**Homework1: Power Tool Segmentation Case**

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1. **Calculating willingness-to-pay**

(5 points) Calculating willingness-to-pay: In the 2-segment case, calculate the first consumer segment’s willing to pay for a top slider over a side slider switch. Report this willingness-to-pay. Show how you set up your calculations, and discuss your findings.

1. Calculating the dollar value of 1 utility

In the first segment of the 2-segment case, the part-worth of Price and Switch Type are:

|  |  |
| --- | --- |
| **Price** | **Part-worth** |
| $79 | 0.30112 |
| $99 | -0.13992 |
| $129 | -0.16121 |

|  |  |
| --- | --- |
| **Switch Type** | **Part-worth** |
| Paddle | -0.71823 |
| Top slider | 0.77791 |
| Side slider | 0.53275 |
| Trigger | -0.59243 |

Table 1 Table 2

The dollar value per utility can be inferred by looking at extremes of the part-worths for the price attribute. Therefore, Dollar value of 1 utility =

1. Calculating willingness-to-pay

Of the first consumer segment in the 2-segment case, the increase in utility of choosing top slider over side slider is

Therefore, in the 2-segment case, the first consumer segment’s willingness to pay for a top slider over a side slider switch is

(3) Findings

In the first segment of the 2-segment case, customers prefer the top slider switch and the paddle switch is their least favorite. In addition, the difference of part-worth between $99 and $129 is not as big as between $99 and $79.

1. **Calculating attribute importance weights**

(5 points) Calculating attribute importance weights: In the 2-segment case, calculate the first consumer segment’s importance weights associated with each attribute. Report the importance weights. Show how you set up your calculations, discuss your findings.

1. In the first segment of the 2-segment case, calculate the part-worth range for each attribute:

|  |  |
| --- | --- |
| **Attribute** | **Part-worth Range** |
| Brand | 0.45746 - (-0.55965) = 1.0171 |
| Price | 0.30112 - (-0.16121) = 0.46233 |
| Power Amps | 0.37874 – (-0.28553) = 0.66427 |
| Life of Product | 0.44018 – (-0.59777) = 1.03795 |
| Switch Type | 0.77791 – (-0.71823) = 1.49614 |
| Girth | 0.01807 – (-0.01807) = 0.03614 |
| **Total** | **4.71394** |

Table 3

1. Calculating the importance weight for each attribute based on the part-worth range

|  |  |
| --- | --- |
| **Attribute** | **Importance Weights** |
| Brand | 1.0171/4.71394 = 21.58% |
| Price | 0.46233/4.71394=9.81% |
| Power Amps | 0.66427/4.71394=14.09% |
| Life of Product | 1.03795/4.71394=22.02% |
| Switch Type | 1.49614/4.71394=31.74% |
| Girth | 0.03614/4.71394=0.77% |

Table 4

1. Findings

From the above table, we can find that switch type, the life of product, and brand are relatively important for the customer in this segment. Girth is the least important one and won’t affect customers’ choices a lot. We are considering introducing a small angle grinder under the DeWalt brand and the part-worth of it is 0.39655, which is the second favorite brand of the customers.

1. **Choose the optimal number of segments**

(10 points) Choose the optimal number of segments: reflect on the differences between the results across the different numbers of segments (i.e., 2, 3, 4, and 5 segments). What are some benefits of having higher numbers of segments? What are some of the main disadvantages of having additional segments? In both cases, be as concrete as possible in your discussions, illustrating advantages or disadvantages through specific examples. What number of segments best balances the pros and cons related to model fit and model usefulness? Briefly justify your decision.

1. Benefits of having higher numbers of segments
2. Having higher numbers of segments is a reflection of DeWalt’s professionalism. In 1992, Black & Decker started a major effort to rebrand its professional quality and high-end power tools to DeWalt and DeWalt brand mostly targets professional users (Source: dewalt.com). Therefore, providing more options to customers can build a professional brand image.
3. Having more segments help the company better understand its customers and also better satisfy the needs of their customers. For example, if the number of segments is as low as 2, then people within the same segment may have very different preference and the segment won’t help us a lot.
4. We can spend money more efficiently to increase our profits. For example, we will do promotion based on customer segmentation and promotion cost money. If we have fewer segments and there are a lot of customers in each segment, then some customers of this segment may not be interested in the promotion we provide and the money is spent for nothing.
5. Disadvantages of having additional segments
6. Analyzing efficiency. We need to analyst our customers and products based on customer segmentation. If we have too many segments and the differences between segments are small, then we may waste money and time to analyze them and set different targets.
7. A higher number of segments will result in fewer number of customers in each segment, and those customers may not be representative when we analyze the segments.
8. We may need to maintain a relatively large inventory level and more production line. For example, when we produce a new product to satisfy a new segment, we need to buy the equipment to produce the product, we need to hire more employee to use the equipment, and also we need to maintain a minimum level of inventory for this new product.
9. The number of segments

When deciding how many segments to choose, there are mainly two things to consider:

1. From the statistics perspective – model fit. Based on the following table, we can know that 3-segments is the best in terms of CAIC and BIC, 4-segments is the best in terms of ABIC, and 5-segments is the best in terms of AIC. Therefore, 3-segments can be a good choice.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Groups** | **Replication** | **AIC** | **CAIC** | **BIC** | **ABIC** | **Chi-Square** | **Relative Chi-Square** |
| 2 | 1 | 7401.66964 | 7611.32546 | 7582.32546 | 7490.17736 | 895.92253 | 30.89388 |
| 3 | 2 | 7224.99025 | 7543.08874 | 7499.08874 | 7359.27783 | 1102.60191 | 25.05913 |
| 4 | 4 | 7160.68006 | 7587.22122 | 7528.22122 | 7340.74750 | 1196.91211 | 20.28665 |
| 5 | 5 | 7122.70640 | 7657.69022 | 7583.69022 | 7348.55369 | 1264.88577 | 17.09305 |

Table 5

1. From a business perspective, model usefulness. Based on the previous discussion of benefits and disadvantages, 3-segments is a number not too high or too low, which can balance the pros and cons. In addition, based on attribute importance, we can efficiently differentiate our customers. However, in this case, segments differences of 4-segments and of 5-segments are not as interpretable as of 3-segments case.

In conclusion, I will choose 3-segments in this case.

1. **Name and profile the consumer segments**

Name and profile the consumer segments: based on the optimal number of segments you choose in Q3, give each segment a name and provide a brief consumer profile for each segment. Your goal is to look for significant and large differences between segments in terms of attribute importance weights and segment-level part-worths.

1. First Segment: Pragmatists

Customers in this segment are very price-sensitive, and cares about switch types (paddle or top slider) and how big the power is (power of 9 Amps is their favorite.). On the other hand, we care less about brand, life of product and girth.

1. Second Segment: Professionals

Customers in this segment care a lot about the life of product (they want it above average) and switch types (Side Slider is their favorite). On the other hand, we care less about price, amps, and girth.

1. Third Segment: Player

Customers in this segment cares a lot about brand (they prefer Bosch) and switch types (Top Slider is their favorite). On the other hand, we care less about price, life of product and girth.

1. **Targeting and positioning**

Targeting and positioning: based on the optimal number of segments you choose in Q3, briefly analyze the pros and/or cons to targeting each of the segments. Based on these evaluations, choose which segment you would target for the introduction of DeWalt Small Angle Grinder, and discuss why. Make sure to briefly mention your analysis of each of the 3C’s (Company, Competition, and Consumer). Craft a positioning statement.

1. First Segment:

Pros:

1. DeWalt is their second favorite brand, so we are not in bad condition. In addition, even though we are not their top 1 favorite brand, the importance weight of brand in this segment is relatively low.
2. They like small girth.

Cons:

1. They are very sensitive to price, so in the competition with competitors, we need to lower our price to attract more customers. However, price is not an attribute that very easy to change because it affected by cost of sales. Manufacturing and woodworking industries are not high-profit industries, therefore, it’s not that easy to lower the price.
2. They like the side slider and top slider a lot. So, we don’t have much choice in terms of switch type.
3. Second Segment:

Pros:

1. Customers really like our brand, DeWalt. Therefore, if we launch a new product in this segment, we will have our customer base.
2. They like longer life of product. Life of product relies a lot on components quality. Therefore, finding reliable components supplier will help a lot.
3. They are not very price-sensitive, so we can get more unit profit.

Cons:

1. Customers really like side slider or top slider much better than paddle or trigger.
2. They like large girth a lot. If we cannot include this attribute in our product, we will need much more effort to change other attributes to satisfy these customers.
3. Third Segment:

Pros:

1. Customers really like our brand, DeWalt. Therefore, if we launch a new product in this segment, we will have our customer base.
2. Except for brand and switch type, they are not very sensitive to other attributes. Therefore, we have a lot of options and can use some current production lines.
3. Customers in this segment like small Girth.

Cons:

1. Switch type is really important to them, and they like Top Slider a lot. We’d better use this attribute in our product and we don’t have much choice.
2. Customers really need the life of product to be above average

In this case, I would choose Segment 3 to target for the introduction of DeWalt Small Angle Grinder.

The new product is from DeWalt and the size of it is small. So, we would target customers who like these two attributes. First of all, Segment 3 really brand sensitive and really likes our brand. Second, they like small girth and our new product has this attribute. Third, with regard to other attributes, customers in this segment don’t have an extreme preference which is too hard to satisfy.

From a company perspective, DeWalt has good reputation in the market and loyal customers. DeWalt cares a lot about customer experience. Through its official website, there are detailed directions for use and customers can easily find customers' support phone numbers on the website. In this 3-segment case, customers of the third segment like our brand and believe in our company.

From a competition perspective, our main competitors are Milwaukee, Bosch, and Metabo. Customers in segment 2 and segment 3 have clear preference on DeWalt and Bosch over Metabo and Milwaukee, which means they didn’t perform well in these markets. However, we didn’t annoy customers in any market segment. Because Segment 3 really brand sensitive and really likes our brand, we may target them to expand our business by introducing the new product.

From a customer perspective, customers in segment 1 and segment 2 have a lot of preferences in terms of different attributes of the product. It’s hard for us to meet all these requirements, and not to say segment 2 like small girth a lot. In addition, people in segment 3 are not very price-sensitive, which means we don’t need to make a lot effort to lower the cost and can yield more profit per unit of product by targeting consumers in this segment.