

**Principles of Engineering System Design**  
**Dr. T. Asokan**  
**Department of Engineering Design**  
**Indian Institute of Technology, Madras**

**Lecture - 05**  
**Tools for Enabling Creative Development**

Dear friends, welcome to another session of System Engineering Design course. Today we are going to discuss about the tools for enabling creative development. As we know, any design or product design or a system design is a group activity and we need to have people with different capabilities different trench to do a very good design or to have a purposeful design.

So, in this lecture we will try to identify few aspects of team building team formation team building and team the planning for the development of a design project. So, what we are trying to cover here is basically two things.

(Refer Slide Time: 00:54)



One is development of teams as you can see the team composition how do you choose the team members proper selection of team members and then team building and team evaluation; how do we build a good team and how do we evaluate the performance of a good team for making the project a successful one and in addition to that we will be looking at the project planning also we will be looking at the what to plan when to od a

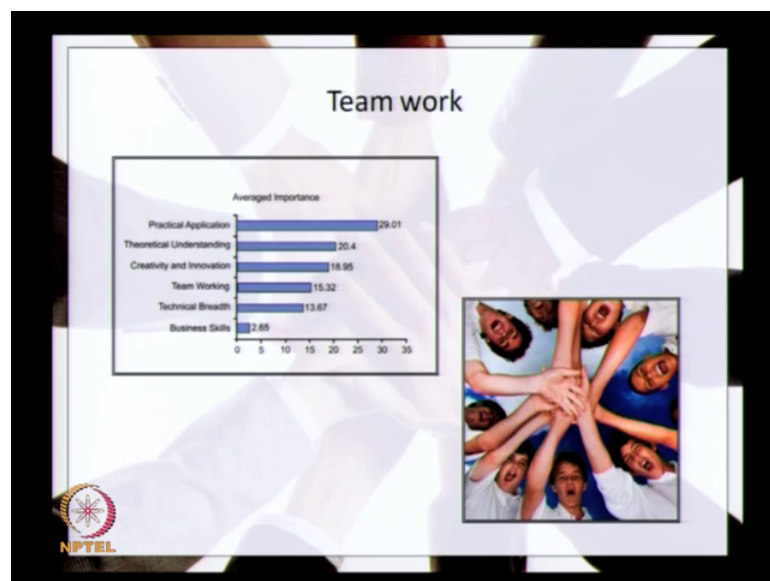
task or what are the task to be done when it to be done and where it has to be done and how we will do this task.

So, these two things basically the formation of teams and team planning they are very important the project success. So, we will look at these things and these actually the tools for creative development processes. So, to remove the barriers that obscures our collective imagination.

So, as you know; it is a collective efforts the design is a collective efforts, we need to have the energy fully focused on a particular project and we need to have a collective imagination and we need to make sure that everyone works for the particular project and make sure that it reaches the logical end of successful design of a project or a system.

Now, let us go to the development of team that is the first task.

(Refer Slide Time: 02:12)

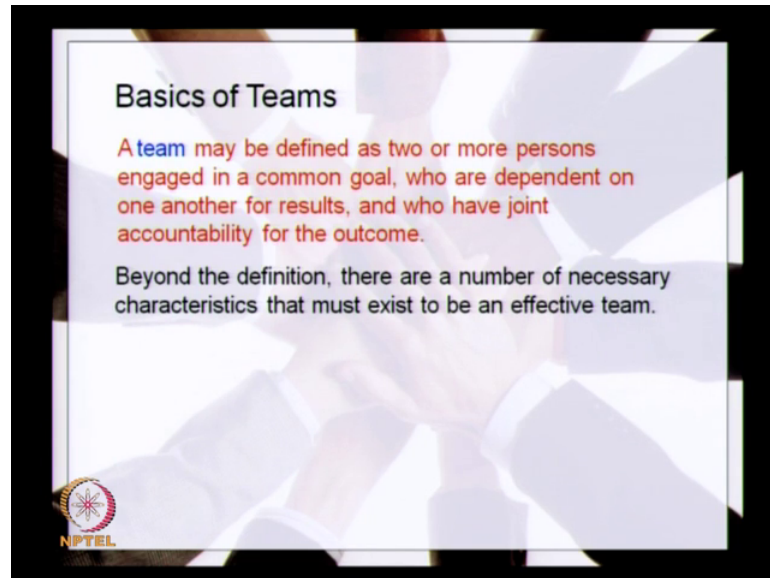


The team work as you know team work is one of the most important aspect of any group activity, if you can see here the success of any team work or any project activity the averaged importance is shown here in this charts. So, you can see here team working is one of the most important parameter here these around 15.32 percent wattage for that one compare to the practical application and theoretical understanding.

So, it is only slightly less than the creativity and innovation which is not only sufficient that the team is very creative and innovative that need to be a very good team building.

And team activity in order to make sure that the whole effort is concentrated on the project and everyone understand the project goals everyone works for the project and everyone is committed to the success of the project.

(Refer Slide Time: 03:03)



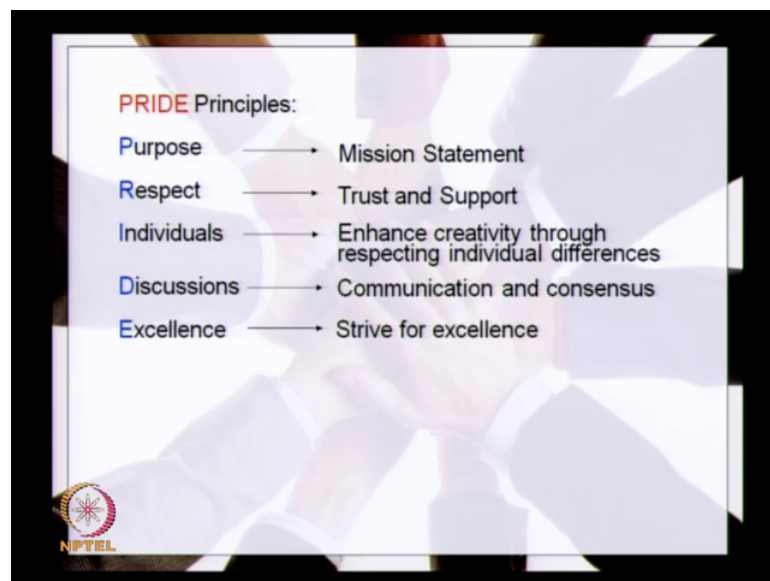
So, in order to do this first what the need to is do a formation of a team. So, how do the form a team what are the basic requirement for the formation of a team. So, we can define that team as 2 or more persons engaged in a common goal who are dependent on one another for results and who have joined accountability for the outcome.

As we can see are these terms are very important a team is basically group of 2 or more persons engaged in a common goal. So, that is important the goal is common for everyone it is not for one per the team leaders goal or someone else goal the goal is for everyone and who are dependent on one another results. So, very important everyone depends on the other person for the result it is not that one person alone can do the job if that was the case, then we do not need to have a group or a many people working on the group.

So, here we can see that they are dependent on one another for results and who have joint accountability for the outcome. So, the accountability is also a joint accountability. So, everyone needs responsible for the outcome of a project.

Now, in order to form the; that group the definition is there, but more than this definition there are number of necessary characteristics that must exist to be an effective team. So, it is not only that we are jointly accountable and we have the common goal alone is not sufficient there are some other characteristics should be there where everyone can understand the goals and the objectives, and how to work together and these characteristics are defined or summarized as pride principles.

(Refer Slide Time: 04:36)



So, you can see that they are this actually you can see the purpose respect individuals discussions excellence. So, these are the pride principles of a very good team or a for good team work we need to follow this principles.

So, purpose is nothing, but the mission statement or the goal of the project. So, everyone understands the goal of the project that is the purpose is understood very well by all the team members and the everyone understand in this same way; it is not that someone understand their objective in one way and the other one things that in a different way. So, the mission statement over a goal work we develop or a mission statement what we develop is a initial stage of the development that is understandable to everyone. So, everyone understands the purpose of the formation of the team.

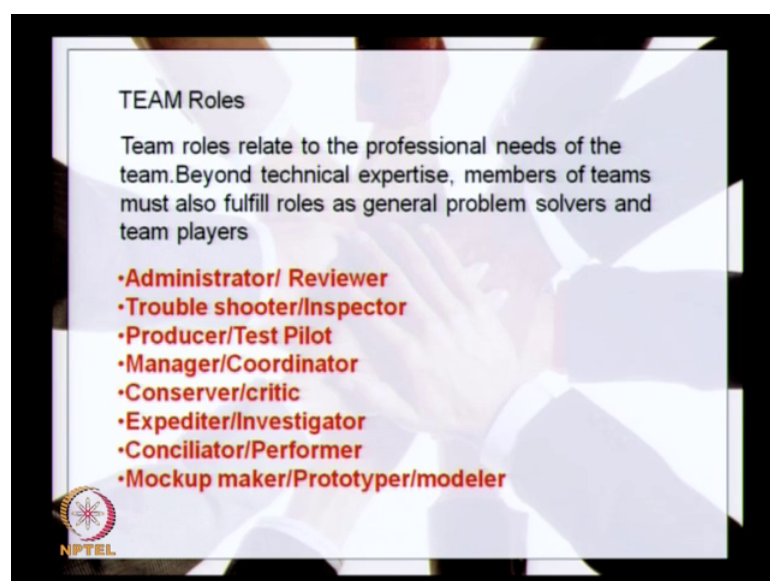
The next one is respect is basically the trust and support. So, you have good trust between your members you trust your partners you trust their capability and you respect them also. So, that is also there you respect their capability and then support them also

whenever needed. So, that is the respect then individuals. So, enhance creativity through respecting individual differences. Now two members are same or they have qualities or same capabilities. So, there are differences between members. So, we need to understand this difference and accept that difference the only you can accept the other person has your partner or your team member.

So, ensure that you understand the plus and minus qualities of your partner and make sure that that is enough for you to make sure that he contributes the team well. So, you enhance the creativity through respecting individual differences then discussions. So, discussions is this is this is one of the important parts. So, we need to have very good discussion between the team members. So, we need to discuss the issues from the starting to the end of the project you need to have proper discussion and communication. So, communication is very important and consensus. So, when you have there is a difference of opinion we should try to reach to a consensus and then go on from there that point.

And then excellence this is for strive for excellence. So, everyone should strive to excel in the work. So, we know that there is a mission there is a goal to be achieved. So, everyone should work for the best output from the team. So, that is the excellence in team work.

(Refer Slide Time: 07:08)



Now, coming to these the pride principle say the one which actually guide you through the formation of the team or through the working of the team now what are the roles for different team members. So, you know in a team there will be different roles. So, the team roles relate to the professional needs of the particular project. So, beyond technically expertize members of teams must also fulfill roles as general problem solvers and team players.

So, there are many roles to be played in the team. So, it is not that somebody very good in technical aspects or somebody is very good in doing hand. So, the talon is not sufficient there are many other roles to be satisfied by the team members. So, what are these roles which need to be played by the team members there are many roles you can see that administrator could be a one person who actually administrates the project or he will be a reviewer who will review the project, and their regular intervals or he can be a trouble shooter or inspector whenever some problem comes up this person will be; act as a trouble shooter and he will make sure that everything is going smooth. So, whenever the problem comes he acts as a trouble shooter.

Then there are producer or the; who will make the mock up or who will make the prototypes manager coordinator, then there are other like expediter investigator conciliator performer mockup maker or prototype modeler. So, these are roles many roles our different roles to be played by team members.

(Refer Slide Time: 08:31)

• Visionary  
• Strategist  
• Need finder  
• Entrepreneur/Facilitator  
• Diplomat/orator  
• Simulator/Theoretician  
• Innovator  
• Director/programmer

It should be kept in mind that all persons perform all of these roles to some degree or other.

*"It is easier to go to Mars or to the Moon than it is to penetrate one's own being"- Carl Jung*

NPTEL

There are many more a visionary a strategist a visionary is one actually looks beyond the present project or you will look at the total outcome of the project and what will happen is something goes from at this level what will be the outcome at the end of the project.

So, he say visionary who actually planes ahead for the project like that there are diplomat is one actually who will interact with the others not only within the team with outside the team also and have proper communication with their clients the stock holders and who are is involved in the project.

Like that you can see there are many roles simulator innovator director programmer, but at any time team members will be playing any of these roles. So, though they are not assigned such a task like a manager or a simulator or a person who actually diplomat at some time we will be a force to play such roles. So, it should be kept in mind that all persons perform all of these roles to some degree or other.

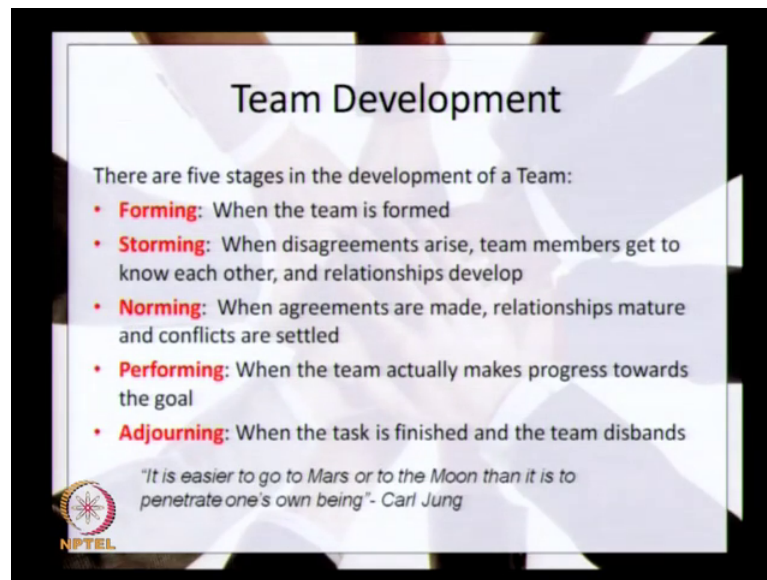
So, some time we will be playing many of these roles and then how do we assigned these roles to different people. So, what are the ways to identify the strength of a person or his characteristics to ensure that yes this person is good for this particular role or this person plays is very good in mathematics. So, he will be good in as analysis or a simulator or this person is very good in communication. So, let us give him a role as a diplomat or a conciliator.

So, how do we actually assign these tasks as you can see it is very difficult to identify the real qualities or that real characteristic of a person? So, you can see here it is easier to go to mars or to the moon than it is to penetrate one's own being. So, we do not really know how do a person behave in a group. So, there are no direct methods to see whether this person will be a perfect fit in the group that is why when any company select the students for their I mean employees; they will actually do many test to find out whether this person is what is his inner person what is how he actually he behaves under different situations to from the team also we need to identify the characteristics of these people and then make sure that their actually fit for a particular task or we need to analyze the personality of a member before we actually assign a team role to him.

So, how do we do this there are some standard methods to do this?



(Refer Slide Time: 10:50)



And we will go through those steps a later stage, but there are methods to this and how one way of doing this is to and known as a method called MBTI; I will come back to that shortly.

So, when we form a team or when we try to start a project we need to form a team and then develop the team and then evaluate the team. So, there are five stages in the development of a good team as you can see here first one is the forming that is the formation of a team. So, here the team members are selected and the team is formed and then next stage is the storming. So, after forming we have a storming where when disagreements arise team members get to know each other and relationships develop. So, this is the stage where it is actually maturing the team relationship. So, we the disagreements will arise team members get to know each other and relationship develop at this stage.

So, the third one is known as norming; norming is nothing but when agreements are made relationships are mature and conflicts are settled. So, from the stage of storming try to know each other well and then the agreements are made and relationship mature and conflicts are settled. So, in this your case also we will see that now teams have been formed. So, initially you will be having some trouble starting troubles will be there we may find that somebody is not working or somebody is not listening to you, but that is a stage of storming. So, once you do go through that stage of storming you will reach the

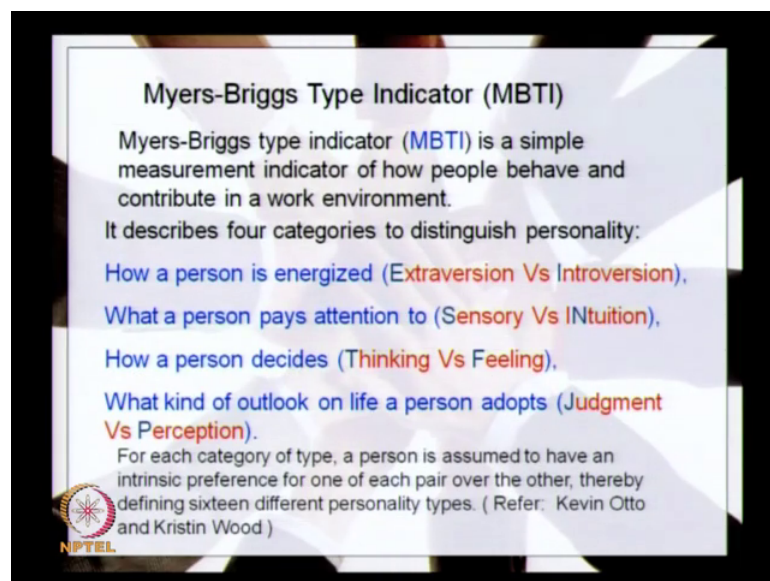


stage of norming when relationships will be stable and the conflicts are settle you are ready to carry out your task.

Then, you come performing when the team will actually make progress towards the goal. So, the project is given to you go through these three stages of forming storming and norming. So, once the norming stage is done you are perfectly all right the team as a team you are very good at the stage and then you will start performing and you reach the goal and then may adjoining the team that is the team the project is over the no more the team is needed. So, you adjoin and then wait for the next project. So, there are five stages every team has to go through these stages then only it will be actually first three stages to go through then only real performance of the team starts ok.

So, we will see how the formation takes place of this as I early mentioned.

(Refer Slide Time: 13:13)



I told you that the form team formation is the first part where we need to select the team members to do a particular task; how do we select the person for a job or we have already got 4 members in a team or a five members in a team how do you assign the different task and different roles to the members and for this we need to know the personality type of an individual. So, what his strength what role he will perform very well what are the characteristics this particular person holds which will be suitable for the team because you know the team and you know the task to the team.

So, we will decide how the person how we can assign a role to a particular person and to understand this there is a method called Myers Briggs type indicator or MBTI have you heard about this ; no. So, this is to some extend a physiological test we can say, but it is not really a physiologic it is more of your own assessment of what are your strengths.

So, in this MBTI, Myers Briggs type indicator the; it is a very simple measurement indicator of how people behave and contribute in a work environment. So, this will try to classify the individuals based on the way they behave and contribute in a work environment. So, it is nothing, but the simple measurement indicator which we can everyone can make their own assessment and then see what kind of a characteristics individual posses.

So, what are the classifications here? So, here it describes the 4 categories to distinguish personality. So, there are 4 categories of individual or we can actually distinguish them into 4 categories the first one is how a person is energized extraversion versus introversion extraversion versus introversions.

So, we know extraverted people and introverted people it is a same thing how a person is energized I will explain the details of his categories so that you can actually make your own assessment of your type. So, how a person is energized? So, the extraversion people will get energy from outside. So, he wants people around him he wants to be always going out and then doing things with people. So, that is such people are extraverted introverted people are more like more to inner self that get their energy from their own self they think they try to analyze thinks and then get the energy from that that is the how a person is energized

Then what a person pays attention to. So, that is an next category a sensory versus intuition someone on their senses take the data from the sense other sources and they pay attention to those, but others will pay attention to their intuition they do not trick the information coming directly through their senses they apply their own intuition and then try to get the information from there. So, that is the; a person pays attention to as a sensory or intuition, then how a person decides.

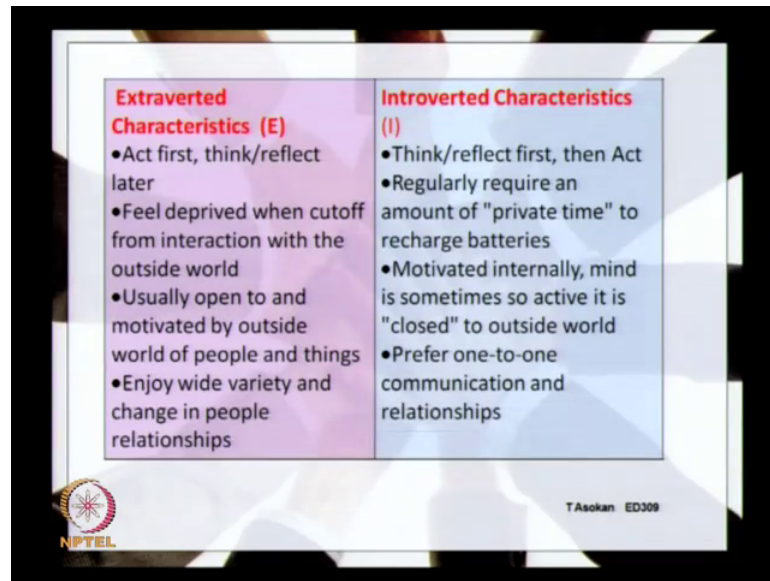
So, how the person will take a decision on what basis you will take a decision. So, you just were the thinking versus feeling. So, those the thinking they will think about the outcomes and other aspects and then take a decision otherwise we will more on the

feeling what will happen to other people. So, what should I do whether I should do this because otherwise we will get hurt or something like that. So, that is the way otherwise we will take the feeling. So, what are feeling people and what kind of outlook on life a person adopts that is a judgment versus perception these also I will explain; what is judgment and what is perception. So, these are the 4 categories how a person is energized what a person pays attention to how a person decides and what kind of outlook on life a person adopts.

Now, every person actually not have to be A, E or I. So, we will for a short form, we called as E or I or N T or F and J or P. So, nobody can be actually E and I they will be having strength in one side. So, it cannot be 50-50 always most of the cases there may be exceptions, but that can be either E or I or S or N T or A F J or P. So, based on this we can actually classify a person as ESTJ or ESTP or ISFP or ISFJ like that we can actually classify the characteristics of individuals. So, this actually indicates the type of person how he is energized what he pays attention to how a person decides and what kind of outlook on life a person adopts.

So, let us go in to the; these details what is an e. So, for each category of type a person is assume to have an intrinsic preference for one of each pair. So, that is what I told you. So, one of each pair; so you can be either E I one of each pair over the other there by defining sixteen different personality types in get more information from the Kevin Otto and Kristin Wood.

(Refer Slide Time: 18:13)



So, let us see what is the difference between E and I as we can see the extraverted person will act first and think reflect later. So, he do not really think before acting sudden action will be coming and he feel deprived when cutoff from interaction with the outside world. So, he wants to be always with the people. So, he cannot cutoff from the society or cutoff from the people. So, he always gets energy from the other people or who are around him.

He is usually open to and motivated by outside world of people and things enjoy wide variety and change in people relationships. So, he likes wide world verity. So, a person who really an out spoke and an goes out and enjoys people company there and enjoy party and things like that. So, that person is extraverted and these people really cannot be isolator or cannot be alone.

So, if you have this kind of people and send them for a vacation in an island with no one else that is the; that is equivalent to a what you call a life time imprisonment or a sentence for him. So, always they want to be among the people or they want to get energy from people there was a real incidence where the one multinational company who actually one sales and marketing. So, they have a many sales people there are most of the sales people are will be extraverted. So, they want to go with people and interact with people.

So, when this company where there making lot of money they decide that everyone will have independent cubicles in the office. So, initially there were all sitting together in a

hall and enjoying the life then they thought that now let us provide them independent cubicles to everyone and most of them, we are happy initially they thought oh I have a rooms. So, I can do whatever I want and after one month the company found that their productivity has come down their sales has gone down and then they try to analyze what is happening then they realize that this people cannot be kept in a cubicle they want to be always with other. So, they removed all the cubicles and put them back in to the same hall where they can interact they can chitchat then they can do whatever they want.

So, these are the people who cannot be a left alone. So, they are usually open and motivated by others they want energy from others the opposite is the introverted characteristics they think reflect first and then acts they are wont immediately act they will take some time to thing and then only they will act they regularly require an amount of private time to recharge batteries. So, they always need some private time. So, that they can recharge their batteries that they recently send they will be recharged or they will feel that they get the energy from being alone or they think about it and then get energy.

And similarly they are motivated internally mind is sometime. So, active it is close to outside world. So, they are internally very active they will be thinking a lot they will be getting new different ideas to do thinks and. So, there will be getting lot of energy and lot of ideas from inside. So, there will be always most of the time there will be close to outside worlds and they prefer one to one communication and relationships ok.

So, this is the E versus I characteristics I hope all of you have received this form. So, this is the form were actually you can see all these explanations. So, now, since you know between the difference between E and I you can actually mark your best fit here. So, whether you fit into A, E or an I. So, think about your own characteristics which way we will fit I am I am sure that you will be able to make a judgment because nobody can be E and I at the same time there may be some way you may be a ten percent I and ninety percent E that is possible, but then you see which is strongest path for you and then you marked at this E or I.

Now, that is for the extraverted and introverted characteristics then we see.

(Refer Slide Time: 22:00)

Sensing Characteristics (S)	Intuitive Characteristics (N)
<ul style="list-style-type: none"><li>•Mentally live in the Now, attending to present opportunities</li><li>•Using common sense and creating practical solutions is automatic-instinctual</li><li>•Memory recall is rich in detail of facts and past events</li><li>•Best improvise from past experience</li><li>•Like clear and concrete information; dislike guessing when facts are "fuzzy"</li></ul>	<ul style="list-style-type: none"><li>•Mentally live in the Future, attending to future possibilities</li><li>•Using imagination and creating/inventing new possibilities is automatic-instinctual</li><li>•Memory recall emphasizes patterns, contexts, and connections</li><li>•Best improvise from theoretical understanding</li><li>•Comfortable with ambiguous, fuzzy data and with guessing its meaning.</li></ul>

The other one sensing and intuitive characteristics S and N as you can see here the sensing characteristic people they mentally live in the now attending to the present opportunities. So, they will be looking at the present opportunity, they do not worry about what is going to happen in the future. So, they are really at present that is the senses they believe on their senses what is coming to them through the senses that is the present and they do not worry about anything else using common sense and creating practical solutions is automatic and instinctual use their common sense to get their solutions memory recall is rich in detail of facts and past events.

So, they have very good recall for the past. So, they take the incidence from the past and then try to use it for taking decisions they best improvise from past experience. So, they do not as a told you they do not worry about the future the take the from the improvise from the past experience and they like clear and concrete information dislike guessing when facts are fuzzy. So, they want clear information they do not like to guess things and when the information is fuzzy they will not they do not like, but concrete to that intuitive characteristics they are mentally live in the future attending to future possibilities. So, they will look at the future the way present times smash is find, but I am going to do with this in the future.

So, what are the possible outcomes coming from here and from this particular situation so that is they will live in the future they use imagination and creating inventing new

possibilities is automatic instinctual new possibilities very instinctual for them. So, they will always try to create new possibilities from the present situation.

Memory recall emphasizes patterns contexts and connections. So, compare to this these are actually the facts details of facts are actually memory recalled, but they actually look for the patterns in the past. So, because they look for the future they look for the pattern the past and then try to apply that into the future, and they best improvise from theoretical understanding the basic theory is improvised or they understand that one and improvise on this theories they are comfortable with ambiguous fuzzy data and with guessing its meaning. So, they do not worry about a fuzzy data they are comfortable with ambiguous data compare to the sensing characteristics. So, you go the difference between sensing and intuitive characteristics.

Now, you can try to identify what is your characteristics whether you are a sensing or intuitive S or N you can mark the in your that paper that is the sensing and intuitive it characteristics.

(Refer Slide Time: 24:30)

Thinking Characteristics (T)	Feeling Characteristics (F)
<ul style="list-style-type: none"><li>•Instinctively search for facts and logic in a decision situation.</li><li>•Naturally notices tasks and work to be accomplished.</li><li>•Easily able to provide an objective and critical analysis.</li><li>•Accept conflict as a natural, normal part of relationships with people.</li></ul>	<ul style="list-style-type: none"><li>•Instinctively employ personal feelings and impact on people in decision situations</li><li>•Naturally sensitive to people needs and reactions.</li><li>•Naturally seek consensus and popular opinions.</li><li>•Unsettled by conflict; have almost a toxic reaction to disharmony.</li></ul>

The next one is thinking versus feeling. So, we can see that in thinking characteristics instinctively search for facts and logic in a decision situation. So, they look for facts and logic in a decision situation naturally notices tasks and work to be accomplished. So, they are actually a thinking characteristics. So, they will think about the task and other work to be accomplished easily able to provide an objective and critical analysis. So,



they will be able to easily provide you a critical analysis of the situation and very objective and critical analysis of the situation and they accept conflict as a natural normal part of relationships with people. So, conflict is not a difficult thing for them. So, they will accept it as a natural part. So, yes I have some difference of opinion it might try to solve it.

So, they do not worry about those conflicts. So, they accept it as a normal part of relationship and feeling characteristics they instinctively employ personal feelings and impact on people in decision situations. So, instead of going for facts or logic they will look at the feelings. So, the personal feelings and impact on people in decision situations. So, they will talk about; if I take this decision what will happen to the other person how he will live feel bad about it or will he try to do something against me. So, that kind of a feeling is more for them thus they do not really look at the logic or facts and decision making ok.

So, then they are naturally sensitive to people needs and reaction because of their feeling characteristics they are sensitive to people needs and reactions then they naturally seek consensus and popular opinions. So, they always try to get popular opinion because when everyone accepts that at least the majority accepts the decision they feel that I will not be hurting many other people. So, he will try to get a consensus on every decision that because of his feeling characteristics and unsettled by conflict have almost a toxic reaction to disharmony. So, they are unsettled by conflict, but they have a very toxic reaction to disharmony they do not really accept the disharmony they want to have a very harmonious relationship with everybody. So, that is the difference between thinking and feeling characteristics ok.

Any questions please feel free to ask questions if you are understood this then you can write down the letter which actually describes your characteristic your character.

(Refer Slide Time: 27:01)

Judging Characteristics (J)	Perceiving Characteristics (P)
<ul style="list-style-type: none"><li>• Plan many of the details in advance before moving into action.</li><li>• Focus on task-related action; complete meaningful segments before moving on.</li><li>• Work best and avoid stress when keep ahead of deadlines.</li><li>• Naturally use targets, dates and standard routines to manage life.</li></ul>	<ul style="list-style-type: none"><li>• Comfortable moving into action without a plan; plan on-the-go.</li><li>• Like to multitask, have variety, mix work and play.</li><li>• Naturally tolerant of time pressure; work best close to the deadlines.</li><li>• Instinctively avoid commitments which interfere with flexibility, freedom and variety</li></ul>

So, T or F and the last one is judging characteristics versus perceiving characteristics; so this again making decision the judging characteristics, so the plan many of the details in advance before moving into action. So, the judging characteristics they really do a very good planning before going in to action. So, here the planning is very import for them they will look for them details of the work to be done in advance before moving into action.

They focus on task related action complete meaningful segments before moving on. So, they will look at for the task related action and then they will look for the meaningful segment what are them really important segments and they will focus on those segments only work best and avoid stress when keep ahead of deadlines. So, they will try to keep ahead of deadlines. So, do not wait for the last moment like you have the assignment you submit. So, they will try to do it well in advance they plan ahead and then they try to complete the work well ahead of time or they plan it ahead so that they will not be under pressure at any time.

So, they will plan very well the work best and avoid stress and keep ahead of deadlines naturally use targets dates and standard routines to manage life. So, they will be having natural targets I have to do this. This week I have to complete the particular task and this many days and they could keep standard routines to manage life. So, everyday get apart some time a particular time do some work and then go to office and go to college. So, all

those things are very well planned. So, they will follow a particular routine in their life. So, that such people are the judging characteristics the other one is the perceiving characteristic; they are comfortable moving into action without a plan and plan on the go they do not really care for a planning you give a task yes I will go now itself. So, they do not really worry about planning ahead and doing things.

So, plan on the go. So, as we do it we plan the things and then complete the task. So, that is the plan on the go type of people they like to multitask have variety mix work and play. So, they not to have verity they do not try to do the same task 2 three times. So, once you complete it next time; we will go to another task and they like to mix work and play they want to enjoy the life also its not only work. So, you mix work and play and then go ahead unlike the judging characteristics is very routine and very very much why had about his routine life and other things, but P is not at all worried about all those things naturally tolerant of time pressure work best close to the deadlines.

So, totally opposites; so this person cannot work on pressure, so he will try to do everything well ahead of the time line, but perceiving characteristics always try to do the things on the go they do not worry if there is pressure yes I will take tomorrow something I have to submit the assignment no problem I will do it tonight I will do not sleep tonight and I complete the work and submit. So, that is the kind of person he is instinctively avoid commitments which interfere with flexibility freedom and variety.

So, they will not commit anything we will not say I will do this tomorrow you will say if you ask me to do it tomorrow I will do it otherwise do not ask me to commit anything I will do it my own time I want is do not worry about that and because his flexibility will be interfere. So, he do not want to commit anything and he want to be have freedom because you want to have the work can play mix together. So, he want to do not make any commitments he will do in his own time unless you ask him for a date he will not give you any date. So, that is the kind of person P ok.

So, now we are complete all the 4 types now you will actually write down at the write this here; choose your 4 personality type letters. Now we will see what actually what is the significance of these personality type; you write down the letters here and keep it with you; I will take one example and then tell you; what are the; what is the significance of these characteristics; all of you wrote it; yes.

Student: (Refer Time: 31:10).

Please.

Student: (Refer Time: 31:12).

Yes, defiantly.

Student: (Refer Time: 31:14).

No, I think extravert and introvert cannot be. So, odd situation dependent because that is an inner self you cannot be an introvert or a I mean a extravert at the same time I mean same time in the sense a person will be having some quality he may be a 15 percent introvert or a 90-85 percent extravert that is possible. So, this 15 percent in some situation he will be keeping quite because of that particular situation.

So, but his main characteristics is still E only. So, suppose you say that one person is keep on changing from E to I or he has quite a 50-50 E and I they are very rare situations. So, most of the time you will be having a A natural; what you call tendency to be one side of the E or I?

Again if you go to the detail of this MBTI, we can see that there are stills more analysis to be done because again what is what will happen if his 15 percent I and a 85 percent E; how he actually behave. So, what are the characteristics for such person? So, that are some more analysis on this, but we will be not, we all not we are not going to that much detail. So, we will be looking at the top level; what kind of what is your type in this MBTI classification, right.

All of you wrote right. So, what is your type you not written.

Student: I N.

I N.

Student: T P.

Let me see whether I have an INTP; now how do we interpret this INTP. So, this is a; the INTP; I do not know whether I have it here.

(Refer Slide Time: 33:13)

### Summary of MBTI types

Manner in which a person interacts with others		
<b>E</b>	Focuses outwardly on others, gains energy from others. Interacts with an initiation	<b>I</b>
		Focuses inwardly, gains energy from ideas and concepts. Reactive interaction


Manner in which a person processes information		
<b>S</b>	Focus is on five senses and experience	<b>N</b>
		Focus is on possibilities, future use, big picture and ideas

Manner in which a person evaluates information		
<b>T</b>	Focus is on objective facts and causes & effects	<b>F</b>
		Focus is on subjective meaning and values

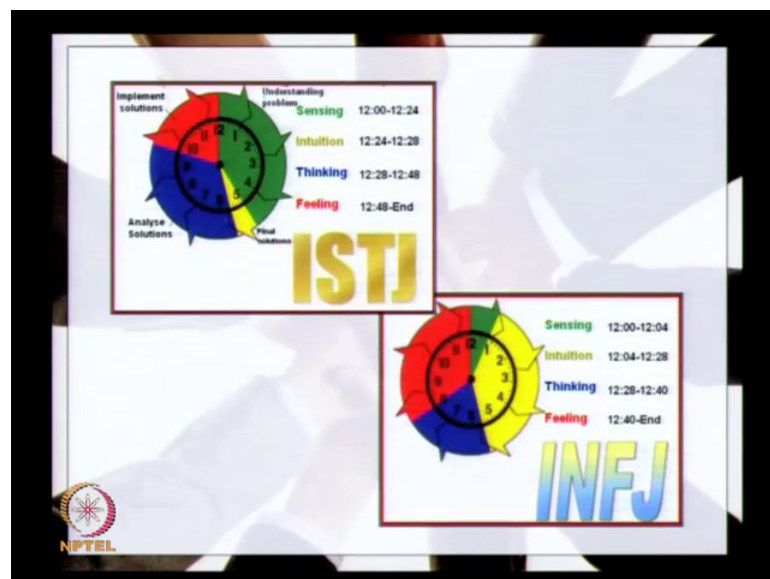
  

Manner in which a person comes to conclusions		
<b>J</b>	Focus is on timely, planned conclusions and decisions	<b>P</b>
		Focus is on adaptive process of decision making



This is a summary of MBTI types whichever already discuss.

(Refer Slide Time: 33:18)



It is INTP is not there, but do not worry I will explain this with this.

(Refer Slide Time: 33:26).

So, this is INTP characteristics the behavior of an INTP type person.

So, there actually the green one actually shows that it is the sensing characteristics. So, this person to understand the problem suppose you give a problem to this person we will take around 12 second for the time being total minutes relative value. So, we will take around 12 minutes to understand the problem ok.

So, and then once you understand the problem then he will take more time to get a solution to take around twenty minutes to get a solution. So, problem understanding and getting solution; it is not that different, but it is almost matching. So, 12 minutes and 20 minutes and then to analyze the solution, we will take much more time. So, the solution getting the solution is not one thing then keep on analyzing a solution and then finally, implementing at the last movement only. So, we will wait till the last movement to implement a solution or it will take more time to analyze the solution then implementing solution that is the INTP characteristic ok.

I will give that ISTJ here. So, this ISTJ is here. So, here this person will take a long time to understand the problem, he will note in understand the problem in the sense you give a problem he will think about that problem for a long time. So, in this case you can see it takes almost twenty five minutes understand the problem and once you understood the problem the solution comes very fast he takes a decision final solution at with a very shorts span. So, you do not need that much time to get a solution, but he takes long time to understand the problem because he will analyze the problem very well try to understand all the complications all the intricacies of the problem and then only he will got to their solution he will not jump into their solution before that.

And once we got the solution. So, it is getting solution is very fast for him, but again he will analyze the solution for a long time. So, just getting solution is not sufficient he will keep on analyzing the solution and then try to implement the solution. So, this is the way how he distributes the time for a particular task if you take it as 60 minutes, then we will see that most of the time he will be spending for analyzing the solution, and then we will go for getting the solution and then sorry most of the time for the understanding the problem then final solution is very fast then analyze solution and implement solution.

So, this is the characteristic of an ISTJ person similarly this INFJ also we can see here you can see that this person INFJ anybody; INFJ; 2 INFJ. So, this person basically is

give a problem no problem I understood the problem let me start working on the solution ok.

Now, then he will keep on working on the solution where a lot of time he will be keep on working for the solution to find a solution then he find a solution. So, it is not worried about details of the solution way I will try to find out the problem itself and then try to get the solution also. And then he will get a solution then he will try to analyze and we will take a long time to implement it because he is not sure of the solution or he is not sure of the problem also. So, he will take cannot know nothing against to you it is the quite natural for anybody.

So, this is he will take a long time to implement the solution because he did not understand the problem very well or he did not try to look at the problem in detail. So, that is why he takes a long time to understand or to implement the solution.

So, that is the type of people INFJ. So, like this for any characteristics you can pardon any questions. So, for like this we can actually see any characteristics I have many a here if you anybody wants I can just tell you if I have a paper share for that.

Student: ESTP.

ESTP; ESTP, let me see if I have it, I will tell you ESTP; yes, you are here; this is ESTP.

Student: (Refer Time: 37:38) same.

Almost like ISTJ right say in this case he takes a long time to understand the problem gets a solution very fast analyze the solution and then try to implement it; it is almost like an ISTJ; anyone else.

Student: Sir, EN (Refer Time: 37:57).

Please stand up one of you; then I will tell you.

Student: INTJ (Refer Time: 38:03).

INTJ; sorry, I do not have the INTJ with me here, I probably I ask somebody anybody ESTP; ES.

Student: ESFP (Refer Time: 38:18) ESFP.



Yes ESFP.

Student: Sir, ESFP.

ESFP you are not much.

Student: (Refer Time: 38:25).

Different.

Student: INFP (Refer Time: 38:28).

ISTP; no.

Student: ISFP (Refer Time: 38:40).

You are get confusing me ISTP; anybody ISTP.

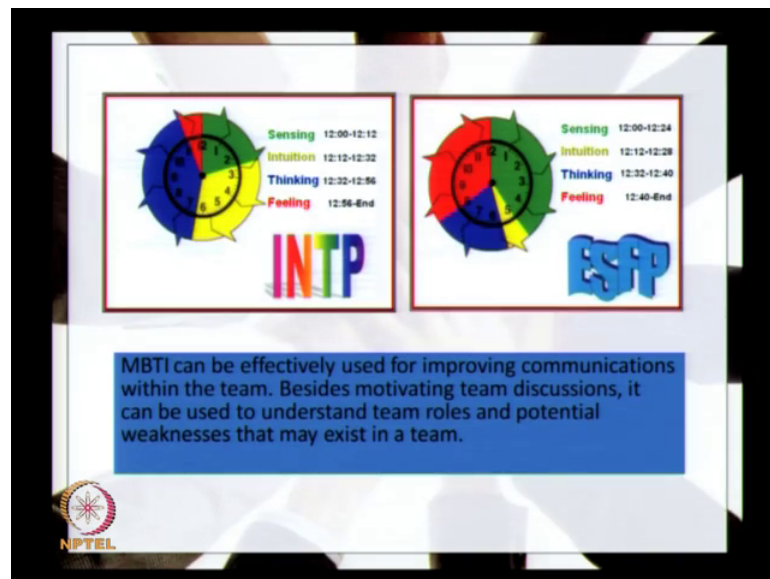
(Refer Slide Time: 38:52)



This is ISTP, fine. So, this is just to tell you how the people how people will behave different people. So, somebody will directly jump into a solution without really understanding the problem somebody will try to take a longtime to understand the problem then get a solution very fast. And then they try to implement somebody will analyzes a solution very fast and then implement it somebody will not implement it unless they analyze it completely and then last minute they implement it.

So, these are the ways in which we actually get the characteristics.

(Refer Slide Time: 39:23)

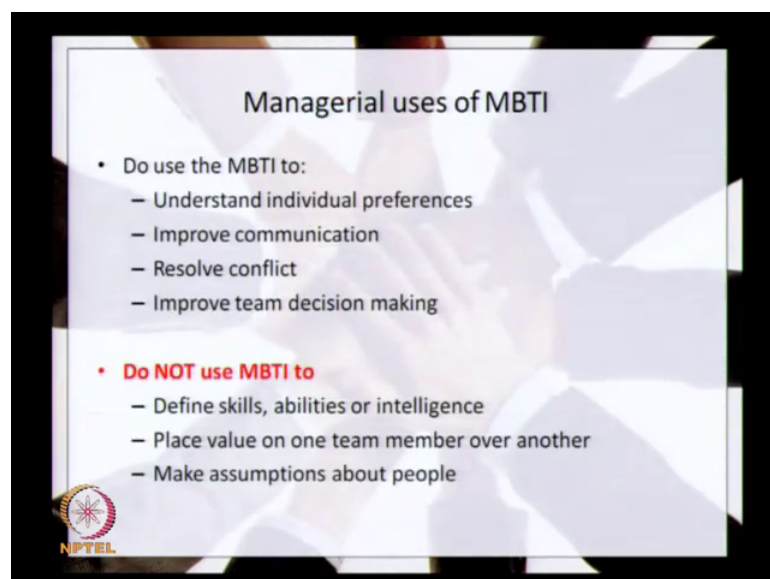


The slide displays two MBTI diagrams. The left diagram is for the INTP type, showing a circular scale with 'Sensing' (12:00-12:12), 'Intuition' (12:12-12:32), 'Thinking' (12:32-12:56), and 'Feeling' (12:56-End). The right diagram is for the ESFP type, showing a circular scale with 'Sensing' (12:00-12:24), 'Intuition' (12:12-12:36), 'Thinking' (12:32-12:40), and 'Feeling' (12:40-End). Below the diagrams is a blue text box stating: "MBTI can be effectively used for improving communications within the team. Besides motivating team discussions, it can be used to understand team roles and potential weaknesses that may exist in a team." The NPTEL logo is visible in the bottom left corner.

This is INTP and this is ESFP. So, these are the ways you actually get it, we can be effectively used for improving communication within the team besides motivating team discussions can be used to understand the team roles and potential weaknesses that may exist in a team ok.

So, of course, this can be used for many good applications it should not be used for any bad applications also.

(Refer Slide Time: 39:47)

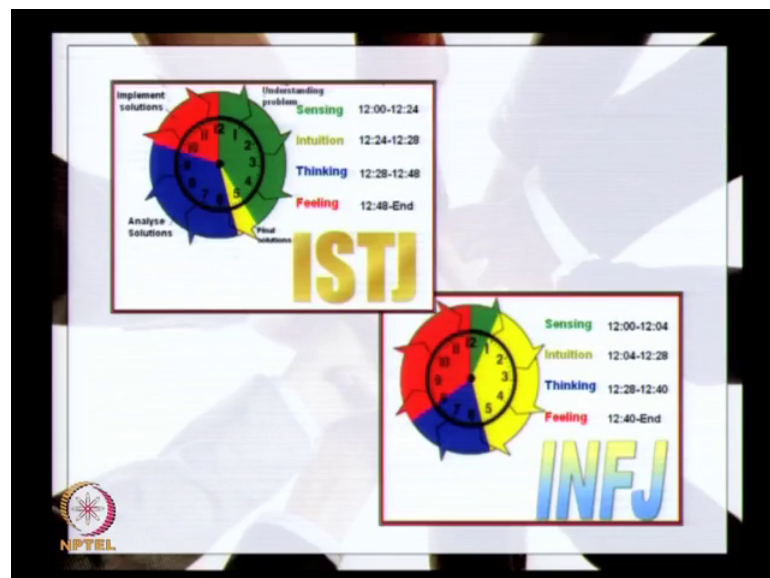


The slide is titled "Managerial uses of MBTI". It contains two main bullet points. The first is "Do use the MBTI to:" followed by four sub-bullets: "Understand individual preferences", "Improve communication", "Resolve conflict", and "Improve team decision making". The second is "Do NOT use MBTI to:" followed by three sub-bullets: "Define skills, abilities or intelligence", "Place value on one team member over another", and "Make assumptions about people". The NPTEL logo is visible in the bottom left corner.

So, we can see that managerial uses of MBTI do use the MBTI to understand individual preferences improve communication resolve conflict and improve team decision making, but it should not be used to define skills abilities or intelligence it is nothing to do with the intelligence or abilities of a person it is only the way people behave. So, that is a totally different. So, no individual behave in the same way. So, we will try to identify that behavior pattern only not the skills or abilities here.

Place value on one team member over another just because I am ISTJ I am not better than ISFP or INFP. So, the there is no value on place value just because of team member and make assumption about people. So, do not make any assumptions about people based on the MBTI classification and just for your information this is me ok.

(Refer Slide Time: 40:36)

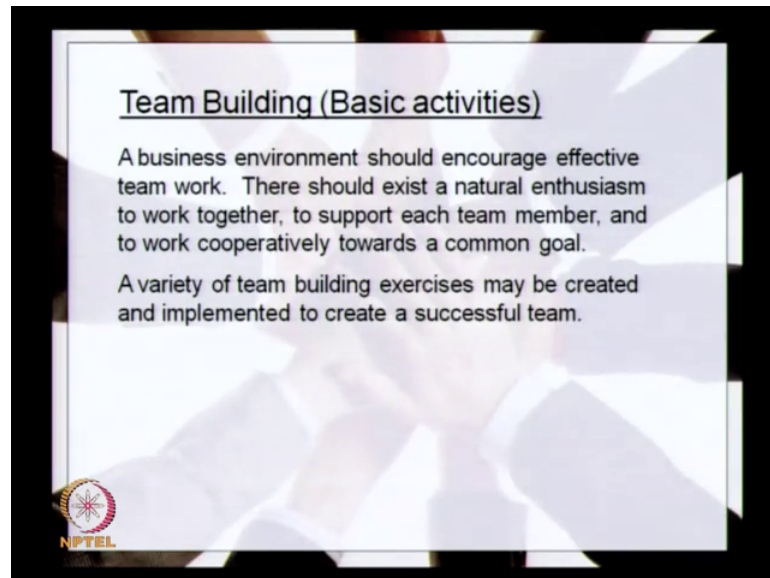


ISTJ any ISTJs here oh good, see once you identify this for the member characteristics we form the team and then there is a MBTI helps us to understand type of person and what is the way he behaves that is just for your understanding of the team structure only or to select the people right people for right jobs.

So, once we identify the people and select the people the next task is to basically form the team. So, how do we develop a team or how do we ensure that the team you has got good cohesion they understand each other and for that we do the task of team building. So, we need to build teams based on; for a particular task. So, we already identified the people. So, that is not sufficient we need to have some task or some kind of activities

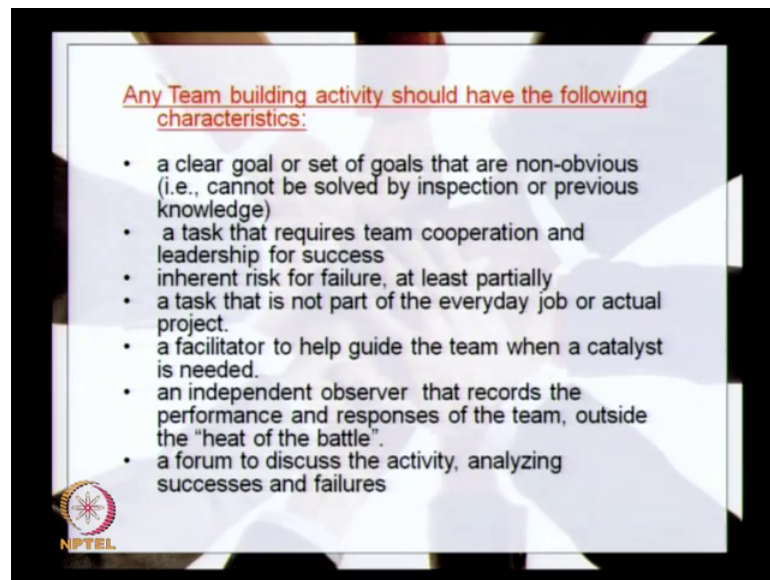
which help us to understand the team members and work together with the team members before we really jump into the real design problem.

(Refer Slide Time: 41:40)



So, as we can see a variety of team building exercise may be created and implemented to create a successful team. So, when we want to create a successful team. So, first we select the people right people try to identify their characteristics. So, that we can give different roles to them and once we have the team formation in place that the next task is team building. So, we need to identify fewer activities which will help us to form a good team or build a good team and these are known as team building activities ok.

(Refer Slide Time: 42:10)



So, any team building activity should have the characteristics. So, we have we know that team building activities something to ensure that we un we take this opportunity or this particular activity to make sure that everyone understand each other there is a good relationship between the team members they can work together they understand there if there any conflicts or anything is there we can understand it the initial stage itself and try to sold them before we really get into the real project product development.

So, any team building activity should have some characteristics like a clear goal or set of goals that are non-obvious that cannot be sold by inspection or previous knowledge. So, we will take an activity which is not very obvious we have a goal which is not very obvious. So, we will take the advantage is not something that what we do in an normal situation or in an normal routine.

So, we will try to take some activities with a clear goal or set of goals that are non-obvious, then a task that requires team cooperation and leadership for success. So, the activity what we are choosing require some kind of team cooperation and a leadership who succeed otherwise that activity will be not having any influence on the team development, then inherent risk for failure at least partially. So, if there is a chance of failure people will try to act in a better way. So, that there should be some risk of failure if there is no risk of failure everyone will take it lightly.

So, any team building activity should have some kind of a risk inherent risk for failure then a task that is not part of the everyday job or actual project. So, it should be a different one and a facilitator to help guide the team when a catalyst is needed and there should be a facilitator who will actually look at the team performance how they are doing in and then try to act as a catalyst who will help to guide the team for improving their performance.

And an independent observer that records the performance and responses of the team outside the heat of the battle and there will be an independent observer who will look at the team the performance of the team members and then he will call the things who is behaving in what way who helps the others who actually tries to do the sold the problem over who acts as a conciliator or who try to create problems in the teams all those things will be recorded by a independent observer.

So, this thing actually helps to identify the behavior of team members and then finally, a forum to discuss the activity analyzing successes and failures. So, we will do after the team building activities completed we will have a an open discussion with members try to see what went wrong what was the positive aspects of the activity; what are the points where we you to focus what are the weaknesses in the team and how do we improve on this weaknesses those things will be analyzed here ok.

So, what we need to do is to do few activities here team building activity. So, I have 2 activities for you the first one is I do not want to give the name of the activity now. So, since we do not have the time today to do this we will do the activities tomorrow. So, come prepared it I will ask few volunteers to come over here and then do some activities, and then we will have some observers and I will give chance to others also to participate, and we will see how to do a how to do team building activity how to become an observer how do we record the behavior of the team members.

So, we will do these activities in tomorrow's class and then we will look at the planning aspect also as the project and the class tomorrow, ok.

Thank you very much.