MARKETING ANLYTICS TOOLKIT

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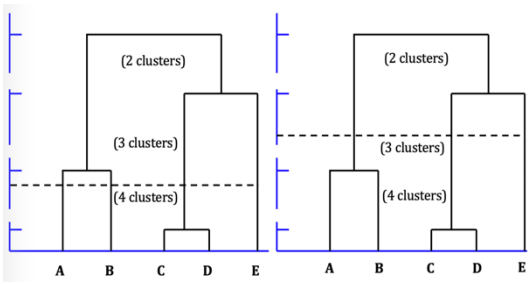
Cluster analysis : A method of data analysis in which large set of heterogenous observations/data, e.g.: customers, companies, objects, is divided into groups by identifying and classifying the data into few meaningful homogenous segments called clusters(Palmatier & Sridhar, 2021)

To form a cluster, data with similar attributes or customer preferences (price, quality, quantity) is grouped under one segment however each segment remain distant from other segments. The main object is to group datapoints such that the data points within a segment should be near its centre, while at the same time the centres of different segments should be as far apart as possible .

Working:

- This data mining tool consist of 'Segmentation step' which uses bases such as price and ratings and 'Describing step' uses descriptors such as age and geographic information.
- It is important that all variable scores should be standardized before analysis to make the analysis accurate.
- Degree of similarity between two datapoints can be measured using **Euclidean distance** using formula $d_{ij} = \sqrt{\sum_{k=1}^{p} (x_{ik} - x_{jk})^2}$ For customer i and j with k denoting their scores on various variables. Small value of distance indicates greater similarity. (Palmatier & Sridhar, 2021)
- Based on similarity clusters are created in a hierarchical order I.e. cases are merger into a clusters and cluster are merged together in such a way the variance within a cluster is minimised.
- In dendrograms, the height of fusion (y-axis) indicates the similarity between clusters. Higher this high less similar the clusters are. Hence, we should always choose optimal number of clusters.
- Review of resulting segments must always be done on the criteria of *Identifiability, Stability, Responsiveness* and *Viability.*



Advantages: (MJV, 2021)
Cluster analysis can identify new corelations of data among large datasets which could be easily missed otherwise. These identification can help businesses to make informed decisions and come up specific strategies which are significantly more efficient at addressing problems and optimising business.

Choice Model : A mathematical/statistical model that predict how likely a firm's marketing interventions and/ or customer characteristics will influence an observed customer "choice" or responses. For example it can help predict how factors like salary and promotion can affect an individuals choice of joining or leaving a company. (Palmatier & Sridhar, 2021)

Working:

- In this model, Individuals are assumed to derive unobserved product-specific utility from multiple products and to select the product that offers the most utility.

- this model uses dependent variables, which are binary(a product is chosen or not) and independent variable, which are which are strengths of different attributes such as brand and price as inputs.

- Used to determine a customer's choice when many similar products are available, what factors influence these customers choice.

- And also used to simplify and optimise marketing strategies based on customers choices and also create effective promotional strategies to create better market for a product.(Palmatier & Sridhar, 2021)

- For example if they are two similar products A & B in market, using choice model we can learn how pricing and discounts can affect sale of both the products i.e. if price of A goes up what % of sales of A will decrease and those of B will shoot up and vice versa. This knowledge can be used to introduce timely discounts and moderate prices to generate maximum profits from sales of both product A & B. At the same time we can introduce a new product C of similar features and create/optimise market for all products.

Advantages:

- This model helps understand what attributes influence customer choices better and design better marketing strategies.
- Tailor better pricing strategies and promotional offers. (Colias, 2016)
- Predict what a set of new customers are likely to choose by understanding the particular weights of a certain attributes of product and optimize products.
- Can help us predict how successful a similar new product can be in a market and how to generate more profits from it.

Conjoint Models : It is a survey-based advanced analysis method used in market research to comprehend complex user decision-making processes/choices of which attributes customer value the most.(*Conjoint Analysis | Complete Guide to Conjoint Analysis*, 2018)

Any product/service can be broken down into attributes that ultimately impact users' perceptions of its value. The objective is to identify which attributes the customer values most and which attributes the customer is willing to trade off on.(Stobierski, 2020). It is also used to predict how a new product would impact the current market and pricing of new products.

Working:

- To determine customer preferences in a product, different combinations of attributes are tested for a product/service(Conjoint.ly, 2017).
- For example, while creating a new design of a product rather than ask the customer what the want in their product, they are them to choose between different(such as camera or screen size in a smartphone) components of the product. A customer's actual priorities are reflected by these choices.
- The analyst must infer the weight of individual attributes based on customer reviews of alternate product profiles each with several attributes i.e. in case of smartphones customer can be provide 8 phone profile with varying attribute values and ask them to rate each profile.
- By drawing the commonality in product attributes from similar rated profiles, significance of each attribute can be measured. The formula $R(P) = \sum_{j=1}^{k_j} \sum_{i=1}^{m} \beta_{ij} x_{ij}$ is used for this analysis where ßij is the weight of significance of each product attribute and R(P) denotes ratings of a P (Palmatier & Sridhar, 2021)

Advantages:
Conjoint model cab be used:

- To predict how a new product will do in market before its launching.
- In designing process a product as customer preferences become clear.
- For determining brand equity. (Regoli, 2017)

Market Response Models : The mathematical models that track the relationship between a firm's marketing investments and the marketing results(Palmatier & Sridhar, 2021)

Working:

- It basically depends on reviewing effectiveness of past marketing strategies and impacts it created in markets outcomes and gather insights from that data to develop future marketing plans.
- It provides insights into exact effect of how investing in marketing can alter the sales of a product/ service. This relation is usually a positive one
- With this model, one can calculate the marketing elasticity, which is the amount of effect an 1 % increase in marketing efforts/investments may have on sales.
- The response model formula is $\ln(Y) = \beta_1 \ln(x_1) + \beta_2 \ln(x_2) + \beta_3 \ln(Z_1) + \varepsilon$, where x1 and x2 are firm spending an z1 is competitor's spending and respective market elasticity is denoted by ß. (Palmatier & Sridhar, 2021)
- For example to understand how marketing decision on pricing affected sales one should collect sales and pricing data of a year's worth and draw statical insight of how changes in price affected sales and based on these results predict market elasticity of pricing. (Palmatier & Sridhar, 2021)

Advantages:

- The response model allows marketing managers to determine which resources have the greatest impact on the overall outcome and thus allocate them in the most efficient manner according to their effectiveness.
- Using response models helps managers understand both the effect of marketing efforts focused on outcomes as well as those directed at competitors. (Palmatier & Sridhar, 2021)
- It can help predict how a marketing strategy can affect a companies outcome in long term.

References

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