

## **Managing Hotel Revenue amid the COVID-19 Crisis**

### **Abstract**

**Purpose:** The revenue management (RM) discipline is built on the principle of demand-based pricing. This study aims to examine how and to what extent RM can be implemented in the hotel industry during low-demand periods, particularly during the coronavirus disease 2019 (COVID-19) crisis.

**Methodology:** We used semi-structured interviews to gather information from hotel RM executives, RM consultants, and RM system providers. Participants were asked to think about the impact of COVID-19 on their RM practices. We interviewed 26 revenue executives between January and March 2020.

**Findings:** Core RM processes are still relevant during the COVID-19 crisis; however, not all components are equally important. Business analysis, pricing strategy, and demand modeling and forecasting are the most critical RM processes. Inventory and price optimization and setting booking controls are not as important at this time; along with distribution channel management, these processes will become more relevant as demand picks up.

**Research implications:** Future research in this area should focus on each core RM process separately and in depth to understand how implementation changes during the crisis and recovery periods. Future studies should also investigate how these processes operate during the recovery period. The full breadth of consequences of the COVID-19 crisis in hotel RM will likely manifest gradually. Therefore, the core RM processes should also be examined when the crisis is over.

**Originality:** Apart from a few studies that touched on RM-related strategies during economic downturns, to our knowledge, this is the first study to systematically examine the extent to which RM can be implemented during a crisis.

**Keywords:** revenue management, crisis management, COVID-19, hotel industry

## **Managing Hotel Revenue amid the COVID-19 Crisis**

### **Introduction**

The revenue management (RM) discipline encompasses two strategic levers: duration control and demand-based pricing (Kimes & Chase, 1998). Demand-based pricing refers to making pricing decisions based on varying demand over a given period. RM executives in the hotel industry have used this pricing method since the inception of the discipline in the early 1980s. The fundamentals of RM dictate that historical demand patterns and trends, along with the number of reservations on hand, should be used to drive price optimization. However, due to the global coronavirus disease 2019 (COVID-19) pandemic, historical demand patterns are no longer relevant, and RM systems cannot be relied on to provide accurate demand forecasts and price recommendations.

RM involves a long-term strategic decision-making process that requires the collection and analysis of relevant data, which help hospitality industry professionals understand the market situation, competitive positioning, and customer segmentation to identify potential business opportunities in their markets (Denizci Guillet, 2020). In this respect, regardless of the level of demand in the market, the RM process is still essential to hoteliers. The only difference is that the RM focus is likely to shift from revenue to bottom-line profit during low-demand periods.

The global COVID-19 pandemic has had a devastating impact on the entire travel and tourism industry, including the hotel industry. This crisis is unlike any other because no other event—be it 9/11, the severe acute respiratory syndrome (SARS) outbreak in 2003, or the 2008 financial crisis—resulted in all types of demand plunging simultaneously around the world. Hotels have been overwhelmed by the increase in room booking cancellations. Hotel industry professionals are under immense pressure, dealing with partial or complete closings,

financial losses with largely unchanged fixed costs, and uncertain short- and long-term demand for hotel rooms (Jiang & Wen, 2020). According to a PhocusWire report that used Smith Travel Research data, as of March 21, 2020, occupancy has decreased by 96% in Italy, 68% in China, 67% in the United Kingdom, and 59% in the United States compared to 2019 (Sorrells, 2020). The report explained that the U.S. occupancy rate has not decreased as much as that of Italy because there was no national or federal lockdown at the time. These lockdowns have undoubtedly had a strong adverse effect on hotel occupancy. The revenue per available room (RevPAR) was down by 85% year over year for the week ending in March 1 in China, which is worse than the RevPAR downturn of 59% during the 2008 financial crisis. Using HotStats data, Simon (2020) reported a 100% or more year-over-year drop in hotel profits in the United States, Europe, Asia, and the Middle East. All around the world, there have been significant declines in occupancy, average daily rate, and RevPAR. Hotels have taken several measures to mitigate the impact of COVID-19 on their business by furloughing staff, reducing costs, and pivoting online (Peterson, 2020).

COVID-19 has caused several changes in hotel consumer consumption behavior around the world, with future implications for the hotel industry. Thanks to social distancing guidelines and stay-at-home orders, many people worldwide have adopted online shopping, distance learning, and working from home. It is not yet clear which of these habits will remain when the pandemic is over. The economic, financial, psychological, and societal trajectories that will result from the impact of COVID-19 on consumer behavior are also unclear, as the crisis is not yet over (Cross, 2020).

According to Deloitte (2020), as consumers are now much more concerned about health and infection risk, hotel companies should place hygiene at the forefront of their business models. Hotel customers should be able to trust that the hotels are taking the necessary steps to protect their customers' health. Building and maintaining trust is important

at this time. A survey conducted by Deloitte in Canada found that Canadian consumers are likely to spend 51% less on travel and 15% less on restaurants in the next four weeks compared to their consumption in the previous four weeks (Peterson, 2020). Business travel and meetings, conventions, and events are an important source of income for the hotel industry. As all travel has come to a halt and companies furlough staff and reduce budgets, this customer segment may not return to normal at all.

Deloitte (2020) divided industries into four categories based on the degree of change in product offerings and the impact of COVID-19 on business abilities: the change hero, the wave surfer, the restructurer, and the redefiner. Tourism and food service industries were placed in the redefiner category, where COVID-19 has a strong negative impact on business abilities and has resulted in a high change in product offerings. Companies that operate in the tourism and food service industries need to restructure themselves and create new product offerings to overcome the crisis. Hotel companies should continuously monitor business and leisure travel trends and consequently adjust their recovery plans.

In countries where COVID-19 is still spreading, governments have imposed many restrictions, including social distancing requirements, travel limitations, and stay-at-home orders. These restrictions have sharply lowered hotel room demand and even destroyed it in some destinations. This destruction of demand has nothing to do with the price. Given that the RM discipline is built on the principle of demand-based pricing, this study aims to examine how and to what extent RM can be implemented in the hotel industry during low-demand periods, particularly during the COVID-19 crisis.

This study adopted the hospitality RM process framework of Denizci Guillet and Mohammed (2015), which involves seven core RM activities in a cyclical process (Figure 1): (1) business analysis, (2) pricing strategy, (3) demand modeling and forecasting, (4) inventory and price optimization, (5) setting booking controls, (6) distribution channel

management, and (7) performance analysis and evaluation. The core activities are interconnected and influenced by eight external factors: business strategies, employees, competition, legal factors, economic factors, social-cultural factors, technology, and customers. Business analysis is the most crucial activity in the seven-step cyclical process. It requires data and intelligence to set the right price (#2) for the product, which relates to demand forecasting (#3); hence, inventory control (#4) is optimized through booking controls (#5) and channel management (#6). This leads to a continuous evaluation and performance analysis (#7).

The reason for selecting the RM process framework of Denizci Guillet and Mohammed (2015) in this study is three-fold. First, it is a comprehensive and unified framework that was developed based on the works of Noone et al. (2011) and Ivanov and Zhechev (2012). Second, this framework outlines the core RM decision-making processes, including all aspects of RM in logical order. Following this framework for data collection will provide a systematic way of guiding the study participants through their RM practices and the impact of COVID-19 on these practices. Third, reviewing core RM processes one by one with the study participants will allow the identification of the most critical RM processes during low-demand periods.

\*\*\* Please insert Figure 1 about here\*\*\*

## **Literature Review**

To understand how and to what extent RM can be implemented during low-demand or crisis periods in the hotel industry, we review the literature in two sections. The first section describes the hotel RM process and explains how RM is connected to demand-based pricing. The second section focuses on crisis management, its existing measures or frameworks, and hospitality and tourism studies about crisis management.

## **Revenue management process and demand-based pricing**

RM originated from the airline industry, where it is known as “yield management.” According to Belobaba (1989, p. 183), yield management refers to “efforts to manage the revenue mix of passengers carried” and involves “both pricing and seat inventory control.” It is now widely applied in service industries for the same objective—to maximize revenue. Applying this concept to the hospitality industry, RM is defined as “a method which can help a firm to sell the right inventory unit to the right type of customer, at the right time and for the right price” (Kimes, 1989, p. 348). This requires a systematic procedure or a system in place.

Supply and demand have an essential influence on all kinds of business. In the RM context, demand-based variable pricing is applied to control for optimal inventory (Choi & Mattila, 2005; Heo & Lee, 2010), resulting in optimal revenue. Since demand fluctuates but hotel capacity is relatively fixed yet perishable, setting the price according to the forecasted demand is critical. Dynamic pricing and booking restrictions are often put in place to optimize inventory and balance supply and demand. When a hotel forecasts high demand or demand exceeds the capacity, higher prices and more restrictions are set to target the selected customers. Conversely, when demand is low, there is less opportunity to yield through pricing. Thus, demand has a direct influence on overall RM strategies and tactics.

We adopted the unified framework for hospitality and tourism RM from Denizci Guillet and Mohammed (2015), who expanded the scope of RM activities identified by Noone et al. (2011). The framework of Noone et al. was first established to evaluate social media-related RM opportunities, issues, and unanswered questions. In their study, they identified five core RM processes: demand modeling, demand forecasting, optimization, setting booking controls, and distribution channel management. This cyclical process has a direct association with total hotel RM, business strategy, and interaction with customers to

establish long-term strategic development. Noone et al. concluded that sales and marketing activities should support RM activities. In their study on RM framework development, Ivanov and Zhechev (2012) identified other RM topics, including RM metrics (e.g., RevPAR, ADR, GOPPAR, yield, and occupancy), human resource issues (e.g., revenue manager, team, and training), hotel revenue centers, the RM process in general, measuring the impact of RM, operational data needed in RM, introducing and implementing the RM function in hotels, economic and marketing principles of hotel RM, integrating RM and customer relationship management, and RM software or the roles of technology in hotel RM.

In an effort to develop a comprehensive and unified framework of RM processes, Denizci Guillet and Mohammed (2015) extended the framework of Noone et al. (2011) to include the RM-related topics identified by Ivanov and Zhechev (2012; see Figure 1). In this extension framework, eight RM-related factors impinge on the seven core RM processes. The eight external factors are business strategies, employees, competition, legal factors, economic factors, social-cultural factors, technology, and customers. The seven core RM processes are part of a recurring process, which requires an evaluation of the business (business analysis) to set the right pricing strategy, to forecast the demand through inventory control, to do price optimization, and to set booking controls in the right distribution channels. The process then goes back to business analysis through performance analysis and evaluation. This is an ongoing process that requires up-to-date information for optimal results.

### **Crisis management**

A crisis is a short-term incident with a large impact, and recovery from a crisis is often a long process (Dahles & Susilowati, 2015; Faulkner, 2001; Ritchie, 2004; Santana, 2004). Among the most disruptive crises to date are 9/11, the 2003 SARS outbreak, the 2004 Indian Ocean tsunami, the 2008 global financial crisis, the 2010 Thai political protests, Hong Kong's Yellow Movement protests in 2014, and the current COVID-19 pandemic in 2020.

Laws et al. (2007, p. 6) defined a crisis as “an event which disrupts the pre-existing state of affairs ... a serious event that can have many causes including natural, political, financial or technical.” They described crises as “chaotic, dynamic and dangerous” (Laws et al., 2007, p. 5). Faulkner (2001) defined a crisis as a situation where an organization faces challenges in coping with changes. The word “crisis” originated from the Greek word *kpinein*, which means to sift or to decide, and is used in Greek medicine “to signify the turning point of an illness ‘in which it is decided’” (O’Connor, 1981, p. 301). The “turning point” is an opportunity to change normal practices, which can lead to either negative or positive effects. Crises are differentiated from routine situations by “a sense of urgency and a concern that problems will become worse in the absence of action” (Santana, 2004, p. 307). Hence, action plans are essential to minimizing the risk caused by disruption and helping businesses recover faster (Faulkner, 2001; Laws et al., 2007; Ritchie, 2004; Santana, 2004).

#### *Crisis management frameworks*

Crisis management aims to prevent a crisis from occurring, or at least identify warning signals, and prepare an appropriate response. Santana (1999) defined crisis management as an ongoing integrated effort to first understand and then prevent a crisis. This effort takes into account stakeholders’ planning, training, and interest in three phases: pre-crisis, during crisis, and recovery. When there are signs of crisis, preparation lists, activities, and plans are put in place. This is the turning point at which the crisis can be avoided, and when a crisis occurs, these plans and activities helps to minimize loss. In addition, when there are signs of recovery, action plans are set into motion, providing businesses the opportunity to reorganize and quickly get back on track.

Faulkner (2001) proposed a framework for tourism disaster management. According to Faulkner, a disaster is a sudden, unpredictable situation over which one has little control, whereas a crisis is related to failing to adapt to the changes associated with inept management



structures and practices. In his framework, the tourism disaster management process has six phases: pre-event, prodromal, emergency, intermediate, long-term recovery, and resolution. The pre-event phase of an effective disaster management plan entails obtaining the commitment of each leader and forming a disaster management team to assess the situation. In the prodromal phase, the activities in the plan are ranked in response to the potential risk level. During the emergency phase, the focus is on the actions carried out according to the plans. It is important to note that constant monitoring activities and media coverage are needed to minimize the damage; therefore, some flexibility is required for these activities to be performed. A system of communication warnings and a command center are important. The disaster strategy needs to be continuously updated and refined to ensure that new information is taken into consideration. The intermediate phase is where the recovery begins, the damage is audited, and the cleanup and media communication strategies are put in place. In the long-term recovery phase, reconstruction and reassessment continue. The last phase is resolution, where routines are restored and a new, improved state is established.

Ritchie (2004) proposed a strategic and holistic framework for managing crises and disaster situations. Knowledge of the anatomy of a crisis or disaster helps increase understanding of the crisis by breaking it down into stages and lifecycles. Ritchie's framework evolved from Faulkner's (2001) six disaster management phases into a three-stage strategic management framework. It begins with the pre-event stage, which requires proactive planning through scanning the environment, including assessing the current situation and risk and having strategic and contingency plans in place according to the different forecasted assumptions. The second stage is implementation. The final stage is related to the resolution, evaluation, and feedback. One of the key highlights is working with various stakeholders, including competitors, for the recovery plan.

### *Crisis studies in hospitality and tourism related to RM*

Studies related to RM and crisis management are limited. Dahles and Susilowati (2015) conducted a longitudinal study of small-scale businesses in Yogyakarta, Indonesia, to understand business resilience during crises (i.e., the 1997–1998 Asian financial crisis, the 2002 Bali bombings, and the 2006 Yogyakarta earthquake). Their analysis was based on three perspectives on resilience: survival, adaptation, and innovation. They reported that some businesses drastically changed and ventured into new startups targeting consumer tastes. Their findings revealed the need to facilitate cost reduction (i.e., layoffs and cost savings) and switch to the domestic market.

Israeli and Reichel (2003) focused on Israeli hospitality practices during the crisis period from 2000 to 2002. The crises were mainly related to the threats of terror activities. They found that tourism mainly relied on domestic travelers. They listed 21 hospitality practices and categorized them into marketing, hotel maintenance, human resources, and governmental assistance. Butscher et al. (2009) outlined hotel pricing strategies during downturns and suggested using a simple, transparent, and customer-oriented approach. They stated that any inconsistency in brand pricing policy could lead to distorted customer perceptions and dissatisfaction. They identified loyalty programs, smart bundling, and upselling as successful crisis management practices.

Focusing on airline tactics, Caudillo-Fuentes and Li (2009) discussed RM during the economic downturn. They reported that nonsystematic large discounts do not benefit businesses in either the short or long term but lead to opportunities in pricing policies. They stated that it is important to find new customer segments with the right pricing structures and marketing campaigns. They also noted that the input of experienced managers is essential during downturns. Measuring risks involving cash flows, they proposed incorporating the

value at risk and sharp ratio. The idea came from Lancaster's (2003) relative revenue per available seat mile at risk, which is associated with cost and revenue.

Gehrels and Blonar (2013) studied how the economic crisis in December 2008 affected RM in two Hilton hotels in Prague, Czech Republic. They used a qualitative method with multiple sources (i.e., participant observation, company documents, and key informant interviews). They found that, in general, market segments did not change, but the customers' buying behavior changed due to the declines in room rates, resulting in a shift in booking channels. For instance, business clients booked through online travel agencies (OTAs) because their prices were more attractive than the corporate rates. This drastic decline in public rates resulted in price wars in response to the 2009 economic crisis. Furthermore, hotels were more concerned about costs than before. Gehrels and Blonar's study provided a detailed description of tactics, but these were only applicable to the two Hilton hotels in Prague and may not apply to the Eastern European hotel industry or to other destinations due to the different markets and segmentation, as well as the external supply and demand within the destination.

Kimes (2009) conducted an online survey ( $n = 291$ ) on the issues faced by the hotel industry after the 2008 financial crisis. The results showed that price wars, pricing, and rate integrity were the three most challenging issues. To address these issues, Kimes (2009) recommended that the hotel industry maintain its price positioning relative to the competitive set, identify potential market segments, and determine the most effective distribution channels. She also suggested possible price and nonprice approaches. The nonprice methods include revealing strategic intentions, competing on quality, creating strategic partnerships, focusing on the loyalty program, developing additional revenue sources, and developing additional market segments that fit the hotel brand image. The price-based methods include bundling services into the rate, using opaque distribution channels, and offering targeted rate

cuts to the selected market segments, especially the offline or unpublished rate. Kimes concluded that regardless of whether times are difficult, the goal of RM is still to maximize revenue. However, these suggestions may not be applicable when there is no demand, such as during the COVID-19 crisis, since the hotel industry has no control over government policies and travel bans.

## **Methodology**

This study adopted a qualitative approach to encourage participants to express their opinions from their own perspectives and experiences.

## **Study design**

We used semi-structured interviews to gather information from hotel RM executives, RM consultants, and RM system providers. Participants were asked to think about the impact of COVID-19 on their RM practices. The interview questions were guided by the core RM processes presented in Figure 1. The questions were mainly related to business analysis, pricing strategy, demand modeling and forecasting, inventory and price optimization, setting booking controls, distribution channel management, and performance analysis and evaluation. The closing question was on expanding the focus of RM beyond rooms. We added some questions on the participants' background and the organizational structure of their hotels to gain a better understanding of the contextual differences. The interviews began with questions about the participants' background and work experience. The questions were slightly adjusted depending on whether the participant was a hotel RM executive, RM consultant, or RM system provider. The expert sampling method was used because the participants had to be experienced revenue executives who made daily RM decisions and were involved in developing RM strategies for their hotels.

## **Participants**

Participants were reached through invitation letters that included information about the study. Twenty-six revenue executives were interviewed between January and March 2020. Table 1 presents the participants' background information. The average RM experience of the participants was 15 years. Eleven participants held bachelor's degrees, ten had master's degrees, four held associate degrees, and one had a doctoral degree. The 19 hotel RM executives held various positions ranging from director of revenue to assistant vice president of revenue optimization. Among the hotel RM executives, eight were working at the property level (managing revenue for one hotel) and 11 were working at the corporate level. These corporate-level participants oversaw numerous hotels and brands within the region or area. Participants had experience with various RM systems, including IDEaS, Duetto, and their own systems. Two participants were from the two most popular RM system providers. Five participants were RM consultants or experts with an average RM work experience of 23 years. Thirteen participants were based in Hong Kong at the time of data collection. The other participants were based in China, Macau, Maldives, Singapore, Thailand, Turkey, Qatar, and the United States.

\*\*\* Please insert Table 1 about here\*\*\*

## **Procedure**

The interviews were conducted through phone or Skype and lasted 45 minutes to an hour. They were recorded and transcribed with the participants' permission. The transcription and review of the data were conducted simultaneously during the interview process. Data saturation was reached after 26 interviews. Transcribed data were uploaded to NVivo for data organization and analysis. The first step of data analysis was the identification of themes (Braun & Clarke, 2006), followed by frequency computation to identify the important themes and their dimensions (Creswell, 2008). For example, if a participant mentioned the relevance

of historical data, a frequency of 1 was recorded under the “demand modeling and forecasting” theme. Data coding was done by two researchers separately. The two researchers then compared their coding and, after a thorough discussion of the context, made changes where there were discrepancies. The trustworthiness of the data was checked in terms of the researchers’ subjectivity, data confirmability, and data transferability (Guba, 1990). Data triangulation and participant checking were used to obtain repeated confirmation of the participants’ responses to decrease the risk of meaning distortion and the researchers’ subjectivity (Krefting, 1991). To ensure the transferability of the findings to comparable contexts, detailed descriptions of incidents were recorded.

## **Findings**

Figure 2 presents a word cloud of the interviewees’ 50 most frequently used words. The words were grouped by similarity in NVivo. For example, “changes,” “changing,” “remodel,” and “renovation” belong to the stem called “changes.” The minimum word length is 4. This visual representation of text data excludes conjunctions and prepositions in the text that are not meaningful. The interviewees’ most frequently used words are “hotel,” “changes,” “activities,” “events,” “content,” “structure,” “build,” and “communication.” These words are put into context in the explanation of the study findings.

\*\*\* Please insert Figure 2 about here\*\*\*

Table 2 shows the frequency of themes and dimensions related to the RM process during the COVID-19 crisis. The frequency refers to the number of times a topic was mentioned in the interviews; the frequencies are listed from highest to lowest. The number of participants refers to the number of participants out of 26 that mentioned the dimension. The first theme, context, refers to the themes related to the background of the study, which revolves around RM practices during the COVID-19 crisis. The other themes echo the core RM processes in the framework of hospitality RM (Figure 1). These themes are business

analysis, pricing strategy, demand modeling and forecasting, inventory control, segmentation, marketing, distribution channel management, and performance management. Two additional themes that emerged from the data analysis are strategies in the near future and human capital matters. These themes are explained in the following sections.

\*\*\* Please insert Table 2 about here\*\*\*

The four subthemes under context are government influence (24 comments from 13 participants), RM applies regardless of demand (10 comments from 7 participants), the similarity of the COVID-19 crisis to the 2003 SARS crisis (7 comments from 7 participants), and having a lack of control over the impact of COVID-19 on the hotel business (5 comments from 4 participants). Government influence refers to the impact of local and central government policies on hotel demand. Policies related to travel restrictions and border closings were mentioned in various locations, including Hong Kong, Mainland China, Europe, and the United States. According to Interviewee 19, “with no demand, it is not about RM but crisis management.”

Comments on the application of RM regardless of demand focused on the RM function under different levels of demand and emphasized that RM works regardless of demand fluctuations.

If the demand is low, there are still statistics to review, such as pace, demand pattern, segment, etc. ... So the RM process is still the same as before; there should be no difference. The only difference is that the figures are smaller in scale, but you can still see the trend. (Interviewee 9)

Another subtheme is the similarity of the COVID-19 crisis to the 2003 SARS crisis. While some participants mentioned that only the 2003 SARS crisis is comparable to the COVID-19 crisis, others stated that the COVID-19 crisis is much graver and will have a longer recovery period compared to SARS. The 2003 SARS crisis was seen as a regional crisis, whereas COVID-19 was described as having a global impact.

Participants mentioned the hotels' lack of control over the impact of COVID-19 on the hotel business. Interviewee 12 explained,

Different types of crises might affect different segments and hence create different RM needs and strategies. On many occasions, sales-driven segments suffer the most during crisis mode, which we are experiencing right here, right now. There is very little you can do in crises such as social unrest and the coronavirus crisis; both prevent travel.

### **Business analysis**

Business analysis includes all activities related to the intelligence required for proper RM implementation. This theme is a popular one, with 82 comments from 24 participants. The topics discussed under this theme are as follows: reviewing past work (e.g., improvement of website content as well as description and photo updates for OTAs and the central reservation system), focusing on digital marketing efforts, and reviewing the effectiveness of the hotel database. Reviewing database effectiveness includes merging duplicate profiles, sorting and taking action for better data cleanliness, reviewing data standards, deactivating rate plans that are no longer applicable or in use, and revisiting reservation policies. In relation to rate plans, predefining and presetting the lowest public rate was also discussed.

One of the measures that the participants analyzed was the total spending per guest. Total RM efforts were mentioned as part of hotels' changing direction from a room RM perspective to a total RM perspective. Participants shared that this crisis has allowed them to reassess and reflect on current business practices. According to Interviewee 23,

It's a good way to remodel our business operations. Today, we try to save and cut costs. Assessment helps us to understand our business more, how we do things, and realize that it is time for change. The future is the key. Move away from the dream stage and focus on the future!

Thirty comments were related to the relevant internal and external data for demand modeling and forecasting during the COVID-19 crisis. Relevant internal data include the days-of-the-week trend, segmentation mix, pace report, distribution channel reports, and cancellations by segment. Relevant external data include macroeconomic data, TravelClick's



Demand 360, hotel association or tourism board data, airline traffic to a destination, all arrivals to a destination, STR Global reports, and data from HotStats Operational and OTAs.

### **Pricing strategy**

Pricing strategy was one of the most commonly mentioned themes in the study. Five subthemes under pricing strategy were identified: demand-based pricing (34 comments from 17 participants), discounting (20 comments from 16 participants), competition-based pricing (13 comments from 10 participants), value-based pricing (8 comments from 6 participants), and cost-based pricing (7 comments from 6 participants). Comments on demand-based pricing largely focused on its lack of usefulness during the COVID-19 crisis due to the lack of demand from all segments. Interviewee 22 said, “There will no longer be a ‘best available rate’ but the ‘lowest available rate’. Our practice is to set the lowest rate and then work with the other segments—corporate and other partners.”

The subtheme of discounting delves into the importance of not dropping rates as a long-term strategy. The underlying logic of this subtheme is that there is a lack of demand, and customers will not simply come when prices are reduced. In addition, it has been proven challenging to increase prices to the original levels after a crisis is over. Interviewee 17 explained,

Many times, the question is what to do if your competitor starts decreasing the price. I would still suggest not dropping the price because it will take longer to increase the average daily rate back to your previous level. In addition, customers’ price perception changes toward your product. For instance, in Bangkok, when Shangri-La Hotel dropped their rate by 50%, people may have come to experience staying in the hotel. But after experiencing it, when the hotel increased the price back to the previous level, people felt it was expensive even though the product was good.

Comments on competition-based pricing focused on the hotels’ positioning among their competitive sets. Price movements in the competitive set are monitored only for reference; one need not follow competitors’ price movements. Interviewee 10 said,

If one hotel drops its rates, it is recommended that you review your own product, location, and brand compared to that hotel. If your product is better—for instance, it has a prime location—it is not recommended that you follow suit. But if you are in a second- or third-tier location, you will follow.

Value-based pricing refers to pricing based on the target customers' perceived value of the product or service offerings. The comments on this subtheme were mostly related to hotels' efforts to create value for their customers through add-in services (e.g., limo pick-up services and food and beverage offers) in staycations catering to the local market. Comments on cost-based pricing focused on some hotels' willingness to accept bookings at a break-even point, as it is essential to cover operational costs, especially labor costs, to maintain their operations.

### **Demand modeling and forecasting**

Demand modeling and forecasting is a crucial step in the RM process. Forecasting is challenging during this unprecedented crisis, as prior reference points do not exist. Seventy-five comments in this section were distributed among five subthemes: the RM system (25 comments from 20 participants), manual forecasts (developing “what if” scenarios; 23 comments from 18 participants), the relevance of historical data (17 comments from 14 participants), the budget is meaningless (7 comments from 6 participants), and headquarters provide guidelines (3 comments from 2 participants). Comments on the RM system were related to the capability and inability of RM systems to generate useful forecasts during the COVID-19 crisis. System capability includes rate report generation, which is helpful in price positioning. Interviewee 3 shared,

RM system pricing may be more accurate if it is generated from prices among the competitor set. But as far as it [the RM system] suggests, it tends to be higher, so human adjustment is required. The key is related to the system setup and how you fit your information into IDEaS. This will include your hotel positioning compared to your competitive price. There is no doubt that occupancy forecasting will be way off.

The vast majority of comments focused on the inabilities of the system rather than its capabilities. System inabilities were mostly attributed to the uncertainty of the business

environment and the irrelevance of historical data, along with the time required for RM systems to learn the new demand patterns. There was a consensus that it takes about 8–15 weeks for RM systems to learn the current trends. However, for most destinations, there is virtually no demand for the system to learn.

Due to the problems stated above, the participants relied on manual forecasts through the development of “what if” scenarios. One set of somewhat relevant historical data that Hong Kong hoteliers rely on is the 2003 SARS data. However, they noted that recovery from the COVID-19 crisis will likely be much slower compared to recovery from the SARS crisis. According to Interviewee 3, “So far, there is no historical data from a similar situation. The forecast is based on three scenarios: if the situation remains the same, if the situation improves, and the worst-case scenario.” The participants explained different aspects of the manual forecasting process. Bottom-up forecasting, or forecasts by different segments, is recommended over a general forecast. Pickup trends from the past 1–2 weeks are used as reliable historical data along with cancellation statistics from different segments. In terms of the forecast horizon, the focus is on the 6-, 12-, and 18-month periods.

Comments on the relevance of historical data to demand modeling and forecasting explained why reviewing previous years’ data (e.g., on pickup trends and pace) is meaningless during the COVID-19 crisis. Participants also said that previously prepared budgets, like historical data, are meaningless. Interviewee 3 said,

Year-on-year comparison is meaningless, since the booking pace and pickup trends are completely irrelevant. I would instead use the current pickup pace within 30–45 days as the reference point and make the necessary assumptions and changes depending on market developments.

Two participants mentioned their reliance on forecasting guidelines provided by their headquarters. According to Interviewee 24,

There are guidelines provided by the area team for forecasting. The cluster or property team will just follow their provided figures. The cluster will send market information and updates to the area teams—including news, policy changes, property

segmentation trends and pickups, and market change information—twice a week. The headquarters make the adjustment, so the system itself is pretty realistic. The system forecasts the coming 90 days and follows the area team guidelines.

### **Inventory control**

There were 24 comments from 21 participants regarding inventory control. Inventory control during the COVID-19 crisis does not exist, as there is not enough demand to control. Participants agreed on the following: there is no inventory control during this period, the lead-in room category should be overbooked, the hurdle rate can be removed, upsells are acceptable with a minimum price gap, and rate fences and guaranteed requirements should be removed.

### **Segmentation**

The participants described how their segmentation changed during the crisis. There were 21 comments from 16 participants in this dimension. Segmentation varies depending on the hotel type and location. Hotels in resort destinations rely heavily on wholesalers, while hotels in metropolitan destinations rely on groups and business customers. When the demand is extremely low, the consensus is that segmentation does not matter so much anymore. Interviewee 1 said, “The current situation is market driven and all segments are down, so we won’t focus on which segment is key. We will try to grab all opportunities.” Participants also stated that it is the buyers’ market and that they should listen to their customers’ feedback and try to fulfill their requirements. During the data collection period (from late January to late March 2020), most hotels did not take any action steps for long-haul markets but continued working with wholesalers for short-haul markets. They focused on business and leisure customers from less affected countries because they assumed that business from these countries would bounce back first. The segment that was hit hardest during the crisis was group business in the form of meetings and events.

### **Marketing**

Participants explained how and to what extent they do marketing during the crisis. There were 16 comments from 11 participants in this dimension. Some opposed investing in marketing at this time, while others supported marketing expenditures. The argument behind ceasing marketing is that there is no demand, especially for the long-haul market, and people travel only for essential trips. Interviewee 9 stated that destination marketing is more important than property or brand marketing at this time. Proponents of investing in marketing highlighted the importance of digital marketing to targeted customer segments, which is relatively less costly. To build consumer confidence, participants recommended that the content of marketing messages focus on hotels' cancellation policies, hygiene procedures, and corporate social responsibility efforts. Interviewee 15 said,

There are some concerns about marketing during the crisis period. But the marketing message and how you put it together matters a lot. For instance, they may illustrate how staff are united and work together to overcome the situation and challenges. This would contribute to corporate social responsibility and strengthen their branding. People want to know whether you handle it well. For example, how Shangri-La Singapore hotel staff clean the hotel, turn it around, what actions they have done to build trust, and the corrective actions they took. The key is to turn the situation around to your advantage.

### **Distribution channel management**

The discussions on distribution channel management were largely about working with OTAs. There were 18 comments from 15 participants in this dimension. The most commonly mentioned topics were OTAs' ability to capture early returning demand, renegotiations on a dynamic commission structure with OTAs, and promotions with OTA partners. Participants also discussed the importance of measuring demand during the recovery stage to understand the channels and locations that are picking up. Interviewee 22 said that this is the time to negotiate with OTAs on a dynamic commission structure rather than a fixed-level commission. Participants were cautious about joining promotions with OTA partners, as these promotions tend to have a negative impact on hotel retail rates. Examples given were

Booking.com's genius additional discount and Expedia's membership rate. One recommended solution to this problem was to join offline promotions or offer packaged/bundled deals so that customers would not see the actual room rate.

### **Performance measurement**

This theme had three subthemes: focus on bottom-line profit over top-line revenue (18 comments from 11 participants), revenue generation index (RGI; 15 comments from 11 participants), and market share (10 comments from 9 participants). While hotels continue to monitor conventional RM performance measures, such as RGI and market share, the ability to cover costs is an important factor for survival. Eighteen comments on focusing on bottom-line profit over top-line revenue reflected this perspective. According to Interviewee 10, "During this period, crisis or extraordinary crisis, we should focus on optimizing cost and profit. It is a shift from RM management and optimization to profit and loss statement management and optimization."

Some participants stated that RGI is useless at this time, while others said that RGI is still a reliable RM performance measure, as there are no other reference points and no data sharing. In addition to RGI, hotels monitor their market share to keep a finger on the pulse of the market. Interviewee 17 explained,

Market share is the key, and it should be emphasized even during low-demand periods. It is used as a form of benchmarking. The market is declining, but we need to ensure that we are not dropping faster than the competitors. When there is no demand, we need to shift to drive revenue from what we have. In Thailand, for example, staycations or domestic travel will be the focus. We will be measuring how much business you can get from these domestic travelers; however, the measure [market share] is still the same.

### **Strategies in the near future**

Participants discussed short-term strategies to get them through this crisis. These strategies are as follows: focusing on seeking opportunities (19 comments from 10 participants), recovery plans (16 comments from 13 participants), RM in other revenue-

generating departments (14 comments from 13 participants), cost management (13 comments from 9 participants), doing more training (11 comments from 9 participants), focusing on the local market (7 comments from 6 participants), and having a flexible strategy (5 comments from 4 participants). The focus on seeking opportunities was best explained by Interviewee 18: “When there is a lack of demand or slow demand, RM is more about being an opportunity spotter. Where can we find an opportunity and gain market share?” The opportunities mentioned by the participants include shifting demand (postponing customer trips to the fourth quarter of 2020 or the first quarter of 2021), serving as quarantine hotels for destinations that require all arrivals to be quarantined, and accommodating medical personnel.

Recovery plans are in place for the hotels to be better prepared for the post-crisis period. The purpose of these plans is to enable hotels to be among the first to capture the market share when there are signs of recovery, such as a pickup in bookings for a particular segment. Participants emphasized the importance of being the first mover to grab the opportunities:

The key performance indicator is whoever recovers the fastest. It is important to look at the long term and make plans on how to sustain the business during the crisis. If you manage to recover faster than the market, you are a winner. (Interviewee 3)

RM in other revenue-generating departments is about revisiting the current practices and operational structure in the spa, food and beverage, and meetings and events, and working with these departments to instill an RM culture in the organization. Interviewee 11 defined this process as change management, as it is crucial to change people’s mindsets and educate them on the importance of change.

Cost management refers to the cost-cutting measures taken by hotels during the crisis period to sustain their business. These measures include cutting the salaries of management staff, requiring staff to take unpaid leaves, controlling utility costs, closing down certain

floors of the hotel, and reducing the operating hours of hotel restaurants. Comments related to cost management also focused on reviewing the hotel's break-even point to keep the hotel running during the crisis.

Eleven participants mentioned that this quiet time during the crisis has allowed them to conduct more RM and cross-departmental training. The majority of these training sessions are now conducted online. Another subtheme is the focus on the local market. Participants see the local market as the main market in the short run and have taken steps to promote staycation packages for the domestic market. The final subtheme under strategies in the near future is flexible strategy. Having a flexible strategy means not having a strategy that is set in stone during the crisis period. As things change quickly and these changes are not under the control of revenue directors, all strategies related to pricing and distribution are flexible and subject to change.

### **Human capital matters**

This theme has four subthemes: the changing role of the revenue leader (19 comments from 9 participants), collaboration between RM and sales and marketing (18 comments from 15 participants), collaboration between RM and finance (7 comments from 5 participants), and collaboration with other departments and industry partners (6 comments from 6 participants). During this period, the revenue leader should be agile and resilient to adapt to where the demand is. In this respect, the revenue leader becomes a strategist rather than an analyst. Revenue leaders should be able to lead and guide the revenue team, including sales and marketing and executive management, on segmentation, pricing, and distribution during and after the COVID-19 crisis. The revenue leader enables the hotel to make informed decisions with confidence. One of the important matters that revenue professionals need to deal with at this time is working with executive management to prevent them from panic decision-making (e.g., unnecessarily decreasing the rates).



All types of collaboration are important during the crisis. Participants emphasized the importance of continuing collaboration between RM and sales and marketing. This collaboration includes efforts to keep existing corporate accounts, promotion and marketing toward non-hotel guest revenue, digital marketing, and communicating changing policies to customers. Collaboration between RM and finance is largely connected to RM becoming more profit oriented rather than revenue oriented. Interviewee 19 suggested that RM do forecasts in collaboration with the finance department. A number of participants elaborated on the importance of changing the revenue-focused perspective to a more profit-focused perspective in business mix and segmentation. Collaboration with other departments includes working with and educating the operational team on RM and the connection between pricing and perceived value.

## **Conclusion**

RM is a discipline characterized by demand-based pricing. The core RM processes remain relevant during the COVID-19 crisis; however, not all components are equally important. Our interviews with 26 revenue executives show that business analysis, pricing strategy, and demand modeling and forecasting are the most critical RM processes. Inventory and price optimization and setting booking controls are not as important at this time; along with distribution channel management, these processes will become more relevant as demand picks up.

When hotels work on their segmentation, they should consider the absence of long-haul leisure and corporate demand, at least in the short term. Performance analysis and evaluation is moving away from room RM toward total profit optimization. The missing link between room RM and total profit optimization is total RM. To move toward total RM, hotels must include other significant revenue-generating centers, such as the spa, food and beverage, and meetings and events as part of the RM process. The total RM stage is still under

development in the hotel industry. Only when the hotel industry masters total RM can it move toward total profit optimization. This process requires departments such as revenue, sales and marketing, and finance to work together. However, the silo approach being implemented by the hotel industry is not a suitable environment for this type of cross-departmental collaboration.

Given the current challenges, as the hotel industry eventually moves into the recovery stage, RM executives should make data-driven decisions depending on the time and rate of demand recovery by market, channel, and segment. A permanent change in consumer behavior is possible; therefore, it is crucial to monitor and learn about changing consumer behavior in a timely manner.

### **Theoretical implications**

The findings of this study reveal several implications for theory development and practice. Three implications are identified and discussed briefly. First, this study contributes to the hospitality RM literature by providing information and insights on how RM is implemented during the COVID-19 pandemic. Holistic approach taken to get viewpoints from the revenue executives on all core RM processes enabled to thorough examination of RM implementation in hotels during the pandemic period. Second, to our knowledge, this is the first study that examines the effects of the pandemic on RM implementation. Our study showed that the critical RM processes during the COVID-19 pandemic differ from the core RM processes listed by Denizci Guillet and Mohammed (2015). The study contributes to the RM literature by improving the understanding of how and to what extent RM is implemented during a crisis or low-demand period. Third, this study also enhances knowledge on crisis management practices, which in turn helps in developing theories of contingency in the hospitality crisis management context.

## **Practical implications**

This study aimed to examine how and to what extent RM can be implemented in the hotel industry during low-demand periods, particularly during the COVID-19 crisis. The findings reveal that RM can be implemented during low-demand periods; however, its implementation during the COVID-19 crisis differs from its implementation during regular or high-demand periods. This difference is due to a number of factors. First, hotel companies should perform business analysis on an ongoing basis to keep up with the fast-changing business environment as authorities start lifting public health restrictions and reopening the economy, and they must make the necessary changes to prepare them for the recovery phase. Hotel companies should be able to respond and adapt to their customers' changed behavior and expectations. The external factors in the RM framework (Figure 1) are much more influential during the COVID-19 crisis and require ongoing business analysis.

Second, there appears to be a shift in RM pricing strategies from demand-based pricing to value-based pricing and competitive price positioning. When the demand is extremely low, hotels may opt for cost-based pricing strategies. It is important to remind hoteliers not to use price as a means to drive customers, which can lead to price wars and reduced bottom lines. This would make the recovery process even more challenging, as it would take a long time to increase the rates to pre-pandemic levels.

Third, given that historical data and budgets are no longer relevant, RM executives rely on manual forecasts and scenario analysis based on the evaluation of feasible outcomes of the COVID-19 crisis and possible events in the near future. Thus, RM systems are not very useful in the crisis. However, RM systems learn the trends about 8–15 weeks after there is some demand for them to learn from. In the current situation with constant changes, RM systems are not capable of providing accurate forecasts. Nevertheless, RM system recommendations are valuable as a guide to better understand hotel and market performance.

Information sharing, constant monitoring of potential business, and media coverage are essential because they allow the revenue team to justify the forecasts and tactics.

Fourth, inventory control, which is normally an important part of the core RM processes, is less relevant during the crisis due to the lack of demand and abundant availability of all room types. Upselling is still suggested with a more attractive price difference.

Fifth, similar to inventory control, segmentation is not as crucial at this time, as there is not enough demand to do proper segmentation. Segmentation is an internal report, and it depends on a number of factors, including hotel location, hotel type, and customer type (i.e., business or leisure). During low-demand or crisis periods, hotels may grab all opportunities regardless of the clientele and their actual or intended segmentation. Having said that, revenue executives should do a proper customer segmentation analysis to detect any changes in trends and spot potential opportunities, as different customer segments are likely to recover at different rates. This step should become more important during the recovery stage when customers start booking again. More specifically, it will become more important when there is an indication of demand or sufficient demand to yield through inventory control. The revenue team will then reset pricing and promotions for the new segmentation mix.

Sixth, there are mixed views on whether to stop marketing during the COVID-19 crisis. Those that continue marketing efforts focus on digital marketing to targeted customer segments to build consumer confidence. The marketing messages focus on hotels' cancellation policies, hygiene procedures, guest wellness and corporate social responsibility measures. Some hotels have reduced their marketing activities, but marketing remains vital to getting a strong boost when demand starts to improve in the recovery. Continuing digital marketing efforts is crucial at this time. For example, hotels should stay visible to their target

customers on metasearch and social media sites and inform prospective customers about the systems they have in place to build customer confidence.

Another example is Banyan Tree Hotels' Instagram post on September 2, 2020, about stress relief from home through a massage session led by a well-being practitioner. As of October 7, 2020, Banyan Tree Hotels had about 68,000 followers. Banyan Tree Hotels are known for their spas and tranquil luxury settings.

Marriott International's "Commitment to Clean" campaign is an example of how to showcase hotel companies' efforts to make customers feel that it is safe to travel and stay in their hotels. As of October 7, 2020, Marriott International had 199,000 followers. Many hotels are expected to focus on enhanced cleaning and safety protocols in their marketing messages to customers as the industry starts recovering. Hotels should adopt marketing strategies that acknowledge the COVID-19 reality and embrace their customers with wholehearted care.

A great example of a marketing campaign is Wyndham Hotels' "Everyday Heroes" program. Wyndham Hotels started this program in honor of COVID-19 frontliners, including truck drivers, delivery drivers, warehouse workers, construction workers, sanitation workers, grocery associates, and healthcare workers. They offer these essential workers an instant complimentary gold membership upgrade (Wyndham Hotels, 2020). Another marketing campaign initiated by Wyndham Hotels is the "Count on Us" campaign, which focuses on the health and safety measures being taken by the company. This campaign aims to build customer confidence when the first wave of travelers comes back.

Seventh, driving business through OTAs and renegotiating commissions is at the center of distribution management. Hotels are cautious about joining price promotions with OTA partners. Managing OTAs appears to be key to early recovery. There were no discussions on driving direct business, which was a topic of great importance prior to the

crisis. At the end of May 2020, the Expedia Group announced a \$275 million global recovery program to help hotels recover from the impact of COVID-19. The recovery program includes reinvesting 25% of the commission earned by Expedia in 2019 from hotels into marketing credits. The Expedia Group has also allowed hotels to defer by 90 days the commission payments collected by properties from guests who book on OTA channels. Expedia also pledged to decrease its commission by 10% (PhocusWire, 2020). This is an important development given hotels' relationship with OTAs in the last decade. Lee et al. (2013) discussed the love-hate relationship between hotels and OTAs. They concluded that OTAs are far more powerful than hotels when it comes to digital marketing and data analytics.

Eighth, in terms of RM performance measurement, hotels are increasingly focusing on bottom-line profit over top-line revenue, which brings total profit optimization to the forefront of RM. While the hotel industry is still trying to move from room RM to total RM, the RM field is turning toward total profit optimization, which requires coordinating hotels' revenue and profit centers holistically rather than treating them as separate silos. Staycation packages have become popular as a way to bundle rooms and other revenue centers. For instance, Four Seasons Hong Kong has launched the "Best Friends (BFF) Slumber Party" package, which includes dining, shopping (i.e., coupons to designated shops at IFC mall), and wellness at an attractive price (Four Seasons Hong Kong 2020). The package invites customers to "gather [their] best friends for a restorative staycation. This package, which invites customers to "gather your best friends for a restorative staycation," is being offered until February 28, 2021, and requires booking one day in advance.

Ninth, revenue leaders are working on short-term strategies and recovery plans to prepare for when demand begins picking up. In addition, RM executives should reexamine the system setups and make the necessary changes and updates in preparation for the

recovery period. Database management is an area that the revenue team can focus on prior to the recovery period. For example, the existing customer database can be tidied up to filter out invalid or outdated profiles and update missing information. The revenue team can use this time to review the existing systems or software used and check whether they are fully and properly utilized. Another area that the revenue team can work on in collaboration with the sales and marketing team is content management on the hotel website, booking engine, OTAs, and other electronic distribution channels.

Tenth, the role of the revenue leader is becoming more strategic, and cross-departmental collaboration is more essential than ever. The role of the revenue leader is becoming more important, as revenue leaders are the center of collaboration between the revenue, sales and marketing, and finance departments. As many hotel businesses are cutting the number of staff in many of their teams, collaboration will become increasingly necessary. This will require revenue, sales and marketing, and finance leaders to step out of their comfort zones and work together. This can help the hotel industry to start moving away from operating in silos. The marketing team should collaborate with the revenue team for successful search engine optimization and digital marketing campaigns.

### **Limitations and future research**

This research has a number of limitations. First, data were collected between January and March 2020. At that time, different countries were in different stages of the COVID-19 crisis. Participants' comments could have been different if the same questions were asked at different points during the COVID-19 crisis. Second, the majority of participants were based in Asia. Future research on crisis RM should involve more participants outside Asia and include other locations around the world.

Apart from a few studies that touched on RM-related strategies during economic downturns (Butscher et al., 2009; Dahles & Susilowati, 2015; Gehrels & Blantar, 2013), to

our knowledge, this is the first study to systematically examine the extent to which RM can be implemented during a crisis. Future research in this area should focus on each core RM process separately and in depth to understand how implementation changes during the crisis and recovery periods. As this is being written, it remains unclear how and when the world economies will reopen. Future studies should also investigate how these processes operate during the recovery period. The full breadth of consequences of the COVID-19 crisis in hotel RM will likely manifest gradually. Therefore, the core RM processes should also be examined when the crisis is over. Case studies could also be conducted on how hotels specifically tackled RM practices during and after the COVID-19 crisis. Case studies would provide an in-depth perspective on hotel companies' RM-related actions and strategies.



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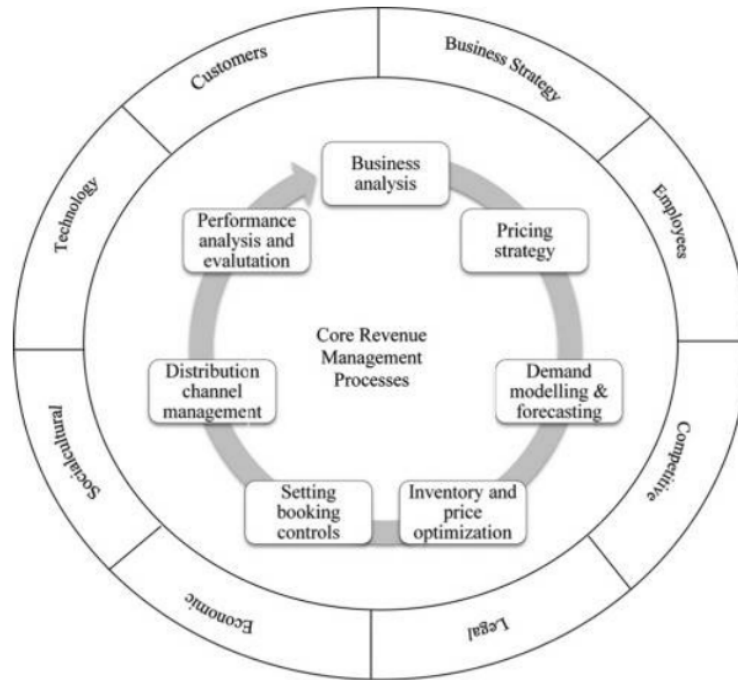


Figure 1. Framework for Hospitality Revenue Management (Denizci Guillet & Mohammed, 2015, p. 529)

Figure 2. Word Cloud presentation of 50 most frequently used words by the interviewees



Table 1. Profile of the participants

<i>Interviewee</i>	Title	Hotel/business category	Years of RM experience	Revenue management system	Education Level	Location
1	Corporate Director of Revenue	Independent hotel chain	10	IDeaS	Bachelor's degree	Hong Kong
2	Area Director of Revenue	International hotel chain	20	Own system	Bachelor's degree	Hong Kong
3	Founder	RM consulting company	25	IDeaS, Duetto, and others	Bachelor's degree	Singapore
4	Corporate Director of Revenue	International hotel chain	19	IDeaS	Master's degree	Hong Kong
5	Area Director of Revenue	International hotel chain	18	IDeaS	Doctoral degree	China
6	Corporate Director of Revenue	International hotel chain	20	IDeaS	Master's degree	Hong Kong
7	Director of Revenue	International hotel chain	13	Own system	Master's degree	Hong Kong
8	Revenue Manager, Corporate Office	International hotel chain	11	IDeaS	Bachelor's degree	Hong Kong
9	Director of Revenue	International hotel chain	10	IDeaS	Master's degree	Hong Kong
10	Vice President Commercial Asia Pacific Region	International hotel chain	20	IDeaS	Master's degree	Singapore
11	Senior Executive, Head of Revenue Management	International hotel chain	15	Own system	Bachelor's degree	Macau
12	Area Director of Revenue Management	International hotel chain	15	Own system	Master's degree	Hong Kong
13	Director of Revenue	International hotel chain	6	Own system	Bachelor's degree	Hong Kong
14	Revenue Manager	Independent hotel chain	6	Duetto	Bachelor's degree	Hong Kong
15	Revenue Optimizer Specialist	RM consulting company	23	IDeaS, Duetto, and others	Associate's degree	Thailand
16	Managing Director/Group Vice President - Asia Pacific Region	RMS provider	15	-	Bachelor's degree	Singapore
17	Founder and Managing Director	RM consulting company	25	IDeaS and others	Associate's degree	Thailand
18	Assistant Vice President, Revenue Optimization	International hotel chain	12	IDeaS	Bachelor's degree	Hong Kong
19	Founder	RM consulting company	18	IDeaS and others	Associate's degree	Singapore
20	Area Director, Account Management, Asia	RMS provider	15	-	Associate's degree	Thailand

21	Director of Revenue	International hotel chain	11	IDeaS	Bachelor's degree	Maldives
22	Regional Director of Revenue	Independent hotel chain	15	Own system	Master's degree	United States
23	Director of Revenue	International hotel chain	10	Own system	Master's degree	Qatar
24	Senior Revenue Manager	International hotel chain	6	Own system	Master's degree	Hong Kong
25	Director of Revenue	International hotel chain	10	Own system	Bachelor's degree	Hong Kong
26	Vice President of Marketing and Business Development	RM consulting company	25	Own system	Master's degree	Turkey

Table 2. Frequency of themes and dimensions related to the RM process during the COVID-19 crisis

Dimensions	Frequency*	# of Participants **
<b>Context</b>		
Government influence	24	13
RM applies regardless of demand	10	7
Similarity of COVID-19 crisis to 2003 SARS crisis	7	7
Lack of control over the impact of COVID-19 on hotel business	5	4
<i>Total</i>	46	
<b>Business analysis</b>	82	24
<b>Pricing strategy</b>		
Demand-based pricing	34	17
Discounting	20	16
Competition-based pricing	13	10
Value-based pricing	8	6
Cost-based pricing	7	6
<i>Total</i>	82	
<b>Demand modeling and forecasting</b>		
RM system	25	20
Manual forecasts	23	18
Relevance of historical data	17	14
Budget is meaningless	7	6
Headquarters provide guidelines	3	2
<i>Total</i>	75	
<b>Inventory control</b>	24	21
<b>Segmentation</b>	21	16
<b>Marketing</b>	16	11
<b>Distribution channel management</b>	18	15
<b>Performance measurement</b>		
Focus on bottom-line profit over topline revenue	18	11
Revenue generation index	15	12
Market share	10	9
<i>Total</i>	43	
<b>Strategies in the near future</b>		
Focus on seeking opportunities	19	10
Recovery plans	16	13
RM in other revenue-generating departments	14	13

Cost management	13	9
Opportunity to do more training	11	9
Focus on local market	7	6
Flexible strategy	5	4
<i>Total</i>	85	
<b>Human capital matters</b>		
Changing role of revenue leader	19	8
Collaboration between RM and sales and marketing	18	15
Collaboration between RM and finance	7	5
Collaboration with other departments	6	6
<i>Total</i>	50	

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Note: \* Frequency refers to number of times a topic has been mentioned by the participants

\*\* Number of participants refer to the number of participants that mentioned the dimension.