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1.) Define the problem

This is the most important part of modelling process. The basic requirement is a clear and detailed statement of the problem. This involves identifying symptoms, underlying causes and impacts.

Example: A certain company observes a decline in their customer satisfaction.

You might be opt to gather direct feedback from the customer through surveys, interviews and many more to help in identifying the problem. You will also define the scope to narrow down the problem.

The survey, based on the example above might reveal that customers are unhappy with customer service response time. The scope indicates that it is more prevalent on regions who are very far from the company.

The poblem definition might be: "Customer satisfaction have dropped by 10% over the past years. We naust observe the root cause of this."

2.) Developing a Model

- This involves creating a representation of the problem in order to understand its dynamics, factors and significance. It is a mathematical representation of the situation

Example: For customer satisfaction, you might need to develop a model that caters various factors such as product quality, delivery duration, customer treatment etc.

You might need to visualize the relationship between these factors through flowcharts. this will help you identify the more significant factors and illustrate how each of them are related.

You might also need to use quantitative methods to predict how impactful changes to different factors affect customer service. You might use multiple linear regression to asses and examine the product quality, delay time, customer response and many more.

3.) Acquiring Input Data

→ In this step, you will collect and prepare the needed and relevant data to support your decision-making and analysis. You need to make sure that the data collected is relevant to the problem by collecting new data. You also need to preprocess the data such as handling missing values to ensure it's accuracy.

Based on the problem defined:

* You need to collect sales data from the point-of-sale system, customer surveys and interviews, marketing report and many more. Also gather demographic data from regions more prone to the problem.
* After gathering, perform data cleaning to correct errors such as handling missing values by interpolation or exclusion.

4.) Developing Solutions

- This include finding the optimal solution that optimize the problem by manipulating model variables.

This includes:

Solving Equations -> Derive equations from your model that describes the relationship between the factors and the objective. Solve this to identify the values that will help the objective.

Trial and Error -> try different approaches to identify the most effective solution.

Example:

* Try different customer service training program. Select the program that leads to the higest improvement.

Complete Enumeration -> Evaluate all possible solutions

Example

* list all of the possible structures, discounts or pricing. Evaluate each strategy to determine the best possible solution.

5.) Testing Solution

-> Involves verifying both input data and model accuracy before the analysis and implementation.

* Verifying Input data

-> ensures the completeness and accuracy of the data.

Example:

verifying customer feedback scores and compare them to different periods to ensure trends.

* Testing Model

-> validate the model to ensure it relates to the problem

Example:

Use a separate dataset to test the models accuracy. Adjust input variables and try to evaluat how these affects the models accuracy

* Collecting New Data
  → After implementing a solution such as enhanced customer service, collect recent feedbacks to assess the prediction of the model.

  Ensure that the data is logical and consistent.

6.) Analyzing Results
- involves determining the implications of the solution, understanding its impact and assess the outcome. It ensures that solution is robust and feasible.

* Determine the Implication of the Solution
  Assess the consequences of implementing a solution

  Example:
  The training program will require time for development delivery, adjustments on schedule and customer service changes

* Study and understand the Impact of the Action
  → Evalute the effects of the proposed changes.

  Example:
  Identify risks such as customer back-lash or potential margic error.

7.) Implementing Results
- involves incorporating the solution into the company's operations. The solution is integrated into daily operations. It can be difficult, especially if employees resist changes.

Example:
The training program is rolled out to all customer service employee. Some employee may resist the new training because it disrupts their daily routine. If the training is not implemented, the customer satisfaction may not improve