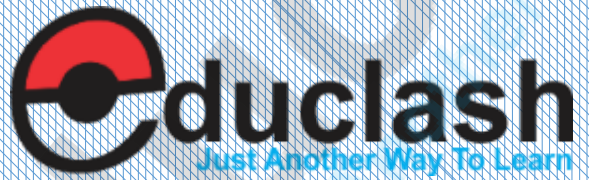
Unit -3



DECISION MAKING

Decision Mkng

Dec^n mkng Concepts :-

Dec^n : Dec^n is derived fm a latin word decido which means cut off.

A dec^n is choice out of several alternatives made by Dec^n maker to achieve objective in a given situation.

Business dec^n r those which r taken during business process to obtain the objective in a given envt. Whatever be the dec^n whether business or other we always assume that Dec^n maker is rational person who will take dec^n with rationality.

Major ch^{cs} of Business dec^n making r—

(a) **Sequential in Nature :-**

(b) **Complex due to Risk & trade off :-**

(c) **Influence by personal Value**

(d) **Made in Institutional setting & Business envt :-**

So in every dec^n these r the common ch^{cs} hence there is a definite method to reach at a dec^n.

The Dec^n making process require creativity, imagination & deep understanding of a human behaviour.

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Rational Dec^n M^kng :-

A rational Dec^n is that dec^n which effectively & efficiently ensure the achievent of goal for which is made.

Rationality is a multidimensional Concept

Simon Herbert Differentiate among type of rationality - A dec^n can be

* objectively rational — If it maximize the value of objective
* Subjectively Rational — If it maxi: the value of awareness of subject.
* Consciously rational — If the process of dec^n mking is consious one.
* Orgnally Rational — If the degree of orientation towards the Org^n
* Personally Rational — If it is achieves an Individual personal Goal..

If a Dec^n maker can explain the logic & reason the objectivity & circumstances in which the dec^n is made then it can be turned as rational Dec^n.

Gross Bertram M. suggests 3 dimension of rationality :-

(1) The Degree of Satisfaction
(2) The degree of Feasibility in achieving the objective
(3) Consistency in Dec^n Mkng

If a Dec^n maker shows a Consistent behaviour in process of dec^n making then one can say that he meets the test of Rationality.

The Problems in Making Rational Dec^n :-

(1) Ascertaining the Problem :-
(Ex: Sale is decreasing) its not a prob)

(2) Insufficient knowledge :-

(3) Not enough time to be Rational :-

(4) The envt may not Cooperate :-

(5) Other Limitations :-

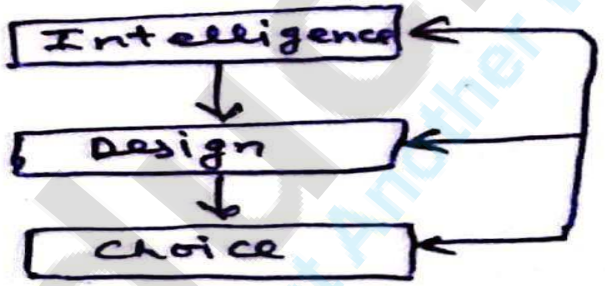
- Poor Comm^n
- Misjudging the motives & value of people
- Uncertainity & Risk
- Inability of human mind to handle the available knowledge & human behavior.

Dec^n Method, Tools & Procedures :- MIS|U-4|04.

Simon's Dec^n Model :-

D. M. is a process by which dec^n mkr reach to a dec^n. for this Herbert Simon describe a model. This model has 3 Phases -

MIS follows this model in its development stage -



Types of Decision Dec^n Mkng System:

Dec^n mkng system can be classified in two ways based on the mgr's knowledge abt envt.

1.- Closed D.Mkng 2. open D.Mkng.

1-Closed D Mkng :- If a mgr operates in a known envt then it is known as closed D.M. The conditions of closed D.M. sys r —

(a) The mgr has a known set of dec^n alternatives & knows their outcome fully in terms of value.

(b) A mgr has a model, method, rule by which Dec^n alternative can be generated, tested & ranked.

(c) The mgr can choose one of them based on some goal or objective.

ex- acceptance of F.D., exam: sys to declare pass or fail.

(2) Open D Mkng :- If the mgr operates in an envt not known to him then it is known as open D.M. The condition of open D.Mkng sys r —

(a) A mgr doesn't know all dec^n alternatives

(b) Outcome of dec^n is also not known fully.

(c) No method, model & rule is available to finalise one dec^n among alternatives

Ex:- Pricing of a new product, new plant location ex-

MIS tries to convert every open D.M sys into closed D.M sys by providing more & more info to mgrs for best D. Mkng. MIS provide more info abt envt & outcomes then mgr can generate alternatives test them & select one of them.

A good MIS achieve this.

Types of Dec^n :-

Orgnal Dec^n differ in no of ways. These differences affect the development of alternatives & choice among them. Dec^n is classified as follows-

(A) On the basis of Dec^n mkng activities :-

3 types - (Robert B. Anthony)

* Strategic planning Dec^n
* Mgmt Control Dec^n
* Operational Control Dec^n

(B) On the Basis of level of Programmability of Dec^n :-

2 types - (By Simon)

* Programmed or Structured Dec^n
* Unprogrammed or Unstructured Dec^n

[C] On the basis of level of Knowledge of Outcome:

3 types -

* Dec^n under Certainty
* Dec^n under Risk
* Dec^n under Uncertainity

[A] On the Basis of Dec^n mkng Activities :- 3 types (Robert B. Anthony)

(a) Strategic planning Dec^n :- These r those Dec^n in which the dec^n mgr develop the objectives & allocate resources to achieve these objectives. Dec^n in this categories r long time of period & usually involved a large investment & effort. such Dec^n r taken by Top mgrs.

Ex: Introd^n of a new product, aquisition of new firm etc

(b) Mgmt Control Dec^n :- These r those dec^n which deal with the use of resources in the org^n & r taken by middle level mgrs.

Ex: Analysis of Variace, Product mix planning etc.

(C) Operational Control Dec^n :- These dec^n r those which deal ☐ the day to day operations / Problems that affect the operation of an org^n. such types of dec^n r taken by bottom level mgrs.

Ex: Prod^n scheduling Dec^n, Inventory Control Dec^n etc.

[B] On the Basis of level & Programmability :- 2 types (Simon)

(a) Programmed / Structured :- If a dec^n is based on method, rule or even guidelines it is called programmed dec^n. Such dec^n r routine & repetitive & require little time for developing in design phase.

Programmed Dec^n have traditionally been made through habit, by procedure or by using some accepted tools. More modern techniques r

(Continue →)

Continue – Programmed Dec^n :

More modern techniques for programmed dec^n s – O.R., mathematical Analysis, Modeling & Simulation. The Program Dec^n mkng can be delegated to a low level mgr.

Ex: Inventory reorder Dec^n.

(b) Unprogrammed / Unstructured :- A dec^n which is not well defined & can not be taken by applyig some rules or by using some model is known as unprogrammed dec^n.

These r those dec^n which r taken in such condition where situation / condition change so frequently & to such an extent that dec^n rules can't be specified. for these dec^n sufficient time hrs. to be spent in design phase.

Unstructured dec^n tend to be solved through judgement, intuition & the rule of thumb. Modern approach for such Dec^n r – Data Analysis on Comps, heuristic techniques etc.

Dec^n of such kind r usually handeled by strategic planning level mgrs & these dec^n can't be delegated to lower level.

Ex: Intro^n of new product, planning for R&D etc.

Dec^n situations which do not fall within any of these two dec^n s known as semi-structured dec^n.

*[redacted] :- On the Basis of Knowledge of Outcome :- 3 types-

An outcome defines what will happen if a dec^n is made or course of action taken. When there r more than one alternatives the knowledge of outcome become imp — Now on Knowledge of outcome these r classified in 3 ways — (Continued)

(a) Dec^n under Certainity :- Dec^n under Certainty take place when the outcome of each alternative is fully known. There is only one outcome for each alternatives. In this case dec^n mkr is required to compute the optimal alternative/outcome. Various optimiz^n technique may b used for such situations.

(b) Dec^n Under Risk :- Dec^n mking under Risk occurs where there is possibility of multiple outcome of each alternatives & probability of each outcome is attached to each alternatives.

Such dec^n mkg is also similar to Dec^n mkg under certainity where instead of optimisig outcome, the general rule is to optimise the expected outcome will apply. The dec^n mkr assumed to b rational.

Ex: If we have 2 chrices -

1 - 2% probability & getting Profit Rs 100000/-

2 - 80% " " " Rs 10000

	Outcome x Prob	Expected val	
S_1	100000 x .02	2000/200	
S_2	10000 x .80	8000/200	** Rational Dec^n mkr will choose S_2

(C) Dec^n Under Uncertainty :- Dec^n under Uncertainty take place where there is number of outcomes for each alternatives & probability of their outcome is not attached with them. In such situation diff. people take dec^n in different ways some use equal probability to each then choose optimum expected value. Other may use - Min regret, Maximax or Maximin Criteria.

Methods for Deciding Dec^n Alternative

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There r several methods to help the mgr decide among the alternatives. Three methods for selection of dec^n alternatives r the goal in view r :-

(a) Optimisation Technique
(b) Payoff Analysis
(c) Dec^n Tree Analysis.

→ All O.R. model use O.T.
→ The method of Dec^n Tree can b adopted when we have chain of Dec^n
→ The use of both payoff matrix & Dec^n Tree requires a probabilistic knowledge. In many situations this knowledge is not available then MIS has to provide the int^n support in this relation.

(a) O.T. :→ L.P., Dynamic Pro^m, Queuing Model Inventory model and so on r the examples of optimisation methods. These methods r used when the Dec^n mking situation is closed. To handle these situations slw Packages r available The methods r termed as O.R methods.

All OR methods attempt to balance two aspect of buiness under some constraints. etc.

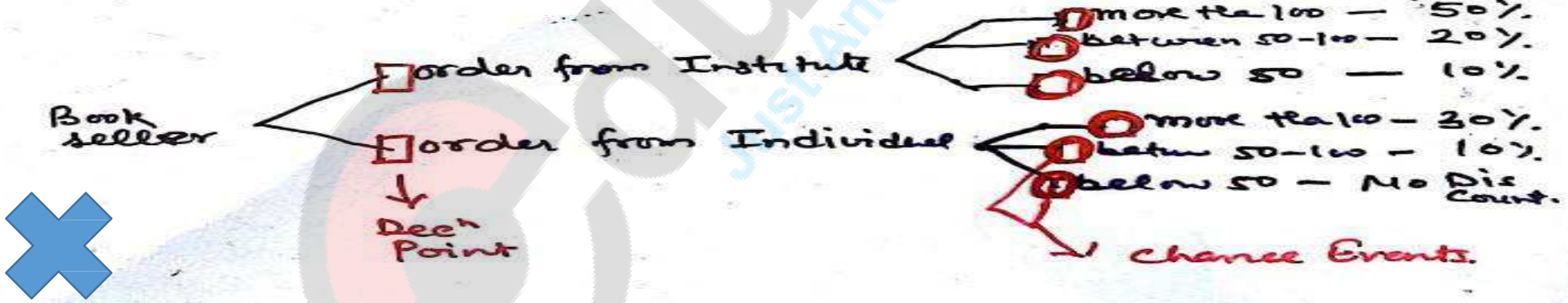
* In L.P. model, the use of resources v/s demand is balanced
* In Queuing Model, the cost of waiting time of custom v/s the cost of an idle time of the facility is balanced.

(b) The pay-off Analysis :- When all the alternatives & their outcomes r not known with certainity, the dec^n is made ☐ the help of pay-off analysis by constructed pay-off matrix.

Result :- which will give highest exp. value suld b' chosen.

Your Dec^n	Competitor's Probability	No change	Increase	Decrease	Expected gai.
		0.50	0.20	0.30	
No change in Price		4	5	8	5.40
Increase the Price		6	4	3	4.70
Decrease the Price		10	12	4	8.60

(c) Dec^n Tree Analysis :- When dec^n maker must make a sequence of dec^n, the Dec^n Tree analysis is useful in selecting the set of sequence Dec^n.



Decision Analysis by Analytical Modeling

On the basis of **Deciding the Decision alternatives** methods like Optimization Techniques, Pay off Analysis, Decision Tree Analysis, a decision is made but these decisions need to be analysed for conditions and assumptions considered in the decision model. The model is analysed four ways-

a) What if Analysis
b) Sensitivity Analysis
c) Goal Seeking Analysis
d) Goal Achieving Analysis

a) What if Analysis-

- The model is built with some variables and relationships between variables.

- This analysis is based on what will happen if the new value of other variables change.

- This model compute the outcome on the basis of new values.

- What if Analysis creates confidence in decision making model by painting a picture of outcome under different conditions.

Ex: Inventory manger wants to know how the cost of holding inventory will be affected if lead time is reduced by one week or increased by one week. Such type of Analysis can be done for purchase price change, demand forecast variations etc.

b) Sensitivity Analysis-

- In what if analysis we test the effect on solution by changing the value of number of variables simultaneously or changing the relations between them.

- In sensitivity analysis, a special case of what if analysis, only one variable is changed and rest are kept unchanged.

- In the problem of inventory, sensitivity analysis can be used to assess the cost of holding inventory, if cost of item increases by 20 per cent .

- In sensitivity analysis, We are testing how sensitive is the cost of holding inventory to the change in cost of item.

- Hence Sensitivity analysis helps to understand the significance of variable in decision-making and improves the quality of decision-making.

c) Goal Seeking Analysis-

- In goal seeking analysis, you do not fix the goal but you try to achieve a goal of an optimum value arrived at after satisfying all the constraints operating in the problem.
- In optimisation analysis, you come to know which are critical constraints and which are limiting the value of goal.
- The decision maker can use this analysis to work on constraints and resources and find ways to improve upon solution to seek highest goal.

d) Goal Achieving Analysis-

- In goal seeking analysis, you analyse the problem in exactly reverse way as that of what if analysis or sensitivity analysis. In goal seeking analysis, goal is fixed and you go down to analyse the variables and values, which would help to seek that goal. We work backward from the goal.

EX: In the inventory problem you would fix a goal of achieving the cost of holding inventory of an item at the level of Rs. 10,00,000. Goal seeking analysis will help you to arrive at values of parameters to attain the inventory level of Rs. 10,00,000.

Behavioural Concept in D.M. :-

A mgr being a human being, behaves in a peculiar way in a given situation. The response of one mgr will differ from other due to they differ at behaviour platform.

Even though tools, procedures, rules are available for dec^n mking but the dec^n. is many a times influenced by personal factors i.e. behaviour

mgrs differs in their approach to take dec^n in org^n. accordingly they r classified in two ways.

→ Achievement oriented :-

→ Task oriented :-

→ Some mgr take the dec^n in which the risk is v. low or they decide low risk or no risk dec^n.

→ Even though Dec^n mking tools r available, but choice of these tools again depend on the motives of a mgr.

→ The behaviour is also influenced by the position he holds in the org^n.

→ The behaviour is also influenced by a fear & anxiety.

→ So the managerial behaviour is a complex mix of the personal values, atmosphere in the org^n, the motives & motivations.

The rationale of the business dec^n will largely depends upon the individuals, their positions in the org^n & their inter-relationship ∈ other mgrs.

Thus the attitude & motives r not consistent across the org^n, the dec^n mking process slow down in the org^n.

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Orgnal D.M. :- How can we improve orgnal D.M.???

D.M. can be improved by —

1. By avoiding conflicting goals
2. Dealing ∈ uncertainty in org^n
3. By orgnal Learning.

1. By Avoiding Conflicting goals :- An org^n is the arrangement of diff people having different positions powers & rights & importance in the org^n, each of them having diff goals.

The Corporate goals & the departmnt goals or the functional goals many a times, r in conflict.

In case of inconsistent goals, the conflict in the org^n increases, affecting the org^n overall performance.

The orgnal Behavior theory provides different methods for resolution of avoiding such conflicting goals.

Methods of Conflict Resolution

Method	Explanation
* Allow local rationality in the setting of goal.	Functional interdependency is minimum. ex: Security, Time officers, Admin fns etc.
* Permission to set goals which can be achieved ∈ an acceptable D.M rules & systems.	where there is final dependency to set goals which will not adversely effect the goals of dependent fns.
* Permission to achieve the goals in sequential manner	If the goals r conflicting they r resolved in sequential manner one at a time. ex: max profit, quality, customer satisfaction

Dealing ⊂ Uncertainty :-

The org^n perform in an envt of uncertainty. The mkt uncertainty, price v, change in govt policies, not knowing moves of competitors, the technology changes & the some of the factors which make the business envt uncertain. Org^{nal} behaviour use trend of risk avoidance ⊂ the available int^n support.

Methods of Dealing ⊂ Uncertainty

Method	explanation
* Decide for a limited short period & make a provision to correct the dec^n. * Negotiated dec^n, making ⊂ limited liability	like - • Purchasing of smaller quantity more frequently. •• Adopting the policy of enhancement in place replacement by new plants or equipment etc. etc • International price agreements supply assurance

In Last: MIS & Dec^n Mkng Concepts

By Org^{nal} Learning :-

The org^n D.M improves ⊂ learning by acquiring an additional knowledge & experience, training & development.

Learning provides a way to review the goals & objectives, and allows to set them more correctly.

The process begins ⊂ a small change in existing policy & guidelines, then slowly changes comes in strategic dec^n's planning & as the time progress, the org^n may have new goals & objectives across the company.

MIS and Decision Making

- MIS should be designed in a way that it can help in various decision situations in the organization
- Designer has to design the system in such a way that the problem is identified in precise terms.
- Designer should design MIS in a way that it should use the models to generate the alternatives and help to find the best alternatives among the alternatives.
- MIS design should use the Programmed and non programmed decision making concepts
- MIS design should use the closed and open system concepts accordingly.
- Many decision situations calls for optimization and OR model, MIS design must use these concepts in design.
- Some of the problems call for competitive analysis, such as a payoff analysis, In these problems , MIS can provide the analysis based on the gains, the regrets and the utility.
- The relevance of the decision making concepts is significant in MIS Design.
- The significance arises out of the complexity of decision making , the human factor in decision making, the organizational and behavior aspects and the uncertain environment, **The MIS addressing these significant factors turn out to be the BEST DESIGN.**


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