Leeds University Business School

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Assessed Coursework Coversheet

For use with *individual* assessed work

Student ID Number:									
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Module Title:	Marketing Analytics								
Module Leader:									
Declared Word Count:									

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Your declared word count must be accurate, and should not mislead. Making a fraudulent statement concerning the work submitted for assessment could be considered academic malpractice and investigated as such. If the amount of work submitted is higher than that specified by the word limit or that declared on your word count, this may be reflected in the mark awarded and noted through individual feedback given to you.

It is not acceptable to present matters of substance, which should be included in the main body of the text, in the appendices ("appendix abuse"). It is not acceptable to attempt to hide words in graphs and diagrams; only text which is strictly necessary should be included in graphs and diagrams.

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Introduction

Product is a premium manufacturer with sales at X million pounds in the first seven months of 20xx**,** increased by X% from same period in 20xx. According to Expert Market Research , the global market value is expected to $147 billion in 20xx from the actual market value in 20xx is X, which will increase by almost X. This means that there is a huge potential market for the product to capture in the future, not only in the UK but worldwide. Therefore, product must be active, improve and develop all the time.

This report will provide market situations of the company and some useful recommendations to improve marketing performance by three major marketing decisions; Managing customer heterogeneity, Managing sustainable competitive and Managing resources trade-offs which will be analysed by marketing analysis tools in R.

Managing Customer Heterogeneity

Segmentations

According to transactions from supermarket partner, we assumed that, now, company has only one product which is 'X'. As provided data with x consumer ID, including existing and potential consumers, and five variables, we used only two variables without 'job' variable because it had high correlation with ice cream.

'**Mean-based Clustering Analysis**' was used to divide segmentations. We segmented consumers into 'four' groups due to significantly different levels of consumption in each segment, when compared with three groups and five groups that some groups had same consumption level.

Table 1: Aggregating four segmented in by Clustering

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The table shows that there are segmentations from consumers. It demonstrated distribution of different variables differently correlate with each segment. There are X variables which significantly different which are X, these variables could be highly impacted on revenue of company.

Plot 1: K-means Cluster plot with X segments

Due to plot 1 (only explained around X% of the data), it can be seen that all segments have some intersect areas, we see that group 1 is modestly well-differentiated, but has the lowest number in consumption level . Moreover, it has significantly differentiated in consumer location. Therefore, according to table 1 and plot1, as a premium manufacturer, even the number of group X has only 1500 people, we highly recommend targeting them as a primary target due to the highest potential mentioned above. The secondary target goes to group X (1900 people) because of a X which means that although their frequency of consumption is lower than group X, they have more potential to pay at higher price of product.

Targeting

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Positioning

As surveyed data has too many information, we decided to use data reviewed from 20xx onwards. Therefore, we have X products from x major brands and X selected attributes.

As all X products contain low level of sugar, it was not necessary to have.

'**Factor Analysis**' was used to identify those attributes into the most related two factors for grouping all 1100 brands. (As tools recommended 9 factors, 1 factors will be easier to categorise and produce brand positioning)

Plot 2: Brand Attributes

The heatmap illustrates that lighter colour indicates high correlation and darker colour represents low correlation. It can be seen that all brands are clearly perceived differently with only two attributes. The rest were not well differentiated.

Plot 3: Brand Positioning

This plot shows adjective map in four regions:

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-
-
-

According to plot 3, the attribute cluster and relationships are not well-differentiated. Most brands are clustered in centre area which means consumer did not perceive the differentiated value of those brands. Thus, there are many positions that company can jump in especially the concentration region

Managing Sustainable Competitive Advantage

Designing Product

The X existing and potential consumers were asked about their ideal product including 16 attributes which be stated below. Each attribute was selected 18 times, so we got 19192 answers in each attribute. These tables below show the percentage of answers by consumer that measured by '**Conjoint Analysis**' to find out new products for company.

a)			
			———

b)			
	———		

		———
l	———	

	———	———	———

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			———				

According to 'price' table (i), almost one-third of the answers chose $1 (X%). Interestingly, there is a huge difference in percentage between $1 (X%) and $1 (X%) at almost X%. In addition, the lowest price at $1 only was selected by X%, whereas $23.2 is chosen by X%. This can be concluded that they are more likely to pay in integer number when the high price that could be related with the perception of higher quality, but they are willing to pay for a decimal price when the low price which could create a buyer motivation.

In addition, those highest number of choices were set to be reference levels for each attribute, then company is able to know which options will be used to develop new products.

Table 2: Conjoint Sub-Utilities

Attributes	Levels	Utilities
		-

Table 2 demonstrated that positive value of utility means prefer than reference value, meanwhile negative value indicates that they prefer reference level.

Willingness to pay

According to table 2, price utility is -3.2 which implies that the price coefficient indicates that a $1 increase in price leads to a utility decrease by 0.0 utile. So, each utile is worth 1/0. Next, we can calculate their willingness to pay for upgrading to another level by using utilities from table 2.

Table 3: Willingness to pay for an upgrading

Upgrade from	To	Willingness to pay ($)	

This table shows how much they are willing to pay for each attribute.

Therefore, we know which attribute has the most value for them, company can utilize most effective way to generate highest sales.

Market Basket

A major supermarket partner has provided transaction of consumers groceries shopping basket. '**Market Basket Analysis**' was used to discover their shopping behaviour. We found that transactions-by-item matrix is 80213 rows by 100 columns. Of those 9.9 million intersections, only X % have positive data because most items are not purchased in most transactions. The most popular item is 'egg', followed by 'bread', which accounted for X, respectively. More than one-tenth of transactions contain only a single item and the median basket size is 4 items with a range is X.

Plot 4: Graph for Market Basket Analysis

The plot above demonstrates that most two-popular dependent items as the two-highest frequency of transactions, they also are independent items in some cases.

Table 4: Consumer basket

In the table above, there are some recommendations for company.

1. Cross-selling with items such as egg and bread, to gain higher number of transactions
2. Stocking proper amount, when milk being a dependent product, to reduce cost
3. Refining more segments based on their basket,

Some suggestions for supermarket partners.

1.

2.

Managing Resources Trade-offs

After we know who is our consumer, what is positioning of company, what will be contained in our product, how much is a suitable price, and what is our promotion. This part will report about communication channels which company must trade-offs by using '**Marketing Mix Modelling**' with Significant at X% confidence interval to design direction for generating the most valuable outcomes and how to determines budget with maximizing profit.

Selecting Advertising platforms

Due to the impact of monthly radio spending on each platform were linear, modelling linear regression was used to run with centre function .

Table 5:Linear regression with four platforms

According to table 5, spending on ‘ads’ does not have a significant effect on monthly sales with $p > 0.05$. Moreover, there is a significant negative effect of ‘ads’ spending on monthly sales, which is 1% increase in ads spending will cause .03% decrease in monthly sales

Therefore, we decided to remove ‘ads’ and ‘ads’ platforms and have only news and twitter that have significant positive effect on monthly sales. This method will lead to allocate a budget to gain maximizing profit and performance for company.

Table 6: Non-linear regression with two-highest potential platforms

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Allocating Marketing Budget

According to an elasticity (coefficient) for ads (0.22) and ads (0.33) monthly ads spending, we can allocate the budget by

1. Sum elasticities
    -
2. Ratio of elasticities
    -
    -
3. Recommendation

Advertising Carryover Effect

To be assumed that consumer response to advertising can be delayed, so each monthly sales will be impacted by advertising in the previous period. '**Modelling carryover effects**' was used to measure the effect as mentioned above.

Table 7: Non-linear regression with adstock rate

It shows that % in monthly sales increase, when compared with table 6.

Synergy Effect

If company would like to have media synergy when combining impact from more than one platforms. In this case, we tried with two variables by using '**Modelling Media Synergy'** with centre function to avoid issues.

Table 8: Non-linear regression with synergy effect

Table shows that they are positive significant from all variables. 1% changes in VCR spending will cause X% change in the effect of ad spending on sales. For allocating budget from combining platforms, this could be further explored.

Future works

Business Week demonstrated that ways of utilising product always change, so company should concern more information that could take the success of the company in the future and beyond.

First, to understand further about consumer behaviour, we suggest that 'occasion of consumption' data should be collected by interviewing or collecting from supermarket partners. For example, consume with others (at work or party) or alone, for energy booster or mood booster for themselves or as a gift. '*Cluster Analysis*' method will be used to analyse their behaviour which can lead to new attractive segments that could be targeted by existing product or new products. In addition, the company should collect 'psychographic variables'; such as interests, behavior, attitude, emotions, sentiments, communications and motivations.

After we understand their consuming objectives and discover new segments, the company will be able to figure out the relationship between each segment and Marketing Mix (4Ps: Product, Price, Place and Promotion) by using the '*Marketing Mix Modelling*'.

For product, it includes ingredients, packaging and portion size attributes. So, we can match difference choices for each segment. Therefore, company could develop new products by building new packaging, plan new portion sizes and understanding consumer needs.

After designing products, company can set suitable prices by using '*Conjoint Analysis*' to measure willingness to pay for other attributes. Moreover, '*Market Basket Analysis*' is able to predict the discount plans; offering promotions to end consumer and wholesaler.

Next, the company should consider other distribution channels that consumer find easy to access and serve their lifestyles; such as, other retailers that competitors already jumped in, convenience stores, and online channels. Then, the company will be able to compare baskets in different channels from '*Market Basket Analysis*'. This will help the company to distribute products and stock them with the suitable number.

Last is promotion, Ahmed et al. (20xx) identified that X is a low-involvement product, the company should consider 'branding' and also '*Customer Lifetime Value'* to capture the relationship between consumer and company, and deeply understand them in each stage by using history purchasing data collected by supermarket partners. Therefore, communicating the right message by the right channels to the right target audience is very important. To prove how is going better when compared by all segment was delivered the same communications, and different communications deliver to each segment, '*Marketing Experiment*' method will be used to identify.

References

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