Improving the Cost and Speed of Product Innovation

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Background: The process from bench testing to national roll-out of consumer products is expensive and time-consuming, sometimes resulting in market-place disappointment[1]. A resource-intensive component of new product development is the cost of consumer evaluation of product alternatives. The incremental process of improvement, that usually characterizes the product development activity, can be significantly enhanced by rapid and cost-effective feedback on product performance during product development. If the timing of consumer feedback can be reduced from two or three months, which is typical of consumer product testing timing, to one or two weeks at significantly reduced cost, the product developer can explore many more options and increase the eventual likelihood of success in shorter timeframes. The purpose of this report is to explore a tool that may provide new product development and positioning guidance in a fraction of the time and cost of typical product testing scenarios.

Scenario: Your company markets carbonated lemon flavored beverages. You would like to improve your current product, which is one of the leaders in the market. As a first step, you choose ten products to assess the relative performance of your existing product, two prototypes and seven competitors. Due to budgetary constraints and the high cost of consumer testing, you do not have the option to include a variety of prototypes that have been developed and that could be relevant for this project. The ten products are profiled through a dedicated descriptive panel. In addition, two hundred typical consumers of this product category evaluate all ten samples and rate them for liking on a 9-point hedonic scale over two consecutive days.

You conduct a Landscape Segmentation Analysis® (LSA) on the data and obtain the map shown in Figure 1. The LSA technique has been described in previous technical reports and papers[2,3,4,5]. Two underlying consumer segments are uncovered which are easily seen in the contour plot as the lighter areas, representing the denser regions of consumer ideals. Most of the products are concentrated around the first segment, while Competitor 1 is the only product one satisfying the second segment. Your current product is placed at the periphery of the first segment, towards the center of the map. Figure 2 shows that the main sensory dimension separating the two segments is sourness. Two possible strategies now seem possible for your company: focus on a single product that will be placed towards the center of the map to appeal to the greatest number of consumers irrespective of segment; or use a portfolio strategy and develop two products, each placed at the center of each segment and appealing most to the corresponding consumers in each segment.

None of the three products, Current, Prototype A, or Prototype B seems to fit either scenario. Therefore, you would like to understand the location and appeal of seven prototypes not evaluated by the consumers. You would also like to evaluate two other competitor products, not included in the first round of testing. To do so, you generate their sensory profiles through your sensory panel using the same set of attributes that were regressed on the LSA map. Cost and timing prevent you from considering the possibility of commissioning another large scale consumer product test and you would like to explore a more efficient alternative.

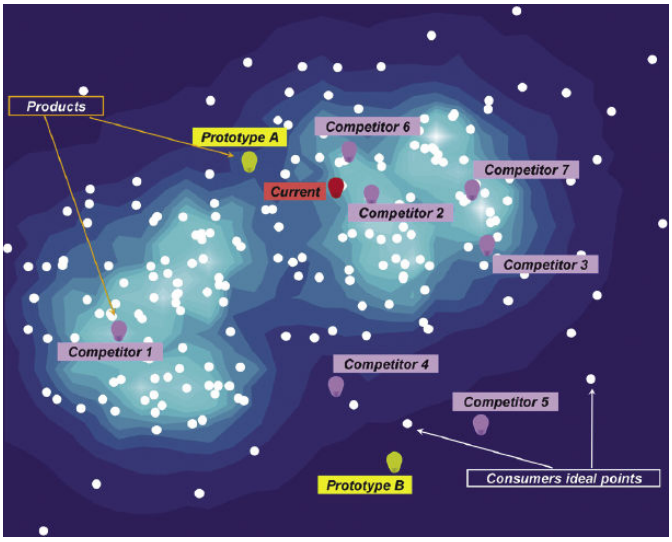

Figure 1. LSA map with contours, consumer ideal points and products

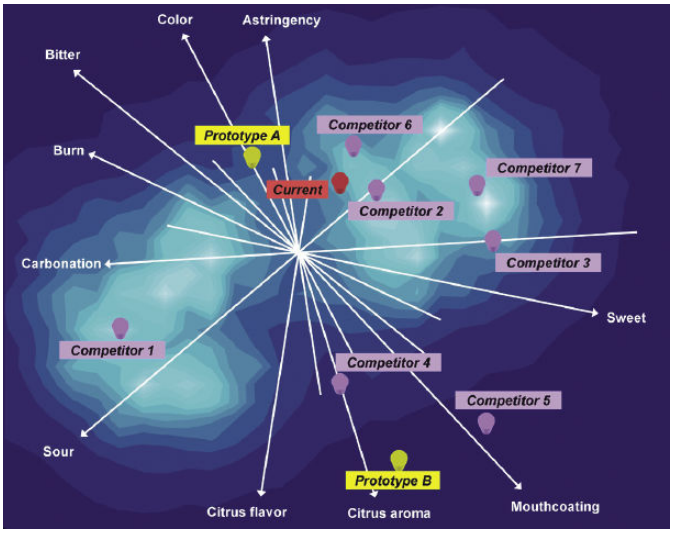

Figure 2. LSA map with contours, products and Drivers of Liking®

Predicting Consumer Liking: Product locations on an LSA map are estimated using solely the individual consumers' overall liking rating for each product through a process called 'unfolding'. This first step results in a map comprising the products and the consumers' individual ideal points, shorter distances indicating greater liking. Once the map has been generated, descriptive or analytical information are placed on the map using a regression approach. Once the descriptive information has been regressed, the profile of any product located at any point on

the map can be predicted using its projections onto the attribute vectors. The higher the correlation between the projections and the actual sensory profiles of the products in the test, the more accurate the prediction. The reverse of this approach, placing products on an LSA map based solely on their descriptive profiles, contributes significantly to speeding the process of finding the best product or set of products for later introduction. The product developer then has a computer-aided design tool which can be used to rapidly evaluate many other alternative than the products originally tested.

This method of predicting consumer behavior will be as good as the quality of the map's described directions. A map less well described by the sensory or analytical attributes will not provide the same product placement accuracy as a map that is well described by the attributes. A useful approach to assess the feasibility of obtaining reliable information about the possible location of products not included in the original consumer test is to assess the predicted location of the products that were tested originally. Their actual map locations are known and their predicted locations can be compared with them. This diagnostic step provides information on the expected quality of future predictions.

Placing Your Prototypes on the Map: After performing the diagnostic test and confirming the accuracy of the predictions, you place the nine additional products (seven prototypes and two competitors) that were profiled using your descriptive panel. Predicted placements are shown in Figure 3. From these map locations, you conclude that Prototypes 3 and 4 are good candidates to appeal to the two underlying segments you discovered with LSA. You can also predict that Prototype 2 should receive the highest average liking rating, as it is centrally located and should receive a lower number of low scores from consumers. The predicted liking ratings taking the whole consumer population into account are given in Table 1. Prototype 2 is predicted to receive an average liking rating of 6.05, while Prototypes 3 and 4 would receive average liking ratings of 5.16 and 5.71, respectively. However, these last two products would appeal strongly to their respective segments with means of 7.21 and 6.85, respectively, when solely considering the consumers in each corresponding segment.

You will use this information to plan the subsequent stages of your product development and optimization project. A decision will need to be made about whether your company should focus on a single product in the market, generally well accepted but not delighting consumers in general (a product similar to Prototype 2) or develop a portfolio strategy with two products (similar to Prototypes 3 and 4) that will appeal to the two subgroups of consumers to a greater degree. In this case, further analysis will be necessary to identify and communicate with the consumers in each segment.

Conclusion: Conducting a Landscape Segmentation Analysis is a first step in the development of a tool to be used to speed the product development process at lower cost. R&D teams find it particularly helpful to design new products, modify current products or study new market competitors, with information quickly available without having to run multiple, costly, repetitive and time-consuming consumer tests. The technique described here provides valuable insights for the location of new or repositioned products. Further development of the technique to account for multiple usage occasions and to provide target zones for product placement to account for variation in product profile data will be discussed in future technical reports The sensory profiles described can be replaced by product or service features and benefits, and the ideal points replaced by need states leading to broad applications in other market research fields.

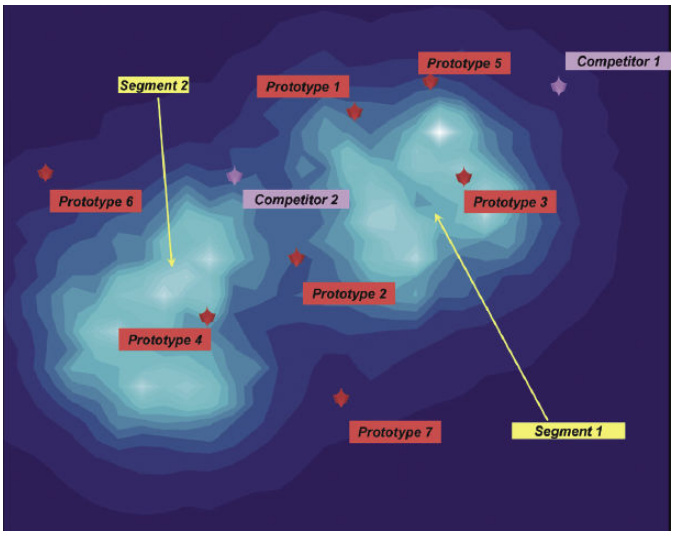

Figure 3. Predicted map locations of the nine products

	Predicted Liking		
Product	**All Consumers**	**Segment 1**	**Segment 2**
Prototype 1	5.41	6.75	4.43
Prototype 2	**6.05**	6.52	5.94
Prototype 3	**5.16**	**7.21**	3.36
Prototype 4	**5.71**	4.94	**6.85**
Prototype 5	4.83	6.77	3.07
Prototype 6	4.34	2.86	5.62
Prototype 7	5.24	5.56	5.47
Competitor 1	3.87	6.10	1.88
Competitor 2	5.80	5.77	5.97

Table 1. Predicted liking ratings for products placed on the map

References

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