

# TheCaseSolutions.com

## LOTZ OF FOOD: THE PERISHABLE TEAM (B)

### HISTORY

#### Thecasesolutions.com

OR was formally established as a field of research about 60 years ago during the Second World War. The British army assembled a group of scientists headed by Professor PMS. Rackett, a physicist and a Nobel laureate, to investigate research into several complex problems. This group consisted of physicists, mathematicians, physiologists, engineers, army officers and others and were officially called "Army Operational Research Group". Unofficially, this group was known as "Blackett's Circus". Members of this group came from various disciplines and they proved to bring a multi-faceted approach to the solving of the complex problems facing the army such as the routing of convoys, logistic planning, submarine searching and others. By developing effective methods of using the new tool of radar, this team was instrumental in winning the Air Battle of Britain. Though their research on how to better manage convoy and amphibious operations, they also played a major role in winning the Battle of the North Atlantic. Similar efforts assisted the Island Campaign in the Pacific.

When the war ended, the success of OR in the war effort spurred interest in applying OR outside the military as well. By the early 1950s, OR had been used in a variety of organizations in business, industry and government.

The increase in the use of computers further advanced the spread of Operations Research. In the 1950s, Operations Research societies were established in England and in the United States. Operations Research was also made an academic discipline when it was first offered as a course in the Massachusetts Institute of Technology in 1948 and in the University of Birmingham in the early 1950s.

In the 1970s many winners of the Nobel Prize won due to their contributions to Operations Research. In this modern era, the usage of fifth generation computers will lead to the processing of information using complex models, optimization and simulations and thus Operations Research techniques will develop even further.

### DEFINITION OF OR

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A technique for the management wherein to solve complex problems that arise from the management of man-machine systems such as the management of resources in industry, business, government and defense. The way to conceive the problem is by building scientific models for the system that include factors such as the end-chances in order to have forecast, decisions and strategies that can help managers and administrators to form policies and take action in a scientific manner.

Operations Research Society of India

### DEFINITION OF OR

#### Thecasesolutions.com

Operations Research is concerned with choosing the best way to handle operational systems in a scientific manner ready with the use of better resources.

Operations Research Society of India

### SCIENTIFIC METHODS

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Scientific method refers to any method that can be proved. The steps that are involved in solving a problem by the scientific method are as follows:

1. Define the problem and the observation method.
2. Observations are made in various situations to understand the problem environment.
3. A hypothesis is put forward based on the observations.
4. Experiments are designed to test the hypothesis.
5. Experiments are carried out, measurements taken and reported.
6. The conclusion is examined, the hypothesis is accepted or rejected.

### LESSON OUTCOMES:

#### Thecasesolutions.com

1. Define operations research
2. Identify the basic steps of operations research
3. Identify model in operations research and the characteristics of good models

### MODELS IN OR

#### Definition of Model

A model is a representation of a reality and can take the form of a graph, and can be physical or mathematical.

#### TYPES OF MODELS

1. Iconic Model  
Iconic model can mean physical representation and can be tangible or intangible. One which is tangible, the construction of an actual model and the object that represents another scene.

2. Analogous Model  
Analogous models are used in physical research to represent a number of physical phenomena. An analogous model may be in the form of a diagram and a descriptive language etc.

3. Symbolic Model  
A symbolic or mathematical model represents a problem with the use of symbols. This model is known as Symbolic Operations Research. A symbolic or mathematical model uses its symbols with the use of symbols. This model is frequently used in Operations Research.

4. Simulation Model  
Simulation models are used when the system under study is too complex and other models cannot satisfactorily represent the system.

#### CHARACTERISTICS OF GOOD MODEL

- The model should be:
1. Easy to understand
  2. Easily manipulated
  3. Realistic in its own way to obtain a solution that is not reasonable
  4. Complete in its structure
  5. Easy to present

### INTER-DISCIPLINARY APPROACH

#### Thecasesolutions.com

Operations Research uses techniques and knowledge from various disciplines. This is based on the fact that a decision maker does not have all the knowledge and experience to understand all aspects of a problem facing an organization. Hence, a group of experts is formed who can solve various types of quantitative management problems. The group consists of mathematicians, statisticians, programmers, theorists, behavioral scientists, economists, etc. Hence, the multi-disciplinary approach to problem solving that can lead to more effective decisions.

### STEPS IN OR

#### Thecasesolutions.com

Identify the problem

Build a mathematical model that represents the system under study

Test the model and obtain a solution.

Maintain the system.

#### DISCUSS IN PAIR

1. "Operations Research" can be defined in many ways. Give a definition from what you understand of Operations Research.
2. What is the function of a model in decision making? Explain briefly 4 types of models. Give 4 characteristics of a good model.
3. Give 2 advantages of using Operations Research to solve problems.
4. How can Operations Research aid management in decision making?
5. Model building is an important part of Operations Research. Name 2 types of models and give an example for each type of model.
6. Explain the meaning of "Operations Research".
7. Explain the steps involved in solving problems in Operations Research.

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### DEFINITION OF OR (1)

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A technique that uses mathematical sciences to solve complex problems that arise from the management of man-machine systems such as the management of resources in industry, business, government and defence. The way to overcome the problems is by building scientific models for the system that include factors with a risk and change in order to form forecast, decisions and strategies. This can help managers and administrators to form policies and take action in a scientific manner.

Operation Research Society of the LOTZ

### MODELS IN OR

#### Definition of Model

A model is a representation of a reality and can take the form of a graph, and can be physical or mathematical.

#### TYPES OF MODELS

1. Iconic Model  
An iconic model is a direct physical representation and may be larger or smaller than what it represents. The characteristics of an iconic model and the objects that it represents are the same.

2. Analogue Model  
Analogue models use one set of physical movements to represent another set of physical movements. An analogue model may be in the form of a diagram such as a demand curve, histograms, etc.

3. Symbolic Model  
A symbolic or mathematical model represents a problem with the use of symbols. This model is frequently used in Operations Research. A symbolic or mathematical model represents a problem with the use of symbols. This model is frequently used in Operations Research.

4. Simulation Models  
Simulation models are used to represent a system under study in a simplified and/or idealized manner. Simulation models are used to represent a system under study in a simplified and/or idealized manner.

#### CHARACTERISTICS OF GOOD MODEL

The model should be:  
1. Easy to understand.  
2. Easily manipulated.  
3. Robust (i.e. it is not easy to obtain a solution that is not reasonable).  
4. Complete in its structure.  
5. Easy to present.

#### LESSON OUTCOMES:

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*Operation Research Society of the U.K*

## DEFINITION OF OR (2)

**Thecasesolutions.com**

Operations Research is concerned with choosing the best way to handle man-machine system in a scientific manner usually with the use of limited resources.

*Operation Research Society of the U.S*



## INTER-DISCIPLINARY APPROACH

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Operations Research uses techniques and knowledge from various disciplines. This is based on the fact that a decision maker does not have sufficient knowledge and expertise to understand all aspects of a problem facing an organisation. Hence, a group of experts is formed who can solve various types of quantitative management problems. This group consists of mathematicians, scientists, programmers, financiers, behavioural science experts and others. The multi-disciplinary approach to problem solving thus can lead to a more informed decision.



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# STEPS IN OR

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that represents the system  
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Test the model and obtain a  
solution.

Maintain the system.