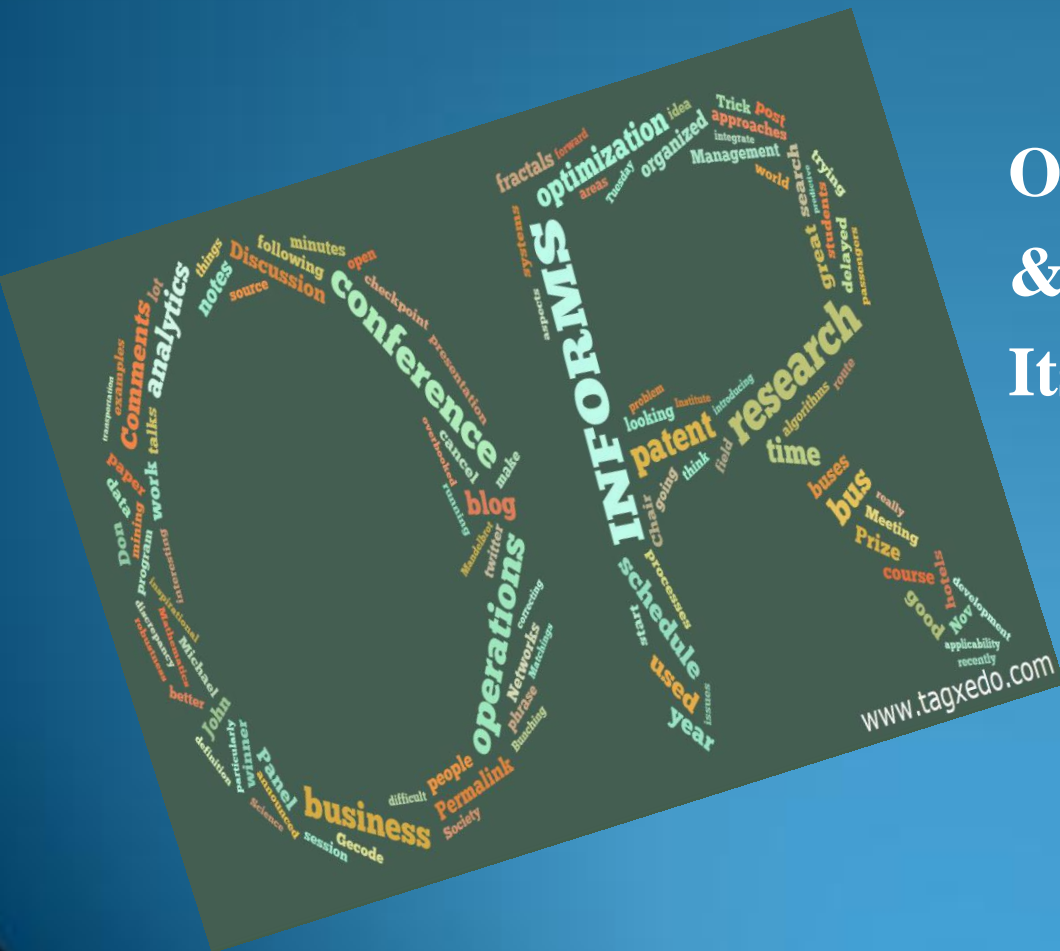


Faculty Development Programme

Operation Research & Its Applications



By
Sunaina Hedav

Contents

- History & Evolution
- Impact of OR
- What is OR
- Scope of OR
- Modelling in OR
- Problem & Application



History & Evolution of operation research

ORIGIN

Operations Research originated in Great Britain during World War II to bring mathematical or quantitative approaches to bear on military operations.

Impact of OR on other countries & on industries

Effectiveness of operations research

- This theory motivated the United States. Successful results:
 - invention of new fight patterns,
 - planning sea mining and
 - effective utilization of electronic equipment.
- Success of British OR teams attracted the Industrial managers to solve their problems.
- Impact of OR in many Indian Industries
 - Delhi cloth mills,
 - Indian Railways,
 - Indian Airlines,
 - Hindustan Lever etc.

What is Operation Research?



Operations research (O.R.) is
the discipline of applying advanced
analytical methods to help make
better decisions.

Scope Of Operation Research

Scope

- **In agriculture** : Every country is facing-
 - the problem of optimum allocation of land to various crops in accordance with the climatic conditions
 - the problem of optimum distribution of water from various resources like canal for irrigation purposes.Thus, the best policies are made in this direction using OR techniques.

- **In marketing** : With the help of OR techniques a Marketing Administrator can decide :
 - where to distribute the products,
 - minimum per unit sale price,
 - the size of the stock,

Also, we can see that OR techniques are used in -

Personnel management, production management, L.I.C, finance, industries etc.

Modelling in OR

- OR studies involve the construction of Mathematical model.
- The model is a collection of logical and mathematical relationship that represents aspects of the situation under study.

Different OR Models


- Transportation Model
- Assignment Model
- Production Model
- Queuing Model
- Replacement Model
- Job sequencing Model
- Network Model
- Markovian Model

Transportation Problem

Transportation problem (TP) is


the problem in which single commodity is transported from various supply points called origin (e.g. plants, factories) to different demand points called destinations (e.g. godowns, warehouses) and objective is to determine how many units to be transported from different origins to different destinations so that the total cost is minimum.

Replacement Problem



Replacement problem (RP) is
concerned with the problem of replacement of machines,
individuals, capital assets etc. due to their deteriorating
efficiency, failure or breakdown.

Queuing Theory



Queuing theory is
the mathematics of waiting lines which is extremely
useful in predicting and evaluating system performance.
Traditional queuing theory problems refer to customers
visiting a store, analogous to requests arriving at a
device.



So, finally we can say:

- Wherever there is a problem, there is OR.
- The application of OR cover the whole extent of anything.

