



The Pricing of Meetings and Event Spaces in Hotel Revenue Management

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Abstract: In this paper, we discuss the pricing of Meetings and Event Spaces in Hotel Revenue Management. We use a measure called Attendee Density, for a Meeting and Event Space, which is similar to the measure of Occupancy for a hotel room. Based on the method for forecasting Occupancy for a hotel room, we forecast Attendee Density for an Event Space. The Attendee Density is the ratio of Attendees Booked to Capacity. To forecast Attendee Density, we have to forecast how many attendees will book in the future. To forecast how many attendees will book at a specific date in the future, we sum our current Reservations on Hand and a quantity called the Pickup. The Pickup is calculated based on a Booking Curve. The Booking Curve is a graph which plots Reservations on Hand against Time. It shows us how bookings happen leading upto a particular event. Once we calculate Pickup based on the Booking Curve, we can forecast how many attendees will book at a date in the future. We can then calculate Attendee Density. A high Attendee Density for the future results in charging a High Price today. On the other hand, a low future Attendee Density results in charging a Low Price currently. We also discuss how we can go about determining a High Price and a Low Price for a Meeting and Event Space.

Keywords: Hotel Revenue Management, Meetings and Event Spaces, Pricing, Attendee Density

1. Introduction and Literature Review

Businesses face complex selling decisions. As an example, how can a firm segment its customers in different ways? The aim is to exploit the different buying behavior or willingness to pay of different customers for the same product.

What prices should the business charge its different customer segments? How should prices vary over time based on seasonal factors and observed demand?

Revenue Management (RM) deals with these demand management decisions and the analytical methods and IT systems that are used to make them. It is a detailed and data driven method to make these decisions. RM started in the airlines in the US, when the airlines there were deregulated in 1978.

RM, as a field of study and application, can be considered an integral part of Operations Research and Operations Management. In India, RM has been applied in the Airline and Hotel industries.

In this paper, we discuss the pricing of Meetings and Event Spaces in Hotel RM. To do pricing, we need to first do

forecasting. We also need to determine what should be appropriate price levels to charge for the Meetings and Event Spaces.

The Forecasting method in the paper is based on Cornell School of Hotel Administration's Online Course on 'Forecasting and Availability Controls', [1].

How to determine price levels to be used? This is based on 2 sources. The first source is a discussion on how to price a hotel room by a Revenue Manager from Singapore on www.quora.com, [2]. The second source is the book [3]. It is an HSMAI Foundation Special Report. HSMAI stands for Hospitality Sales and Marketing Association International. It is a leading body for Hotel Revenue Management in the US.

Finally, how Forecasting and Price Levels can be combined is based on the following Webinar on the website of IDEaS [4]. It is 'Smart Space by IDEaS: Extending Revenue Strategy to Meetings and Events'. IDEaS, now part of SAS, is a leading Hotel Revenue Management technology company in the US.

Lastly, our understanding of RM, has benefited tremendously from the following 2 leading textbooks on RM

in the US. The first textbook is by Talluri and van Ryzin [5]. The second textbook is by Phillips [6].

The above completes the references that we have used in the writing of this paper.

Below we carry out a detailed Literature Review.

Ivanov [7] is a research monograph that aims at developing an integrative framework of hotel revenue management. It elaborates the fundamental theoretical concepts in the field of hotel revenue management like the revenue management system, process, metrics, analysis and forecasting.

Kimes [8] looks for insight that professional managers have about the future. A survey of 487 professionals found the future was going to be much more strategic in nature and will be more strongly driven by technology in which function space will be the new frontier.

According to Weatherford and Kimes [9], the arrivals forecast is one of the key inputs for a successful hotel revenue management system, but no research on the best forecasting method has been conducted. The authors used data from Choice Hotels and Marriott Hotels to test a variety of forecasting methods.

Ivanov and Zhechev [10] present a literature review of the main concepts of hotel revenue management and the current state-of-the-art of its theoretical research. The article emphasises on the different directions of hotel RM research and is structured around the elements of hotel RM.

Noone et al [11] mention companies are struggling to keep up with the rapid consumer adoption of social media. Although many companies have begun to develop social media programs, the industry has yet to fully explore the potential of this emerging data and communication medium.

Choi and Mattila [12] discuss that at the core of revenue management principles lies the concept of demand-based

variable pricing. Hotel managers are concerned that pricing hotel rooms according to this concept may alienate customers due to the perceived unfairness of the practice.

Abrate and Viglia [13] discuss that dynamic pricing techniques allow using a number of variables in a tactical way compared to standard catalogue prices. Their study merges in a conceptual model the relevance of the tactical and the strategic dimension of these variables, classified according to their tangible differences.

Choi and Kimes [14] study electronic distribution channels' effect on hotel RM. According to the authors, hotel managers have become more conscious of the need for optimization methods.

Kimes [15] discusses the history of hotel revenue management (RM) and traces its evolution over the past 25 years. The most important change in hotel RM has been its evolution from a tactical inventory management approach to a more strategic marketing approach.

We next discuss Forecasting.

2. Forecasting Demand for Meetings and Event Spaces

Consider the following situation. Suppose a Hotel has 8 Meetings and Event Spaces.

There are 2 Large Meetings and Event Spaces with a capacity of 40-100 Attendees.

There are 2 Medium Meetings and Event Spaces with a capacity of 20-40 Attendees.

Lastly, there are 4 Small Meetings Spaces with a capacity of 5-20 Attendees.

The Attendee Density is used as a measure of Occupancy.

Consider Medium Event Spaces.

The Attendee Density (for Medium) = Total Attendees Booked (Medium) / Total Capacity of the Medium Spaces

To do Pricing of Meetings and Event Spaces, we first need to forecast demand for each of the 3 sizes of Event Spaces. We then also need to determine 3 suitable price levels for each of the 3 sizes of Event Spaces. These levels are a High Price, a Medium Price and a Low Price for each of the 3 sizes of Event Spaces.

Consider a Business Hotel in a major metro city. Today, it is Thursday, 6th September. We would like to forecast demand for Medium Event Spaces for Thursday 13th September. As we mentioned before, the hotel has 2 Medium Event Spaces with a capacity of 20-40 Attendees.

There are currently 45 Reservations on Hand (ROH) for Attendees for the Thursday next week, i.e. 13th September. How do we determine today, i.e. 6th September, how many reservations we would expect to have on 13th September?

This is done by using a curve which plots Reservations on Hand on the y axis, versus Days to Go on the x axis. This curve is called a Booking Curve. Using the Booking Curve, we determine Pickup. The Reservations on Hand above, is in terms of the Number of Attendees for Medium Event Spaces.

Pickup is based on historical data from the Booking Curve.

It tells us how much demand we expect to see in terms of the Number of Attendees, a certain fixed number of days out into the future. Suppose the Pickup for Medium Event Spaces for a Thursday, for a seven day period into the future is 22.

This value of Pickup of 22, is coming from a Booking Curve for the Number of Attendees for Medium Event Spaces for Thursday.

We can then write,

Forecast for Medium Event Spaces (No. of Attendees) for Thursday, 13th September

= Reservations on Hand on Thursday, 6th September

+ Seven day Pickup for Medium Event Spaces, Thursday

= 45 + 22

= 67

To do a forecast, we need a value of Pickup. How do we determine Pickup for Medium Event Spaces (of the Number of Attendees) for next Thursday?

We need a Booking Curve for Medium Event Spaces for Thursday. In fact, we do not need just one Booking Curve, but 5 Booking Curves for the previous 5 Thursdays. We discuss this next.

Consider the following data.

Table 1. Booking Data for Medium Event Space, Thursday, 6th September.

| Days To Go | Reservations on Hand (No. of Attendees) |
|------------|---|
| 0 | 66 |
| 1 | 63 |
| 2 | 60 |
| 3 | 57 |
| 4 | 54 |
| 5 | 49 |
| 6 | 46 |
| 7 | 42 |
| 14 | 34 |
| 21 | 25 |
| 28 | 16 |
| 35 | 7 |

From the above data, we can see that there are 16 confirmed Reservations on Hand (ROH or Attendees) for Medium Event Spaces, 28 days before the event. Similarly, the ROH is 57, 3 days before the event.

As the Days to Go decreases, ROH increases. The closer

we get to the day of the event (low Days To Go), the more confirmed Attendees we have (high ROH).



Figure 1. Booking Curve for Medium Event Space, Thursday, 6th September.

We would also need the data below to determine Pickup. This data corresponds to the Booking Curves for the previous 4 Thursdays.

Table 2. Booking Data for Medium Event Space for the previous 4 Thursdays.

| Days To Go | ROH Thu, 30 th Aug | ROH Thu, 23 rd Aug | ROH Thu, 16 th Aug | ROH Thu, 9 th Aug |
|------------|-------------------------------|-------------------------------|-------------------------------|------------------------------|
| 0 | 67 | 64 | 63 | 69 |
| 1 | 61 | 61 | 60 | 66 |
| 2 | 57 | 58 | 55 | 61 |
| 3 | 54 | 54 | 52 | 57 |
| 4 | 49 | 49 | 49 | 52 |
| 5 | 45 | 46 | 48 | 51 |
| 6 | 42 | 45 | 46 | 49 |
| 7 | 39 | 43 | 45 | 48 |
| 14 | 28 | 31 | 33 | 39 |
| 21 | 19 | 22 | 21 | 30 |
| 28 | 12 | 15 | 10 | 19 |
| 35 | 4 | 9 | 1 | 12 |

We now see how to use this data to determine Pickup. For that, we need an Average Booking Curve.

The reason we use an Average Booking Curve is that the single Booking Curve for the most recent Thursday, may contain noise or may not necessarily be representative of how booking happens leading up to a Thursday.

An Average Booking Curve or an average booking pattern over the last 5 Thursdays, may be more representative of how booking happens leading up to a Thursday.

How do we calculate the Average Booking Curve?

Consider, Days To Go = 2. The ROH for the Average Booking Curve at Days to Go =2, is the Average of the ROH of the 5 Booking Curves of the previous 5 Thursdays, at the value of Days to Go =2.

From the previous data, the ROH of the Average Booking Curve at Days to Go =2, is

$$(60 + 57 + 58 + 55 + 61) / 5 = 58.2$$

Similarly, the ROH of the Average Booking Curve at Days To Go = 0, is

$$(66 + 67 + 64 + 63 + 69) / 5 = 65.8$$

Also, the ROH of the Average Booking Curve at Days To Go = 5, is 47.8

Suppose presently there are for example, 20 days to go, for the target date of the Event (e.g. 13th September).

The Pickup is calculated based on historical data (the Average Booking Curve).

Table 3. Pickup for Medium Event Space for Thursday.

| Days To Go | Average Booking Curve | Pickup |
|------------|-----------------------|--------|
| 0 | 65.8 | |
| 1 | 62.2 | 3.6 |
| 2 | 58.2 | 7.6 |
| 3 | 54.8 | 11 |
| 4 | 50.6 | 15.2 |
| 5 | 47.8 | 18 |
| 6 | 45.6 | 20.2 |
| 7 | 43.4 | 22.4 |
| 14 | 33.0 | 32.8 |
| 21 | 23.4 | 42.4 |
| 28 | 14.4 | 51.4 |
| 35 | 6.6 | 59.2 |

The Pickup calculates how many Attendees do we expect to get between now (Days To Go = 20) and the target date of the Event (Days To Go = 0).

More formally,
 Let Days To Go = t.
 The Pickup at Days To Go = t is,
 ROH of the Average Booking Curve at Days To Go = 0
 ROH of the Average Booking Curve at Days To Go = t
 Suppose as before, today is Thursday, 6th September

and we have 5 reservations on hand (Attendees for the Event) for a Thursday 5 weeks from now, i.e. 11th October.

Our forecast for the number of reservations (or Attendees) we would have for Medium Event Spaces on Thursday, 11th October is,

$$\begin{aligned} \text{Forecast} &= \text{ROH} + \text{Pickup for 35 days (or at Days To Go = 35)} \\ &= 5 + 59.2 \\ &= 64.2 \text{ or } 65 \end{aligned}$$

We can always round up, because we can always take an extra reservation (or Attendee) due to No- shows or cancellations.

In the above, we would like to mention that there is one Booking Curve for each combination of Size and Day of Week. So for 3 sizes and 7 weekdays, there would be 21 Booking Curves, to do forecasting of demand for Event Spaces.

We next discuss how to determine a High Price and a Low Price for a particular size of Event Space.

3. Determining a High Price and a Low Price for a Meeting and Event Space

Consider a Business Hotel in a major metro, which has 3 sizes of Event Spaces: Large, Medium and Small.

We would suggest 3 price levels for each of the 3 sizes of Event Spaces. Consider the Pricing for a Medium Event Space.

As a suggestion, we could have 3 levels of Prices. A High Price, a Medium Price and a Low Price.

The High Price is set based on Value Pricing. The Low Price is set based on Cost Plus Pricing.

How do we set the High Price?

We set the High Price at just a little bit lower than the price of a higher end competitor, offering a higher Value.

The Value of an Event Space in a Hotel would be based on the Location and Amenities. In addition to the Location of a Hotel, the other components of Value would be Amenities. The Amenities would include among others:

Audio-visual Equipment

Tables, Chairs and Lighting

Food and Beverages

Ambience

Let us consider the following.

What if,

Price of Medium Event Space > High Price, as set previously?

We would be charging a higher price than a higher end competitor who offers a higher Value. We would not be priced competitively in the market. Our Ranking by Value on a website like Tripadvisor would certainly drop.

What if,

Price of Medium Event Space < High Price ?

We charge a High Price, only when we have very High Attendee Density (which is a measure of Occupancy), for e.g. above 85%. If we charge too much lesser than High Price, we would be leaving money on the table. We would have the same high Attendee Density, even if we had priced higher.

How can we possibly do Value Pricing? The example below illustrates this.

We give a weight to each component of Value. So, in the example below, Location has a weight of 5, Audio-visual equipment has a weight of 5 and Ambience has a weight of 3.

We are comparing our hotel to 2 competitors, Competitor 1 and Competitor 2. We give a score of 5 if the hotel is Excellent on a specific component of Value. We give a score of 3, if the hotel is Good on the specific component of Value. Lastly, a score of 1 is assigned for Poor performance.

We then find the weighted scores for our Hotel and our 2 Competitors on each component of Value. Finally, we find the Total Weighted Score. This is shown in the Table below.

Table 4. Example of Value Pricing of Medium Event Spaces: A Benchmarking Study.

| | Hotel Score | Weighted Score | Competitor 1 Score | Weighted Score | Competitor 2 Score | Weighted Score |
|-----------------------------|-------------|----------------|--------------------|----------------|--------------------|----------------|
| Location, 5 | 5 | 25 | 5 | 25 | 1 | 5 |
| Audio-visual Equipment, 5 | 5 | 25 | 5 | 25 | 3 | 15 |
| Tables, Chairs, Lighting, 5 | 3 | 15 | 5 | 25 | 3 | 15 |
| Food, Beverages, 3 | 3 | 9 | 3 | 9 | 1 | 3 |
| Ambience, 3 | 3 | 9 | 5 | 15 | 3 | 9 |
| Total Score | | 83 | | 99 | | 47 |

The Total Score can be used as a proxy or a measure for the Value of the Medium Event Space, offered by the Hotel. We find that Competitor 2 offers a much lower Value. So that hotel is not really a competitor for our hotel. On the other hand, we can consider Competitor 1, as a slightly higher end

competitor, offering a higher Value.

So the High Price of the Medium Event Space should be a little bit lower than the price of the Medium Event Space of Competitor 1.

We set the Low Price, based on Cost Plus Pricing. We

could set the low price of the Medium Event Space in the range of 10% to 20% above Variable Cost.

The Variable Cost of an Event Space would consist of among others:

- Food and Beverages
- Utilities
- Labor Costs
- Cost of dry cleaning
- Cost of providing Wi-Fi

We do have to price at a minimum at a certain margin above Variable Cost. If we price below Variable Cost, part of

$$= ROH + \text{Pickup for Days To Go} = t$$

This is calculated as discussed in the section on forecasting demand.

We then have,

Forecasted Attendee Density (Medium) at Days To Go = t , is,

$$= \text{Predicted Number of Attendees (Medium) / Total Capacity of Medium}$$

The final pricing for a particular Size of the Meetings and Event Space is based on forecasted Attendee Density (a measure of Occupancy).

Forecasted Attendee Density in the High Occupancy range (e.g. above 80%): High Price

Forecasted Attendee Density in the Medium Occupancy range (e.g. between 50% and 80%): Medium Price

Forecasted Attendee Density in the Low Occupancy range (e.g. below 50%): Low Price

The basis of the above pricing scheme is the following. Given a low forecasted occupancy, we would like to charge a low price. We would like to make at least some margin on the Event Spaces, rather than make no margin at all.

On the other hand, given a high forecasted occupancy, we would like to charge a high price. Since there is high demand for the Event Spaces, we would like to make a high profit, by selling the Event Spaces at a high price.

5. Conclusions

In this paper, we discuss the pricing of Meetings and Event Spaces in Hotel RM. Our contribution has been to combine leading but disparate sources and present an approach on how such pricing could be done.

We use a measure called Attendee Density, for a Meeting and Event Space, which is similar to the measure of Occupancy for a hotel room. Based on the method for forecasting Occupancy for a hotel room, we forecast Attendee Density for an Event Space. The Attendee Density is the ratio of Attendees Booked to Capacity. To forecast Attendee Density, we have to forecast how many attendees will book in the future. To forecast how many attendees will book at a specific date in the future, we sum our current Reservations on Hand and the Pickup. The Pickup is calculated based on a Booking Curve. It shows us how bookings happen leading upto a particular event. Once we calculate Pickup based on the Booking Curve, we can forecast how many attendees will book at a date in the future.

the cost of hosting an Attendee is borne by us.

Once the High Price and the Low Price are set, the Medium Price could be a suitable price somewhere in the middle of the range.

We next discuss Pricing of Meetings and Event Spaces.

4. Pricing of Meetings and Event Spaces

Consider a Medium Event Space.

The Predicted Number of Attendees (for Medium) for Days To Go = t , is,

We can then calculate Attendee Density.

A high Attendee Density for the future results in charging a High Price today. On the other hand, a low future Attendee Density results in charging a Low Price currently. We also discuss how we can go about determining a High Price and a Low Price for a Meeting and Event Space. The High Price is calculated based on Value Pricing. The Low Price is calculated based on Cost Plus pricing.

Future work could consider a similar method for pricing of hotel rooms. However, in that case tactical pricing considerations based on competitor's actions also become more important.

References

- [1] Cornell School of Hotel Administration's Online Course on 'Forecasting and Availability Controls'.
- [2] <http://www.quora.com>, accessed in August 2018.
- [3] Cullen, K. (2015) *The Evolving Dynamics of Revenue Management*, HSMIA Foundation and STR, Nashville.
- [4] <http://www.ideas.com>, Webinar, 'Smart Space by IDEAS: Extending Revenue Strategy to Meetings and Events'.
- [5] Talluri, K. and van Ryzin, G. (2005) *The Theory and Practice of Revenue Management*, Springer, New York.
- [6] Phillips, R. (2005) *Pricing and Revenue Optimization*, Stanford University Press, Stanford, California.
- [7] Ivanov, S. (2014) Hotel revenue management: From theory to practice. Zangador.
- [8] Kimes, S. E. (2011) The future of hotel revenue management. *Journal of Revenue and Pricing Management*, 10 (1), pp. 62-72.
- [9] Weatherford, L. R. and Kimes, S. E. (2003) A comparison of forecasting methods for hotel revenue management. *International journal of forecasting*, 19 (3), pp. 401-415.

- [10] Ivanov, S. and Zhechev, V. (2012) Hotel revenue management—a critical literature review. *Tourism: an international interdisciplinary journal*, 60 (2), pp. 175-197.
- [11] Noone, B. M., McGuire, K. A. and Rohlf, K. V. (2011) Social media meets hotel revenue management: Opportunities, issues and unanswered questions. *Journal of Revenue and Pricing Management*, 10 (4), pp. 293-305.
- [12] Choi, S. and Mattila, A. S. (2004) Hotel revenue management and its impact on customers' perceptions of fairness. *Journal of Revenue and Pricing Management*, 2 (4), pp. 303-314.
- [13] Abrate, G. and Viglia, G. (2016) Strategic and tactical price decisions in hotel revenue management. *Tourism Management*, 55, pp. 123-132.
- [14] Choi, S. and Kimes, S. E. (2002) Electronic distribution channels' effect on hotel revenue management. *The Cornell hotel and restaurant administration quarterly*, 43 (3), pp. 23-31.
- [15] Kimes, S. E. (2016) The evolution of hotel revenue management. *Journal of Revenue and Pricing Management*, 15 (3), pp. 247-251.