DentMed STP

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Context and the Issue

We are the market leader in the growing space for digital X-ray equipment. We provide high-end products and have the edge with highest image quality and diagnostic flexibility. However, our market share has dropped by 10%, while our key competitors, with claims of equal product quality, are eager to expand upon it (grew 5%). They are not matching the needs we provide for our niche yet, but we are forced to revisit what the market needs are, both to solidify our retention strategies and find areas for expansion.

Dataset

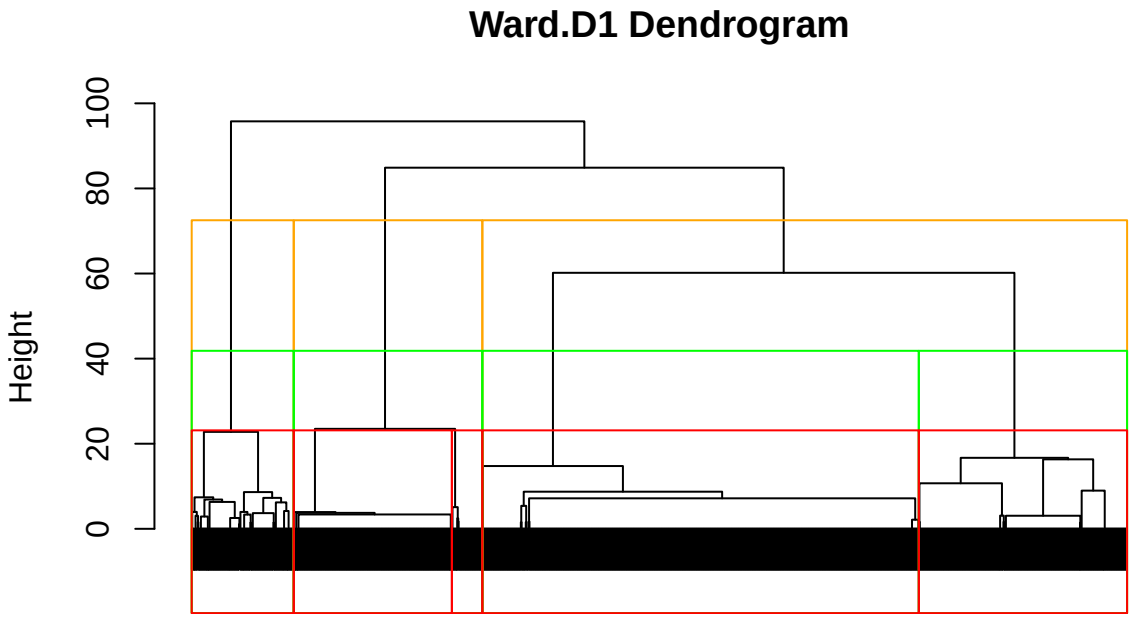
The raw dataset contains n=2330 observations (obs.) with four sets of variables. The first set, concerned with consumer preferences recorded on 7-point Likert scales (Needs), will allow for a meaningful grouping of the market. The second set, with recordings of past purchase behaviors (PPB), will provide valuable business insights, which then allows for a useful descriptions of the segments that arose from clustering, and will thus inform our strategy on targeting and the adequate positioning. This will be complemented by the following two sets. Trade show behaviors (TSB), that show time spent at our and key competitor booths, as well as the total time, which allows us to see proportions and infer possible future dynamics of the given segments, and the risks we might face. Finally, 7-point Likert scales on trust in media (Trust) will further guide our targeting and positions ideas and strategies.

Cleaning

Dataset had to first undergo the clean-up process to remove faulty data. There were 10 obs. with full rows of missing data that were removed, and all other have complete recordings so there were no decisions to be made on partially missing data. Time spent was checked with regard to totals, to check for any faults, but there was nothing to remove. Likert scales were checked to see whether thay fall in the 1-7 range (inclusive), and further 20 obs. were removed as a whole. Percentages and indexes that range from 1 to 100 were check, which then found fault in 28 obs. that were removed. Any problematic outliers that could confound the results were not found. The final number of obs. was n=2272.

Clustering

The clustering techniques were used across Needs scales. We have used hierarchical clustering which allowed for visual inspection of the dendrograms, but we also complemented it by comparisons across different linkage methods and with the results of the K-means clustering. The Elbow curve shows the technically viable count of clusters could go up to 7. However, the dendrogram below shows clusters above 4 do not partition the largest cluster and their sizes are too small as well, thus providing us with no additional business worth insight.



Green represents the chosen 4 clusters

All clustering techniques result with four clusters that have negligible differences in clusters sizes and their characteristics. However, fit across different linkage methods was compared using Cophonetic Correlation Coefficient (below), and Ward.D2 linkage using Hierarchical clustering at k=4 was decided upon as the optimal solution for the business issue at hand.

```
## [1] "Complete: 0.81"
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## [1] "Ward.D1:  0.77"
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## [1] "Ward.D2:  0.89"
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Segments and Characteristics

The segment labeling here uses the fisherman metaphor. We are facing four segments of varying sizes, varying needs, and varying purchasing behaviors. This is reflected in the naming convention here; 'Pebble' (22%), 'Small Fish' (46%), 'Big Fish' (22%), and 'Whales' (11%).

The first segment named 'Pebble' represents 22% of the market. It reflects the highly price sensitive consumers that are looking for an average product on a budget. Historically they have low amount of orders, low sales, and hard ever refer to other dentists. We hold around 10% of this market, and it accounts for minuscule proportion of our sales. Based on their needs they are a mismatch for our offering and the approximated customer lifetime value of this segment is very low. The other segments are discussed in detail below, after which proposals for targeting and positioning will be made; informed by previous characteristics, projected dynamics, trust, and referral rates.

Whales

Whales form the smallest segment, accounting for only 11% of the market. However, they are a perfect match for our high-end offerings. They are looking for a premium and they do not mind the price. They buy a lot and they buy often, and on top of that they are extremely loyal with all of their purchasing coming from us. They do not care about software integration, likely because they are fully immersed in our product ecosystem, but there is a chance we are neglecting their 'technical assistance' needs.

TSB show that on average they spent 45% of their time at our venues, while one quarter of their time was spent 'shopping around' at the key competitors. We are at this risk of losing our main niche if we do not address their rising needs for technical assistance immediately.

Big Fish

Big Fish forms the second mid-sized segment, like Pebble, for the 22% of the market. They want a high quality product, but they are mindful of the price (not as price sensitive as Pebble and Small Fish). They also want quality technical assistance, but in contrast to Whales they show a high need for software integration. Their purchases are the highest in dollars, they buy almost as often as Whales, and the average relationship we have with them is as long or longer than the Whales.

However, slightly less than half of their purchases come from us so this segment is the main battleground at this point, and is likely the segment leaking out customers. TSB shows that on average they have spent twice as less time at our booths compared to our key competitors; 36% and 78% time spent respectively (proportions were averaged so they do not add up to 100).

This segment requires most of our attention with regard to retention and future expansion, their referral rates are low so maybe they should be targeted indirectly, which will be discussed in proceeding paragraphs. Also, if we win them over we could submerge them in our product ecosystem, lessening their need for software integration, and cementing them as loyal customers.

Small Fish

This is the largest segment of the market at 46%. They are very price sensitive, like Pebble, seeking above average product with a focus on technical assistance. Their purchases are one third of the size of either Whales or Big Fish and they order less frequently, but their overall size partially makes up for it and justifies their consideration.

Around 32% of their purchases is from us, but their TSBs show they spent double the time at our competitors. However, the most revealing part about their TSBs is that overall they spent a low amount of time at both our and competitors booth; 12% and 20% respectively. This suggests that the high-end quality and premium price of our offerings might be a mismatch, but the rest of the market still does not manage to satisfy their needs overall. There is a chance our current hold of about the third of this segment might slowly diminish over long-term if we ignore the market dynamics.

Targeting and Positioning

We should first focus on developing better technical assistance and informing our target segments of it through adequate media. First, we need to retain our dominance of the Whale segment. They place high amount of trust in their peers and in magazines. They also have the most referrals on average. We should use this conjunction to counteract low referral rates in other segments. On the other hand our main target for expansion, the Big Fish, place high trust in peer suggestions but their referral rates are low. We propose referral programs to be introduced through magazines. Incentivizing the Whales to refer both to praise the product within the segment, and to use referral programs in order to have a spill over effect to the Big Fish.

Second, we should further examine the software integration needs. The goal here should be to provide ease of use across our product line, while also providing satisfying levels of software integration with the products of our competitors. We should already have informed the consumer base well about our high levels of technical assistance which would help them with any problems in integration. However, we should use internet sources to reach the Big Fish and advertise the ease and quality of use across our product ecosystem. We should reiterate the compounding effects of using multitude of our products. Further the Big Fish in this sense are approached from three directions they place most trust in; magazines, internet, and peer suggestions.

Third, since our two focal targets are our long-term customers we should also create loyalty programs to preserve our current base, and offer them discounts or trials of additional products in order to demonstrate the benefits of the holistic use of the ecosystem.

Finally, we should make sure the integration across brands is still working to degree where it will not create frustrations and push our base towards the competitors. In the case of the Small Fish, they are on a budget and seeking quality products. Even though we hold one third of that segment, and the value we extract is less than that of Whales/Big Fish, we should still make sure our less expensive lines of products provide better integration with other brands.