Software Manuals

### Problem Statement

While working on new projects, there are many questions that needs to be answered. Some of them are:

* How long each task is going to take in the project.
* Projected Estimate for their fixed expense. (The problem is, they want to look at a range of different scenarios. So, they see what happens if it's 5%, or how much it will be if it increases to 14%.)
* How many products they must produce for the break even.
* What expected projected profit if sale price and quantity sold is adjust.
* How many products they need to produce to get a minimum of $80,000 profit?
* How much money they make if they finish the task in 20 weeks.
* Company wishes to maximize the profit.

Answering these questions is always possible through manual efforts, but it has a couple of downsides:  
 1. Time consuming process

2. Possibility of human errors

3. Not robust and scalable

To solve these issues, we require an automated system that can answer these questions with accuracy and without consuming much human time and effort.

### Approach

* Broken down the task into several tasks. Then estimate how long each task is going to take in the project for this use project management technique called Program Evaluation Review Technique (PERT) which is used to calculate the amount of time it will take to realistically finish a Task.
* For the Projected Estimate for their fixed expense, I have last year fixed expense, so I use data table to see different outcomes for the different expense increase.
* Implement a model and supply Excel with a variety of inputs to get robust results. Then analyse and create different scenarios for sale price versus quantity sold for optimum solution.
* Finding the optimal parameters so that we can maximize revenues, minimize costs, and optimize outcomes.

## **Solutions**

* Company has to produce minimum 7 manuals for no loss.
* The sale price is $35 and the quantity sold per manual is 2140 then the company has to produce 12 manuals for $80,000 in profit.
* If the Sale price is decrease/increase by $5 then quantity sold per manual is increase/decrease by 15% but the projected profit is not looking good.

| **Scenario Summary** | |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Current Values: | Current Price | Price Decrease | Price Increase |
| **Changing Cells:** | |  |  |  |  |
|  | **Sale\_Price** | $35.00 | $35.00 | $30.00 | $40.00 |
|  | **Quantity\_Sold\_\_Per\_Manual** | 2,140 | 2,140 | 2,461 | 1,819 |
| **Result Cells:** | |  |  |  |  |
|  | **Projected\_Profit** | $80,000.00 | $80,000.00 | $67,594.20 | $55,188.41 |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

Mandated Constraints

Only allowed to have 12 staff maximum and those staff are not prepared to work more than eight hours a day, although they are prepared to extend that to six days a week.

**The company currently produces 12 manuals and wishes to maximise profits**

If Company has to complete the task in 20 weeks, look at the projected profit, that's not looking so good because the problem is with all this overtime work to pay for, it is eating into our profits quite badly.

| **Scenario Summary** | |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Current Values: | 20 weeks | 30 weeks | 21 weeks | 42 weeks |
|  |  |  | Created by Aastha on 8/18/2022 | Created by Aastha on 18-08-2022 | Created by Aastha on 8/18/2022 | Created by Aastha on 8/18/2022 |
| **Changing Cells:** | |  |  |  |  |  |
|  | **Total\_staff** | 10 | 11 | 10 | 12 | 10 |
|  | **Working\_day\_\_hours** | 7 | 9 | 8 | 8 | 7 |
|  | **Working\_week\_\_days** | 4 | 6 | 5 | 6 | 4 |
| **Result Cells:** | |  |  |  |  |  |
|  | **Projected\_Profit** | $1,98,800.00 | -$1,00,225.42 | $86,300.00 | -$44,950.00 | $1,98,800.00 |