Project Management

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Week: 1

Lecture 01: Introduction to Project Management – I

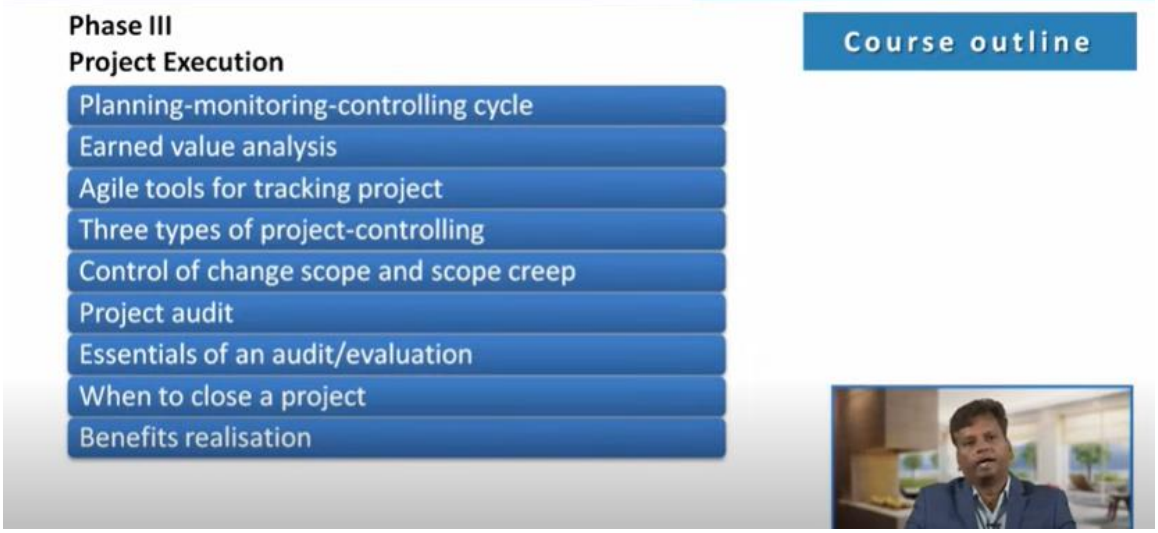
Dear students, welcome to the course on Project Management. The outline of this course is there is going to be four stages, four phases of this course. The first phase is project initiation, the second phase is project planning, the third phase is project execution and the last phase is IT for project management. The first three phases there will be a sequence project phase 1, phase 2, phase 3. The last phase is to give some introduction to some software packages for the purpose of executing complicated projects. In the phase 1 as I told you it is a project initiation, there are certain lectures that I am going to cover in this course.

So in the phase 1, the first lecture is on introduction to project management 1, the second lecture is introduction to project management 2, the third lecture is agile project management. Then I will discuss about different project selection models, then I will give you various examples for selecting the projects, then we will study about the importance of project manager, then we will study about various attributes for an effective project manager, then we will study about how to manage for stakeholders, then we will study about how to resolve the conflicts, then what is the negotiation, what

is the procedure for doing negotiation that we will cover there. Then we will study about the project in the organization structure, different types of organization structures, how the project can be fit into there. Then we will study the important factors that is the human factors and the project team.

In phase 2 that is a project planning stage, we study about the traditional project activity planning, then we will study about agile project planning, then coordination through integration management, then we will study about project feasibility analysis, then estimation of project budget, then project risk management, then we will study quantitative risk assessment methodology, then we will study about critical path method that is the one of the way to schedule the project. The another way of scheduling project is PERT, that is a program evaluation and review technique, then how to do the simulation for doing the risk analysis that we will cover, then we will study scheduling with the scrum if it is agile project, then we will talk about crashing a project so that we can reduce the project duration, then we will discuss about resource loading, resource leveling, finally gold reds critical chain. The third phase is project execution stage, then we will study about the planning, monitoring, controlling the project whole cycle, then we will discuss about earned value analysis for measuring the progress or performance of your project, then we will study about agile tools for tracking the project, then we will study about three types of project controlling, then we will study about control of change scope and scope creep, then we will study about project audit, then we will study about essentials of audit and evaluation, then finally we will discuss about when to close projects, then we will study about benefits of projects. The last phase is what are the various softwares for project management, then I will give you some demo on project management softwares, then I will discuss about how can we use some simulation softwares for project management, finally I will summarize the course. So, the textbook which I am going to follow for this course is a book written by professor Meredith and

Schafer, the Indian edition of the book was adopted by me, so I have added so many Indian cases wherever it is required in the book.



So, the agenda for this lecture is I will discuss about introduction to the projects, then we will go for history of projects, later we will discuss about the definition of your project, then I will make a difference between programs and projects and task and work packages, then we will discuss about triple constraint, very three important constraint for any projects, then we study in detail about the concept of scope, then there are some ancillary goals for the project that also we will discuss here, finally I will discuss about some of the important characteristics of a project, then I will conclude this lecture. See, first we will go the introduction to the project management, so now the project management advances rapidly in all domains, in every field there is a project management, whether it is a construction, whether it is a government, whether it is a software industry, wherever you go the project management topic is very important So, projects are getting much more sophisticated and complex and involving multiple

organizations and billions of dollars, while success rates of standard projects are improved and the non traditional projects are struggling to achieve the success. When you look at the history of the projects, look at the picture on the right hand side even the construction of Taj Mahal, the construction of Indian new parliamentary building and launching of the Chandrayaan 3, these are some of the known well known examples of projects. So, rapid growth in project management in organizations, there is a shift from external to internal projects that is previously some projects are done by external organizations. Now, the organization itself wanted to do their own projects, they do not want to outsource their projects.

So, the success in executing internal projects improve efficiency and competitiveness, when the company itself it executes some projects, so their efficiency for doing the project is increasing and the competitiveness also increasing. So, project management provides a powerful tools for planning, implementing and controlling activities. Initially, I discuss about four phases, in each four phases we will discuss about various tools that will be the objective of this course. Now, we will go to the formal definition of your project. The project management institute define project like this, “A temporary endeavor undertaken to create a unique product, services and result.”

The Definition of a "Project"

- "A temporary endeavour undertaken to create a unique product, service, or result" (PMBOK®, Project Management Institute, 2013)
- In its early days, project management was used mainly for extensive, complex research and development (R&D) projects
- Massive construction programs were also organised as projects, including the construction of dams, ships, refineries, and freeways.

When you analyze this definition, the first term it is coming to us is the temporary endeavor, only one time activity and it is going to create or to provide a unique product or services. In its early days, project management was used mainly for extensive complex research and development projects. Now, but the project management is used everywhere, like some of the example of complex projects are massive construction programs, where also organized as a projects including the construction of dams, ships, refineries and the freeways. As the techniques of project management were developed mostly by the military, then the use of project organization began to spread. So, most of the techniques of the project management is started from the military.

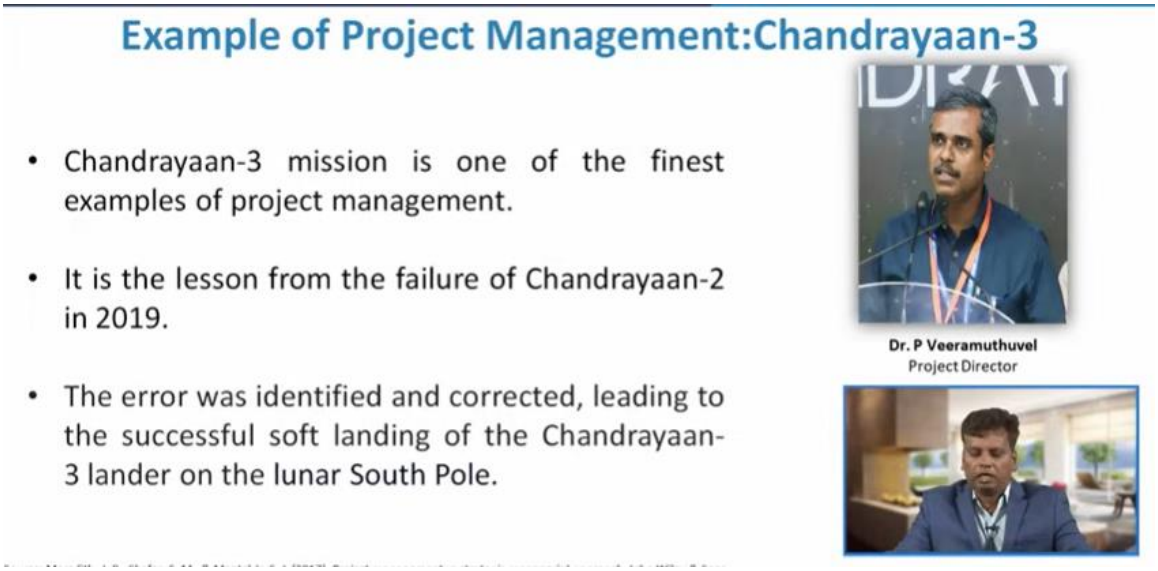
History of Project Management

- As the techniques of project management were developed, mostly by the military, the use of project organisation began to spread
- Project-based organization helped private construction firms on smaller projects like warehouses or apartment complexes
- Automotive companies used project organization to develop new automobile models
- Most striking has been the widespread adoption of project management techniques for the development of computer software

Now, it is used in the various business domains. Now, other things the project based organization helped private construction firms on smaller project projects like warehouse or apartment complexes. So, that is giving a better result. So, what they are doing that many new organizations. Now, even though the things are react the task is very smaller activity.

Now, they are doing in the form of a projects. Automative companies used project organization to develop new automobile models. Here what is the meaning of this project organization? Organizations which executes all their activity in the form of projects. Look at the picture on the right hand side, the software company. It is the best example for project based organization, because all activities task or all the projects all the activities done in the form of projects.

So, most striking has been the wide stepped adoption of project management techniques for the development of computer softwares. In software industry, we study in detail about the agile project management. So, the project management is extensively the project management techniques are extensively adopted by software industry. Now, I am going to provide one of the best example of project management that is Chandrayaan 3. This project was successfully executed by ISRO.



So, the project director for Chandrayaan3 is Dr. P Veeramuthuvel. There are lot of project management tools and learnings from the success of our Chandrayaan3. So, Chandrayaan3 mission is one of the finest example of project management. It is the lesson from the failure of Chandrayaan2 in 2019.

That is one of the best example that is learning from the failures and rectifying the failures. So, what has happened the error was identified and corrected leading to the successful soft landing of the Chandrayaan3 lander on the lunar south pole. Some of the learnings which we can take from the success of Chandrayaan3 is clear project objectives. So, what was the objective of Chandrayaan3? To explore the moon and contact scientific experiments. Another project management techniques that we can learn from the success of Chandrayaan3 is detailed planning.

Example of Project Management:Chandrayaan-3

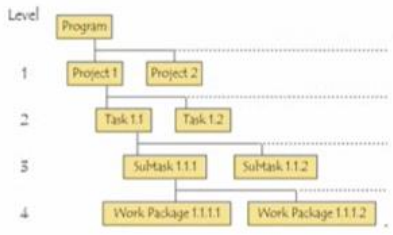
- Collaboration
  - Collaboration between various institutions, including ISRO (Indian Space Research Organization), academia, and industry.
- Monitoring and Control
  - Continuous monitoring and control mechanisms were in place to track progress and make adjustments as needed, another key aspect of project management.

So, there was a extensive planning including designing spacecraft, calculating trajectories and specifying scientific payloads. So, some more learning from the success of Chandrayaan3 is a collaboration and coordination. Collaboration between various institutions including ISRO, academia and industry. The next learning is monitoring and control. There was a continuous monitoring and control mechanisms were in place to track the progress and make adjustment as needed.

It is another key aspect of project management in Chandrayaan3 project. Now, we will discuss about difference between projects, programs, task, work packages. Why this difference is required is in the whole course we will discuss about these terms programs, project, task and work packages. Now, I want to make you to clarify exactly what are the difference between projects, programs, task and work packages. As I told you the military that is the source of most of these terms generally use uses the term programs to refer a substantial long range objective that is broken down into projects.

Program, Project, Task and Work Packages

- The military, the source of most of these terms, generally uses the term program to refer to a substantial, long-range objective that is broken down into a set of projects
- Projects are divided further into tasks, which are, in turn, split into work packages that are themselves composed of work units

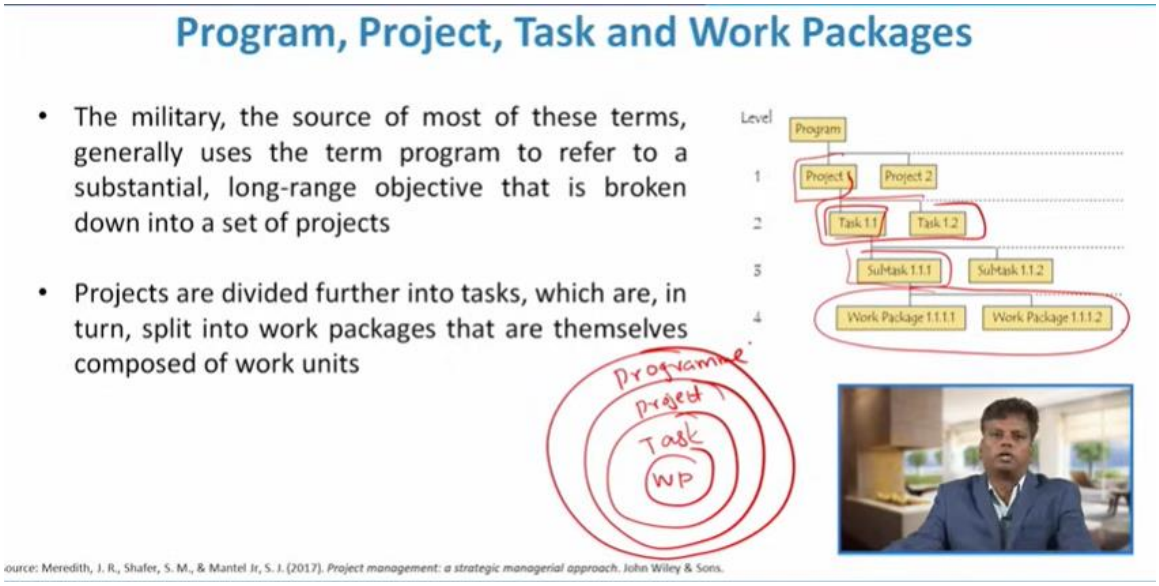


So, the bigger circle is programs. So, how the programs the collection of project is the program. Then the projects are subdivided further into task which are in turn split into

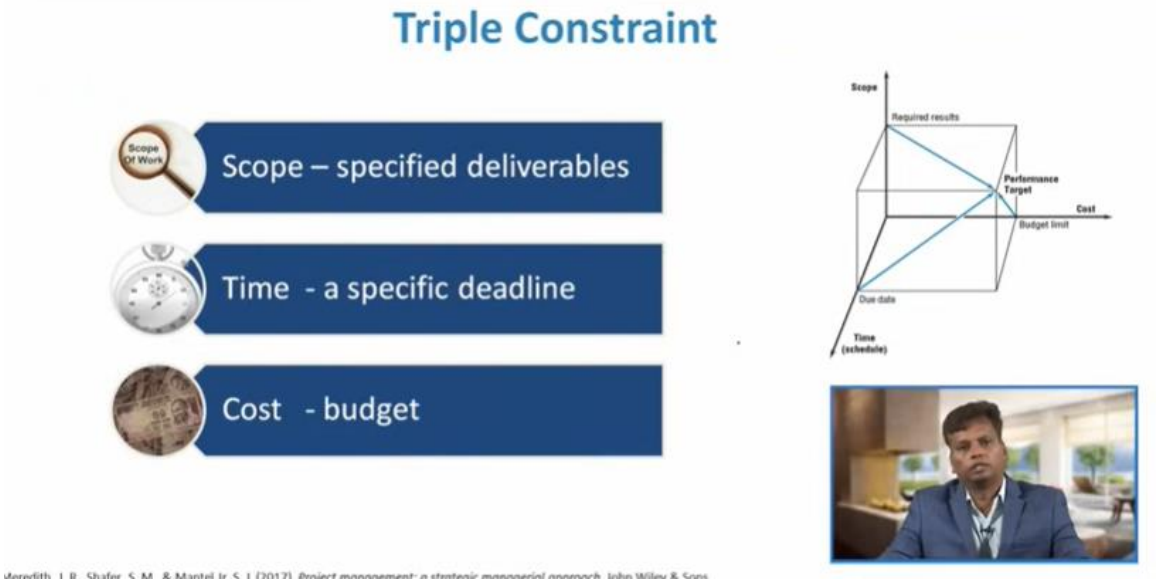
work packages that are themselves composed to work units. Please look at the picture on the right hand side. You can read from the bottom there are work packages.

See there is a work packages that has come from certain task. For example, task 1.1.1 have some work packages. Then actually this has come from another division of task 1.1

So, from 1.1 we got 1.1.1. So, the collection of task is a project. So, the collection of project is a program. So, what we can say see the smaller circle is work packages.

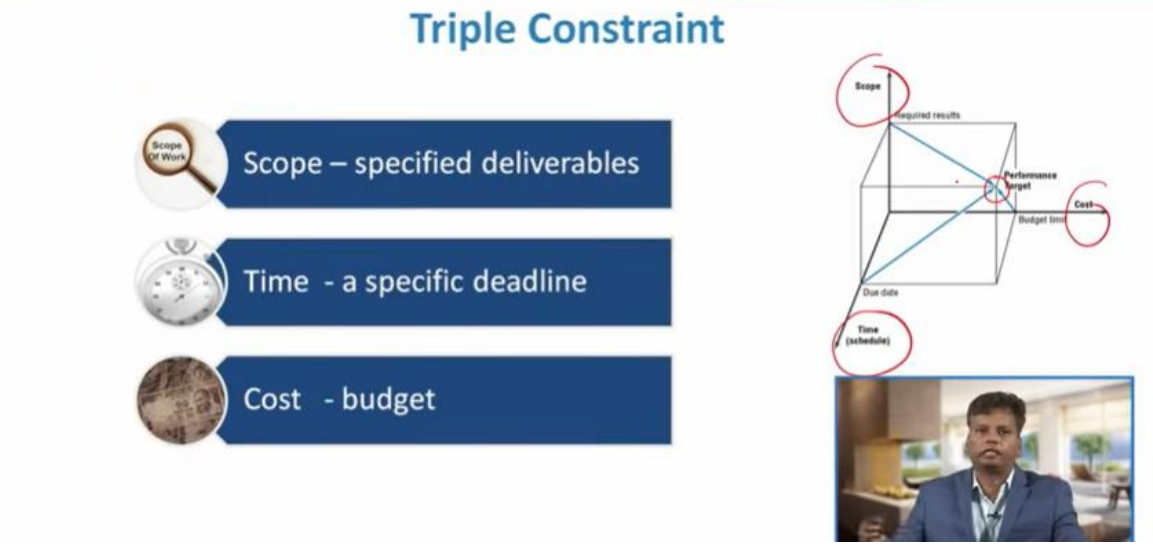


Then task. Then project. The final one is the program. This terminology is borrowed from the military. Next we will discuss about very important constraint for any projects.



There are three constraint. One constraint is scope. Here the meaning of scope is specified deliverables. The second constraint is time a specific deadline. The third one is the cost that is the budget. When you look at the picture right hand side there is a all

these three constraints are plotted.



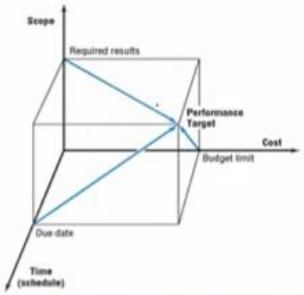
One is time. Here there is a time that is a schedule. Then the cost. Then there is a scope. You see that this is the performance target all are interrelated. If there is any small adjustment in one constraint that will affect the other constraint.

For example, if you want to compress the time. So, cost will increase. If you are expanding the scope time will increase cost will increase. So, here a successful project manager need to have a trade-off among these three project constraint that is called triple constraint. This illustration implies that some functions relate them to one another.

So, all these three triple constraint is linked by some functions. Although these functions vary from project to project and from time to time for a given project. What is the role of a project manager by looking at this triple constraint? There are two primary task for a project manager. First one is to manage these trade-off. When talk about functions mean there is a relationship between these three constraint.

Triple Constraint

- This illustration implies that some "function" relates them, one to another
- Although the functions vary from project to project and from time to time for a given project
- Two primary tasks of the project manager (the "PM")
  - to manage these trade-offs and
  - anticipate and address risks to the project



ource: Meredith, J. R., Shafer, S. M., & Mantel Jr, S. J. (2017). *Project management: a strategic managerial approach*. John Wiley & Sons.

So, the task of a project manager is to understand the trade-off to manage the trade-off and the second one anticipate and address the risk to the project. So, that is a primary constraint of the primary objective of any project manager. We discuss about the scope. The availability of outcome itself is part of the outcome. There is a tendency to think of a project solely in terms of its outcome that is the scope.

Availability of outcome itself is part of the outcome

- There is a tendency to think of a project solely in terms of its outcome—that is, its scope
- But the time at which the outcome is available is itself a part of the outcome, as is the cost entailed in achieving the outcome
- The completion of a building on time and within budget is quite a different outcome from the completion of the same physical structure a year later, 20 per cent over budget, or both

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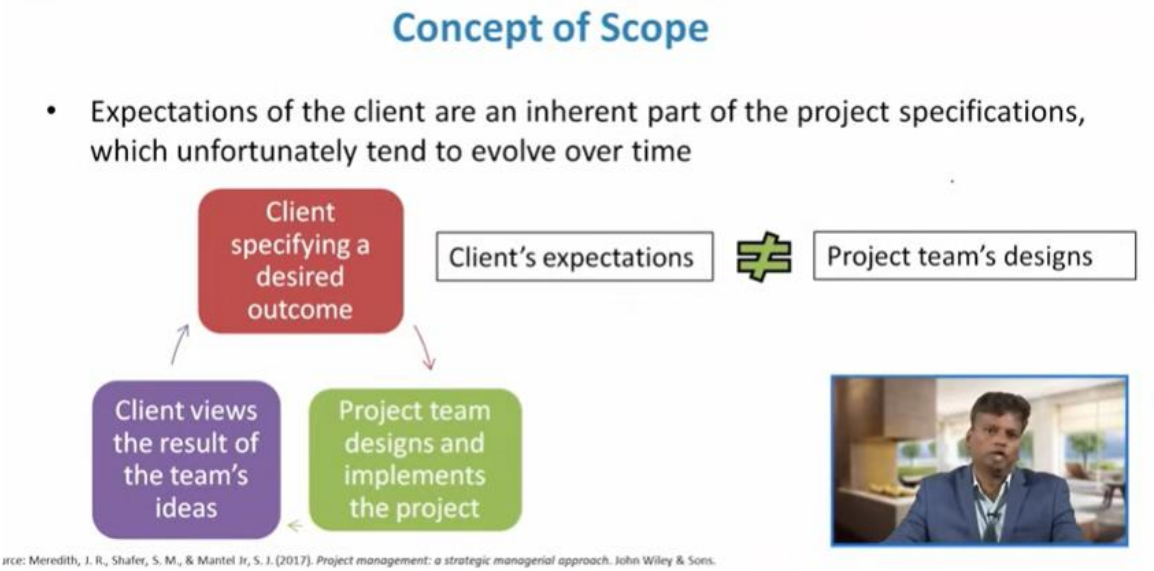
But the time at which the outcome is available is itself a part of the outcome as is the cost entailed in achieving the outcome. The timing of outcome is more important when you are providing. Whether you are providing now or later and providing the outcome at the right time itself an important outcome. So, the completion of a building on time and within budget is quite different outcome from the completion of the same physical structure at an year later and 20% over budget or both. The first case you are providing the outcome at the right time at the right budget.

Later part of the sentence we discuss about the same project is completed longer duration of time but 20% over the budget. So, here the providing the outcome right time at the right budget is more important. Now I will explain little bit in detail about the concept of scope. Expectation of the client are inherent part of the project specification which unfortunately tend to evolve over time because every project is implemented to meet the expectation of the project. So, client views the result of the team's ideas.



So, what will happen the clients expectation sometime may not match with project team's designs. If there is no proper collaboration, if there is no proper communication about the scope. So, always there will be a mismatch between expectation of the clients and the project team's designs there will be a gap. We talked about three important goals time, cost, scope. There are other ancillary goals for any project.

One is improving the organization's project management competency and methods. So, when you keep on doing different and variety of projects what will happen that will lead

to increase the company's the organizations organizations project management competency and methods. And the another ancillary goal is developing individuals managerial experience through project management. So, what will happen when the people work in the projects.

So, they will get a more managerial experience. And the third ancillary goal is gaining a foothold in a new market. When you execute a new project, so you will get your presence in that domain. Another important aspect that has to be kept in mind as a project manager is health of the project team. The project manager should not exhaust the team. So, when making a trade-off consider the external factors that impact or impacted by the project even if they are outside the sponsoring organization.

Because you have to taken into consideration of all stakeholders of your project. Some of the stakeholders are environmental groups, trade unions, competitive firms and the like. So, you have to have the all the people you have to consider all the stakeholders of the projects. I will discuss about three characteristics of any project.

One is every project is unique. We have seen in the definition of the project. Every project is unique and the project is one time occurrence. The third characteristic is project is that they have the finite duration. These are the three important characteristics of any project. That is uniqueness, one time occurrence and finite duration.

Three - Characteristics of Projects

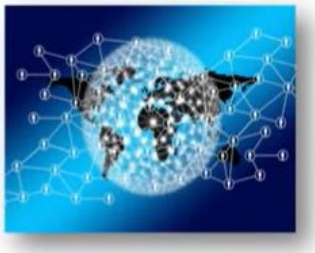
- Every project is unique
- Project is a one-time occurrence
- Projects is that they have a finite duration

Source: Meredith, J. R., Shafer, S. M., & Mantel Jr, S. J. (2017). *Project management: a strategic managerial approach*. John Wiley & Sons.

Now we will discuss about some of the characteristics of your project. One is interdependencies. Project often interact with other projects being carried out simultaneously by their parent organizations. Obviously you need to have interaction interdependencies with other project and with your parent organization. So, these interactions take the form of competition for scarce resources between projects.

Interdependencies

- Projects often interact with other projects being carried out simultaneously by their parent organization
- These interactions take the form of competition for scarce resources between projects
- Projects always interact with the parent organization's standard, ongoing operations
- PM must keep all these interactions clear and maintain the appropriate interrelationships with all external groups



Source: Meredith, J. R., Shafer, S. M., & Mantel Jr, S. J. (2017). *Project management: a strategic managerial approach*. John Wiley & Sons.

So, people may fight for the resources that will lead to the competition. So, project always interact with the parent organization's standard and ongoing operations. So, project manager must keep all these interactions clear and maintain the appropriate interrelationship with all external groups. Another characteristic of any project is limited budget. Often the budget is implied rather than detailed particularly concerning the personnel but it is strictly limited.

When we give any project proposal, we may not have the exact personnel requirement.

We may have a rough estimate over the project duration of the time then we will realize that we need more money, more budget for personnel. So, that is so what is happening this budget is always limited. So, the attempt to obtain additional resources frequently leads to a next attribute called conflict. We will study in detail about the conflict in coming lectures.

So, these are the some of the characteristics of the project. So, dear student in this lecture I discussed about history of projects then I discussed about the definition of the project. Then I have explained what are the differences, how it is interconnected like programs, projects, task and work packages. Later I have discussed about triple constraint, then little bit I have expanded the concept of scope, then I have discussed about ancillary goals, finally I have discussed about some of the characteristics of the project. Thank you. Thank you very much.