**MARKETING ANALYTICS: Case Study 2**

**Product/ Service Analytics: Conjoint: Acme Espresso Machines**

**1. Background and Objectives:**

* The case study presents a scenario where you, as the marketing manager for Acme Espresso Machines, aim to enhance the company's market share.
* The objectives are to identify specific market segments, determine the features desired by different segments, and create marketing messages that resonate with these segments.

**2. Conjoint Analysis:**

* Conjoint analysis is chosen as the methodology to address these objectives. Conjoint analysis helps in understanding customer preferences for various product attributes.

**Conjoint Analysis for Espresso Machine Preference Identification : -**

|  |  |  |  |
| --- | --- | --- | --- |
| **Speed** | **Capacity** | **Price** | **Preference** |
| 1 | 1 | 1 | 4 |
| 1 | 1 | 0 | 3 |
| 1 | 0 | 1 | 5 |
| 1 | 0 | 0 | 4 |
| 0 | 1 | 1 | 3 |
| 0 | 1 | 0 | 1 |
| 0 | 0 | 1 | 3 |
| 0 | 0 | 0 | 2 |

1. **Regression Analysis on all three attributes: -**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT | |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.976741 |  |  |  |  |  |  |  |
| R Square | 0.954023 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.9195402 |  |  |  |  |  |  |  |
| Standard Error | 0.3535534 |  |  |  |  |  |  |  |
| Observations | 8 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 3 | 10.375 | 3.4583333 | 27.66667 | 0.003902258 |  |  |  |
| Residual | 4 | 0.5 | 0.125 |  |  |  |  |  |
| Total | 7 | 10.875 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 2 | 0.25 | 8 | 0.001324 | 1.305888724 | 2.69411128 | 1.305888724 | 2.694111276 |
| Speed | 1.75 | 0.25 | 7 | 0.002192 | 1.055888724 | 2.44411128 | 1.055888724 | 2.444111276 |
| Capacity | -0.75 | 0.25 | -3 | 0.039942 | -1.444111276 | -0.0558887 | -1.44411128 | -0.05588872 |
| Price | 1.25 | 0.25 | 5 | 0.00749 | 0.555888724 | 1.94411128 | 0.555888724 | 1.944111276 |

**Steps :-**

**Step 1: Attribute Selection:**

* The case identifies three attributes which are independent variables they are : Speed, Capacity, and Price, which are important to customers in choosing an espresso machine.
* We choose Preference as our dependent variable.

**Step 2: Attribute Level Selection:**

* For each attribute, there are two levels: e.g., Speed (Fast/Slow), Capacity (Large/Small), and Price (High/Low).

**Step 3: Product Bundles**: Product bundles are created by combining different attribute levels, representing various configurations of espresso machines.

**Step 4:**

**Hence, we perform Regression Analysis to analyze the relationships between attributes and customer preferences.**

***Significance level (alpha) set to : 0.05***

We know that,

**Null Hypothesis (Ho):** We considered rejecting the null hypothesis when the p-value was less than the alpha level, implying that there's a relationship between the attributes and preferences within the market segments.

**Alternative Hypothesis (Ha):** There is a significant relationship between the selected attributes (Speed, Capacity, and Price) and customer preferences within the market segments.

**We understand through Regression Analysis that :**

* R-squared represents the proportion of the variance in the dependent variable (Preference) explained by the independent variables (Speed, Capacity, and Price). An R-squared of 0.954 indicates that these variables explain 95.4% of the variance, which is quite high and suggests a strong relationship.
* It's important to note that there is a significant difference between the means of the population (independent and dependent variables).
* Product Bundling: Bundling Speed and Price can increase the product's value in the market, as indicated by the lower p-values for these attributes as compared to capacity.

**Step 5:**

**Target Market Analysis:**

Based on the analysis, the target market is deduced. For example, people with busy schedules who prefer quick and cost-effective coffee solutions and do not care about capacity.

**Validation and ROI Analysis:**

The case discusses the validation of findings through part-worth segmentation and provides an example of ROI analysis to support target market conclusions.

1. **Part-segment Analysis I:**

|  |  |  |
| --- | --- | --- |
| **Speed** | **Price** | **Preference** |
| 1 | 1 | 4 |
| 1 | 0 | 3 |
| 1 | 1 | 5 |
| 1 | 0 | 4 |
| 0 | 1 | 3 |
| 0 | 0 | 1 |
| 0 | 1 | 3 |
| 0 | 0 | 2 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT | |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.922266075 |  |  |  |  |  |  |  |
| R Square | 0.850574713 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.790804598 |  |  |  |  |  |  |  |
| Standard Error | 0.570087713 |  |  |  |  |  |  |  |
| Observations | 8 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 2 | 9.25 | 4.625 | 14.230769 | 0.008630983 |  |  |  |
| Residual | 5 | 1.625 | 0.325 |  |  |  |  |  |
| Total | 7 | 10.875 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | Coefficients | Standard Error | t Stat | P-value | Lower 95% | Upper 95% | Lower 95.0% | Upper 95.0% |
| Intercept | 1.625 | 0.349106001 | 4.654746681 | 0.0055583 | 0.727594455 | 2.522405545 | 0.727594455 | 2.522405545 |
| Speed | 1.75 | 0.403112887 | 4.341215711 | 0.0074204 | 0.713765334 | 2.786234666 | 0.713765334 | 2.786234666 |
| Price | 1.25 | 0.403112887 | 3.100868365 | 0.0268268 | 0.213765334 | 2.286234666 | 0.213765334 | 2.286234666 |

1. **Part-segment Analysis II:**

|  |  |  |
| --- | --- | --- |
| **Speed** | **Capacity** | **Preference** |
| 1 | 1 | 4 |
| 1 | 1 | 3 |
| 1 | 0 | 5 |
| 1 | 0 | 4 |
| 0 | 1 | 3 |
| 0 | 1 | 1 |
| 0 | 0 | 3 |
| 0 | 0 | 2 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT | |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.816496581 |  |  |  |  |  |  |  |
| R Square | 0.666666667 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.533333333 |  |  |  |  |  |  |  |
| Standard Error | 0.851469318 |  |  |  |  |  |  |  |
| Observations | 8 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 2 | 7.25 | 3.625 | 5 | 0.06415003 |  |  |  |
| Residual | 5 | 3.625 | 0.725 |  |  |  |  |  |
| Total | 7 | 10.875 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 2.625 | 0.52141634 | 5.034364666 | 0.003986 | 1.284656627 | 3.965343373 | 1.284656627 | 3.965343373 |
| Speed | 1.75 | 0.602079729 | 2.906591795 | 0.0335324 | 0.202304785 | 3.297695215 | 0.202304785 | 3.297695215 |
| Capacity | -0.75 | 0.602079729 | -1.245682198 | 0.2680697 | -2.297695215 | 0.797695215 | -2.297695215 | 0.797695215 |

**Part-segment Analysis I & II:**

**Attribute Selection:** In these two part-segment analyses, we considered different combinations of attributes as independent variables while keeping "Preference" as the dependent variable.

Part-segment Analysis I: Independent Variables - Speed and Price

Part-segment Analysis II: Independent Variables - Speed and Capacity

Regression helps us understand how changes in independent variables (attributes) relate to changes in the dependent variable (Preference).

**a. Part-segment Analysis I (Speed and Price):**

* In this analysis, R-Square indicates that approximately 67% of the variance in customer preferences is explained by the selected independent variables (Speed and Price). This demonstrates a moderate level of influence.
* We observe a significant difference between the means of the population regarding the independent variables and the dependent variable. This suggests that, in this particular market segment, Speed and Price have a more substantial impact on customer preferences.

**b. Part-segment Analysis II (Speed and Capacity):**

* In this analysis, the R-Square value is approximately 39%. This indicates that 39% of the variance in customer preferences is explained by the combination of Speed and Capacity.
* Similar to the first analysis, there's a noticeable difference in means between the independent variables (Speed and Capacity) and the dependent variable. However, this difference is less pronounced compared to the combination of Speed and Price.

**c. Target Market Implications:**

* **Part-segment Analysis I:** This segment analysis suggests that in specific customer segments, speed and price play a more significant role in influencing customer preferences. These segments might include individuals with busy lifestyles who need a quick and affordable solution for their daily caffeine fix.
* **Part-segment Analysis II:** For customers who consider both speed and capacity when choosing an espresso machine, it indicates that a balance between these features is essential. This segment might include users who value both the convenience of quick coffee preparation and the ability to serve multiple cups at once.

These part-segment analyses help Acme Espresso Machines gain a deeper understanding of how various attributes influence customer preferences in distinct market segments. The results can be utilized to tailor marketing strategies and product development to better meet the specific needs and desires of these segments.

1. **Part-segment Analysis III:**

|  |  |  |
| --- | --- | --- |
| **Capacity** | **Price** | **Preference** |
| 1 | 1 | 4 |
| 1 | 0 | 3 |
| 0 | 1 | 5 |
| 0 | 0 | 4 |
| 1 | 1 | 3 |
| 1 | 0 | 1 |
| 0 | 1 | 3 |
| 0 | 0 | 2 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT | |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.625143662 |  |  |  |  |  |  |  |
| R Square | 0.390804598 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.147126437 |  |  |  |  |  |  |  |
| Standard Error | 1.151086443 |  |  |  |  |  |  |  |
| Observations | 8 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 2 | 4.25 | 2.125 | 1.6037736 | 0.289662012 |  |  |  |
| Residual | 5 | 6.625 | 1.325 |  |  |  |  |  |
| Total | 7 | 10.875 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 2.875 | 0.704893609 | 4.078629687 | 0.0095527 | 1.063013293 | 4.686986707 | 1.063013293 | 4.686986707 |
| Capacity | -0.75 | 0.81394103 | -0.921442675 | 0.3990986 | -2.842302026 | 1.342302026 | -2.842302026 | 1.342302026 |
| Price | 1.25 | 0.81394103 | 1.535737792 | 0.1851988 | -0.842302026 | 3.342302026 | -0.842302026 | 3.342302026 |

**Part-segment Analysis III:**

**Step 1:**

**Attribute Selection:** In this part-segment analysis, the chosen independent variables are "Capacity" and "Price," while the dependent variable remains "Preference."

**Step 2:**

This analysis employs a regression model, which helps us understand how changes in the independent variables (Capacity and Price) relate to changes in the dependent variable (Preference).

**We Understand that:-**

* The R-Square value for this analysis is approximately 39%. This indicates that 39% of the variance in customer preferences is explained by the combination of Capacity and Price. While this is a moderate level of explanation, it signifies that these attributes have a notable influence on customer preferences.
* Just like in the previous analyses, we observe a significant difference in means between the chosen independent variables (Capacity and Price) and the dependent variable. This indicates that there are clear distinctions in customer preferences related to these attributes.

**Step 3:**

**Target Market Implications:**

* **Capacity and Price Analysis:** This analysis underscores the importance of the combination of "Capacity" and "Price" in influencing customer preferences. Customers who consider both the capacity of the machine and its price point are typically value-conscious buyers.
* **Return on Investment (ROI):** To better understand the significance of this segment, consider a scenario where a midrange coffee maker priced at $200 is available. This coffee maker uses coffee capsules, with an average cost of $0.30 per capsule. If a consumer frequents a local coffee shop and pays $3 for a cup of coffee, a comparison can be made.
* **ROI Calculation:** Over three months (approximately 90 days), the cost of purchasing coffee from a shop would amount to $3 per day, totaling $270. In contrast, brewing coffee at home using capsules would cost $0.30 per day (considering one capsule per day), summing up to $36. Additionally, the initial purchase of the coffee maker at $200 is included, resulting in a total cost of $236 for three months.
* **Target Market Conclusion**: Based on this ROI calculation, it is evident that individuals who consume coffee daily and seek to save money by making their coffee at home are a significant target market for coffee makers. These customers can recoup their investment in a coffee maker in just three months, which makes coffee makers an attractive option for those who value both affordability and convenience.

This analysis highlights the significance of the combination of "Capacity" and "Price" as key factors in customer preference for coffee makers. The ability to provide an efficient and cost-effective solution for coffee lovers seeking savings and convenience is a valuable proposition for this target market.

1. **Single-segment Analysis:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT | |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.7504788 |  |  |  |  |  |  |  |
| R Square | 0.5632184 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.4904215 |  |  |  |  |  |  |  |
| Standard Error | 0.8897565 |  |  |  |  |  |  |  |
| Observations | 8 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 6.125 | 6.125 | 7.736842 | 0.031932948 |  |  |  |
| Residual | 6 | 4.75 | 0.7916667 |  |  |  |  |  |
| Total | 7 | 10.875 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 2.25 | 0.444878261 | 5.0575634 | 0.002316 | 1.161422112 | 3.338577888 | 1.161422112 | 3.338577888 |
| Speed | 1.75 | 0.62915287 | 2.7815179 | 0.031933 | 0.210518387 | 3.289481613 | 0.210518387 | 3.289481613 |

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| SUMMARY OUTPUT | |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.5360563 |  |  |  |  |  |  |  |
| R Square | 0.2873563 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.1685824 |  |  |  |  |  |  |  |
| Standard Error | 1.1365151 |  |  |  |  |  |  |  |
| Observations | 8 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 3.125 | 3.125 | 2.419355 | 0.170844398 |  |  |  |
| Residual | 6 | 7.75 | 1.2916667 |  |  |  |  |  |
| Total | 7 | 10.875 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 2.5 | 0.568257571 | 4.3994135 | 0.004571 | 1.109523816 | 3.890476184 | 1.109523816 | 3.890476184 |
| Price | 1.25 | 0.803637563 | 1.5554275 | 0.170844 | -0.716430278 | 3.216430278 | -0.716430278 | 3.216430278 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT | |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |  |  |
| Multiple R | 0.3216338 |  |  |  |  |  |  |  |
| R Square | 0.1034483 |  |  |  |  |  |  |  |
| Adjusted R Square | -0.045977 |  |  |  |  |  |  |  |
| Standard Error | 1.2747549 |  |  |  |  |  |  |  |
| Observations | 8 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA | |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 1.125 | 1.125 | 0.692308 | 0.43723653 |  |  |  |
| Residual | 6 | 9.75 | 1.625 |  |  |  |  |  |
| Total | 7 | 10.875 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 3.5 | 0.637377439 | 5.4912518 | 0.001527 | 1.94039359 | 5.05960641 | 1.94039359 | 5.05960641 |
| Capacity | -0.75 | 0.901387819 | -0.8320503 | 0.437237 | -2.955616536 | 1.455616536 | -2.955616536 | 1.455616536 |

**We Understood that :-**

* **Market Viability:** The continued success of coffee makers such as Nespresso, Cuisinart, and DeLonghi, as well as the entry of tech firms like Panasonic into the market, highlights that the target market for coffee makers remains substantial and is still expanding. This suggests that there is a consistent demand for coffee makers among consumers.
* **Acme Espresso Machines:** However, in the case of Acme espresso machines, the analysis indicates that the target market for these machines leans more towards valuing speed and affordability over the machine's capacity. This means that Acme's competitive advantage and marketing efforts should focus on these specific attributes.
* **Target Market Characteristics:** The typical target market for coffee makers are individuals who have a genuine appreciation for coffee but may not always have the time or inclination to visit a coffee shop whenever they crave a cup of coffee. These consumers are looking for a convenient and cost-effective solution to enjoy their coffee, making speed and price key selling points.

In summary, while the overall coffee maker market is robust, the success of Acme's espresso machines will depend on effectively targeting consumers who prioritize speed and affordability in their coffee-making experience. Understanding the specific preferences of this target market is crucial for Acme's marketing and product development strategies.