

Data Mining Applications for the Hospitality Industry

Within the travel industry, customers have always considered their time at a hotel as an experience rather just a visit. Activities such as fine dining, nightly entertainment, spas, corporate seminars/meetings nurture this notion of ‘customer experience’. This range of activities is going to have varying levels of appeal among a given clientele. The role of data mining and analytics can be quite significant in helping us to better understand these varying client needs.

Our first task might be to conduct a basic customer value exercise in order to ultimately identify our best customers. As with many analytical exercises, the concept of seasonality needs to be considered here. Seasonality is a very significant factor within the hotel industry. Most analysts would agree that for the travel industry, the issue of seasonality can potentially have a significant impact on travel behaviour. For example, one traveler may spend \$1,000 annually as a casual traveler throughout the year and is considered an “average customer”. Another traveler spends \$1,000 annually, but on a tennis package for one week period. Both customers spend the same amount but are in fact very different types of customers. This notion of seasonality is significant when conducting any analytics exercise particularly if we consider that many hotels will offer tennis and golf packages in the summer and ski packages in the winter.

In addition to the issue of seasonality, there are various services that may have more appeal to certain groups of customers. Fine dining and theatre may appeal to one group of customers while spas and perhaps valet type services appeal to another group. With varying interests amongst travel clientele, a “cluster type” segmentation exercise would be a very useful way to identify different groups of customers. Experts in the travel industry would certainly agree that there are distinct or homogenous customer segments. Using the data being captured on travel customers, we can apply some science to identify truly distinct customer segments.

How do we integrate the notion of customer value within the cluster segmentation approach? Typically we might conduct a value segmentation exercise on the entire customer base and then overlay the cluster segments to see how they align with customer value.

Table 1

Decile	# of Customers	Average Customer Value	# of Customers in Cluster 1	# of Customers in Cluster 2	# of Customers in Cluster 3
1	50,000	\$300	30,000	15,000	5,000
2	50,000	\$250	25,000	15,000	10,000
3	50,000	\$200	20,000	20,000	10,000
4	50,000	.	.	.	.
5	50,000	.	.	.	.
6	50,000	.	.	.	.
7	50,000	.	.	.	.

Boire Filler Group

8	50,000	.	.	.	.
9	50,000	.	.	.	.
10	50,000	\$5	5,000	15,000	30,000

In Table 1 above, high value customers (\$300 avg. value) comprise mainly Cluster 1 type customers while low value customers (\$5 avg. value) are comprised primarily of Cluster 3 customers.

For the hotel industry, a more useful approach might be to identify the unique cluster groups and to *then* conduct a separate value segmentation exercise for each cluster. For example, for a given hotel we identify 4 basic clusters or distinct customer groups such as tennis groups, ski group, pampered group (e.g. use spa and valet type services) and the nighthawk group (fine dining and theatre goers). The segmentation approach might look as follows:

Table 2

Tennis Group			Ski Group		
Decile	# of tennis customers	Avg Annual Customer value	Decile	# of ski customers	Avg Annual Customer value
1	15,000	\$150	1	10,000	\$240
2	15,000	\$100	2	10,000	\$200
3	15,000	\$75	3	10,000	\$175
4	15,000	.	4	10,000	.
5	15,000	.	5	10,000	.
6	15,000	.	6	10,000	.
7	15,000	.	7	10,000	.
8	15,000	.	8	10,000	.
9	15,000	.	9	10,000	.
10	15,000	\$15	10	10,000	\$24

Pampered Group			NightHawk Group		
Decile	# of Pampered customers	Avg Annual Customer value	Decile	# of nighthawk customers	Avg Annual Customer value
1	10,000	\$320	1	15,000	\$475
2	10,000	\$275	2	15,000	\$425
3	10,000	\$225	3	15,000	\$375
4	10,000	.	4	15,000	.
5	10,000	.	5	15,000	.
6	10,000	.	6	15,000	.
7	10,000	.	7	15,000	.
8	10,000	.	8	15,000	.
9	10,000	.	9	15,000	.
10	10,000	\$35	10	15,000	\$50

In Table 2 we can see that the tennis group has the lowest value of the four customer segments. In fact, a customer in the highest value tennis segment might be considered average value compared to the pampered group or nighthawk group customer. This tiered segmentation approach for each cluster allows us to evaluate each group separately, on its own merits.

As seen in the charts above, initial learning from this type of segmentation could be used in developing a marketing strategy that is data-driven.

For instance, some top-line thoughts on how we might use this information for customers in the ski group cluster, are as follows:

- Cross-sell tennis packages to all ski package customers while cross-selling ski packages to tennis package customers
- Up-sell getaway type packages that include fine dining and a theatre pass to high value ski and high value tennis customers.
- Cross-sell a spa type package to high value nighthawk customers (deciles 1, 2, and 3)
- For customers that are both high value pampered (deciles 1, 2, and 3) and high value nighthawk (deciles 1, 2, and 3), create a VIP type program of benefits that are exclusively available to a very small elite group of customers

The examples above relate to personal travel activities, and the needs of business travelers are equally if not of greater importance to the hotel sector. The hotel could examine its current business customer base and once again establish unique groups of business customers. For example, we know that there are groups of business customers that simply use the hotel for overnight stays, while others are there for longer term events held at the hotel. It may be possible to further segment these groups based on industry sector. We would certainly expect that local events held by the oil and gas industry might be more appropriate in Alberta, while financial services type events may be more prevalent in Toronto. Of course, all this supposition on what might define unique business segments would need to be determined quantitatively through clustering routines. By using the data and mathematics rather than intuitive judgment to define key customer segments, we can develop unique programs that are appropriately geared to different groups of unique business travelers.

Customer experience has always been the overriding customer philosophy within the travel industry, long before the advent of data analytics. Yet, with data analytics, the travel industry can now use information to make better decisions regarding its customers. This enhanced decision-making capability enables hotels to be more proactive with its customers. Traditionally, success in the hotel industry has always been determined by superior customer service actions that address the immediate requested needs of the customer. The competitive advantage in today's hotel industry is driven more by the ability to anticipate and proactively meet the needs of customers; an ability that can only be exercised through data analytics.