What Is Operation Research

The History Development Of Operation Research (O.R.)

The main origin of OR was during the second world war in 1947.

At that time, the military management in England called a team(group) of scientist, to study the difficult problems related to air & land defence of the country. Since they were having very timited military resources , it was necessary to decide upon the most effective use of them , for example the sea transport , effective bombing , etc .

During world war II the military commands of UK and USA engaged many teams of scentestis to study military operations. The teams were note actually fighting in the war but they were only advisers to win the war so OR is called “an art of winning the world without actually fighting it”

As the name implies operations research deals with research on (military)operation . The work of this team of scientists was named operational research in england. The good result of British OR teams quickly advised united states military commands to work on similar activities . The work of OR-team was given various names in united states:

1-operational anlysis

2-operational evaluations

3-operational research

4-systems analysis

5-systems research

6-management science

The name operations research is very much used every where.

Following the end of the war, the success of military teams attracted the industrial mangers who were seeking solutions to their problems of(maximizing the profit and minimizing the cost).

The first mathematical technique in this field, called the (simplex method of linear programming), was developed by american mathematician

George B.Dantizig in 1947.

We may not get the best answers, but definitely we find the bad answers were worst answers exist.

QUESTIONS

1-Comment the follow statement:

i-OR is the art of winning the war without actually fighting it.

ii-OR is the art of finding bad answers were worst exist.

2-Give the brief history and development of operation research.

2-Definition of OR

OR has been defined in various ways according to its development.

Some definition are given bellow

i-OR is the scientific method of providing executive department with a quantitive basis for decision making regarding the operations under their control. MORSE & KIMBAL (1948)

ii-OR is the scientific method of providing executive with an analytical and objective basis for decisions.

P.M.S BLAKETT (1948)

iii- OR is the application of scientific methods , techniques and tools to problems involving the operations of systems so as to provide these in control of the operations with optimum solutions to the problem

- CHURCHMAN , ACOFF , ARNOFF (1957)

IV- OR is the art of giving bad answers to problems to which other wise worse answers are given . –T.L. SAATY (1958)

V- OR is the attack of modern methods on complex problems arising in the direction and management to large systems of man machines materials and many industry . Business and defence . –operations Research Quarterly (1971)

VI- OR is the scientific approach to problem solving for executive management . –n.m. WAGNER (1974)

VII- OR is an aid for the executive in making the decisions by providing him with needed quantitative information based on the scientific method of analysis .

- C. KITTEL (1975)

From all above definitions , we think that whatever else “OR” may be it is certainly concerneed with optimization theory .

A decision , which taking into account all conditions can be considered by best one , is called an optimed decision .

Management applications of OR:

i-finance-badgeting and investment

cash-flow analysis, long-time capital requirement

Divided policies

ii-credit policies, credit risks,…etc

iii-claim and complaint procedure.

2-Purchasing, procurement and its exploration:

i-rules for buying, supplies, and stable or unstable prices.

ii-To find, how much quantity and when to pure chase.

iii-Bidding policies.

iv-replacement policies.

3-Production management:

i- distibutions of items

ii-place of keeping the items war houses, hospitals,….etc

iii- Manufacturing: production scheduling, equencing.

iv- Maintenance and project scheduling.

4-Marketing:no. of salesman, advertisement of items for sail.

5-Personal management: selection of good sallery serviceman on less.

6-Research and development: above applications shows that “OR has replaced management by personality

MAIN PHASES OF OR STUDY

OR study has folloing main phases:

1- formulating the problem.for this following information is required:

ii- who has to take the decision?

ii-what are the objectives?

iii-What are the limits of controlled variables?

iv-What are the uncontrolled variables?

V-What are the conditions on variables?

Wrong formulation of problem can not give right decision

2-Making a mathematical model:

A mathematical model should include the following three important basic things:

i-decision variables and parameters.

ii-Conditions or restrictions.

iii-Objective function.

3-Finding solution of the model

For this we use the methods which are available in mathematics or other sciences

4-Testing the model one it is solution (updating the model) after getting the solution we test it for the errors if any.

5-Controlling the solution

we control and check the solution if the value of the parameeres is changed(like price of food items0

6-Implementing the solution finally the solution is given to work practically for manager, engineers,….etc

SCOPE OF OPERATION RESEARCH

OR is useful in the following important fields:

1-In agriculture : We can solve

i- The problem of optimum distribution of land according to climate and nature of crops.

ii-The problem of optimum distribution of water from river, canal,….etc

2-In finance :we can solve the problem of optimum distribution of many two diffferent departments.

3-In industry: we can solve the problem of optimum production of goods.

4-In marketing:we can solve the problems of optimum sales, purchase of goods in market.

5-In personal management: A personed manager can use OR techniques:

i-To a point good persons on minimum pay.

ii-To find the age of retirement for employees.

6-In production management:

A production manager can use OR techniques.

i- To find the no. and size of items to make.

ii- To find sequencing of jobs on machines .

7- In life Insurance : what shoud be the premiumrate of insurance policies.