Unit 4
DECISION ANALYSIS

Lesson 32

Managerial
Decision
Making

Learning Objective :

In this unit, you will gain insights on making better decisions within group or department settings in the more network-oriented organizational structures typical of the New Economy.

- Acquire a variety of strategies for framing problems, and learn when to apply them.
- Learn to accurately assess the degree of uncertainty in individual problems.
- Recognize when you have enough information, the right information, or when you need to do more research.
- Structure more complex challenges to ensure you are addressing the right issues.
- Involve the proper people at the right time in the right way.
- Create environments that foster feedback and learning.

Introduction

So Let us first describe what is called as **Decision Analysis**:

> Making decisions in an atmosphere of increasing time pressure, uncertainty, and conflicting expert opinions creates challenges for any manager. Making such leadership decisions in crisis situations is even more demanding.

I think that you all agree with me on this statement.

> To a great extent, the success or failure that you (or any individual) experience even in day-to-day life depends on the decisions made by you. Decision making in today's environment and especially in business is far more complex than earlier and the cost of making errors is too high. Thus to make a right decision a systematic approach is necessary.

Decision analysis provides an analytic and systematic approach to decision making.

Now you must be thinking how to implement this analysis?

This require a study of decision models.

Before embarking on our study of decision modeling (or system-analytic approaches to decision making), it would be good to catch a glimpse of the basic approach used by managers to make important (non routine) decisions. Let's begin with a widely accepted definition for the term *decision*:

Decision - the act or process of choosing one course of action from among several alternatives

This is literally a descriptive definition of the process of making a choice. In order to conduct the process rationally (i.e., coherently), professional managers tend to follow these **steps**:

1. Define the problem

   This refers to the process of correctly identifying and making explicit the fundamental problem or opportunity (as opposed to apparent symptoms) faced by the decision maker. Defining the problem allows the decision maker to pose the all-important question: What must be done to solve this particular problem? Thus, problem definition focuses attention on possible action alternatives that in principle should lead to the attainment of concrete objectives.

2. Gather information

   Information gathering aims to ascertain relevant facts related to the decision problem. This usually reduces to a search problem. Typical sources of information are published articles and reports, internal company records, market surveys and intelligence, personal views and opinions of various stakeholders culled by interviews and questionnaires or even informal conversations, professional consultations, and direct observation by the decision maker of actual problem-related processes within or outside the organization.

3. Identify action alternatives

Creativity is called upon in this phase of the overall decision process. As the decision maker gathers information, s/he begins crystallizing possible solution alternatives. Classical decision making draws heavily on subjective aspects such as intuition, experience and judgment in order to produce sound action alternatives. More formal methods may also be invoked, such as brainstorming, focus groups and quality circles. The emphasis at this point should be on generating alternatives, not criticizing them.

4. Evaluate the alternatives

The decision maker compares the pros and cons inherent to each action alternative. Costs and benefits are estimated and their impact on organizational objectives is assessed. Weak alternatives are winnowed out and a minimal set of preferred choices is determined, often consisting of two final contenders.

5. Select the best alternative

This is the classic decision-making point. The decision maker ought to be clear on which alternative offers the best course of action. Consequently, making use of the best personal judgement, the decision is made.

6. Implement the chosen alternative

The decision maker sets in motion a course of action that involves the customary managerial tasks: planning, organizing, leading and controlling. It is at this point that the functional business specialties come into play: production/operations, marketing, finance, accounting and, to the required extent, human resource management.

Now I would like you to see the distinction between **different types of decisions** made in an organization.

Basically there are two types of decisions

- Programmed or Structured decisions.
- Non-Programmed or Unstructured decisions.

Now,
Let us see what is a **programmed or structured decision.**

Programmed decision is the one which is well defined. In this you as the decision maker, are aware of the extent of the decision and has a clear set of options to make your choice.

All this require a decision rule with which you can choose the ideal alternative at your disposal.

Let me state this with an example…

> A manager has to choose a new packaging machine from a choice of two models. Suppose the two models are similar to a certain existing machine and are known to be reliable. The manager here want to choose the machine that offers the most attractive post-tax discounted return for a period of five year.

Now, what do you think that the manager need to do first?

At first he should collect the details of each machine such as price and operating costs.

He may collect these details using certain formula approved by the organization for capital expenditure proposals.

Using these details in a systematic manner he will come to a decision for the model of machine he should order.

Now coming to the second type of decision.

Non-Programmed or unstructured

When decisions are unique and not routined, they can be classified as non-programmed or unstructured. The example of this type of model, I want to take up later in the section “Decision making under uncertainity”.

Let us discuss now,

Some of the rationale behind how people seek and interpret information, and actually make decisions.

Image Theory - This theory has three parts (images). The value image consists of the decision maker's principles; what's right or wrong, any organizational rules or principles that must be followed, etc. The second image is the trajectory image, the goals that the decision maker wants to achieve. The third image is the strategic image, which are the plans adopted to achieve the goals, including making decisions, evaluating, and modifying approaches based on results. Decisions can be made by screening out candidates because they don't pass a minimum level, or by doing some sort of combined comparison to rank the candidates in preference order.

Recognition Primed Decision Making (RPD) - This model describes how experts make decisions under stressful situations, perhaps due to time pressure or rapidly changing environments. The decision maker uses their expertise and experience to quickly assess the situation and to come up with an acceptable course of action. They then "play out" the course of action to see whether it is feasible or requires modification. If the first choice doesn't work, they will go back, select another option, and do the evaluation again. A good example is a firefighting captain who arrives on the scene of a burning building. He will quickly recognize what to do and act accordingly, but the situation may change rapidly and he will have to stay on top of the situation, perhaps changing priorities on the fly. One aspect of RPD is that the expert can quickly rule out unimportant information or unusable solutions, almost on a subconscious level, whereas a novice would need much more time to explicitly think through all possibilities.

Explanation Based Model - There are two parts to this model: The coherent story and the choices. The theory says that the decision maker will attempt to create a full story from some incomplete raw facts and then match this story against possible choice options to come up with a solution. For example, a jury will try to formulate a full explanation of a defendant's behavior from the evidence, general knowledge about similar events, and knowledge about story structures in general. With their completed story, they will then try to match

that with the choices (verdict categories). If a match is found, they can make a decision, otherwise the process would have to be repeated with additional inputs.

Lens Model - The lens model is a part of Social Judgment Theory. It tries to analytically build a model of how well a person's judgments match up with the environment they are trying to predict. The interface between the two are the cues that represent the environment. An example is a trader trying to predict what the market will do so that they can pick good stocks. Some of the cues might be unemployment rate, price/earnings ratio of the stock, inflation rate, etc. The trader observes the cues and makes a judgment on how to interpret them, then selects stocks. The lens model takes a large number of these trial cases and comes up with equations for how well the trader does, plus other models for how well the cues are judged or how well they represent the environment. Even with perfect information, most task success rates are nowhere near 100%. This is due to many factors, including errors in judgment, insufficient or unrecognized cues, or important cue patterns that are hard to determine.

Dominance Testing - There are four major steps to making a decision. First, the decision maker simply screens out alternatives that do not meet minimum standards. After that, if there is more than one choice left, the second step is to select a promising alternative. This can be a fairly subjective choice based on preferences or initial reaction. The third step is to test for dominance. An alternative is dominant if, for all the selection criteria, the alternative has no disadvantages and at least one advantage, it is selected. Often, this is not the case, and the fourth step is entered. This is where the decision maker tries to restructure or reinterpret the information in order to make the promising alternative dominant so it can be selected. This can be good or bad, since if overdone it can mean talking yourself into making a bad decision.

Let us move on to a very important aspect of decision making.

ESSENTIAL CHARACTERISTICS OF DECISION MAKING

Irrespective of the type of decision model, there are certain essential characteristics which are common to all:

DECISION ALTERNATIVES

A finite number of decision alternatives are available to you (the decision maker) at the time of making a decision. The number and type of such alternatives may depend on the previous decisions made and the consequences of those decisions. These alternatives are also called courses of actions, acts or strategies and are under control and known to you that is you will determine what courses of action are possible.

Decision alternatives must be mutually exclusive (clearly distinct among themselves) and, ideally, collectively exhaustive (cover all reasonable options open to management). Determining a realistic set of action alternatives demands creativity and experience on the nature of the problem under consideration. Managerial intuition is extremely valuable at this stage of the analysis.

STATES OF NATURE

Decision theory will require you (the decision maker) to develop a mutually exclusive and collectively exhaustive list of possible future events. These future events are referred to as states of nature and they depend upon certain factors which are beyond the control. There may be a great deal of uncertainity with respect to the occurrence of the states of nature.

PAYOFF

A payoff is a quantitative measure of the result of taking a particular course of action combined with the occurrence of a particular state of nature. It is the net gain or loss obtained as the outcome of the decision that accrues from a given combination of decision alternatives and events. They are also known as conditional profit values. In business, payoffs are usually expressed using monetary values. In decision analysis, however, one can make use of either monetary values or abstract utilities

PAYOFF TABLE

The payoff estimates are presented in terms of the interaction of the decision alternatives and the states of nature in the form of a payoff table.

GENERAL STRUCTURE OF PAYOFF TABLE

Suppose the problem under consideration has n possible states of nature denoted by E1, E2, …… , En and m alternative actions denoted by A1, A2, ……., Am. Then the payoff corresponding to your(the decision maker) selected action Aj under the state of nature Ei will be denoted by aij

where i = 1, 2, ……., n ; j = 1, 2, ……., m

	DECISION ALTERNATIVES			
STATES OF NATURE	**A1**	**A2**	**……**	**Am**
E1	a_{11}	a_{12}	……	a_{1m}
E2	a_{21}	a_{22}	……	a_{2m}
.	.	.		.
.	.	.		.
.	.	.		.
.	.	.		.
.	.	.		.
.	.	.		.
En	a_{n1}	a_{n2}	……	a_{nm}

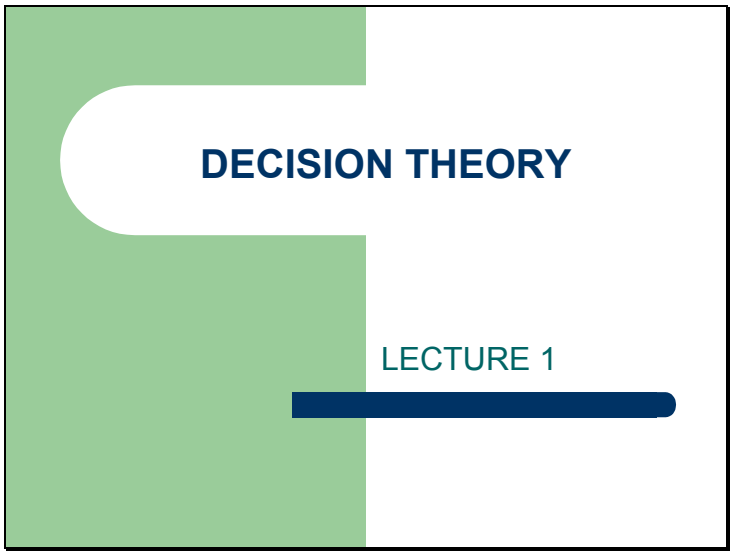
So, now let us summarize today's discussion:

Summary

We have discussed about

- Steps followed by professional managers for taking decisions.
- Types of decisions.
- Characteristics of decision-making.

Slide 1



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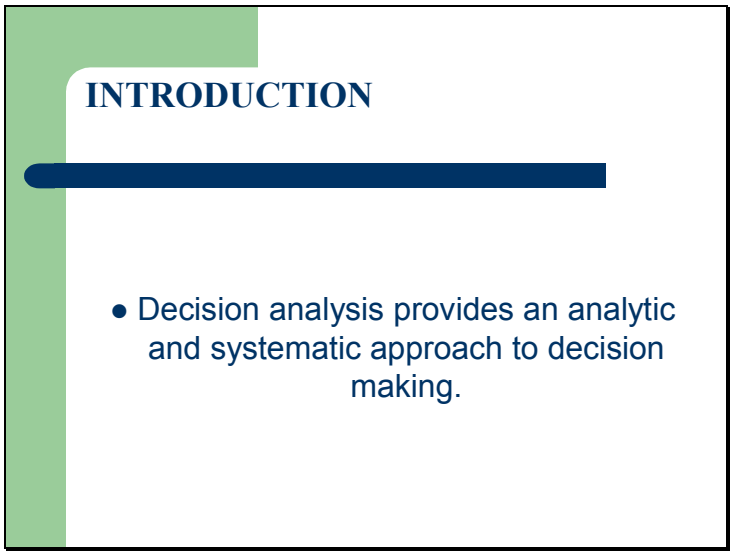
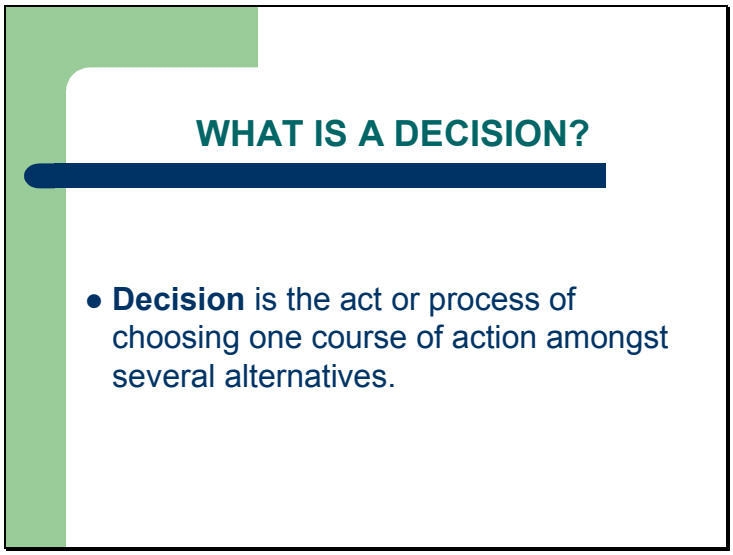
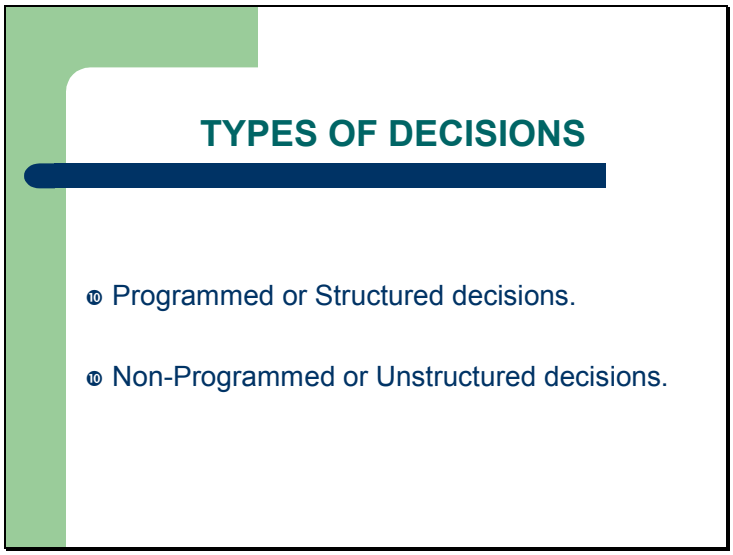

INTRODUCTION
● Decision analysis provides an analytic and systematic approach to decision making.

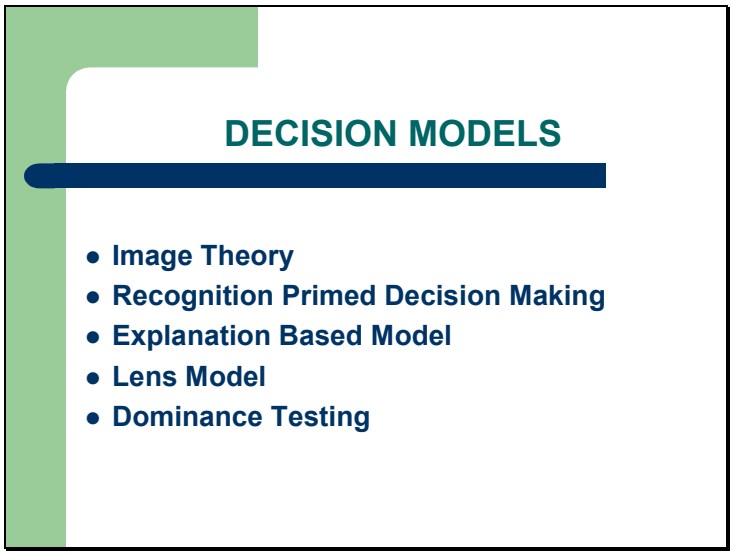
Slide 3


WHAT IS A DECISION?
• Decision is the act or process of choosing one course of action amongst several alternatives.

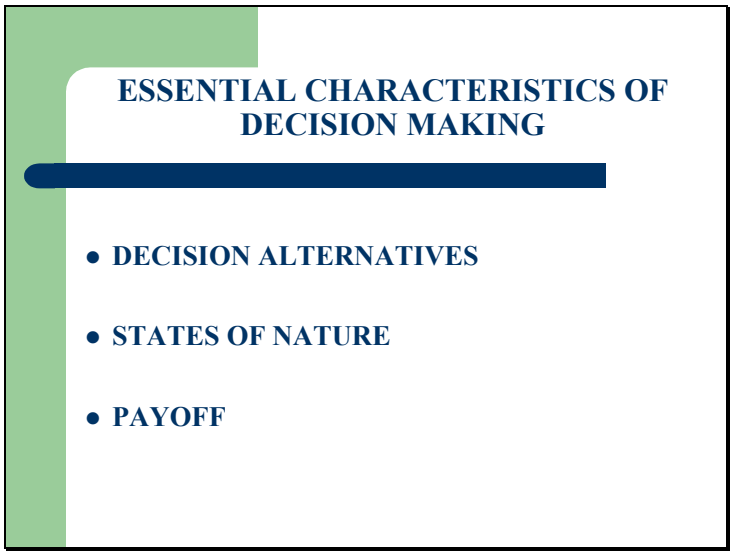
Slide 4


TYPES OF DECISIONS
Programmed or Structured decisions.
Non-Programmed or Unstructured decisions.

Slide 5


DECISION MODELS
Image Theory
Recognition Primed Decision Making
Explanation Based Model
Lens Model
Dominance Testing

Slide 6


ESSENTIAL CHARACTERISTICS OF DECISION MAKING
DECISION ALTERNATIVES
STATES OF NATURE
PAYOFF

Slide 7

GENERAL STRUCTURE OF PAYOFF TABLE

STATES OF NATURE	DECISION ALTERNATIVES A1	A2	.....	Am
E1	a_{11}	a_{12}	.....	a_{1m}
E2	a_{21}	a_{22}	.....	a_{2m}
.	.	.		.
.	.	.		.
.	.	.		.
.	.	.		.
.	.	.		.
En	a_{n1}	a_{n2}	.....	a_{nm}