**Introduction**

NuWave is a startup company that offers a wide range of electronic gadgets and accessories like fitness bands, smartwatches, chargers, cables, etc.

They manufacture their own products but procure raw materials from other companies since they can't afford to build their own research and development department at present.

**Situation**

NuWave wants to launch a **new smartwatch,** which will be one of their **flagship** products. They plan to launch the watch with an **OLED display.**

They intend to first enter the market and gain **at least 5% of the market share.**

As a new player in the smartwatch market, they want to price the watch lower than their competition (selling at ₹ 7,799).

The demand in such a market is elastic, meaning a small price change can cause a significant change in demand.

To achieve 5% of the market share, NuWave needs to sell at least **1,800 units per day.** Assume NuWave can **completely fulfil the demand for the day**.

**Complication**

For NuWave to sell 1,800 smartwatches a day, they need to have a certain level of inventory.

Each smartwatch requires **one OLED panel.** For smooth production, they need to have its stock as well.

NuWave approached Samsung for acquiring the panels. Samsung quoted the price at **₹ 1,475 for one unit.** The price will decrease as the order quantity increases.

NuWave can store only 2000 OLED panels in their own facility. To store more, they need a warehouse, which will cost them **₹ 12,000/day.** They can store **10,000 OLED panel units in one warehouse.**

The warehouse should **not be underutilized.**

Now, as a business analyst at NuWave, **your job is to find out:**

1. **At what price** should they sell *one*unit, to gain a 5% market share and earn at least a **2% profit margin?**
2. **Minimum order quantity**of panels at **that price point** so NuWave doesn't make a loss.

**Key Expectations from Analysis**

Build a spreadsheet model to find out the selling price of one smartwatch so that:

1. NuWave can gain a 5% market share.
   * (company sales/industry sales) over a period of time.
2. Earn at least a 2% profit margin.
   * (Revenue-cost)/Revenue

**SKILLS USED**

|  |  |  |
| --- | --- | --- |
| **Skill Stack** | **Tools & Techniques** | **Skill Levels** |
| Tools | Excel, Google Sheet | Basic |
| Analytical Skills | Data Collection | Intermediate |
| Data Analysis and modelling | Intermediate |
| Core Skills | Problem Solving | Intermediate |

**Data Collected**

Quote from Samsung: As order quantity increases, price per unit decreases.

|  |  |
| --- | --- |
| Order Quantity | cost/unit |
| 1 | ₹ 1,450 |
| 5,000 | ₹ 1,425 |
| 20,000 | ₹ 1,250 |
| 50,000 | ₹ 450 |

Based on Survey: Demand of product increases, as price decreases.

|  |  |
| --- | --- |
| Selling Price | Demand |
| ₹ 8,000 | 175 |
| ₹ 5,000 | 10,500 |

**Approach**

# Having understood the problem and the business process, this section outlines the high-level approach necessary for solving this experience. Entire Data Modelling is divided into three milestones for detailed Analysis.

**MILESTONES**

**MS1: Finding Relationship between Order Quantity and Cost of OLED Panel.**

Given Data:

|  |  |
| --- | --- |
| Order Quantity | cost/unit |
| 1 | ₹ 1,450 |
| 5,000 | ₹ 1,425 |
| 20,000 | ₹ 1,250 |
| 50,000 | ₹ 450 |

Order – Cost Relation Graph:

Analysis of Three lines:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Line 1 | Line 2 | Line 3 |
| Intercept | 1450.005001 | 1483.333333 | 1783.333333 |
| Slope | -0.005001 | -0.011666667 | -0.02051470 |

* Here in Line 3 slope decreases more than Line 1 and 2 slopes. This indicates ordering bulk quantity decreases the price per unit panel.

Model Table for Relation between Order Quantity and Per unit panel price:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Order Quantity | Price/Unit | Price/Unit | Price/Unit | Min |
| 1 | ₹ 1,450 | ₹ 1,450 | ₹ 1,450 | ₹ 1,450 |
| 1,000 | 1445.004001 | 1471.666667 | 1762.818625 | ₹ 1,445 |
| 5,000 | 1425 | 1425 | 1680.759792 | ₹ 1,425 |
| 10,000 | 1399.994999 | 1366.666667 | 1578.186252 | ₹ 1,367 |
| 15,000 | 1374.989998 | 1308.333333 | 1475.612711 | ₹ 1,308 |
| 20,000 | 1349.984997 | 1250 | 1373.03917 | ₹ 1,250 |
| 25,000 | 1324.979996 | 1191.666667 | 1270.465629 | ₹ 1,192 |
| 30,000 | 1299.974995 | 1133.333333 | 1167.892088 | ₹ 1,133 |
| 35,000 | 1274.969994 | 1075 | 1065.318547 | ₹ 1,065 |
| 40,000 | 1249.964993 | 1016.666667 | 962.7450065 | ₹ 963 |
| 45,000 | 1224.959992 | 958.3333333 | 860.1714656 | ₹ 860 |
| 50,000 | 1199.954991 | 900 | 757.5979247 | ₹ 758 |
| 55,000 | 1174.94999 | 841.6666667 | 655.0243839 | ₹ 655 |

**MS2: Finding Relation between Price and Demand based on collected Data.**

|  |  |
| --- | --- |
| Selling Price | Demand |
| ₹ 8,000 | 175 |
| ₹ 5,000 | 10,500 |

|  |  |
| --- | --- |
| Intercept | 8050.847458 |
| Slope | -0.2905569 |

Based on Intercept and slope we can find the price for the required number of units to be sold. Below is the model table for the price and demand relationship.

|  |  |
| --- | --- |
| **Selling Price** | **Demand** |
| ₹ 8,000 | 175 |
| ₹ 5,000 | 10,500 |
| ₹ 7,511 | 1800 |
| ₹ 6,551 | 5000 |
| ₹ 6,251 | 6000 |
| ₹ 5,051 | 10000 |
| ₹ 4,451 | 12000 |
| ₹ 3,851 | 14000 |
| ₹ 3,251 | 16000 |
| ₹ 2,651 | 18000 |
| ₹ 2,051 | 20000 |
| ₹ 1,451 | 22000 |
| ₹ 851 | 24000 |
| ₹ 251 | 26000 |

**MS3: Creating price model based on above two milestone observations.**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Internal | Warehouse | Total |
| Capacity | 2000 | 10000 | 12000 |

Other Costs:

|  |  |
| --- | --- |
| Warehouse ₹/day | ₹ 12,000 |
| Other Cost Components/unit | ₹ 6,000 |

**Price Model:**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Order Quantity** | **Panel Cost/Unit** | **Total Cost/Unit** | **Warehouse Storage Days** | **Total Cost** | **Total Cost per unit** | **Total Revenue(Based on Demand)** | **Profit** | **Profit Margin** | **Total Revenue/unit** | **Required Profit Margin** | **Req Revenue per unit** |
| 1800 | ₹ 1,442 | ₹ 7,442 | 0 | ₹ 1,33,95,600 | ₹ 7,442 | ₹ 1,35,19,800 | ₹ 1,24,200 | 0.92% | ₹ 7,511 | 2.00% | ₹ 7,594 |
| 5000 | ₹ 1,425 | ₹ 7,425 | 2 | ₹ 3,71,49,000 | ₹ 7,430 | ₹ 3,27,55,000 | -₹ 43,94,000 | -13.41% | ₹ 6,551 | 2.00% | ₹ 7,581 |
| 6000 | ₹ 1,413 | ₹ 7,413 | 3 | ₹ 4,45,16,000 | ₹ 7,419 | ₹ 3,75,06,000 | -₹ 70,10,000 | -18.69% | ₹ 6,251 | 2.00% | ₹ 7,571 |
| 10000 | ₹ 1,367 | ₹ 7,367 | 5 | ₹ 7,37,26,667 | ₹ 7,373 | ₹ 5,05,10,000 | -₹ 2,32,16,667 | -45.96% | ₹ 5,051 | 2.00% | ₹ 7,523 |
| 12000 | ₹ 1,343 | ₹ 7,343 | 6 | ₹ 8,81,92,000 | ₹ 7,349 | ₹ 5,34,12,000 | -₹ 3,47,80,000 | -65.12% | ₹ 4,451 | 2.00% | ₹ 7,499 |
| 14000 | ₹ 1,320 | ₹ 7,320 | 7 | ₹ 10,25,64,000 | ₹ 7,326 | ₹ 5,39,14,000 | -₹ 4,86,50,000 | -90.24% | ₹ 3,851 | 2.00% | ₹ 7,476 |
| 16000 | ₹ 1,297 | ₹ 7,297 | 8 | ₹ 11,68,42,667 | ₹ 7,303 | ₹ 5,20,16,000 | -₹ 6,48,26,667 | -124.63% | ₹ 3,251 | 2.00% | ₹ 7,452 |
| 18000 | ₹ 1,273 | ₹ 7,273 | 9 | ₹ 13,10,28,000 | ₹ 7,279 | ₹ 4,77,18,000 | -₹ 8,33,10,000 | -174.59% | ₹ 2,651 | 2.00% | ₹ 7,428 |
| 20000 | ₹ 1,250 | ₹ 7,250 | 10 | ₹ 14,51,20,000 | ₹ 7,256 | ₹ 4,10,20,000 | -₹ 10,41,00,000 | -253.78% | ₹ 2,051 | 2.00% | ₹ 7,404 |
| 22000 | ₹ 1,227 | ₹ 7,227 | 12 | ₹ 15,91,30,667 | ₹ 7,233 | ₹ 3,19,22,000 | -₹ 12,72,08,667 | -398.50% | ₹ 1,451 | 2.00% | ₹ 7,381 |
| 24000 | ₹ 1,203 | ₹ 7,203 | 13 | ₹ 17,30,36,000 | ₹ 7,210 | ₹ 2,04,24,000 | -₹ 15,26,12,000 | -747.22% | ₹ 851 | 2.00% | ₹ 7,357 |
| 26000 | ₹ 1,180 | ₹ 7,180 | 14 | ₹ 18,68,48,000 | ₹ 7,186 | ₹ 65,26,000 | -₹ 18,03,22,000 | -2763.13% | ₹ 251 | 2.00% | ₹ 7,333 |

**Model Description:**

**Order Quantity – Total units produced at once/ ordered for manufacturing.**

**Panel Cost/Unit – Panel Cost per unit based on Order – Price per unit panel model (MS1).**

**Total Cost/Unit = Panel Cost/Unit+6000**

**Warehouse Storage Days – Calculated based on Order Quantity, Internal Capacity and Warehouse capacity.**

**Total Cost = (Total Cost/Unit \* Order Quantity) + (Warehouse Storage Days \* 12000).**

**Total Cost per unit = Total Cost/ Order Quantity.**

**Total Revenue (Based on Demand) – This metric is calculated based on the price we required from price – demand model which was developed in Milestone 2, multiplied with the Order Quantity.**

**Profit = Total Revenue (Based on Demand) - Total Cost.**

**Profit Margin = Profit/ Total Revenue (Based on Demand).**

**Total Revenue/unit = Total Revenue (Based on Demand)/ Order Quantity.**

**Required Profit Margin – 2% is the minimum required profit margin we are targeting.**

**Req Revenue per unit = Total Cost per unit/ (1- Required Profit Margin).**

**Analysis and conclusion based on Model Table:**

In the model table, we haven’t acquired the required profit margin based on price we have taken based on demand relationship. We have calculated the selling price that will meet the condition. As there is no huge difference between **Total Revenue/unit and Req Revenue per unit.** We can go for **Req Revenue per unit.**

To sell 1,800 watches per day, we need to set minimum selling price as ₹7,594.

**Excel Analysis:**

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