

Project Management for Managers
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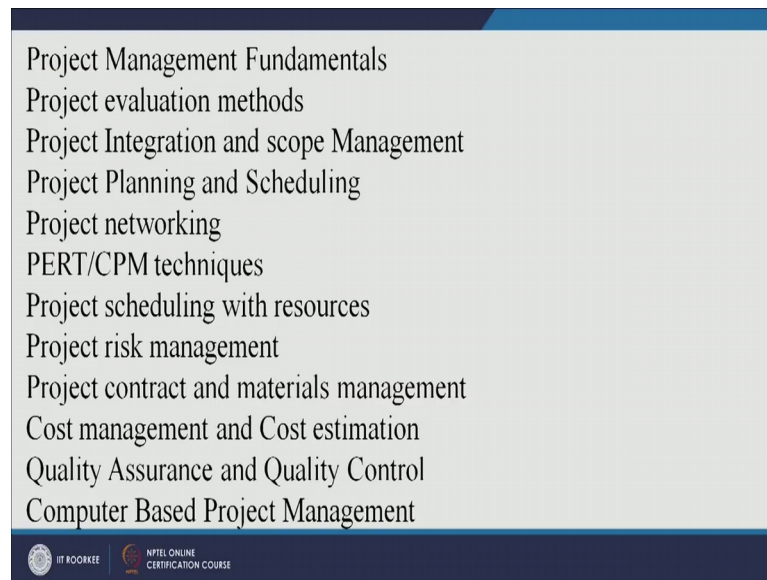
Lecture - 01
Introduction of Project Management

Good morning friends, this is Dr. M K Barua, I am associate professor in department of management studies. I welcome you all in NPTEL online certification program and the subject which I am going to take up here is project management for managers. This subject is very important for the students of mechanical engineering, industrial and production engineering, civil engineering, MBA students and also for working professional. Why it is important for working professionals because working professionals most of the times deal with projects and they should know how to manage a project.

So, let us get started in this course. There are several people who think that project management is PERT and CPM, there are another set of people who think that project management is capital budgeting, some other people think that project management is project financing and there are several other set of people who think that project management is this, project management is this and so on, but in reality one should study project management from 10 different knowledge areas point of view and we see those 10 areas and in this course we will see what are the processes available in those areas.

In short I can say that there are 10 areas and 47 processes. So, the incomplete this is 10 by 47 course 10 areas plus 47 processes. So, let us get started will be talking about project management fundamentals what a project is what project management is and other issues, how projects have evolved over a period of time and will also see project integration. And scope management actually these two are knowledge areas of project then we will have planning and scheduling how to plan a project, how to schedule various activities of a project and to represent a project we always go for networking of projects.

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We represent a project through networks. So, you would have studied during your undergraduate or postgraduate programs something called CPM and PERT then we will see what is project risk management is another knowledge area we have see will see project contract and materials management deals with procurement management cost management and estimation then we will see about quality aspects of project and finally, some softwares related to project management.

There are multiple objectives of project management will see some of the objectives. So, to understand the importance of project management in today's world why projects are important these days because organizations whenever they do something they do through projects. So, projects are important for the world in general and for the organizations in specific.

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Project Management Course Objectives:

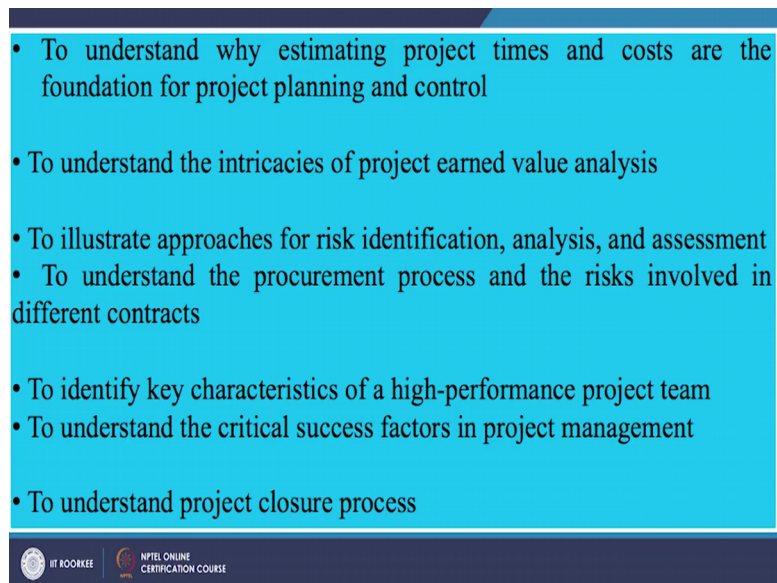
- To understand the importance of project management in today's world.
- To establish the importance of projects in implementing organization strategy
- To understand the rules for creating a Work Breakdown Structure for a project
- To demonstrate the importance of WBS to the management of projects and how it serves as a database for planning and control
- To develop a network diagram for a project



To establish the importance of project in implementing organization strategy you cannot start a project without having strategies. In fact, projects help in fulfilling strategies of the organization then you have got understand the rules and rules for creating a work breakdown structure for a project. In fact, what happens at the top level of hierarchy of project you have got programs and then we divide program into sub programs then projects, sub projects and so on.

So, you have got to complete work breakdown structure and how to how to break down the structure that is again and important point we will see that point as well will see how to develop network diagrams for a project.

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- To understand why estimating project times and costs are the foundation for project planning and control
- To understand the intricacies of project earned value analysis
- To illustrate approaches for risk identification, analysis, and assessment
- To understand the procurement process and the risks involved in different contracts
- To identify key characteristics of a high-performance project team
- To understand the critical success factors in project management
- To understand project closure process

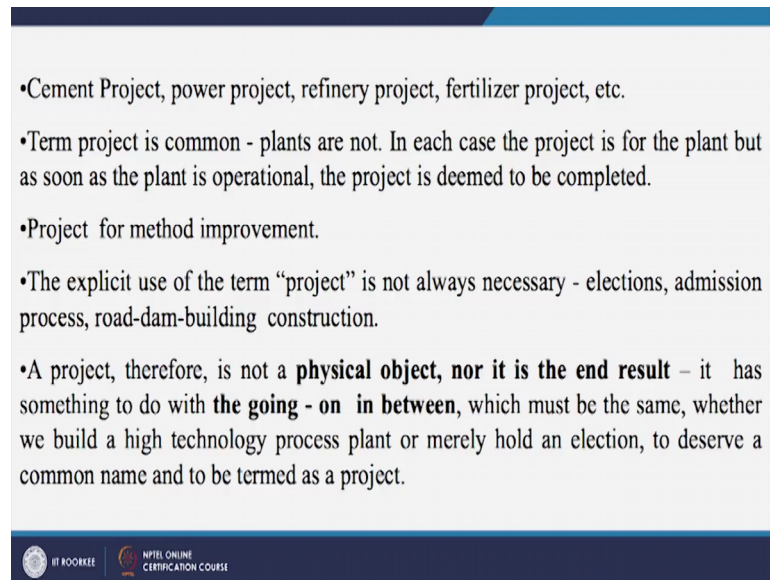
One of the important points in project is to estimate how much time project will take and what would be the cost. So, will see cost planning time planning and so on to understand the intricacies of project and value analysis. In fact, one of the ways to control project is earned value approach will see this approach as well then we have got some other objectives also to understand the procurement process in a project you will have to go for procurement of several things several materials sometimes assembly sub assemblies and so on.

So, procurement is another knowledge area of project will see what are the characteristics of high performance project team what characteristics should the project team should have we will see in detail and what qualities project manager should have to understand project closure process. In fact, similar to start of the project closure is also an important aspect it should not be abrupt closer and there is a process of closing down a project. So, we will see that process as well. In fact, you would have seen something called fertilizer project power project road project then project for let us say RND project and so on.

So, in all these things you would have observed that the word project is common. So, once the project gets over it does not remain project it becomes a process or operations, but for having a project it is not necessary that something should have project word in it in it for example, if I say conduction of elections in India is a project, but I do not say it

is election project for example, when I prepare for examination it is also a project, but I do not say exam project. So, for having a project it is not necessary that the word project should be there.

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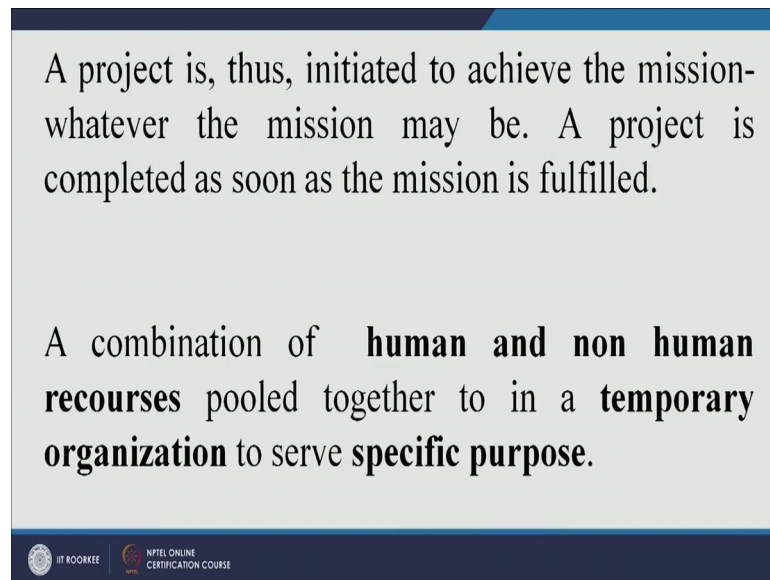
- Cement Project, power project, refinery project, fertilizer project, etc.
- Term project is common - plants are not. In each case the project is for the plant but as soon as the plant is operational, the project is deemed to be completed.
- Project for method improvement.
- The explicit use of the term “project” is not always necessary - elections, admission process, road-dam-building construction.
- A project, therefore, is not a **physical object, nor it is the end result** – it has something to do with **the going - on in between**, which must be the same, whether we build a high technology process plant or merely hold an election, to deserve a common name and to be termed as a project.

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So, what is project a project is therefore is not a physical object nor it is the end result it is something to do with the going on in between right.



So, let us say I am taking up this course because I am doing this course for the first time on online mode this is a project for me right so in so there are several differences between a project and a process.

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A project is, thus, initiated to achieve the mission- whatever the mission may be. A project is completed as soon as the mission is fulfilled.

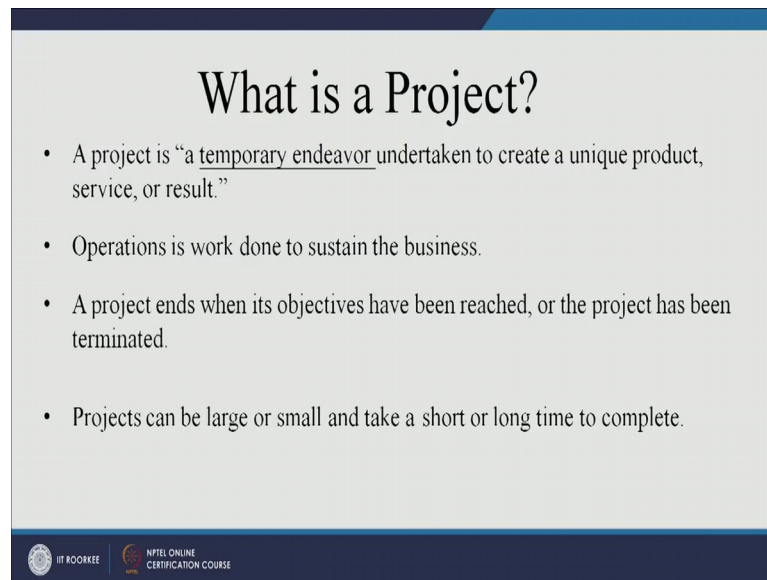
A combination of **human and non human recourses** pooled together to in a **temporary organization** to serve **specific purpose**.

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So, what is project; project is something which we start to achieve omission will say that a project its over a project is over when mission is fulfilled the another way of defining project is it is a combination of human and non human resources pulled together in a temporary organization to service specific purpose.

Now, there are several types of resources human and non human also for example, let us say material resource let say equipment. So, all these are non human resources when we pulled these resources together in a temporary organization when I say temporary organization. It means I have collected team members from different other organizations or I have recruited people to build a team and this team is temporary in nature that is why I am calling it a temporary organization to serve a specific purpose of the project.

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What is a Project?

- A project is “a temporary endeavor undertaken to create a unique product, service, or result.”
- Operations is work done to sustain the business.
- A project ends when its objectives have been reached, or the project has been terminated.
- Projects can be large or small and take a short or long time to complete.

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So, this is project as I said a project is temporary endeavor undertaken to create a unique product service or result the objective of a project is to achieve something which you planned a priori now every project is unique itself when I say unique it means it would be different from other projects in terms of location in terms of time or in terms of resources. So, every project is unique in itself if you look at the other things related to project operation is work done to sustain the business once you complete the project you start operation and you continue doing operations because you want to sustain in the business.

A project ends when its objectives have been reached yes that is very much true once you achieve all the objectives of a project you just terminate the project and depending upon its size. It can be small large medium size and on we will see different types of projects on the basis of on the basis of let say RND investment around the basis of movies controlling that project it maybe government project or private project or combination of these 2 agencies.

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What is a project?

- A group of tasks (activities) performed within a definable time period (schedule) in order to meet a specific set of goals/objectives (performance) within a budget (cost plan)
- A project generally exhibits most of the following conditions:
 - ⊗ It is *unique*
 - ⊗ A project is *finite*
 - ⊗ Usually *complex*
 - ⊗ A project is *heterogeneous*
 - ⊗ *Non-repetitive*
 - ⊗ Requires *multiple resources* from a finite resource pool

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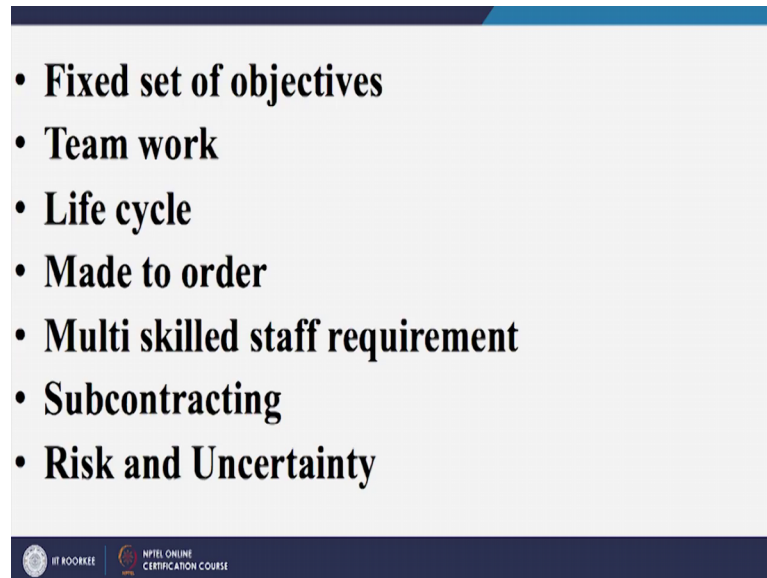
And there are several other forms of projects. So, let us look at couple of conditions which you should fulfill before saying that this is a project.

So, a group of task performed within a definite time period in order to meet certain specific objectives within a given budget this another way of defining project and every project is unique as I said it is unique in terms of time resources and location I will give you an example suppose if I construct a road from here to Delhi from Roorkee to Delhi and you also construct a road from let us say Delhi to Agra. So, what is the difference both these are road projects, but they are unique because the location is different the construction timing may be different and the resources which are being used for constructing these two road projects might be different.

So, that is why every project is unique a project is also a finite when I say finite it means it has got a definite start as well as a definite end. So, it is a finite thing projects are usually complex. In fact, that is why they are projects when I say complex it means you would be involving several people from different organizations several resources several tools and techniques she would be applying and all these things make a project complex it is not a simple task to achieve a project is heterogeneous when I say heterogeneous it means I am working let us say if I am working on a project I will have several team members. So, those team members will have different educational background they will have different cultures they will have different languages and they would have different

understanding level all these things again make a project heterogeneous. So, it is not a homogeneous entity at the end of the day it is heterogeneous it is also non repetitive this one of the important characteristics of project when is a non repetitive it means whenever I do something for the first time it is called project if I do it again and again it does not remain a project.

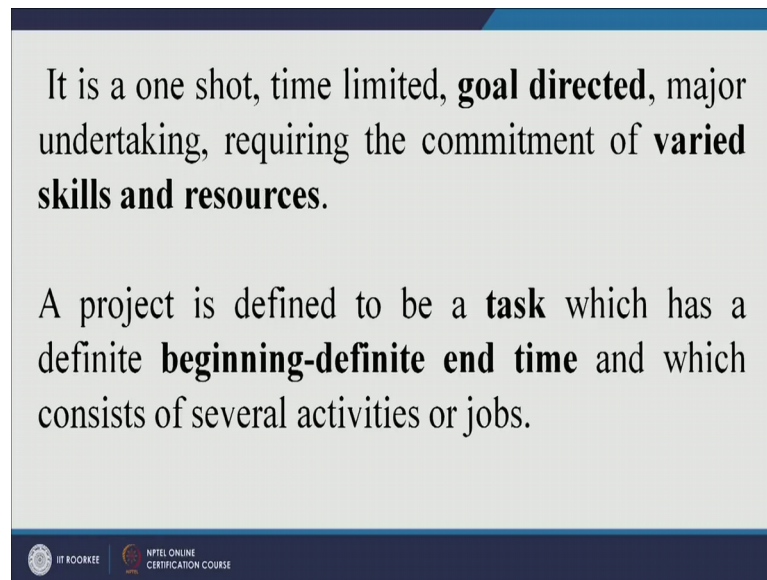
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A project is something which requires multiple resources and resources are always finite. So, you need to use limited resources in optimum manner a project has got fixed setup objectives you will always have teamwork in a project because success of a project depends on how the team is working towards achievement of objectives of the project every project as got a lifecycle will see life cycle phases in detail. But every project has got a life cycle similar to life cycle of a human being most of the times projects are made to order whenever we receive some order from customer then will prepare project according to the requirements of the customer it is a multi skilled staff requirement.

As I said you need several people having varied skills in project you will always have subcontracting because in a project you would be performing several activities and you do not have resources to perform all those activities. So, what you do you generally subcontract some of the activities to third party and there are risks and uncertainties in project one of the important knowledge areas of project is risk management will see in detail risk management as well.

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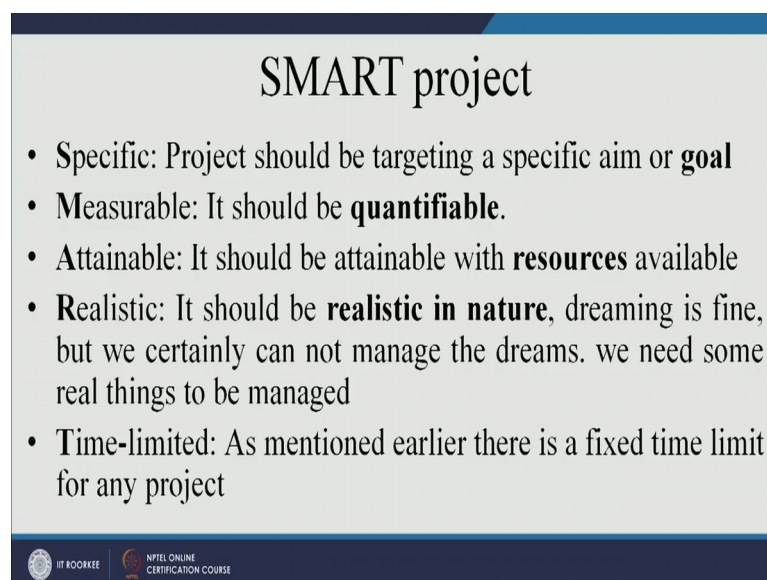
It is a one shot, time limited, **goal directed**, major undertaking, requiring the commitment of **varied skills and resources**.

A project is defined to be a **task** which has a definite **beginning-definite end time** and which consists of several activities or jobs.

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So, what is project it is one shot time limited goal directed major under taking require me requiring the commitment of varied skills and resources that is project. A project is defined as I said task which has to be which has a definite beginning and definite in time this what I have also talked when I talked about characteristics of project; project is smart when I say smart you get specific objectives and objective are naturable.

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SMART project

- **Specific:** Project should be targeting a specific aim or **goal**
- **Measurable:** It should be **quantifiable**.
- **Attainable:** It should be attainable with **resources** available
- **Realistic:** It should be **realistic in nature**, dreaming is fine, but we certainly can not manage the dreams. we need some real things to be managed
- **Time-limited:** As mentioned earlier there is a fixed time limit for any project

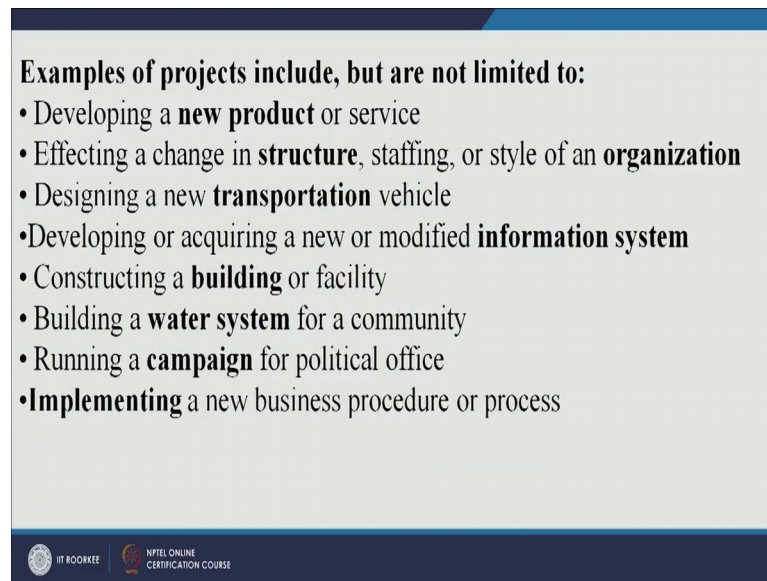
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So, S and M A stands for attainable we should attain the goals of the project with whatever resources we have got it is realistic project should be realistic though we

should dream big, but things should be realistic at the end of the day and project is time oriented as I said you are, but definite beginning and definite end. So, this is smart.

You can have several examples of project these are some of the examples, but are not limited to. So, whenever you come up with an let say new product or service it is a project let us say if you are changing the organization structure of the company then it is also a project designing a new transportation vehicle.

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Examples of projects include, but are not limited to:

- Developing a **new product** or service
- Effecting a change in **structure**, staffing, or style of an **organization**
- Designing a new **transportation** vehicle
- Developing or acquiring a new or modified **information system**
- Constructing a **building** or facility
- Building a **water system** for a community
- Running a **campaign** for political office
- **Implementing** a new business procedure or process

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Let us see if you are doing some project to enhance the mileage of the vehicle that is also a project developing or inquiring a new or modified information system. So, if you let say go for implementation of management information system in an organization that is also project.

Constructing a building a dam or any other facility is also a project and there are hundreds of examples of project you can see some of them are water system running election campaign implementing new business procedure or process. So, as I said there are various elements of project based on the definitions which we have just gone through projects are complex one time limited by budget schedule and resources are developed to resolve a clear goal or set of goals and projects are customer focus.

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Various elements of project: Based on set of definitions

- Projects are **complex, one time** processes
- Projects are **limited by budget, schedule, and resources**
- Projects are developed to resolve a clear **goal or set of goals**
- Projects are **customer focused**

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So, let me tell you what is the difference between a project and a process difference between project and process are you can call operations.

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Process & Project Management

Process	Project
1. Repeat process or product	1. New process or product
2. Several objectives	2. One objective
3. On-going	3. One shot – limited life
4. People are homogeneous	4. More heterogeneous
5. Systems in place	5. Systems must be created
6. Performance, cost, & time known	6. Performance, cost & time less certain
7. Part of the line organization	7. Outside of line organization
8. Bastions of established practice	8. Violates established practice
9. Supports status quo	9. Upsets status quo

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So, in a project you will always have some new process, but in a process you will be doing things again and again. So, projection non repetitive to give you an example suppose if I want to switch off visible and for the first time I do not know where is this switch that is a project for me once I switch it on and if I continuously doing it for let us say next 30 days then that is not a project. So, in a project the most important point is it

is non repetitive in a project you will have most of the time one objective, but in operations or in processes you will have several objectives.

As I said processes are ongoing continuously you are doing something every day that is not a project that is operation or process, but the projects are one shot they what limited life they what start date they what ending date in operations you have got homogeneous people, but in projects you have got heterogeneous people in processes you have got systems in place, but in project you need to create new systems because you are not doing project most of the times in your organization many times you might be doing project outside your organization. So, you need to come up with new systems new set up new set of rules and so on.

The how to evaluate processes you have got performance cost and time which are known, but in case of projects you need to look at performance cost and time which are generally less certain there is no uncertainty as far as these things are concern in projects in process you have got line organization while in case of project you have got outside of line organization if you look at the ninth point you have sub in process you support status quo, but in case of project you always upset status quo when I say upset status quo means you are doing some changes in your organization either in the form of rules and regulations are in Hindi form of lets organization structure are you are going out to do some project and so on.

So, you are challenging status quo I will give you an example let us say if in an educational institute in an examination let us see if seventy percent students failed in a subject then what you should do you may do several things for example, you can have special classes for them on every Saturdays. Now this is what you challenge the status quo of the institute because on Saturday generally you do not have classes similarly you do other things in a project at the end of the day you are challenging the status quo of the organization in terms of rules regulations.

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	Project Management	Operations Management
Repetition	Non repetitive	Repetitive
Work force required	Multi-skilled or very highly specialized for short durations	Limited skills, a huge learning effect
Revenues	No revenues	Revenues and profit/losses
Objective	Scope, performance, time, cost	Profits generated, cost reduced, quality of products or services
Equipments needed	Special purpose equipments for a short durations	Same equipments are continuously used
Subcontracting	Essential, involves many subcontracting agencies	Generally avoid use of subcontracting agencies
Risk	Very high risk as generally no chance of recursion	Risk is less as chances of improvement always there

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And some other things as I said in project you require multi skilled people when you distinguish project and processes on let say revenue criterion then in project management generally you do not have revenues, but in operations you have got revenues and profit losses. In fact, what happens when you complete the project let say if you are coming up with a new product and launching a new product is also a project?

So, once you are done with project once you launched the product you will be selling that product to customers and then you would be generating revenue if you look at risk criterion than you have got in project management its very high risk. I generally no chance of recursion while in case of processes they are generally less risky and as for as subcontracting is concerned in a project you will have very large amount of contracting these are some other criteria on which you can distinguish between project and operations.

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	Project Management	Operations Management
Duration	Fixed, ceases with attainment of objective	Continuous in nature, ceases in special situations like divestment.
Improvement	Radical improvement to face the existing competitor	Incremental improvement to reduce cost or add to value
Major impact	future	present
goal	Creation of new thing	Maintenance of existing thing

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So, far we discussed several things about project I hope that by this time you would be very much clear about project what is project let us look at something about what is project management.

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What is Project Management?

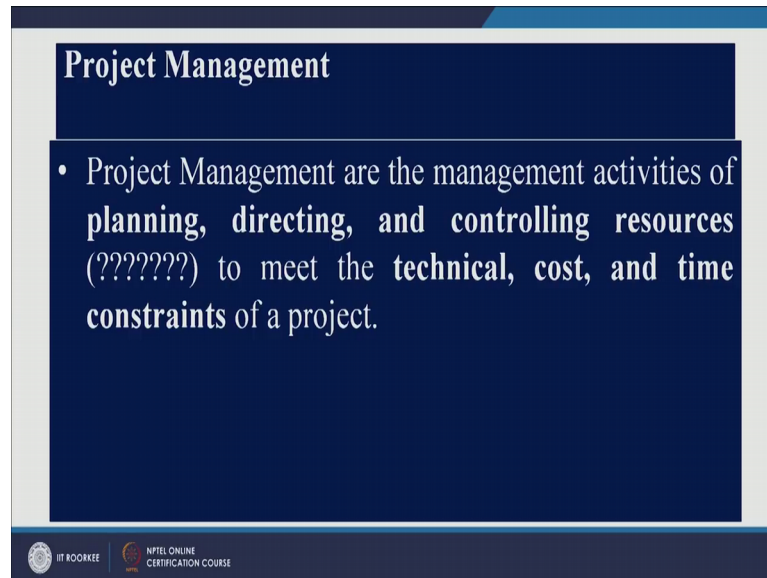
Project management is “the application of knowledge, skills, tools, and techniques (KSTT) to project activities to meet project requirements.”

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If you look at the definition of project management body of knowledge in book USA then project management is application of skills tools and techniques to project activities to meet project requirements. So, that is this; this is one of the definitions of project

management very important definition widely acceptable definition application of knowledge skills tools and techniques.

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Project Management

- Project Management are the management activities of **planning, directing, and controlling resources** (???????) to meet the **technical, cost, and time constraints** of a project.

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In other words we can say that project management is planning of several activities directing and controlling various resources now what are the resources as I said you can have several resources one of the ways of classifying resources is human and non human resources. So, you can have let say money you can have time you can have material you can have human resource right. So, what is project management is planning directing and controlling resources to meet technical cost and time constants of the project.

Now, why project why project management is important why one should go for project organizations are involved in several projects because they achieve their mission objectives through projects that is why they take projects.

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Importance of PM?????

- Fast technological changes: Electronic goods
- Narrow product launch windows:
- High entropy of system: Expansion
- Short life cycle of products: s/w, mobile.
- Globalization impact: BRICS
- Large organizations:

Customer focus

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Let us look at couple of other reasons why project management is important these days one of the things is fast technological changes world is changing very rapidly and if you look at the electronics goods market is changing even at faster right. So, to remain in business you need to be updated you need to produce those things which are needed by customers and for that you need to come up with newer and newer projects.

Nowadays product launch window is very narrow earlier customers used to require products at sometimes after a period of 6 months or after a period of one year, but nowadays customer preferences are changing very rapidly. So, you need to launch product in a very short period of time that is why projects are important these days high entropy of system because things are changing fast things are expanding every organization wants its share of market. So, that is why they are going for projects as I have said there is short life cycle of products especially in the area of software and mobile every alternate month nowadays you would be getting new mobile phone.

So, that is why you need projects and of course, it is a globalization is playing an important role. So, when we move towards more and more globalization you need to come up with new and new projects and there are several large organizations which will have large number of people for survival of those organizations they need to come up with projects and sometimes what is happening in a log in a large organization they also

go for consulting experts whenever they want to do something new for which they do not have resources they go for they go to consultants and then they get things done.

At the end of the day whatever you do whenever you come up with a project it should be customer focused. So, in one word we can say that why projects are important because customers are changing you need to fulfill their requirements. So, let me conclude what we have done in first session of this course we have defined what is project we have also defined what are different characteristics of a project we have seen what are the differences between project and processes. We have also defined what is project management and we have seen several definitions of project management, but you should remember the very the important definition of project management that is its application of our knowledge skills tools and techniques to various activities of the project for completion of its success.

Thank you very much for attending my first session.