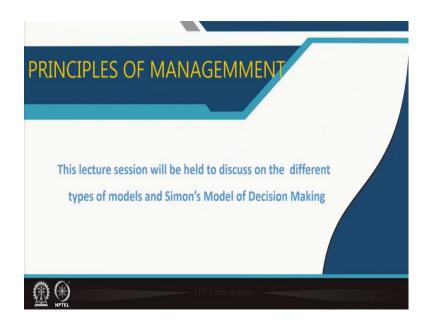
Principles of Management Prof. S Srinivasan Vinod Gupta School of Management Indian Institute of Technology, Kharagpur

Module – 03 Lecture - 12 Different Models of Decision Making-

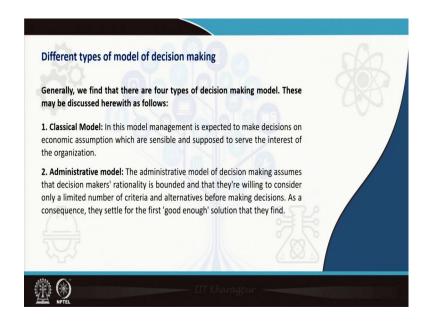
Welcome to lecture 2 of module 3. In the module 3 lecture-1, we discussed about the decision making definition, concepts and the process of decision making. Today, we are going to discuss about Models of Decision Making ok.

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So, we are going to see multiple models and we are going to spend time on you know understanding more on the Simon's model of decision making which is most important decision making model which is been widely appreciated and used by the companies ok.

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So, there are four types of decision making generally. So, one is you know classical model. In this model management is expected to make decision on economic assumptions which are sensible and supposed to serve the interest of the organization.

So, classical model which always talks about you know how we it is only on the economical assumptions know where it is you know I want to focus on the product or profitability perspective where it is on the economic assumptions management will make which are very sensible and suppose to serve the interest of the organization. Now, interest of the organization is nothing but where whatever the you know goals or the profit orientations, the classical model talks about you know that perspective.

Then administrative model, so the administrative model of decision making assumes that you know decision makers rationality is bounded right. So, how what do you we say you know bounded rationality?

It is nothing but you know see every human is having some ability or some you know limitations in terms of the ability to understand the problem itself you know because you know every human you know when the moment we are talking about human beings human being has certain limitation and understanding or even formulating the problems, or sometimes even to access the information or at least to store the informations or access to these you know wide width of informations, so that you know when you are making rational decision. So, rational decision when we are talking about rational decisions rational decisions should consider all possible informations all possible ways to you know address these problems, but whereas, you know every time when we are talking about the humans being taking a decision there is always a bounder rationality, because as a human there will be a limitation on their ability to collect the information even to formulate the problems.

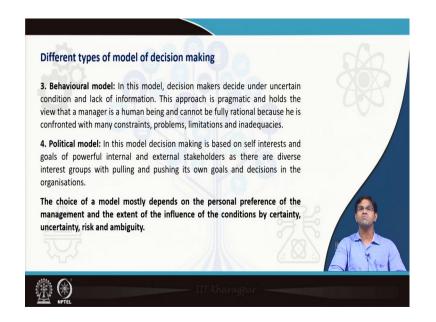
So, you know what will happen in the administrative choice model where they will you know because of that limitations, they will only make a you know very limited number of criterias or the alternate solutions. And then what are they do you know they go for a satisfying decisions in meaning that you know they will settle for a good enough solution that they find.

So, meaning that you know I you know as with my limitations I you know if I extent to a possible I can go for four choices, whereas you know with my limitation I making two choices. Then what will happen out of the two, two choice, I will make the one best choice which actually serves my purpose as an individual right, it serves my purpose, then it is a satisfying kind of a decision individual make.

You know administrative model it is actually talking about the bounder rationality, the you know limitation the ability of human being in you know formulating the problem or collecting the informations and processing the informations to go for the alternate course of actions.

Where in this situation what will happen they will only make a limited number of choices. On this limited number of choices, they will choose the best possible one which actually suits their purpose. So, they go for a satisfying perspective there that is the discussed in the administrative model.

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Then try to understand the behavioural model, which is one of the most pragmatic model because it holds the view that a manager is a human being and cannot be fully rational. As we are also know it is actually you know complementing the administrative choice model also.

And you know human cannot be fully rational because he is confronted with many constrains, there is always a problem, there can be limitation, there can be negative questions, because every human being has got their own limitation, challenges or the way they think, the perspective, the cognitive ability, there are multiple things are associated with the behavioural perspective, attitude in a perspective there.

And we are talking about human being involved in the behavioural perspective, there can be always a limitation and challenges associated with the individual dispositional thinking, cognitive thinking, cognitive abilities and all that, so that is actually saying you know that is actually saying you know it you know human cannot be fully rational in their approach towards the so addressing the problem or solving the problem.

So, behavioural model which is the one of the most pragmatic approach because it you know actually accepts or even you know says that yes human will have certain limitations and they will have some in adequacies in the processing of the informations that will actually drive the way they will address or approach to the problem.

Then political model. So, in this political model of decision making which is based on a self interest or the goals of powerful internal or external stakeholders. So, the in the political model what happened decision are most of the time driven by the people who are very powerful, may be it can be internal to the organisation, may be for example, you know stakeholders, share holders, who are a investors if they are very powerful.

Let us talk about a situation where you know one particular individual holds 30 percent of the share of a company, then he or she becomes a very powerful in driving the decision or influencing the decision made by the company.

So, external stakeholders for example, let say government is an external stakeholder, let say you know government says with the recent you know modification in the government environmental policies, if government says limit certain activities then that will influence the decisions of the organisation right.

Now, for example, when the organisation you know government says you cannot emit beyond this you know carbon emissions, then what will happen you know organisation has to bound to accept and follow the rules, then they will have to rearrange the way they have to make the decisions and the policies they frame the activities they do in the company, so that is actually influencing the decision making.

So, it is again based on the self interest and the you know goals of the powerful internal and external stakeholders as they diverse interest groups with pulling and pushing its own goals and decision in the organisations ok.

The choice of model we are talked about you know four different models right, classical model, administrative model, behavioural model and political model. Now, how one will choose out of these four model? Generally, you know choice of the model mostly depends on the personal preference of the management and the extent of the influence of conditions by you know certainty, uncertainty risk and ambiguity.

We talked about you know these conditions influencing the decision making in the lecture 1 on the module 3, we talked about these factors which is actually influencing the decision making.

So, the choice of the model again depends on this condition which is influencing my decision you know it is it in a very certain, if it is a very stable outcome, I know what is going to happen, then kind of a behavioural model I choose is different based on the situations.

If there are lot of uncertainty which kind of model I go; and there is a risk or ambiguity then it will tell you know for example, there is lot of risk or ambiguity you know uncertainty then people might go for administrative model of choice where I you know I do not know what is the future course of actions, what will be the future for my business.

So, I will rather make two, three alternatives, and then I will choose the one best possible solution which I will really reserves my purpose, then I choose that particular model ok.

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Different types of model of decision making	don .
Bhattacharyya, D.K. has identified two more model of decision making. Such as- rational decision making model of individual and non rational decision making model of individual.	
 These may be discussed in brief as follows- Rational decision making models of individual: In this model of decision making there are certain steps and the decision maker, at every step, needs to apply their own perceived ideas to ensure that the plan is flawless. 	
It includes- - Analysis of the opportunity, establishing objectives, determining planning premises, identification of alternatives, evaluation, selection, implementation and review.	ŝ
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So, we will try and see the other you know types of models also. There are different types of model, you know Bhattacharyya has defined two more model of decision making which he says you know rational decision making model of individual, and non rational decision making model of individuals; so rational and non rational decision making.

Now, in the rational decision making model of individuals, how this is actually working. So, let us try to understand it. In this model of you know decision making there are certain steps the decision maker will take ok. At every step he needs to apply their own perceived ideas to ensure that the plan is flawless ok.

So, now, let us try to understand what are the process of this rational decision making. So, first is you know analysing the opportunity. As we discussed in the earlier lecture also, so here analysing the opportunity becomes the first step, meanings that you are analysing the opportunity or identifying the problem.

Then, then establishing the objectives. So, when you know even before establishing the objective, there is one important process will happen is you know identifying the decision criteria. So, let me give one example let say you know analysing the opportunity or identifying the problem.

Let say you know as a company I wanted to buy a car for my company purpose ok. Now, the what is my problem? I need to buy a car. Now, I need to identify the decision criteria. What are the decision criteria I can see? See one is price of the car, then I can see the you know mileage the car might provide ok, then fleet size, and you know many other factors we will come up that will become a decision criteria ok.

On this decision criteria, what will happen the company will give weightage on these multiple decision criteria we will talked about. For example, let say you know I am buying a car for a regular use, and I also worried as a company I also worried about the fuel efficiency because I do not want to spend more money on the fuel or mileage right. So, to (Refer Time: 09:12) the mileage.

So, then what will happen in that particular situations, out of this decisional criteria price or mileage, so in this situation though company is ready to pay more money to buy a car which capable you know better mileage.

So, what will happen in this situation, the weightage will be given more on the fuel or the fuel efficiency or a mileage capacity, then though this decision criteria weightage will be more for this particular criteria. Then based on that you will establish the objective which car you are going to buy.

Then determining the planning premises. As we said you know what are the decision, what are the premises which is going to impact my planning that is called the planning

premises factors which is going to affect the planning so that is the planning premises. You know are these scope under which are let say you know what are the assumptions under which you are going to make the planning, so that is the planning premises then that is also important one.

Then identifying the alternatives. Now, let us go back to the same example of buying a car then I am coming with a alternative let say you know I found a car from one similar car from Tata, and another from you know Hyundai, another from Honda, another from you know let say another you know brand.

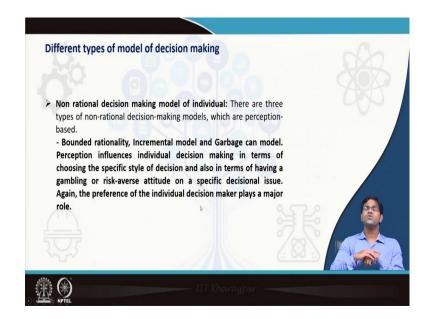
So, I have four choices you know I identifying the alternatives. Now, on this alternatives what will happen I need to do ok, keeping this you know Maruti Group, Maruti, Hyundai, Tata, Honda ok, Mahindra let keep all these five you know brands are having a car.

Now, I made a decision criteria, now I need to provide based on the weightage, I need to see ok. On these five brands which one is yeah, this I will put the weightage, then I am actually out of these alternatives I am evaluating based on my criteria which I expect right, so because I have the criteria to make a decisions. Now then I am evaluating out of these five model based on which I am going to estimate which one will be very and much you know well I am going to align with my needs.

Because you know I identified I need to buy a car which is a fuel efficient one. Out of these five brands I am going to evaluate, then I will select based on the evaluation I did, I will choose one of the these cars from the five brands. Then what will happen ok. After these choice, then I will implement meaning that I will go place an order, or I will go book a car for my company.

Then I will review that you know ok, so this is how the rational decision making happens you know meaning that you know you will I try to identify the problem, you know may you will have to collect the information to identify and decision criteria, provide weightage for the decision criteria, then determine the planning premises, identifying the alternatives and meaning you know collect five different models and under which you know we are going to ranking and evaluate and select one. This is a rational decision making model ok.

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So, now, we will also understand the non rational decision making model of individuals there are three types of you know non rational decision making models which are bounded rationality as I said in the very first in the beginning of this session.

So, as an individual there is a you know I will have a limitation and the ability to collect the information or process the informations, or trying to understand or even the framing the problem itself also. There can be some limitations on the ability to framing the problem or getting the information or processing the information, there is always a bounded rationality.

And then incremental model. So, incremental model is very similar to the administrative model of choice, where you know you will have to make a simple choices, and you do know whichever serves your purpose your fine.

And there is one another called garbage can model which is very interesting. So, garbage can model what is actually happening is you know people generally work other way around meaning that you know instead of you know you start from a problem progressing towards a solutions, you either you start with the solutions and you know you talk about a solution.

The moment you are other way around working mean around means you will have a solution which actually you know the solution which is not even you know related to any problem or you will talk about a solution where the problem do not even exist right.

You know they put everything on the bin, same bin, like you know there is a problem, solutions, they mixer around, there they do not have a systematic way of you know identifying what is the problem, what is the solutions, rather you know since they have a solution they will propose that you know this is the solution it can be use for this kind of a problem where the problem may not even exist. Because they say you know I have a solutions, you say this solution can be used for this particular problem, so that is the garbage can model.

So, the perception influences individual decision making in terms of choosing a specific style of decisions, also in terms of having a gambling or risk averse attitude on a specific decisional issues.

See you know there are you know time when we are talking about decisions because as I said you know in decisions though driven by the informations and the systematic process, but finally, you know individual is the one who is engaged in a decision making there is always a possibility of a certain cognitive biases right.

So, what will happen you know escalation of commitment because you know I have spent a lot of time in you know understanding these or let say you know I have conducted you know I let say you know I wanted to buy a particular product. Let say I want to buy a car, so I went and visited this particular showroom many a times, I interacted with the manager. So, I you know spent lot of time though this buying decision is not very fruitful, since I made lot of effort and I wanted to buy that. So, that is an escalation of commitment.

Some time you know cost you know I invested so much in one particular, then I will make a decision to buy that car ok. So, sometimes you know what will happen you know we will make a representative analysis you know based only on a small you know sample of things we will think you know ok, this is going to be for everybody also you know.

Let say you know few we have discussed with a few set of a people, and then assume that whatever the information provided by the few people is the true, it is going to serve the purpose, then we make a decision.

Or let say you know we have only seen you know one or two product, but based on their one or two product we have closing a deal with one particular company for serving a multiple products then that is also you know representatives you know where they we may make a biasness in the decisions making.

So, as an individual who is engaged in decision making there can be potentially you know bias will influence. So, it is also important then as an organisation we need to work on how do we address or control these biases in your decision making.

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Simon's model of decision making	
Herbert Simon has significantly contributed to bet decision making process which is related to contribution has been emerged as Simon's Model of shown that human beings go through three essen solving problems.	behavioural model. His i Decision Making. He has
He called these as the Intelligence, Design and Choic be considered as the types of problem solving.	ce stages. These can also,
The stage wise decision making model is	Intelligence
shown in the reverse triangular aside for having an ideas at a glance .	Design
	Choice
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Now, we are moving to the important part of our lecture which we are going to discuss about the Simon's model of decision making. Simon's model of decision making is falls on the behavioural model of decision making as we discussed in the you know beginning of this lecture.

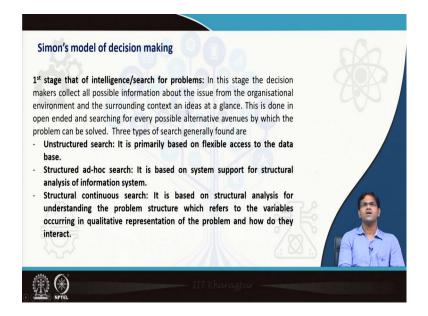
You know as we said you know classical model, administrative model and behavioural model, Simon's model belongs to the third model which is a behavioural model ok. How about Simon has significantly contributed to better understanding of the decision making

process and which is related to a behavioural model as I said the Simon's model related to a behavioural model.

His contribution has been emerged as Simon's model of decision making has shown that human being go through three essential stages in act of solving a problem. So, every human being when they make a decisions, they go through these three you know stages of the three stages in the decision making or solving the problem.

So, he called another three stages which he said intelligence, design and choice stages. So, now you can see on the inverted triangle, you can see that you know it start with the intelligence, design and choice. So, we will try to see one by one now ok.

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Let us start with the first stage intelligence or this is also otherwise called as a search for problems which is nothing but you know you are cognisance of the problem or you are trying to you know understand the existence of the problem, then the causes of the problem.

You know in this stage you know makers collect all possible informations about the issue from the organisation environment and the other surrounding contacts, it is kind of a you know very similar to doing you know environmental scanning, internal and external environmental scanning, you are collecting all possible information, processing

the informations this is done in an open ended and searching for every possible alternate avenues by which the problem can be solved.

So, you are not restricting only to certain sections of the you know data collections where you are keeping it wide, you wanted to collect a information from all possible way even you can take it as a 360 degree collection of data informations, so that you know you are trying to understand the problem framing the problem trying to understand the causes of the problem ok.

There are three types, they do this searches you know its intelligence phase you are actually you know collecting and making more awareness about the problem. So, that you know whatever the choice you are going to make which will be very very relevant and which will actually address the problem rather than you know we always say right you know phrases like you know roaming around the bush, running around the bush. So, you know this will not happen when you are actually having the sufficient information at hand.

The Simon's model which says you know every individual and they making a decision they have to start with the collecting the informations from all possible ways and in all possible prospective, so that you know you have sufficient information. Now, in this searches of you know information there are you know multiple ways you know three step types of search they do.

One is unstructured search which is primarily based on a flexible access let us say you know there is no structure you do, but you will try to collect information as much as possible. There is no structured or systematic way of collecting information.

Then structured the adhoc search you know which is not very systematic in nature, but there is yes there is certain amount of systematic in nature which is engaged in an analysis of the information ok. Then structural continuous search, you know you are systematically doing and then there is it is also continuous activities.

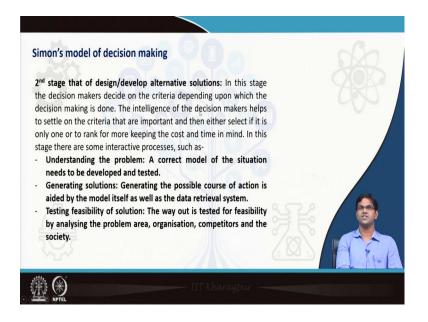
Based on a structural analyses for understanding the problem structure which refers to variables occurring in qualitative representation of the problem how do they interact you know it is systematic.

But under continuous process you know let say you know you need to start from the sequence of 1, 2, 3, then how these 1, 2, 3 is interacting is these 1, 2, 3 interacting with the A, B, C, what is its interactions, you go start from the you know systematic way of collecting and then you also continuously collect informations. You would not stop at one stage you try to connect the information continuously, so that you know you are able to predict in a better way.

So, it is way for example, if you now relate this with a machine learning approaches it actually you collect all possible data informations, you are actually training a system to predict the future right, so machine learning approach.

You relate you know this Simon's model works with the machine learning also, where you know it actually you know collect all information feed, so that you know when you are able to make a system that can predict a model, then you know you should it should have a all possible information. So, that you know it will actually able to efficiently work.

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Then second stage. So, moving from the first stage which is an intelligence phase and it is also otherwise search you know searches for the problem, then second stage is a design. Design phase is nothing but is it is also otherwise called as develop alternate solutions. In this stage the decision makers decide on the criteria depending upon which the decision making is done. Now, we go back to the rational model in one thing which I said as an example you know you need to make a decision making criterias. So, what are the criterias under which you wanted to make a decision?

The same example buying a car, what are the parameters you need to consider when you are buying a car is. Its price or fuel efficiency, or the durability of the car, the design of the car, the model of the car, sometimes you know sporty car or the by the look wise, it can be multiple parameters you can tell, then that become a decision criteria.

Let say you know take two people who wanted to buy a car. One is you know a person who is going to get retired, he or she wants to buy a car. Another person is a you know college going student wants to buy a car.

Now, look at the decision criteria and all. For the person A, the decisional criteria may be different it can be like you know may be very comfortable, more leg room because he is a old person want to have more leg room, and space between the seats that is called we called legroom, then we say now fuel efficiency definitely, price can be a potentially one of the important parameter these are all of the decision criteria for person A.

For now for the person B is a college going student. What will be the decision making criteria, sporty vehicle and the you know efficiency or the you know rpm rate on the outlook of the car, the maximum speed it can go, these are all become the decision criteria for the person B to buy a car ok. Now, making the decision criteria upon the decision criteria, then intelligence decision makers helps to settle the criteria that are important.

Then either select if it is only one or rank more keeping as I said you know based on these two people, then this you have multiple criterias, then these criteria you will try to place the criteria rank the rank in order which one is important for you, which one is important for you second, then based on this ranking what will happen you will associate certain weightage.

For example person A, who is a person who is going to get retire wanted to buy a car, so you will say you know price congestion, you will say 0.7 is a weightage I give for a price.

Then 0.6 is the give for a mileage. Whereas, a person B which is a college going student want to buy a car, so the sporty appearance can be 0.8, I give lot of weightage this person will give lot of weightage on this sportiness, and the you know rpm rate or the you know efficiency of the car.

So, that will give lot of weightage you know the criteria decision making is done. Then based on the ranking and the weightage you are given then you collectively make alternative choices then you make a best alternate solutions.

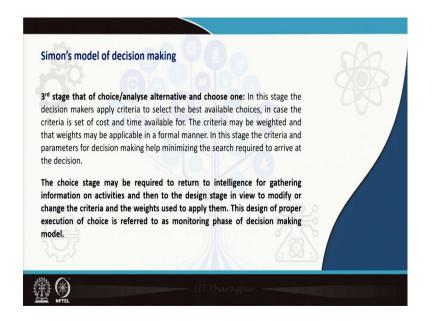
Now, in this process also you know there are some stages involved you know some interactive process, understanding the problem that is very important. First is you know a correct model of the situation needs to be developed and tested. So, further you need to understand what are the problem or what are the opportunity that we are going to decision take decision.

Then generating solutions, so that is the second one. Now generating the possible course of action is aided by the model itself as well as the data retrieval system. So, once you are able to understand what kind of a problem, then you need to understand generate solutions, what are the possible solutions you are going to make to address the particular product.

Then testing the feasibility of the solutions. Now, you need to test. Yes, I have made you know my model has generated five possible solutions to address this particular problem. Now, I need to see whether this five possible solutions are feasible or not. How, even if it is feasible which is going to be superior which is going to be not that superior to the other model we are talking about alternatively superiority.

So, then you test the feasibility of the solutions you try to see ok, which one will be a better one to address this particular problem, which one will be the second one to address the problem, based on the feasibility, then you need to choose the best alternative course of action.

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Now, we are going to the third stage which is the choice or analysing the alternate solutions we made, choosing the best one to address our defined problem that is the stage 3 ok. So, in this stage, the decision maker apply criteria to select the best available choices. So, I have listed down the criterias, I have weight the criterias, now I also made the alternate choices.

Now, interacting this decision criteria with respect to the alternate choices, then based on that I will have to choose one. So, based on the weight I will put the weightage calculate, and then say list come up with the ranking 1, 2, 3, 4, 5, then I say ok, one becomes the top choice considering the weights I have given to my decision criterias.

So, for example, fuel efficiency you know price or the look of the car, the colour of the car, the brand of the car, the durability of the car can be anything. So, there are lot of decision criterias are given, they have given an associated weights to these criterias. Then collectively I have made a calculation to see which one seems to be the first.

Out of these five brands, I talked about now which brand is going to meet my all my criterias; and then out of these I will choose the one best choice which actually addresses my problem or the opportunity where here the problem I have explained is that of buying a car.

So, based on this criteria or based on the you know weightage I have given calculation I made, I will be able to arrive at the solution of deciding which car to buy right. So, this stage is nothing but the choice stage is an important where you will see all the alternative solution and choose one which actually meets your needs or address your criteria. This choice stage may be required to know may be required to return to intelligence for gathering information on activities.

So, in this search choice stage there is always an interactivity between the other stages also. For example, let say you know you we all collected informations as I said you know its a systematically and a continuous process you continued to keep collect the informations.

Now, you then you moved on to you know design phase, you may you know you model about what are the alternate you know decisions to be made for the particular problem.

Then you went to the last stage of choice, but even this choice stage there is always a likely nature where you will go back to the intelligence phase to draw some more information in order to you know ensure that you know your model is very efficient in making a right decision for to address the problem, because you know you do not just you know independently you know work, but if there is always a network of these phases.

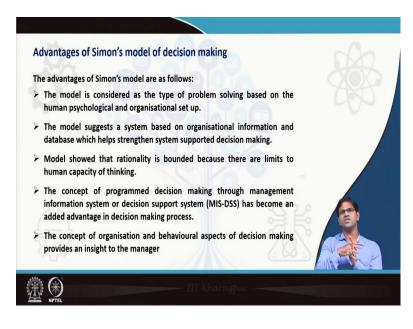
So, you will go back to the intelligence phase, draw some more additional informations. Because you know the additional information will actually you know suffice the better decision making, you know it will actually add more value for my decision making criteria, it will add more information; and the more the informations better the decisions.

Right for example, Bayes theorem, if you apply the Bayes theorem you know a priory informations given the information is provided, I will be able to predict a better probability. Similarly, where the as increasing the more informations, you will be able to come up with the better decision choices ok.

This decision of proper exhibition of choices referred to as a monitoring phase of decision making model. So, you know if you collaborate with the other model, this is also in line with the other model, but it is make contains into only a three phases which is easiest to understand rather than going for you know 6 or 7 phases of decision making.

Here the three phases which actually comprehensively brings down all 6 or 7 model which have been discussed by Ashwathappa or Benny words in the lecture 1, where here it is making it is very simple way three-phases when you start with intelligence phase, then the design phase and the choice phase ok.

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So, and now let us also see the advantages of Simon's model of decision making. The major advantages you know this model is considered as the you know type of problem solving based on the human psychological and organisational set up. You know it is very relevant in considering the human nature in a behavioural model in perspective.

The model suggests the system based on organisational information and database which helps strengthen the system support a decision making. It is very simple because you know this model says with you know you make decision based on the information provided to you, the information supplied to you, because actually it support see you know system driven or information driven decision making.

The model showed that a rationality is bounded because there are limits to human capacity. As you know its again you know as we said you know behavioural model always says that you know there is a boundedness in the rationality of the human being, because human beings have defiantly have certain limitations in thinking or cognitive ability.

So, this a method is also this model is also supports that you know argument saying that yes individual as an human being you will have a cognitive ability, but there is a limitation you know cognitive ability to address the problem.

Then this is also concept of program decision making through you know management information system or decision support system has become an added advantages in decision making process.

Since we said you know there is a systematic way of collecting informations, you have as I said you know there is always a network you go back to the you know intelligence phase even in your choice phase, you go back and retrieve some more additional information to make a better decision.

So, you know it is this is always driven by the decision support system or management information system it is an interconnection when they making decision making. And this also concepts of organisation and behavioural aspect of decision making provides an insight to a manager. You know it is also talks about you know how as an individual you make a choice, but how you will make an informed decision [vocalised noise] collecting the all possible information possible to make a decision ok.

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So, these are the references. And today we discussed about the models of decision making. And you know and most importantly we discussed about Simon's model of

decision making; it talks about three stages which is you know intelligence, design and choice stage.

Thank you.