

PORTFOLIO TASK 2: CONJOINT ANALYSIS

Introduction

This study is conducted for the launch of a new mobile phone. Using different factors at different levels, all different possible combination of products is listed and ranked according to their preference. This analysis technique will help discover the optimal features for the product based on customer preferences.

The most important concept in conjoint analysis is the 'Utility'. It is a subjective judgment of preference unique to each individual. The 'factors' are the attributes that are to be analyzed. To carry out this analysis, the first step is to choose the factors that ought to be tested. Then determine the level of each factor.

Factors for the launch of new phone

The factors to be considered in this case are listed below. The levels are listed against corresponding factors.

1. Camera megapixels – 64 MP, 108 MP
2. Battery Life – 4500mAh, 5500mAh
3. Storage Capacity – 128 GB, 256 GB
4. Display – OLED, Dynamic AMOLED, Retina Display, Super Retina XDR Display
5. Price – £400, £700, £1000

The next step of analysis will be to list all the possible combinations of features a phone can have. This is followed by ranking the products made of these combinations. This study contains the average of rankings from six respondents.

This data is now input to SPSS Statistics software to run conjoint analysis.

Steps to perform Conjoint Analysis:

1. Rearrange the data to be fed into the SPSS software.
2. For the ease of calculation and interpretation, for every factor let there be a reference level. The other levels will be considered as dummy variables in the software (For n levels there will be (n-1) dummy variables).
3. The reference levels are as follows: Storage capacity – 128 GB, Battery life – 4500 mAh, Camera – 64 MP, Display – OLED and Price - £400.

The dummy variables will then be as follows.

- Storage Capacity: 256 GB – S1
- Battery Life: 5500 mAh – B1
- Camera: 108 MP – C1
- Display: Dynamic AMOLED – D1, Retina HD – D2, Super Retina HD – D3
- Price: £700 – p1, £1000 – p2

	A	B	C	D	E	F	G	H	I
1	Product	S1	B1	C1	D1	D2	D3	p1	p2
2	P1	1	1	0	0	0	0	0	0
3	P2	1	1	0	0	0	0	1	0
4	P3	1	1	0	0	0	0	0	1
5	P4	1	1	0	1	0	0	0	0
6	P5	1	1	0	1	0	0	1	0
7	P6	1	1	0	1	0	0	0	1
8	P7	1	1	0	0	1	0	0	0
9	P8	1	1	0	0	1	0	1	0
10	P9	1	1	0	0	1	0	0	1
11	P10	1	1	0	0	0	1	0	0
12	P11	1	1	0	0	0	1	1	0
13	P12	1	1	0	0	0	1	0	1
14	P13	1	1	1	0	0	0	0	0
15	P14	1	1	1	0	0	0	1	0
16	P15	1	1	1	0	0	0	0	1
17	P16	1	1	1	1	0	0	0	0
18	P17	1	1	1	1	0	0	1	0
19	P18	1	1	1	1	0	0	0	1
20	P19	1	1	1	0	1	0	0	0
21	P20	1	1	1	0	1	0	1	0
22	P21	1	1	1	0	1	0	0	1
23	P22	1	1	1	0	0	1	0	0
24	P23	1	1	1	0	0	1	1	0
25	P24	1	1	1	0	0	1	0	1
26	P25	1	0	0	0	0	0	0	0
27	P26	1	0	0	0	0	0	1	0
28	P27	1	0	0	0	0	0	0	1
29	P28	1	0	0	1	0	0	0	0
30	P29	1	0	0	1	0	0	1	0
31	P30	1	0	0	1	0	0	0	1

Fig: Image of the rearranged data in the file

4. Linear regression is used in conjoint analysis; hence, next step will be to run linear regression on this dataset for being able to predict a customer's preference.
5. In Regression, select 'Rank' as the dependent variable as it depends on the other variables. The focus here is to get the utility values, thus, there is no need to follow the exact linear regression process of checking adequacy of the model or finding the most parsimonious model.
6. Ensure that the 'Estimates' will be displayed in the 'statistics' tab of linear regression dialog box.
7. The following table will be obtained, in which the 'Standardized coefficients beta' is the measure of utility.

Coefficients ^a						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	35.281	7.388		4.775	<.001
	S1	12.417	4.926	.224	2.521	.014
	B1	15.917	4.926	.287	3.231	.002
	C1	-8.208	4.926	-.148	-1.666	.099
	D1	.417	6.966	.007	.060	.952
	D2	-15.958	6.966	-.249	-2.291	.024
	D3	-8.458	6.966	-.132	-1.214	.228
	p1	6.594	6.033	.112	1.093	.277
	p2	20.875	6.033	.355	3.460	<.001

a. Dependent Variable: Rank

Fig: Image showing the model summary of conjoint analysis

From the table above, it clear that customers prefer 256 GB storage capacity rather than 128 GB (as the coefficient for 256 GB is positive). Similarly for the battery life, 5500 mAh has a positive coefficient. The camera megapixels and display have negative coefficients that indicate 64 MP and OLED are more preferable in respective cases of camera and display.

- The next step is to tabulate the standardized coefficients (in excel) against their respective levels to find the trade-offs between different levels of each factor.

Display		Difference		Storage Capacity		Difference
OLED	0			128	0	
Dynamic AMOLED	0.007	0.007		256	0.224	0.224
Retina HD	-0.249	-0.256				
Super Retina HD	-0.132	0.117		Battery Life		Difference
				4500	0	
Price		Difference		5500	0.287	0.287
400	0					
700	0.112	0.112		Camera		Difference
1000	0.355	0.243		64 MP	0	
				108 MP	-0.148	-0.148

Fig: Image from excel showing corresponding standardized coefficients and their trade-offs

It can be observed that customers prefer good battery life and more storage capacity. The camera is not the top preference. People prefer AMOLED to OLED and Super Retina HD to

Retina HD. The price has positive values that hints at the fact that given good battery life and storage capacity, customers are willing to spend more than £400.

9. In the next step, the sum of utilities will be calculated. Replace '1's in the dataset with their respective utility values. Calculate the sum of utilities of every product in a new column.
10. Rearranging the data based on the sum of utilities, it is clear that the product most sought after is 'P6'. The product with the highest sum of utilities is the most preferred product. This product has Dynamic AMOLED display, 5500mAh battery life, 256 GB Storage capacity, 108 MP camera and costs £1000.

Utility estimates: The difference between the sum of utilities of two consecutive ranking products will give utility estimates which will give more useful information like how better the upper rank product is compared to the lower rank.

Conclusion

In this analysis, the sum of utilities was calculated to estimate the most sought product using conjoint analysis. The most sought-after product was found to be 'P6' with the best features. It can be concluded that irrespective of price, the choice of customers these days are to have a best featured phone.