish to start the this way it goes. Now, some of the activities there may be possible to do it parallelly instead of sequencing then their project durations come down. We have seen in the last module that resource scheduling that how that marriage inception reception arrangement there we have seen it after planning that arranging for the band then the your decorating the decorating the that venue and the refreshment those if is done parallelly the project durations comes down. Similarly, here what we do you first track the project by doing it doing it sequentially say I will give you the example how does it look like. Suppose your project is going these are the in sequence a b c d these are the activities.

Critical activities in sequence what you can do now instead of that you can say start the b here with a with a lag time. Similarly, you can start c here c with a lag time you can start d here with a lag time. So, c previous the project durations were this much now the project durations have come down to this much it has compressed. So, first tracking this is called first tracking of project. Then is the critical chain critical chain project management we have discussed it in the last module no critical that what you do you estimate we generally estimate time activities in 80 to 90 percent certainty, but if this estimations are reduced to 50 50 certainty there is a huge scope for reductions of your project completions and you we offer what project to have the safety net or safety margin project buffer feeder buffer and resource buffer we have discussed it before.

So, the this requires the organization culture not to padding the estimates and to be more professional allow the people to make mistakes or to let when the resources are not available. So, next is the you reduce scope when resources are constrained the most popular way that is being done prevalent way is you reduce the scope of the project like we have seen it that pressure for coming for to market to market to product that pressure you reduce the scope. So, those scope suppose if you wanted to make a curve to of its mileage should be say 24 kilometres per litre. So, if you cannot attain it you make it a 20 litres 20 kilometres per litre. So, they are you are reducing the scope, but be careful when you reduce the scope.

So, reduce the scope should not make your product the less competitive if it is not less competitive people will go for your the competitor's product. So, be careful for that then compromise quality this is the last and the least wanted one should not compromise with quality because if the quality is compromised that you know that is the generally the market acceptance comes low, but if you have no other alternative it has to be done then you do it, but it is the least preferred, but the reduce of scope when you reduce the scope there one more thing is your project cost and time both reduces because you are doing away the exact requirement. So, these are the options for accelerating project duration. Now, we will further discuss what if cost not time is the issue then what you do commonly used option for cutting cost the cost is the issue you mean your budget is limited ah, but time is flexible. So, you have to cut down the cost how do you do that one way you do it by reducing the scope of the project as we talked about in the last point when you when you reduce the scope of the project then your cost also and time also is reduced then other way another is the having owner take on more responsibility.

Now the owner of the project or the they should take some more they should do work by themselves that way you can reduce the cost budget because this you are not doing it in house suppose say you the owner wants to paint he decides in his building that constructing a building he will paint himself interior he will remodel himself the bathroom ah. So, they can do it if the your budget cost your cost comes down suppose the owner decides with training should not be given to the to the the contractor we will do the training of the our employees in house. So, that way you are taking more responsibility and that one of the way to reduce the cost then others are outsourcing project activities like as I told you can outsource partly or fully of the prop ah. So, if you outsource you are generally outsource to the efficient people and they do it faster job better job and as a much lesser cost then you could have if the owner could have done it. So, you outsource the project either is part or the fully and another one is the brainstorming cost saving option the this is also either you encourage brainstorming within your company within your all stakeholder.

So, that the some options may come out and there may be many options may come out small incremental reductions and all that way it is a potential means of reducing the cost and or saving the cost. These are the are when the your time is not time cost is the issue. Now to summarize what the what we have done in this module is that it discusses the rationale of crashing or reducing the project duration. This may arise due to imposed project duration dates such as time to market pressure, unforeseen delays, incentive contracts that is bonuses for early completion, composed imposed deadline and contract commitments, overhead and public goodwill cost and pressure to move resources to other projects. Further we have elaborated the options for accelerating project completion when resources are not constrained such as by adding resources, outsourcing project work, scheduling over time, establishing core project team, do it twice first and then correctly.

It also explains the options when resources are constrained such as by fast tracking the project, critical change project management, then reducing project scope and compromise quality which is generally avoided and is least desired. Now coming to the references these are the books you can consult and further enhance your knowledge. Thank you very much for attending today's lecture.