Chapter-16 Working with What-If Analysis Scenario Manager in MS Excel

What-If Analysis in Microsoft Excel allows you to explore various scenarios by changing the values of different variables in your data model. One of the advanced tools within **What-If Analysis** is the **Scenario Manager**, which enables you to define and compare multiple sets of input values (called scenarios) to see how they affect the outcome of your model.

What is the Scenario Manager?

The **Scenario Manager** in Excel allows you to create and manage different sets of values (scenarios) for your model and analyze how these values impact the results. This is particularly useful for comparing multiple possible outcomes based on different assumptions, such as forecasting sales with varying cost, price, or quantity assumptions.

How Scenario Manager Works

1. **Define multiple scenarios**: You can define several scenarios, each with its own set of input values for certain cells.
2. **View and compare results**: You can switch between scenarios to see how the result of your formula changes based on different inputs.
3. **Create summary reports**: After comparing scenarios, you can generate a summary report that shows the results of all the scenarios side-by-side.

Steps to Use the Scenario Manager in Excel

1. Prepare Your Spreadsheet

To use the Scenario Manager, your spreadsheet should contain a formula that depends on several input values. These input values will change between different scenarios, and you want to see how they affect the outcome.

Example: Suppose you have the following simple profit calculation:

- **Sales (A1)**: 10,000 units sold.
- **Price per Unit (A2)**: $50 per unit.
- **Cost per Unit (A3)**: $30 per unit.
- **Profit (A4)**: Formula =A1 * (A2 – A3).

In this case, the **Profit** depends on **Sales**, **Price per Unit**, and **Cost per Unit**.

2. Access Scenario Manager

1. Go to the **Data** tab in the Excel ribbon.
2. In the **Forecast** group, click on **What-If Analysis**.
3. Select **Scenario Manager** from the dropdown menu.

3. Add a Scenario

1. In the **Scenario Manager** dialog box, click **Add** to create a new scenario.
2. In the **Scenario Name** field, enter a name for the scenario (e.g., "Best Case", "Worst Case", "Base Case").
3. In the **Changing Cells** field, enter the cell references for the input cells that you will change in this scenario (e.g., **A1**, **A2**, **A3**).
4. Click **OK** to proceed.

4. Define the Values for the Scenario

After clicking **OK**, the **Scenario Values** dialog box will appear. Here, you will define the specific values for the input cells for this scenario.

- **Base Case** (or initial scenario): If you're starting with the current state, just enter the current values in the appropriate fields.
- For **Best Case** or **Worst Case** scenarios, you would enter different values for Sales, Price per Unit, and Cost per Unit.

For example:

- **Base Case**: Sales = 10,000, Price = $50, Cost = $30.
- **Best Case**: Sales = 12,000, Price = $55, Cost = $25.
- **Worst Case**: Sales = 8,000, Price = $45, Cost = $35.

Click **OK** to save the scenario.

5. Add More Scenarios

Repeat the **Add** process to create additional scenarios. You can define as many scenarios as necessary. Each scenario will represent a different combination of input values.

6. View and Compare Scenarios

To view the results of each scenario:

1. In the **Scenario Manager**, select the scenario you want to view.
2. Click **Show** to apply the scenario to your spreadsheet.

3. The values for the input cells will change according to the scenario, and the result (e.g., Profit) will update automatically.

7. Generate a Summary Report

You can generate a summary report that shows how the results of all your scenarios compare side by side:

1. In the **Scenario Manager** dialog box, click **Summary**.
2. In the **Scenario Summary** dialog box, select the **Result Cell** (the cell containing the formula whose outcome you want to track — in this example, it would be **A4** for Profit).
3. Click **OK** to generate the summary report.

Excel will create a new worksheet that displays the values of the changing cells for each scenario, along with the resulting output (Profit, in this case).

Example: Creating a Scenario to Forecast Profit

Let's say you want to forecast your company's profit based on different sales assumptions. Here's how you can use the Scenario Manager to explore different scenarios:

1. **Set up your model**:
   o **Sales (A1)**: 10,000 units (initial value).
   o **Price per Unit (A2)**: $50 (initial value).
   o **Cost per Unit (A3)**: $30 (initial value).
   o **Profit (A4)**: Formula =A1 * (A2 - A3).
2. **Access Scenario Manager**:
   o Go to **Data > What-If Analysis > Scenario Manager**.
3. **Create Scenarios**:
   o **Base Case**: Sales = 10,000, Price = $50, Cost = $30.
   o **Best Case**: Sales = 12,000, Price = $55, Cost = $25.
   o **Worst Case**: Sales = 8,000, Price = $45, Cost = $35.
4. **Create the Summary Report**:
   o Click **Summary** in the Scenario Manager and select **A4 (Profit)** as the result cell.
   o Excel will generate a report showing the profit for each scenario (Base, Best, Worst Case).

Benefits of Using Scenario Manager

- **Compare Different Scenarios**: Scenario Manager lets you easily compare how different assumptions affect the results of your model.

- **What-If Scenarios for Planning**: It's useful for forecasting and planning in financial models, budgeting, sales projections, and more.
- **Efficiently Analyze Risk**: Helps to visualize the impact of different possible outcomes, which can be crucial for decision-making.
- **Simple Interface**: It allows non-experts to perform complex "what-if" analysis without the need for complicated formulas or programming.

Limitations of Scenario Manager

- **Manual Input for Each Scenario**: Unlike tools like **Solver**, which can automatically find the optimal solution based on constraints, the Scenario Manager requires you to define the scenarios manually.
- **Fixed Input Cells**: You can only specify a fixed set of input cells for each scenario. If the number of variables changes frequently, the Scenario Manager might not be the best option.
- **Limited to a Maximum of 32 Changing Cells**: Excel allows up to 32 changing cells in a scenario, which can be restrictive for very complex models.