Conjoint Analysis

Market Simulator with Tableau

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# Question 1

To answer the question we assume that our Xiaomi smartphone is built with the **lowest attribute levels** which are:

* Screen = **LED**
* Sound = **Mono**
* Sim Card = **No Dual**
* Camera = **20 MP**
* Price = **$350**

Our boss wants to know:

1. What is the **Preference Share** of this product using:
   * **First Choice** model
   * **Logit** model
2. If we were to **change the price** ($300, $400, $450), how would that impact **revenue**?
3. What price gives the **highest revenue**, and by how much does it increase?

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* 1. Selected Xiaomi product is **P1b**, priced at **$350**:

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| ➤ First Choice Model: Pie chart (Market Share First Choice) shows:   * P1b (Xiaomi) = 10.80% * Samsung = 63.0% * Apple = 26.41% | ➤ **Logit Model:** Pie chart **(Market Share Logit)** shows:   * **P1b (Xiaomi)** = **13.40%** * Product 2 (Samsung) = 50.07% * Product 3 (Apple) = 36.53% |

**1.2** Revenue for each price level was calculated using the formula:

where Markrt volume is 10 million smart phones in the EMEA-region.

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| Product | Price ($) | Logit Share (%) | Revenue (in million $) |
| P1a | 300 | 18.2 | 300 × 10M × 0.182 = **546** |
| P1b | 350 | 13.4 | 350 × 10M × 0.134 = **469** |
| P1c | 400 | 6.7 | 400 × 10M × 0.067 = **268** |
| P1d | 450 | 3.6 | 450 × 10M × 0.036 = **162** |

**1.3** Considering the revenue:

* Max Revenue at $300 = $546M
* Current Revenue at $350 = $469M
* Revenue Gain:

**Conclusion:**

* Xiaomi smartphone with the current low-end configuration at a price $350 would secure:
  + **10.8%** market share under a First-Choice model
  + **13.4%** market share under a Logit model
* At a price of **$350**, the estimated revenue is **$469 million**
* The **optimal price point** based on revenue is **$300**, generating an estimated **$546 million**, a **$77 million increase** over the base case

## Question 2

To answer the question we are going to determine which **single attribute improvement** would yield the **highest revenue** for the new Xiaomi smartphone, assuming:

* Price is fixed at **$350**
* Market volume is **10 million units**
* Only one attribute (Screen, Sound, Sim Card, or Camera) can be upgraded from its base level

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*LED → QLED* *Mono → Stereo:*

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*No Dual → Dual:*  *20 MP → 60 MP:*

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| --- | --- | --- | --- | --- |
| Attribute | New level | First Choice share(%) | Logit share (%) | Revenue (M $) |
| Screen | QLED | 13.64 | 16.80 | 350 × 10M × 0.168 = 588 |
| Sound | Stereo | 29.55 | **31.33** | **350 × 10M × 0.3133 = 1,096.55** |
| Sim-card | Dual | 25.57 | 24.69 | 350 × 10M × 0.2469 = 846.15 |
| Camera | 60MP | 27.84 | 28.13 | 350 × 10M × 0.2813 = 984.55 |

**Conclusion:**

Among the single attribute improvements evaluated, upgrading the **Sound** from **Mono to Stereo** yields the **highest revenue**, with a Logit share of **31.33%** and an estimated revenue of **$1,096.55 million**.

## Question 3

R&D department gives us the opportunity to improve **two attributes**: **Screen** and **Sound**.

Each improvement comes with a **cost per unit**, and the goal is to find:

1. **Which configuration gives the highest revenue?**
2. **Which configuration gives the highest profit**, assuming:
   * Base production cost = **$200**
   * Market volume = **10 million smartphones**

The following table shows by how much the manufacturing cost per unit will increase for different attribute improvements.

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*LED + Mono (base) QLED + Mono*

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*OLED + Mono LED + Stereo* A comparison of a pie chart

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*QLED + Stereo OLED + Stereo*

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*LED + Atmos QLED + Atmos*

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*OLED + Atmos*

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| Screen | **Sound** | Cost($) | First Choice share(%) | Logit share (%) | Revenue (M$) | Profit(M$) |
| LED | **Mono** | 200 | 10.80 | 13.40 | 350 × 10M × 0.134 = 469 | (350-200) × 10M × 0.134 = 201 |
| QLED | **Mono** | 220 | 13.64 | 16.80 | 350 × 10M × 0.168 = 588 | (350-220) × 10M × 0.168 = 218.4 |
| OLED | **Mono** | 240 | 19.60 | 21.48 | 350 × 10M × 0.2148 = 751.8 | (350-240) × 10M × 0.2148 = 236.3 |
| LED | **Stereo** | 210 | 29.55 | 31.33 | 350 × 10M × 0.3133 = 1,096.6 | (350-210) × 10M × 0.3133 = 438.6 |
| QLED | **Stereo** | 230 | 40.34 | 39.68 | 350 × 10M × 0.3968 = 1,388.8 | (350-230) × 10M × 0.3968 = 476.2 |
| OLED | **Stereo** | 250 | 55.11 | 48.73 | 350 × 10M × 0.4873 = 1,705.6 | (350-250) × 10M × 0.4873 = **487.3** |
| LED | **Atmos** | 240 | 43.47 | 40.79 | 350 × 10M × 0.4079 = 1,427.6 | (350-240) × 10M × 0.4079 = 448.7 |
| QLED | **Atmos** | 260 | 51.70 | 48.41 | 350 × 10M × 0.4841 = 1,694.4 | (350-260) × 10M × 0.4841 = 435.7 |
| OLED | **Atmos** | 280 | **61.93** | **56.59** | 350 × 10M × 0.5659 = **1,980.7** | (350-280) × 10M × 0.4841 = 396.1 |

**Conclusion:**

* To **maximize revenue**, the optimal configuration is:
* **OLED screen + Atmos sound**
* Estimated Revenue: **$1,980.7 million**
* Cost per unit: $280
* To **maximize profit**, the optimal configuration is:
* **OLED screen + Stereo sound**
* Estimated Profit: **$487.3 million**
* Cost per unit: $250

Launching the **OLED + Stereo** model is the best balance of **high market share and optimal profitability**. This setup outperforms all others in profit, while still capturing nearly half the market.

## Question 4

Two key competitor changes have occurred:

* **Apple** upgrades its camera to **60 MP**, keeping the price at **$450**.
* **Samsung** cuts its price by **$50**, bringing it to **$350**.

Xiaomi can **only upgrade one attribute** of its base model. The goal is to identify which upgrade will **maximize profit**.

*Screen:**QLED Screen: OLED*

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*Sound: Stereo Sound: Atmos A comparison of a pie chart

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*Dual Sim Camera: 60MP*

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| New level | Cost ($) | First Choice share(%) | Logit share (%) | Revenue (M$) | Profit(M$) |
| QLED | 220 | 4.83 | 7.33 | 350 × 10M × 0.0733 = 256.55 | (350-220) × 10M × 0.134 = 95.29 |
| OLED | 240 | 6.25 | 10.14 | 350 × 10M × 0.1014 = 354.90 | (350-240) × 10M × 0.168 = 111.54 |
| Stereo | 210 | 8.24 | 13.84 | 350 × 10M × 0.1384 = 484.40 | (350-210) × 10M × 0.2148 = 193.76 |
| Atmos | 240 | **18.75** | **22.11** | 350 × 10M × 0.2211 = **773.85** | (350-240) × 10M × 0.3133 = **243.21** |
| DualSim | 220 | 11.36 | 12.69 | 350 × 10M × 0.1269 = 444.15 | (350-220) × 10M × 0.3968 = 164.97 |
| 60MP | 260 | 11.65 | 14.18 | 350 × 10M × 0.1418 = 496.30 | (350-260) × 10M × 0.4873 = 127.62 |

**Conclusion:**

In light of heightened competitive activity, Xiaomi’s best strategy is to:

**Upgrade Sound from Mono to Atmos**

This option results in:

* The **highest profit** among all single-attribute upgrades: **$243.2 million**
* A strong **Logit market share** of **22.11%**

Launching Xiaomi’s new smartphone with **Atmos sound**, priced at **$350** is the most profitable single-attribute upgrade in this competitive market.