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# The Direction Ahead for Pricing RM in Hotel Industry

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## ※ Revenue Management

Revenue Management (RM) aims to maximize revenue by selling the right product to the right customers through the right distribution channels at the right price and time. In the hotel industry, managing fixed assets incurs high costs, predominantly attributed to expenses such as maintenance and labor, irrespective of demand fluctuations. Conversely, variable expenses incurred when selling additional hotel rooms—such as housekeeping and amenity costs—constitute a smaller proportion of the overall cost structure. Given that hotels prioritize brand asset management, reducing fixed costs has limitations. However, due to the lower proportion of variable expenses, maximizing profits through cost management has its constraints as well. Conversely, with a relatively higher proportion of fixed costs, increasing sales through operations does not significantly escalate variable expenses. In essence, in the hotel industry, maximizing profits through RM, rather than cost management, proves more effective. From this perspective, RM fundamentally involves finding solutions on how to maximize revenue.

Due to the distinctive nature of the hotel industry, Revenue Management (RM) has become a pivotal aspect of hotel operations. Recent shifts in the industry landscape, such as the emergence of alternative lodging services and diversification of service channels, have led to a rapid evolution, making RM reliant on the individual capabilities of revenue managers somewhat limited. Specifically, the intricate decision-making involved in room pricing, which stands as one of the most critical aspects of revenue management, necessitates sophisticated decisions based on consumer demand. This brief aims to spotlight Pricing RM amid the current hotel industry scenario. It delves into the state of Pricing RM currently employed in the hotel industry, discusses the status of Revenue Management Systems (RMS) alongside recent technological advancements, and seeks to propose directions for the application of Pricing RM in the future of the hotel industry.

## Utilization of Pricing RM in the Hotel Industry

### Global chain hotels employ internal RMS for pricing strategies



Internal RMS-based Price Setting Process

Recognizing the significance of RM, global chain hotels have independently developed and utilized RMS for a considerable period. Examples include Marriott’s OneYield, IHG’s Concerto, and Best Western’s BestRev. These internal RMS can encapsulate the characteristics of hotel chains and seamlessly integrate with Property Management Systems (PMS). Particularly, the utilization of such proprietary RMS has been increasingly prevalent with the accumulation of extensive data and advancements in analytical technology. For instance, IHG’s Concerto integrates previously separate reservation management systems with RM functionalities, organically connecting demand forecasting, price optimization, and revenue maximization. This system collects diverse data such as hotel location, amenities, room quantities,

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staff expertise, and tenure, proposing personalized services based on past reservations and diversifying booking options to encourage direct bookings.

In such hotel types, the internal RMS leverages Pricing functions to establish Best Available Rate (BAR), allowing RM practitioners to continuously adjust prices based on their expertise. To aid decision-making, Business Intelligence (BI) Tools like Lighthouse (formerly OTA Insight) are also integrated into operations. Each promotion is allocated quotas based on groups, determining prices accordingly, and setting varied prices based on the nature of products or reservation groups.

However, even within the same chain hotel, each property may adopt distinct approaches to determine room prices. Given each property’s unique characteristics, applying standardized policies universally poses limitations.

**Hotels without internal RMS employ external RMS for room pricing**



External RMS-based Price Setting Process

Hotels without internal RMS yet executing RM functions utilize external RMS for room pricing. Systems are designed to integrate internal hotel data with RMS, generating BARs based on various data and the RMS’s algorithms for the upcoming 365 days. Similarly to chain hotels, RM managers adjust prices based on benchmark BARs using their experience and may introduce other tools as necessary.

Representative RMS solutions commonly employed in the hotel industry include IDeaS and Duetto. IDeaS RMS offers features like demand forecasting based on deep learning, overbooking prevention, and provides pricing information based on room types, daily rates, length of stay, and individual hotel rates. It also analyzes cancellations, no-show patterns, widely utilized by numerous hotels. Duetto provides a unified RMS solution incorporating dynamic pricing, property management, forecasting, reporting, analytics, marketing, and loyalty programs. This machine learning-based service merges third-party data and updates information every 20 minutes.

Furthermore, solutions centered on Pricing functions include Roompricegenie and Wheelhouse. Roompricegenie suggests daily maximum and minimum prices per room type, offering a base price that users can adjust for the final price. It provides fine-tuning based on seasonality and demand characteristics and determines prices according to competitor rates and demand patterns (considering up to 10 competitors and fluctuations in hundreds of Airbnb listings). Wheelhouse offers Data-driven Pricing and Rule-based Pricing, adjusting prices based on various factors. Besides pricing functions, it provides services to manage 35 platform channels, including Airbnb.

**Hotels without RMS employ heuristic-based price setting**



Heuristic-based Price Setting Process

Hotels unable to afford high-end RMS rely on heuristic-based pricing. Particularly for new properties lacking historical data, setting a baseline price involves analyzing prices of neighboring or similar establishments. Existing properties adjust prices based on weekly sales performance, albeit with varying adjustments aligning with the owners’ business objectives. For instance, aggressive price cuts might be employed if the goal is to sell all rooms, whereas maintaining prices could be favored to preserve the property’s image.

Recently, with increased transaction activities via platforms, these companies provide pricing consultation services or supplementary pricing-related services. The platform’s consultation services involve MDs communicating directly with owners, suggesting and modifying appropriate ADRs. Leveraging the two-sided market, these MDs utilize B2B and B2C data within the platform and can propose suitable prices based on the property’s position in the market. Apart from basic transaction data, they can access data generated during user exploration, giving them a competitive advantage.

Whereas the aforementioned services involve human-to-human interaction, Expedia Group’s Rev+ aids hotels in setting optimal rates. It provides services based on real-time global data from Expedia Group, offering insights into current market demand and price changes. It allows checking market demand for up to 12 months ahead and incorporates competitor data. Furthermore, it offers convenient settings for owners to modify room rates and availability.

### Top 10 RMS Companies

Rank	Vendors	Hotels	Hotel Share	Rooms	Room Share
1	Expedia Group Rev+	107,000	17.8%	6,985,000	23.3%
2	IdeaS Pricing System, G2,G3	15,000	2.5%	2,600,000	8.7%
3	Marriott OneYield	7,124	1.2%	1,343,022	4.5%
4	IHG Concerto	5,761	1.0%	851,874	2.8%
5	Choice Hotels ChoiceMAX	7,153	1.2%	590,897	2.0%
6	Duetto GameChanger, ScoreBoard, BlockBuster	3,500	0.6%	590,000	2.0%
7	Infor EzLite, EzRMS	4,000	0.7%	500,000	1.7%
8	Beonprice	2,465	0.4%	306,250	1.0%
9	Best Western BestRev	3,150	0.5%	242,550	0.8%
10	Maxim RMS	1,125	0.2%	225,000	0.8%
<b>Total</b>		<b>156,278</b>	<b>26.1%</b>	<b>14,234,593</b>	<b>47.5%</b>

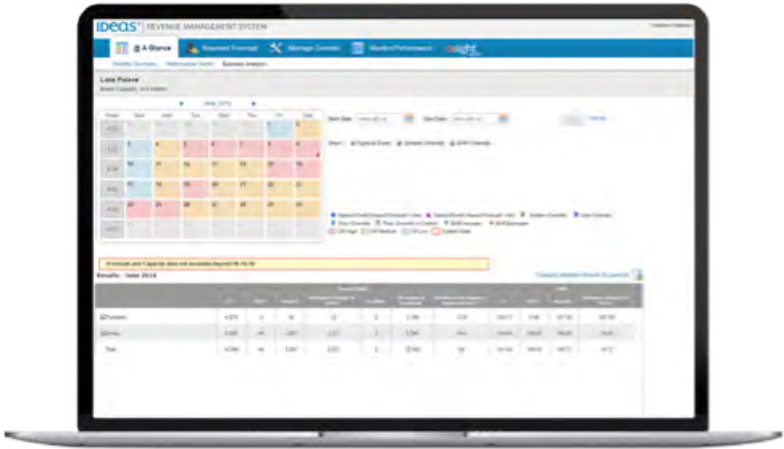
Source: Skift Research, 'Hotel Tech Benchmark: Revenue Management Systems 2021' (2021)

<Pricing Services in Global RMS Firms>

- 1 Duetto (Established in 2012 / based in San Francisco, USA)**

  - Integrated RMS solution: dynamic pricing, property management, forecasting, reporting, analytics, marketing, loyalty programs.
  - Service for dynamic pricing: "Open Pricing."
  - Price information: Point Estimate.
  - Machine learning model: integrates third-party data, updates every 20 minutes.
- 2 IdeaS (Established in 1989 / based in Minneapolis, USA)**

  - Acquired by SAS in 2008 for stronger Data Analytics.
  - Offers integrated features: demand prediction, overbooking, cancellation/no-show analysis.
  - Provides pricing details by room type, daily and length-of-stay rates, and hotel-specific data.
  - Built on deep learning.
  - Includes Last Room Value (LRV).

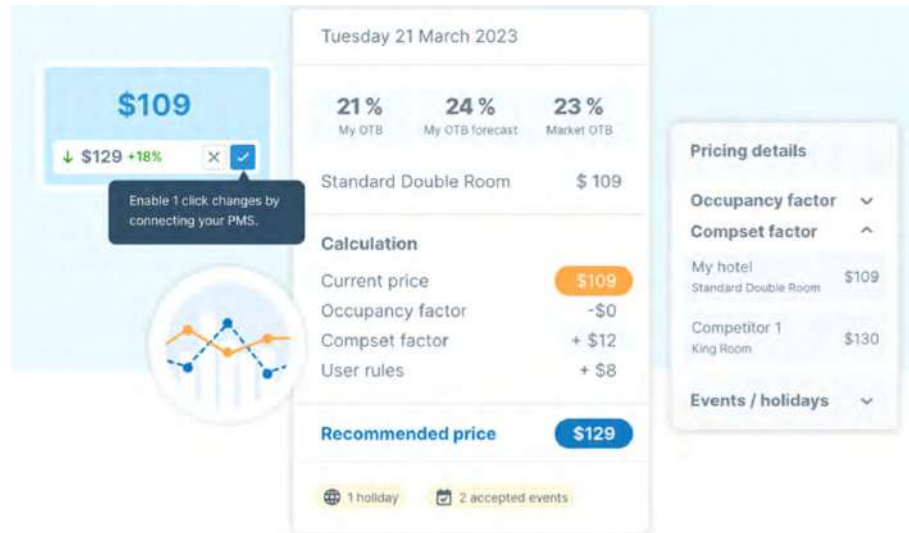


Source: IdeaS

<Pricing Services in Global RMS Firms>

3 Lighthouse (formerly OTA Insights / Established in 2012 / based in London, UK)

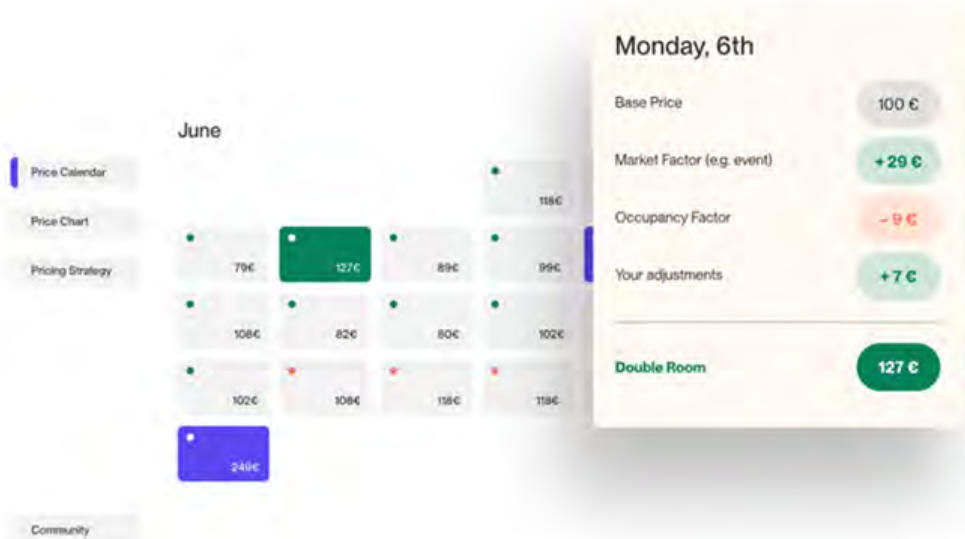
- Price Prediction up to 365 Days Ahead
- Suggests adjusted prices based on Occupancy Factor (Demand) and Compset Factor (Competitor)



Source: Lighthouse

4 Roompricegenie (Established in 2012 / based in Switzerland)

- PMS / CM-based
- Daily maximum and minimum price suggestions for various room types
- Provides a Base Price; users adjust for the final price decision
- Offers Fine-tuning based on seasonality and demand characteristics
- Considers competitor prices, demand patterns
  - : Up to 10 competitors, hundreds of Airbnb listings
- Provides price suggestions up to 18 months ahead, up to 12 daily price updates



Source: Roompricegenie

## **Constraints Exist in Pricing RM Based on the Level of RMS Utilization**

In examining the forms of Pricing RM within the hotel industry—(1) Internal RMS Usage, (2) External RMS Usage, (3) Non-use of RMS and Heuristic-based methods—a distinction emerged. While (1) appears ideal and (3) seems restrictive, limitations on applying Pricing RM persist across all forms.

Firstly, in the case of (1) internal RMS Usage and (2) external RMS Usage, there are constraints in validating solution performance. Particularly in the case of external RMS, the logic behind price derivation within the solution remains unknown, leading to the acceptance of the generated BAR as the optimal price. Subsequently, objectively assessing whether the BAR provided by internal RMS maximizes the effectiveness in Pricing becomes challenging. Given that it requires scenarios dividing solution utilization and heuristic usage for a realistic comparison, the situation becomes difficult as this directly impacts revenue outcomes, making practical experimentation challenging.

Furthermore, (2) External RMS Usage implies limited autonomy in system utilization compared to (1) Internal RMS Usage. Utilizing external RMS follows a standardized model from external companies, unable to customize to fit hotel-specific attributes fully. Inputting variables beyond those addressed by the company or local area specifics isn't feasible. External RMS, relying on open data, lacks adaptability to sudden market shifts, restricting responses to exceptional events like state visits or COVID-19.

For (3) Non-use of RMS and Heuristic-based methods, the burden lies in the absence of established metrics for measuring Pricing RM's performance. While some smaller hotels acknowledge the need for Pricing RM, cost constraints in hiring revenue management personnel or using RMS hinder adoption.

## **Proposal and Outlook for Pricing RM**

### **Proposing Optimal Pricing RM Strategies for Different Hotel Tiers**

To overcome constraints tied to the level of RMS utilization and propose efficient Pricing RM, six types were derived based on data availability and RMS usage for different hotel tiers.

#### **Basic Type**

Utilizes transaction data's historical patterns from PMS to determine prices, suitable for motels or small accommodations lacking separate RM functionality or facing practical limitations in adopting RMS.

#### **Big Data Utilization Type**

Similar to the Basic Type but utilizes social media and search engine indices (e.g., Google Trend, Naver DataLab) accessible without paid subscriptions. Suited for small accommodations with an RM professional capable of collecting and utilizing big data periodically, despite RMS subscription limitations.



### Competitor Information-based Type

Determines prices based not only on historical transaction data but also on competitor pricing information gathered directly through booking or price comparison platforms. Suited for small accommodations restricted from subscribing or utilizing RMS.

### RMS Basic Type

Like the Competitor Information-based Type, mainly utilizes competitor data but incorporates real-time usage for Dynamic Pricing. Suitable for medium-sized or larger hotels.

### RMS Advanced Type

Utilizes processed public data and area information through RMS when direct collection and utilization are challenging. Allows sophisticated price determination compared to merely using competitor pricing, fitting larger-scale hotels.

### RMS Premium Type

Incorporates social media and big data into Dynamic Pricing through RMS, representing the most advanced form, albeit relatively high cost, suitable for larger-scale hotels.

## Pricing RM Strategies by Type

Sources of Data	Non-utilization of RMS Services			Utilization of RMS Services		
	Basic Type	Big Data Utilization Type	Competitor Information based type	RMS Basic Type	RMS Advanced Type	RMS Premium Type
Transaction DB (PMS)	○	○	○	○	○	○
Public Data	×	×	×	×	○	○
Market Information	×	×	×	×	○	○
Competitor Information	×	×	○	○	○	○
Social Media / Search Engine Data	×	○	×	×	×	○

## **The Advancement of Generative AI and Pricing RM Outlook**

Despite the emergence of alternative pricing RM strategies, the dependency on human resources remains high in the realm of RM pricing. This doesn't imply a low level of RM in the hotel industry but rather emphasizes the significant decision-making aspect of pricing in RM. Furthermore, the general trend within the hotel industry suggests an inability to rely on RM systems, indicating a lack of perceived utility compared to the prices offered by RM services. Even though some RM systems claim to provide competitive pricing services, the persistent reliance on heuristic decisions by RM personnel remains a challenging factor in reshaping the established landscape of RM in the hotel industry.

However, recent advancements in generative AI are anticipated to transform not only the hotel industry but the entire ecosystem of various industries. While the initial stages of adopting generative AI involved providing answers based on text, the future iterations are expected to flexibly contribute to solving diverse industry problems. There's a high likelihood of combining generative AI with RM in the hotel industry. Many RM service providers already proclaim the provision of AI-based real-time pricing services. When combined with generative AI, the performance and potential of these services are anticipated to be boundless. Considering that hotel room pricing is influenced by numerous factors, sophisticated data collection from external sources and near-real-time preprocessing and prediction could lead to highly refined price determination. Particularly, this room pricing can cater not only to general situations but also enable highly precise mass customization for specific scenarios, channels, or customer segments.

In the near future, the evolution of generative AI alongside RM suggests a shift in the fundamental philosophy of RM. However, to enable this shift, substantial technological investments, including data infrastructure, must precede. Consequently, except for large-scale hotels, it's limiting for typical hotels to adopt this new form of RM. As RM evolves further based on new technologies, integrating tech-based RM as a functional element within a hotel's internal system is anticipated to become more challenging. Thus, the future of RM might not involve hotels directly implementing these technologies; rather, technology-savvy companies will develop services by integrating technology, and hotels will subscribe to these third-party provided services. The role of existing RM service providers in the RMS progression is a natural consequence of technological advancement and industrial ecosystem changes. Hotel companies are better off strategically accepting these shifts rather than resisting the utilization of third-party services to enhance their chances of survival in competitive environments.

Furthermore, if the hotel industry actively adopts RMS services based on technology, the RMS market will expand further, enhancing service sophistication while decreasing service unit costs. This will establish a cyclical system where hotel companies benefit once again, creating a self-reinforcing cycle.



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