UNIT 18 FUTURE DESIGNING TECHNIQUES

Structure

18.0   LEARNING OUTCOME

Upon completion of this Unit, you should be able to:

- Explain the concept of group decision making

- Discuss the key group decision making techniques; and

- Enumerate the trend extrapolation techniques

18.1   INTRODUCTION

The organisation's ability to adjust, adapt and modify its strategies to rapidly changing environment – a futuristic approach, so to say – is the key to its steady growth and development. This requires an organisation to anticipate future environment effectively. Therefore, future estimation must be done as precisely as possible.

The methodologies available for technological forecasting come under many broad categories. Each methodology has its advantages and disadvantages and the forecaster before employing it must be fully aware of the limitations of a particular methodology. Often, forecasts made with the help of different methodologies can be used as cross checks on individual results. The best approach is to use if possible, a combination of methodologies. A concurrence of forecasts made using different methodologies increases confidence in the initial forecast (Rohtagi, *et. al,* 1979).

In the past (and to some extent in the present also), individuals, on the basis of their intuitive ability gained through experience and knowledge, generally used to predict the future. Simon's 'behavior alternative model' which is the most noted decision model, is individual centric, relying on a rational individual's weighing of pros and cons of alternative courses of action in a problem situation. However, since current technological innovations and organisational complexity require multidisciplinary interactions, a single individual however competent he/she may be, is not able to do the job. Even the combining of the views of different persons in the form of opinion polls etc. would not serve the purpose. It is in this context that group decision making is considered an important aid to organisational decision making. In this Unit, we shall examine the concept of group decision making, its important techniques including the trend extrapolation techniques.

18.2   GROUP DECISION MAKING

In today's organisations, a large number of decisions are usually taken by a group of people rather than an individual, e.g., in a business enterprise, decisions are generally taken by the Board of directors or its committees. For example, in the Universities, most of the decisions are taken by the Senate, Syndicate and other academic bodies. We may distinguish here between policy-decisions and day-to-day decisions. Policy decisions are generally taken by the group, while the individual decides on the pattern of policy-decisions, i.e., there is very little discretion vested in the individuals to avoid favoritism and nepotism. Group decision-making is very essential in complex situations dealing with multiple aspects and to handle such situations, generally committees, study teams, task forces, review panels, expert committees, etc., are appointed. Group decision-making is significantly influenced by the environment and culture of organisations and the action profile of its members. Democratisation and dispersal of power are the basic requirements for effective group decision-making. Group decision-making cannot take place in an organisation, which is predominantly characterised by an autocratic decision-making style.

Group Decision-Making Situations

Let us discuss two special situations of group decision-making.

(i)   Risk Shift Phenomenon

It has generally been observed that groups generally are more prone to taking riskier decisions than individuals. Four reasons are advanced for these phenomena.

a)   Risk-takers are able to persuade other members to change their views in favour of risky decisions.

b)   Members, after becoming familiar with the issues, feel more confident to take risky decisions.

c)   Responsibility for decision-making can be passed on to others, thus avoiding the fear of being pin-pointed.

d)   Risk taking offers an opportunity for the group members to become the leaders. Dominant and clever members generally occupy the leadership berth in a group.

(ii)   Group Thinking

This phenomenon was first discussed by Janis (1971). It refers to a mode of thinking in a group in which the seeking of concurrence among members becomes so strong and compulsive, that it overrides any realistic appraisal of alternative course of action. The members exhibit a tremendous desire for unanimity, whereby, some individuals become passive.

Advantages of Group Decision-Making

Following are the major advantages of group decision making:

(a)   Establishing Realistic Objectives

Groups possess greater cumulative knowledge and facts as the members represent different specialisations and each can thus contribute from one's own perspective or angle and help in sharpening the decisions to be taken. The individual may take the decision in a hurry, while all the pros and cons are thoroughly examined by the members of the group.

(b)   Developing Alternatives

Since a group consists of many members, therefore, there is a possibility of developing many alternatives before a decision is finalised. An individual maybe biased in favour of one-sided approach, while the group examines all the available alternatives before finalising the decision.

(c)   Participation and Support from Members

Since the decision is taken with the help of members, it is supported during implementation. They are ready to own the responsibility for any lapse, etc. If they are more satisfied with the decisions, they are more likely to achieve the objectives.

 (d)   Group Cohesion

Members of a group while deciding collectively develop certain common attitudes, beliefs and emotions. These feelings and beliefs, over a period of time, get strengthened and develop group norms.

18.3   GROUP DECISION MAKING TECHNIQUES

Let us discuss the following five techniques, which can help in group decision-making.

1)   Brainstorming

2)   Synectics

3)   Delphi

4)   Nominal Group Technique

5)   Heuristic Technique

18.3.1 Brainstorming

Brainstorming was developed by Alex F. Osborn to help trigger creative ideas in the field of advertising agency. He explained the term as the use of the brain to storm a creative problem – "and to do so in commando fashion, with each stormed decision audaciously attacking the same objective." Brainstorming generates new ideas, solves

problems, motivates and develops teams. It motivates the teams to work together. Brainstorming process involves:

- Definition and agreement on objectives

- Categorising, combining and refining of ideas

- Assessing the effects and results

- Prioritising the options

- Agreeing on action

- Controlling and monitoring the follow up

In order to obtain the maximum creativity from the group under the brainstorming technique, following points maybe kept in mind:

a) Ideas can be criticised freely.

b) "Free-wheeling" is welcomed. The wider the idea, the better, as it is easier to take down ideas than to think about them.

c) Quantity is encouraged. People should be asked to develop as many ideas as possible.

d) Combination and improvement are sought. In addition to contributing ideas of their own, participants should react to the ideas of others so that they can be turned into better ideas; or two or more ideas can be integrated to instill another new idea.

e) Problems may be split into parts if it is unmanageable.

According to Rohtagi *etal* (*op. cit*) the following conventions need to be adopted during a brain storming session.

1) The session should be very informal and free. Very frank and unorthodox views, some of which may be close to absurd, are allowed. The formal trappings and paraphernalia of organised symposia are discouraged during brainstorming sessions.

2) The objective is stated in very clear terms, and only one objective is chosen at each brainstorming session.

3) No criticism or cross questioning is allowed during the brainstorming session.

4) Ideas, which appear absurd at first sight, are also considered. No questions on feasibility or constraints are allowed.

5) Participants are liberated from inhibitions by arrangement of small informal sessions.

6) The second or higher order implications of ideas are not considered.

Properly conducted brainstorming sessions may yield several new ideas. However, in such sessions, interdisciplinary interactions are not adequately fostered.

Brainstorming reached the peak of its popularity in the 1950s. However, the study conducted by Thomas S. Bouchard at Yale University in 1958, indicated that individuals working alone could produce more unique ideas than a group.

Yet, brainstorming facilitates participation of all members in suggesting ideas, plan of action, retain the ideas, assess, evaluate and analyse the effects of ideas.

There are several criticisms of brainstorming. It is very time-consuming and thus costly; and only superficial ideas are brought out. Unfortunately, as a technique for assisting decision-makers to reach risky and uncertain decisions, it is not generally recommended.

18.3.2 Synectics

Synectics, not so well known as brainstorming, but of greater value to decision-making, is a creative technique developed in 1944, by William J.J.Gordon. He termed the technique synaptic, a word of Greek derivation, which means fitting together different, distinct, novel and irrelevant ideas. Its purpose is to increase the creative output of individuals and groups. The synaptic process involves: (a) making the strange familiar, and (b) making the familiar strange. It is an approach to creative thinking that depends on understanding together, that which is apparently different.

In this process, the leader has to play a vital role in forcing members to be away from the routine and encourage them to offer solutions after analysing the problem. Methods like role play, analogies and paradoxes are employed to generate creative ideas.

Gordon, however cautions, "Although the mechanisms are simple in concept, their application requires great energy output. In fact, synaptic does nothing any way to make creative activity easier … The mere stringing together of metaphors is non-productive. Synaptic participants must keep in the back of their minds the problems as understood so that they can identify those mechanisms which illuminate the problem."

Synectics differs from brainstorming in several important respects. It is much more adaptable to complex decisional problems. Yet, similar to brainstorming, synectics is very time-consuming and expensive. Overall, synectics seems to have potentially a great deal to offer and might be able to help making basic decisions, that require creative solutions.

18.3.3 Delphi

It is one of the techniques that help in accurate and meaningful forecasting. .

Delphi was first developed in USA by N.C.Dalkey and his associates in the Rand Corporation as a forecasting methodology and later it emerged as a group decision making tool. It has only recently become popular as a technique to assist in making risk-uncertainty decisions, e.g., long-range forecasting. Today, numerous organisations in business, and government especially in areas such as education, health, and military are using Delphi. This technique involves the solicitation and comparison of anonymous judgment on the topic of interest through a set of sequential questionnaires, interspersed with summarised information and feedback of opinions from earlier responses. No decision technique will ever be able to predict the future completely but the Delphi technique seems to be as good a crystal ball as is currently available. Delphi technique is used in USA to prioritise national funding for projects among different states with conflicting goals or if the scale of the decision making problem is large. The technique has many variations, but generally it works as follows:

1) A panel of experts on the particular problem in question is drawn from both inside and outside the organisation.

2) Each expert is asked to make anonymous predictions.

3) Each panelist then gets a composite feedback of the way the other experts

answer the questions.

4) Further predictions of the future are made possessing information in hand.

5) Once a convergence of opinions begins to emerge, results are made use of for forecasting.

A major key to the success of the technique lies in its anonymity. Keeping the responses of panel members anonymous eliminates the problem of 'saving face' and encourages the panel experts to be more flexible and thus to benefit from the estimates of others. In the traditional interacting group-decision making technique, the experts may be more concerned with defending their vested positions than with taking a good decision. It has the advantage of being able to involve people with special qualifications who are separated geographically in decision-making. The absence of face-to-face interactions insulates members from the undue influence of others. Delphi technique aims at achieving consensus on controversial topics.

This technique has the following advantages:

1) Direct interaction is avoided by using a programmed sequential questionnaire of three or four rounds.

2) The expert is not called to defend his publicly expressed opinion, and anonymity of individual forecasters is maintained.

3) Subordinates do not have to differ with senior executives face to face.

4) Salesmanship forecasts are avoided.

5) The final result is a statistical group response.

6) Results are based on interactions combined with controlled feedback.

The Delphi process attempts to:

1) Develop a range of possible programme alternatives.

2) Bring underlying assumptions or information that lead to different judgments.

3) Provide information which may generate consensus on the part of the respondent group.

4) Correlate informed judgments on areas that cut across a wide range of disciplines.

5) Educate the respondent group about the diverse and interrelated aspects of any particular area.

In other words, Delphi can be applied to a wide variety of programme planning and decision problems in any type of organisation. Delphi is particularly appropriate when decision-making is required in a political or emotional environment or when the decisions affect strong factions with opposing preferences. The tool works formally or informally, in large or small contexts, and reaps the benefits of group decision making while insulating the process from the limitations or group decision-making *(http://www.corolla.com)*.

The major criticisms of the Delphi technique are that it is a time- consuming technique, quite costly and laborious and it has no scientific approach or support.

18.3.4 Nominal Group Technique

The Nominal Group Technique (NGT) follows a highly structured process and tries to integrate creative thinking through group interaction, in order to solve organisational problems in a useful manner. Nominal grouping has been used by social psychologists for a couple of decades. A nominal group is simply a "paper group", because no

verbal exchange is allowed between the members. In group dynamics research, social psychologists would pit a fully interacting group against a nominal group. In terms of number of ideas, uniqueness of ideas and quality of ideas, research has found nominal groups to be superior to real groups. The general conclusion is that interacting groups inhibit creativity. This, of course, applies only to idea generation, because the interactive effect of group members is known to have a significant effect on other variables.

The nominal grouping approach, when used as a specific technique for decision-making in organisations, has been labeled as Nominal Group Technique (NGT) by Delbey and Van de Yen. It consists of the following steps:

1) Silent development of ideas in writing.

2) Round-robin feedback from group members to record each idea in a terse phrase on a flip chart.

3) Discussion of each recorded idea for clarification and evaluation.

4) Individual voting on priority ideas with the group decision being mathematically derived through rank-ordering or rating.

The difference between this approach and Delphi is that the NGT members are usually acquainted with one another, have face- to- face contact, and communicate directly with each other. Although, research is just starting to emerge on NGT, there is some evidence that the technique leads to many more ideas than traditional interacting groups and may do as well or slightly better than Delphi groups. This type of technique certainly holds a great deal of promise for improving basic and creative management decisions.

18.3.5 Heuristic Technique

Similar to Delphi and nominal grouping, the heuristic technique has recently gained significance as a decision-making technique. Heuristics attempts to discover something new.

In short, heuristics can be considered as a sophisticated technique of controlled trial and error. When applied to decision-making, heuristics, according to some is a combination of two approaches – the systems and behavioural approaches – as it considers both major variables and the reactions and feelings of people in the system. In other words, heuristics allows the decision-maker to consider less-than-rational paths and thus preclude frustration when more preferable alternatives are somehow available.

The major cause of the recent widespread use of heuristics as a decision- making technique is its adaptability to computer programming. Strange as it may seem, the biggest breakthrough for assistance in making non-programmed basic decisions may be through heuristic programming of the computer.

18.4 TREND EXTRAPOLATION

Since World War II, quantitative and qualitative methods of forecasting gained prominence. This intends to reduce the uncertainty especially in decisions when these are made in the face of great uncertainty about future or at the backdrop of the future consequences of today's decisions.

Trend extrapolation is a key forecasting technique that provides analysis of future trends based on the available data. Trend extrapolation assumes that there shall be changes in future and hence attempts are made to predict or forecast them. It is based

on the assumption that the present development in any area will continue in the same direction. Trend analysis relies more on subjective judgment rather than objective extrapolation of historical data.

Trend extrapolation assumes that things will keep changing in the future the way they have been changing in the past. One simply extends the line or the curve forward to predict where things will be at a certain future time. If the population of a city is known to be increasing at the rate of 2% a year, we assume that it will continue to do so in the future, and we can use simple arithmetic to calculate what the population will be in five years. In other words, we can generate a forecast by observing a change through time in the character of something and projecting (extrapolating) that change into the future. In making a forecast, we naturally disregard short-term changes or fluctuations, such as the swelling of a city's population each morning as people come to work. What is important is the longer-term change, that is, the trend.

Trend extrapolation is one of the most commonly used ways to generate a forecast. City planners, economists, demographers, and many other specialists constantly extrapolate trends-consciously or unconsciously-when they think the future. So, too, do ordinary people. Assuming that the future will be like the past or that past changes will continue in the same direction and rate is a perfectly sensible way to begin trying to understand the future *(http://www.crab.rutgers.edu)*

The forecasts are generally done using statistical time extrapolation technique similar to those used in economic forecasting. The Economic Survey presented to Parliament in India during the budget session is also prepared in this manner. As reported by Rohtagi *et al, (op.cit)* trend extrapolation is a quick way of deriving a forecast, but it is not necessarily the most accurate one; extending present trend curves to several decades or centuries in the future is certainly not valid. Generally, one should not project the future anymore than the equivalent time period for which one has systematic past data. For instance, with a past systematic trend of twenty-five years, projections of at the most up to twenty-five years into the future can be performed with some confidence. As expected, the shorter the time period into which the trends are extrapolated, the higher will be the confidence in the extrapolations.

Rohtagi *et.al (op.cit)* gives the following advantages and disadvantages of trend extrapolation techniques of forecasting.

The advantages of trend extrapolation include:

1. These techniques are simple, easy, and they consume very little time and effort.

2. Trend extrapolation depends only on the past performance, and not on any assumptions, which may be subjective.

3. A trend curve contains the net effect of all the interacting influences like social effects, economic, technological, and political factors. There is therefore, very little chance of inadvertently leaving out any important factor.

The following are the disadvantages:

1. Trends cannot be extrapolated very far into the future.

2. It does not explicitly state or identify the interacting parameters and effects of environments, which are responsible for the past trend.

3. Unless reliable year wise data are available, future projections based on insufficient data could be grossly inaccurate.

18.5   NORMATIVE FORECASTING

This is goal-oriented forecasting where one recedes from future goals to the present and intermediate-term technological needs. Normative forecasting is, therefore, primarily need-based forecasting. The first step is to specify the future goals that the organisation plans to achieve. The capabilities which must exist in the present or the intermediate future are then identified for the achievement of those specific goals. In a way, this is a method of pushing the technologies in the required direction in response to the identified needs of the future. Due to innovations in computer programming, this method of designing the future has today gained prominence in many organisational situations. . There are a large number of techniques under the broad classification of normative forecasting (Martino, 1972).

Normative forecasting helps determine the most probable future. It requires data that describe the present state of the object and a general model of the normal or usual development of the class of objects or phenomena.

The techniques we have discussed in the earlier sections help in forecasting. But there are limits to forecasting. It is difficult to determine the reliability of predictions.

There are not too many methods for predicting the reliability of predictions. One of the best is triangulation: this involves making parallel forecasts with different methods if it is possible. If different methods had to provide dissimilar forecasts, it gives an idea of the range of the uncertainty sensitivity analysis. It is another method, which works only with numerical models. Most forecasting methods allow one to calculate what the result will be, if one of the starting assumptions or one item in input data is varied or if one knows the probable error of one of the assumptions, this knowledge can be used to calculate the probable error of the resulting forecast. (*www.2.uiah.fi/projects/metodi/190.htm*)

18. 6   CONCLUSION

Decision-making is a major function of public systems management. The techniques for decision-making have been dominated mainly by quantitative models. . There are only a few creative techniques (brainstorming and synectics), and participative techniques, although these are not equal as sophisticated as the quantitative models. Yet, it is the basic management decisions under uncertainty, which are crucial for organisational success. At times, certain organisational assumptions and decision-making procedures inhibit organisations from attracting individuals with the ability to provide unusual solutions. Implementation of explicit creativity techniques can attract these individuals to organisations and provide legitimacy and psychological safety for them. Creativity techniques do not replace management judgment in the risky process of decision-making. These techniques do have the potential to improve the process by enhancing the quality and quantity of inputs to be incorporated in decision making. Techniques such as delphi, nominal grouping, and heuristics offer some hope, but much more needs to be done in this important area of management decision-making. Besides, all these techniques have been experimented in the context of developed countries. Much more experimentation and application of these techniques are required in the developing countries like India, to ensure rational and acceptable decisions in complex organisations.

18.7   KEY CONCEPTS

Behavioural Approach

It is the study of human behaviour through inter disciplinary approach drawing knowledge from various social sciences disciplines.The object of this approach is to understand human behaviour in the organisations.

Behaviour Alternative Model

Herbert A.Simon has enumerated the Logic Rationality Model of Decision Making which is also known as Behaviour Alternative Model. Simon focused on the role of values and facts in decision making. Three activities namely, Intelligent Design and Choice activities ,have been referred to as important in decision making. Simon has mentioned that the decision makers' behaviour,which is required to be guided by rationality,is often subjective,and hence he changed the focus from 'rationality'to 'bounded rationality'in decision making.

Systems Approach

According to systems approach ,administration is considered as a system comprising sub-system, structure, people, actions and interactions that enable the organisation perform certain functions. The administrative system is said to consist of three distinct processes-inputs, throughputs and outputs. The system's frame work assumes interactions between the three processes.

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18.9 ACTIVITIES

1. Attempt to enquire about the ways in which decisions are arrived in any public organisation.

2. Visit the nearby resident welfare association or any voluntary organisation and observe the decision- making methods adopted by it.