**Reputation Index in Hotel Industry**

**What is Reputation Index?**

Reputation Index is a measure of online reputation of the institution (or its set of competitors) based on reviews furnished in various OTA/Ranking/Online review/Social media websites.

**Where else it can be used?**

It is used across multiple industries ranging from

1. Stock market
2. Travel and Hospitality
3. Retail stores
4. Online commerce

In this article we will focus on Hospitality. We would create an index that would reflect the online reputation of the hotel. This index can be used as input feature in demand forecasting and price optimization models.

Also from investor perspective, it is a tool to assess the fluctuation in value and overall risk associated with a hotel investment. From a government’s perspective, it is a tool to assess the industry health of the country, region, city and there by promoting investments for building tourism infrastructure as well.

**Why it is important for hotels to maintain high VI?**

To remain ahead in the industry, hotels need to do better revenue and pricing management and while maintaining high occupancy, which is based on highly accurate demand forecasting and price optimization. It would also help the hotel to price their room according to movement in Value Index. Its been observed that Value Index has a high correlation with demand.

**How it is calculated?**

There are 2 types of value indexes

1. Value index of subscriber from online reputation
2. Value index for all hotel competitors as a single variable from online reputation data

For Calculating Value Index, we require following:

* Sentiment Score of each reviews for all OTA sites
* Review count per day per OTA Site (Review Velocity)
* Market share of hotel
* Market Share of competitors
* Hotel Star Rating
* Geographical placement of the hotels

Let us say we have to calculate VI for a hotel H and it has competitor hotels c1, c2, c3….cn

We need to have online reputation data of the hotels i.e. online reviews. These reviews can be extracted from multiple OTAs in the market such as TripAdvisor, Booking.com, Agoda, etc

Following key metrics can be extracted from online reviews data:-

1. Number of reviews
2. Readability index of the reviews (Flesch-Kincaid score and Flesch -readability score)
3. Sentiment score of the reviews
4. Review velocity
5. Channel popularity
6. Review size (word count of the Review)
7. Review Language

Let’s call the above features m1, m2…m7

Assumption: Competitors keep changing and so market share as well

Calculating the decay score of sentiment

It is based on the fact that a traveler may not book a hotel on the same day on which he is reading a review. Furthermore, there exist a recall value of reviews from each channel and different channel popularity.

The sentiment score was decayed in a way that it gave a very high weightage to the most recent review and lower weightage to older reviews. Moreover, analytically, the weightages were found to be different for different channels.

At = log(xt) + α.At-1 ………………*for m3*

VI function can be defined as

β = (H, c1….cn, m1…m7)

Site VI: Ωcn = At\*(w1.m1….w6.m6) [wn is the weight for each mn]

Aggregated VI: ΩCn\*m5) [***Wi*** is the weight]