

Summary Document
Module 1: Problem Solving Skills
Session 4: Analysing the Problem

In this session, you learnt how to approach a problem with the help of different frameworks.

Segment 2: Building a Hypothesis

In this segment, you learnt that hypothesis is an assertion or a supposition that can be validated. With the help of the furniture shop example, you understood that a hypothesis can be positive as well as negative.

The two main components of a hypothesis are as follows:

- Independent variable
- Dependent variable

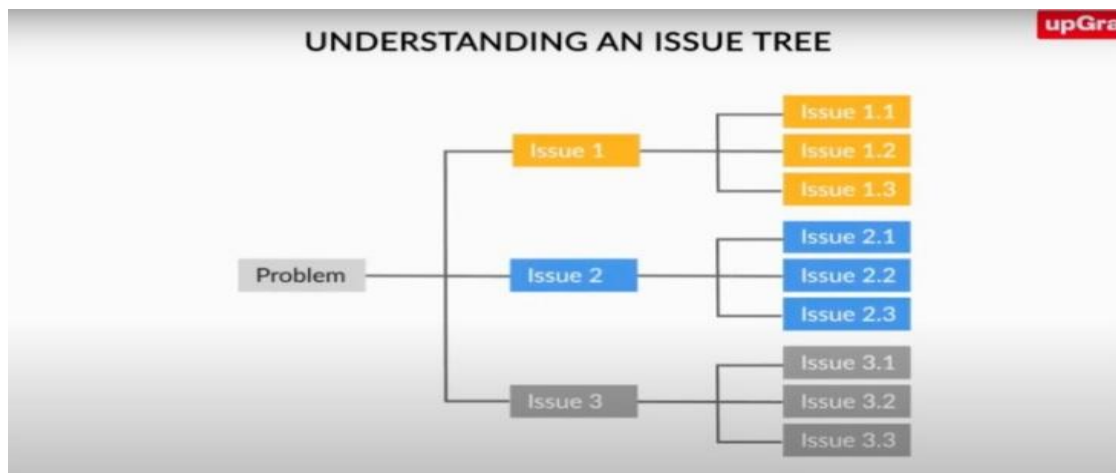
While forming a hypothesis, it is important to remember the following:

- Not all hypotheses that you form need to be true or correct.
- Eliminating hypotheses is a part of the solution.
- It is important to identify what does not explain a problem as it is to identify what does.
- The most effective hypothesis is written in a specific manner. The more specific it is, the more precise testing can be done and the more precise actions can be taken.

Segment 3: Validating a Hypothesis

After you have formed your hypothesis, the next step is to test the same. In this segment, you learnt about the issue tree framework that can be used to validate your hypothesis.

An issue tree depicts a series of logical conditions and sub conditions, which are more detailed and specific issues, which if proven true, prove that the hypothesis is correct.



For a hypothesis to be true, at least one of the two conditions and the sub conditions associated with it must be true.

You then learnt, with the help of the LED bulb company's example, how the issue tree can be used to validate hypotheses and concluded that the decline in the profit was due to the decline in the revenue.

Next, you learnt about the two different types of issue trees that are common in problem solving:

1. Probabilistic decision analysis: This method takes into account the probability of occurrence of all the outcomes that you are evaluating. The main objective of this method is to identify the most appropriate option when the probabilistic outcomes have uncertain pay-offs, or the costs associated with them are not clear.
2. Precedence chart: The key objective of this method is to determine the series of steps that are required to achieve a goal.

Segment 4: MECE Approach

In this segment, you learnt about the best way to frame your hypothesis. An important aspect of forming a hypothesis is the MECE principle. MECE stands for Mutually Exclusive and Collectively Exhaustive. It is a method of grouping information into elements that are mutually exclusive and collectively exhaustive. You also learnt 'mutually exclusive' means that the items/elements can only fit into one category at a time, and 'collectively exhaustive' means all items can fit into one of the categories.

Next, with the help of an example, you learnt how the MECE approach helped Sam to classify the students into different categories based on their marks.

You then learnt about the different approaches that can be used to solve complex problems and assure that the possible solutions follow the MECE principle. Some of these approaches are as follows:

- Applying a formula
- Following the value chain
- Following known processes
- Going with the established list

Segment 5: MECE Consideration

In this segment, you learnt about various practices that should be followed while forming and testing a hypothesis. Few important considerations to keep in mind while formulating hypotheses and issue trees are as follows:

- Do not make a wild guess; your hypothesis should be based on valid assumptions based on the available data.
- Do not rely on your hypothesis blindly. You must question your hypothesis at every step until it is proved right.

- Involve other members of your team while formulating a hypothesis.
- Keep refining the hypothesis until you reach the final solution.
- Do not manipulate or adjust the data to prove your hypothesis. The hypothesis should be formed without any biases.
- It is important to consider both quantitative and qualitative aspects while framing a hypothesis.

Complying with these practices can help you devise an effective solution to the problem.

Segment 6: Root Cause of Issues

In this segment, you learnt about the root cause analysis, which is a critical approach to analyse a problem. The two frameworks that can be used to reach the root cause of a problem are:

- 5 whys technique and
- Fish-Bone diagram.

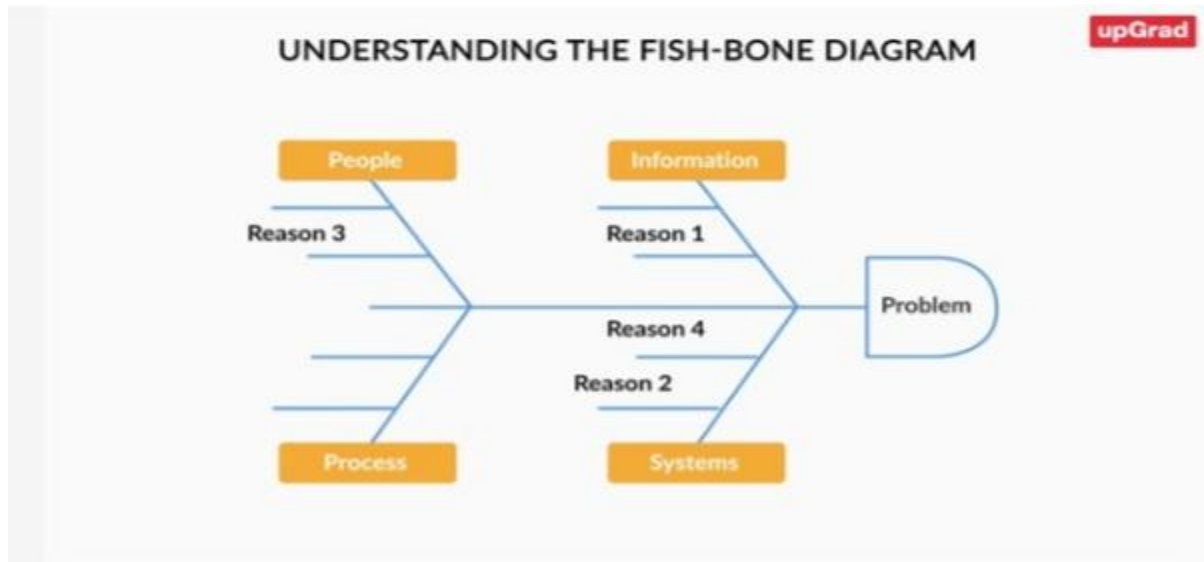
You also learnt that the 5 whys technique is used to identify the most logical underlying cause of a problem, and as the name suggests, this technique involves asking the question 'Why' five times so that you are able to reach the root cause of the problem rather than dwelling on the superficial causes that are actually the effects of the root cause.

Next, with the help of an example, you understood how the company applied the 5 whys technique to solve the problem of lost sales.

You also learnt that the root cause of the problem is very different from the problem on the surface; hence, it is important to spend time on asking questions to reach the root cause of the problem.

An important advantage of this technique is that it does not involve any advanced concepts such as statistical analysis and therefore can be learnt in a short period of time. However, this technique does not work effectively when there are multiple causes or solutions to the problem and therefore may not always produce a consistent result.

Finally, you learnt about the Fish-Bone diagram and how it can be used to reach the root cause of the problem. The Fish-Bone diagram is also known as the 'cause and effect' diagram or the 'Ishikawa diagram' and is a visualisation tool. This technique helps in ideating and categorising the potential causes of a problem in an intuitive manner.



Additionally, you also learnt about the Pareto principle, which states that almost 80% of the outcomes are a result of 20% of causes. Hence, to get to the desired goal in a more effective manner, you should focus more on these 20% causes. For example, while preparing for an exam at the last minute, the students can focus on the 20% of the topics that contain the maximum marks.

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