

PART
ONE

**New Analytics
for a New
Environment:
The Evolution of
Hotel Revenue
Management
Analytics,
Technology,
and Data**

CHAPTER **1**

**The Social World
Has Changed
Revenue
Management
Forever**

Revenue management has a lot less control today than we like to think we do. It used to be that we could influence guest behavior by putting a particular pricing strategy in the market. With price transparency, rate parity, user generated content, mobile and all of the other myriad of influences on guest behavior, we can't change behavior with just a price. Our guests are in control, and we need to understand them better to be effective. Price alone won't do the trick anymore.

—Nicole Young, Vice President, Revenue Management and Sales, SBE Hotels

The chapter opening quote perfectly illustrates the challenges revenue management faces today. In today's interconnected social world, getting it right is harder than it used to be. Pricing and competitive positioning are becoming more complicated by the day, as service triumphs and mistakes are laid out for the world to see. Revenue managers are asked to build profitable pricing strategies in the face of price transparency, distribution complexity, increased competition, changing market conditions, hyperconnected consumers, and evolving technology. The market has changed, the technology has changed, and the revenue manager has changed as well. Hoteliers are left wondering how to evolve to manage through these changes.

Any statistics I provide about the evolution of the social web and its impact on the search and booking process will likely be outdated before the book is out of copyediting, but the trend will be directionally correct. It is clear that social media has gone mainstream, and it has changed the way consumers engage with one another and the vendors they do business with. Pew Research Center, in a 2014 study, estimated that 52 percent of American online adults use two or more social media sites, with Facebook being the most popular at 71 percent. Seventy percent of Facebook users engage with the site daily and 45 percent interact several times per day (Duggan et al. 2015: www.pewinternet.org/files/2015/01/PI_Social-MediaUpdate20144.pdf). To illustrate how this has changed behavior,

the 2014 Pew study reports that nearly half of web-using adults get their news about politics and government from Facebook. A Harris poll found that half of Americans get recommendations about something good to try from social media (www.mediapost.com/publications/article/241179/half-of-americans-get-product-recommendations-from.html). My own research has shown that 55 percent of leisure travelers (Noone and McGuire 2013b) and 80 percent of business travelers (Noone and McGuire forthcoming) read reviews some or all of the time when researching a hotel purchase.

This evolution of the social web came close on the heels of the revolution of ecommerce, which completely transformed the way that consumers research and buy products. Online travel agencies (OTAs), like Expedia (founded in 1996) and Orbitz (founded in 2001), took advantage of the Internet as a buying platform to build online storefronts that display multiple hotel options in a market, so that consumers have easy access to price, location, and feature comparisons across the market. TripAdvisor (founded in 2000) provides a platform for user-generated content describing the travel experience. Today, TripAdvisor has more than 225 million reviews and opinions about more than 4.9 million accommodations, restaurants, and attractions worldwide (www.tripadvisor.com). Review sites are now integrated with Facebook so that consumers can identify reviews generated by friends, or friends of friends. Metasearch sites like Trivago and Kayak aggregate prices and information from booking sites across the web, helping consumers identify the “best” deals (even though with rate parity, they should be finding the same rates for the same hotel offered everywhere).

Facilitated by this robust and complex digital ecosystem, consumers today look at dozens of websites during the search process, making it challenging for hotels to understand where demand is sourced, and which partners are generating bookings. A 2013 report from Expedia Media Solutions and Millward Brown Digital found that leisure travelers visited up to 38 sites before booking a vacation package, an average of 15.5 of them in the week before booking (<http://info.advertising.expedia.com/path-to-purchase>). The OTAs had a 47.2 percent share of site visits in this study. Let’s not forget that all of this digital activity is rapidly shifting from computers to smart phones, tablets and other mobile devices.

Before I describe how this book will help hotel revenue management survive and thrive in the new social world, it is important to briefly describe where hotel revenue management started, and why the changing marketplace I discussed earlier has put pressure on traditional revenue management systems and practices.

THE CHANGING MARKETPLACE

Based on the success of revenue management in the airlines after deregulation (Smith, Leimkuhler, and Darrow 1992), major hotel companies saw an opportunity to adapt this model to their business, which shares similar characteristics. Yield management, or revenue management as it came to be known, is a pricing methodology that is well suited for industries that have a limited capacity (only 300 rooms in the hotel), perishable inventory (if the room goes empty one night, you lose the opportunity to sell it for that night), segmentable demand (business travelers and leisure travelers value the product differently), time-variable demand (at a business hotel, weekdays are busy, weekends are slow), and a low cost of sale (compared to the cost of operating the hotel, the variable cost associated with booking one more room is relatively low) (Kimes 1989).

Hotels followed the airline model of forecasting demand and preserving inventory for higher paying guests. Overbooking policies protected against no-shows and length of stay controls helped to fill the days around busy periods (“shoulder days”) (Vinod 2004). These measures were very successful, even when implemented in a relatively manual environment. However, this methodology originated at a time before the Internet existed, so it was difficult for consumers to “price shop” in the market. Demand was relatively stable, and assumptions about the independence of rates held for the most part. After realizing substantial value from manually applied overbooking and length of stay controls, rudimentary forecasting techniques, and pricing strategies like threshold models to shut off lower rates as demand started to build, hotels were only just starting to implement automated revenue management systems based on airline models in the late 1990s.

Suddenly, the Internet went mainstream, ecommerce became widespread, and consumer behavior started to change dramatically.

Distribution opportunities expanded, and third parties started to sell hotel rooms online on behalf of their hotel customers. Just a few years later, the social web connected consumers to one another and to their preferred vendors across distances and networks. Consumers were suddenly empowered to take control over how they researched, how they made a decision of where to book, and what channels they used.

Today, online travel agents (OTAs), price transparency, social media, mobile, search, review sites, last-minute booking apps, and flash sales have created a market that is more dynamic and generates more data than ever before. Consumers have easy access to price and value information about all the hotels in a market, which means more pressure on hotels to understand and account for competitive dynamics. Disruptive events like economic downturns, political disruptions, and catastrophic weather events have shaken consumer confidence. Booking windows are shortening, driven by the shift to mobile devices and new last-minute booking apps that promise the very best deal on hotel stays. All of this activity means the past is no longer the best predictor of the future.

Traditional revenue management systems have been unable to cope with these changing market conditions primarily because the airline model they were based on assumes that prices are relatively stable, so availability for different prices could be controlled without impacting demand. The models assume that predetermined rates could be open and closed based on independent demand levels. With rate parity agreements, price transparency and the disintegration of traditional rate fences, simply opening and closing rates according to demand forecasts no longer provides optimal price recommendations. Pricing for the mass market must account for price sensitivity of demand and also be balanced against the traditional agreements with groups, wholesalers, and corporate accounts.

THE EVOLUTION OF THE REVENUE MANAGEMENT FUNCTION

Cross, Higbie, and Cross (2009) provide an overview of the evolution of revenue management in the lodging industry, from the inventory-focused role it played in the late 1980s and 1990s, to the post-9/11 shift toward a more expansive role within the organization. Historically,

as described previously, revenue managers were tasked with opening and closing predefined room rates based on predicted demand such that the best combination of occupancy and rate was achieved for any given night. More recently, with the emergence of the digital economy as described earlier, revenue management has begun to evolve from this tactical orientation to a more strategic role that encompasses marketing, sales and channel strategy. With this evolution has come a broader set of responsibilities across a number of domains including pricing, management of the entire revenue stream (total hotel revenue management), and a customer-centric approach to developing demand (Figure 1.1). Consequently, the background and skill set of an “ideal” revenue manager have evolved. I will address all of these topics, and their implications on the practice of revenue management, in this book.

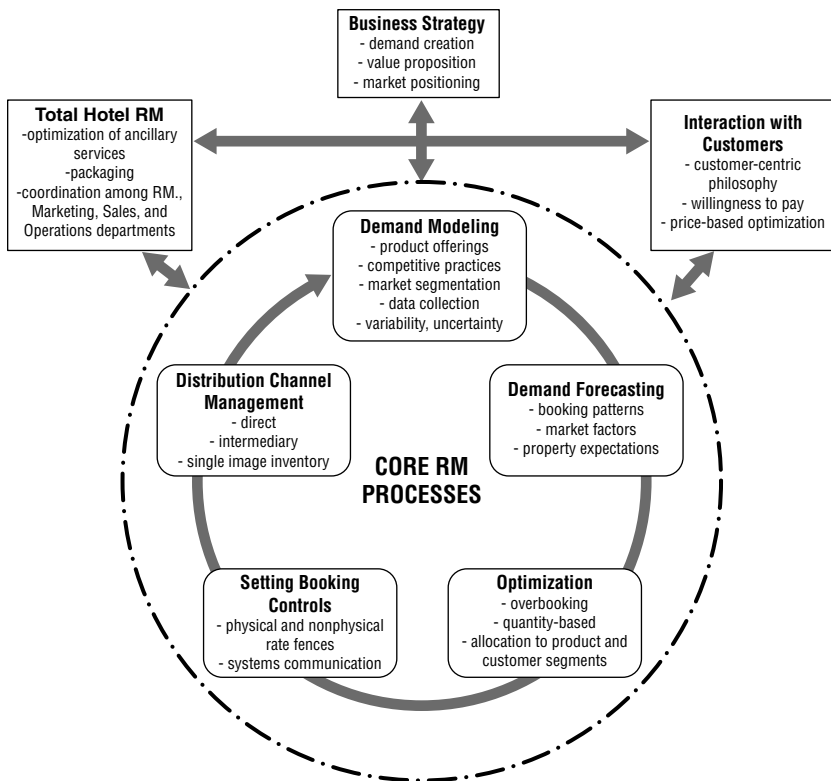


Figure 1.1 Evolving Scope of RM Activities (Noone, McGuire, and Rohlfis 2011)

Cross and his coauthors conducted the research for this article before the social web became mainstream, before the economic crisis of 2008, before everyone had a smartphone and therefore, before the guest experience went digital. These impacts have only exacerbated the effects that Cross and his coauthors discuss in their article, and revenue management has become further complicated by emerging opportunities in digital marketing, such as personalization.

The success of revenue management programs in general has raised the visibility of the discipline, and increased the scope of revenue management activities. Revenue managers are now asked to take on additional responsibilities including ecommerce, business strategy development, analysis of competitive dynamics, application of revenue management to nontraditional areas of the hotel or to new categories of hotels, and more recently understanding and accounting for the impacts of digital marketing, social media, review sentiment and mobile in a pricing strategy. These expanding responsibilities require revenue management to develop new relationships across the organization, working cross-functionally with counterparts in sales and marketing as well as in the restaurants, spas, function space, and even retail outlets.

Technology has also evolved since the advent of revenue management systems, providing the opportunity to incorporate more data, use more complex mathematical algorithms, and get better answers faster. Data volume, variety, and velocity are increasing exponentially, as the influences on hotel pricing expand. Systems can handle this data deluge, but the practical question arises about what data should be incorporated into revenue management algorithms, which data has a place more in strategic decision making, and what data will only be a distraction for revenue managers.

Technology evolutions are also impacting the way that data can be visualized and consumed. New data visualization software puts the power to consolidate disparate data into a single source, and visualize that data through a flexible, dynamic interface. Reporting is moving away from static charts and graphs and into highly visual displays available wherever and whenever needed. As revenue managers are increasingly called on to explain their strategy to broader audiences

and in the face of a complex marketplace, there is a huge opportunity to leverage these new visualization tools and techniques to create compelling stories that inspire action.

With the widespread adoption of automated revenue management systems, revenue managers are no longer required to go through the manual process of acquiring data and building models in Excel. There is now more time to spend on developing and implementing a pricing strategy around system recommendations. With this evolution, the role and skill sets required of a revenue manager are evolving as well. The traditional hard-core data- and analytics-focused revenue manager is evolving into a more business-oriented leader.

WHAT TO EXPECT FROM THIS BOOK

As I have traveled around the world in the past few years, speaking with revenue managers about the value of data and analytics to move their business forward, I hear several common themes:

- Revenue management analytics are evolving, driven by price transparency, and now the social web. The way that revenue management problems are solved needs to change, both because of changing consumer behavior, and also because new technology enablers are available that can provide better, more detailed answers faster. Revenue managers are eager to understand the opportunities that come with evolving pricing and revenue management analytics.
- Revenue leaders are also anxious to take advantage of new data sources to improve their day-to-day pricing decisions and their overall pricing strategy; for example, reputation data or web-shopping data. Before they can even consider new “big data” sources, they struggle to get access to and information from their more traditional data sources. Technology moves fast. It is challenging to keep up.
- Effective pricing to the connected consumer requires working cross-functionally in the organization and better synchronizing activities with counterparts in marketing, sales, and operations.

Technology can be the glue that binds these departments together, but developing a framework for interaction is also crucial, and challenging.

- As revenue management has demonstrated success in generating revenue for full-service hotels, there is a strong desire to apply these techniques more broadly, both to other revenue-generating assets in the hotel and also to different types of hotels, like economy or limited service. Yet, there are technology and business process limitations to making this happen.
- There is a talent shortage across all analytical functions, and revenue management is no exception to this. Revenue managers are highly concerned about where they will find the talent to take their organizations into the next decade and beyond. As the practice of revenue management is evolving, so are the talent, skill set, and organizational structure of the revenue management function.
- Hotel executives, owners, and asset managers are beginning to understand the value of revenue management, but in many cases, they still have limited understanding of its application and value. Revenue managers are struggling to communicate their value to stakeholders outside of the revenue management function.

Through my blogs and articles, I have tried to make sense of the impact of changing market and technology dynamics. From the reaction to that work, I realized that there was a real need to lay out in more depth the realities of the current environment, describe how that has impacted the modern practice of revenue management, and provide strategies for revenue management, and hotels in general, to meet the challenges and take advantage of the opportunities.

This book is not a “how to” for the property level revenue manager. If you are looking for that, I would suggest that you sign up for HSMAI’s Certified Revenue Management Executive program and take advantage of the *Evolving Dynamics* book that accompanies it. Nor will this book describe in detail the math behind pricing and revenue management systems. There are two great resources for that information,

Pricing and Revenue Optimization by Robert Phillips and *The Theory and Practice of Revenue Management* by Kalyan Talluri and Garrett van Ryzin.

One of the revenue leaders I spoke to about the content of the book remarked to me that the book seemed to be less about the practice of revenue management itself and more about the implications of changes in consumer behavior on revenue management. She is right. The changes in consumer behavior driven by the market factors I described earlier have fundamentally changed how hotels need to think about the revenue management function. Using research from leading experts, my own experience, and the experiences of revenue leaders from around the world, the book will help hotel revenue managers make the right decisions about data, technology, and business processes to move their business forward in the face of this changing consumer behavior. In fact, I hope that this book will be useful to a broad range of hoteliers even beyond revenue management who want to understand revenue management better, and that revenue managers can pass this along to their colleagues in marketing, asset management, or operations to help them better understand the crucial role of revenue management and the pressures that are facing it.

In today's social world, the job of the revenue manager is both more complex and more strategic. In the book, I describe the modern practice of revenue management to help revenue managers develop the knowledge and skills required to stay current and be successful. Starting with the core of revenue management, the pricing systems, I describe innovations in analytics and technology that are improving the accuracy and reach of pricing decisions, both tactical and strategic. Then, I discuss the expanding role of revenue management, and address some of the current pressures that the discipline is facing, including understanding the role of reputation in pricing, working more closely with marketing, and embracing total hotel revenue management. Finally, I describe some broader strategic opportunities that revenue management should be prepared to get involved with, such as personalization initiatives. As new opportunities present themselves in the future, revenue management must be prepared to address them. The final chapter describes how to identify the right skill sets and organization to facilitate the ongoing success of revenue management

programs, as well as provides some predictions from revenue leaders about where the discipline will evolve. The following section describes in more detail what you can expect to learn from the book.

WHAT'S IN THIS BOOK

Data, technology, and analytics have always played a crucial role in the revenue management discipline. As the social world has evolved, rapid innovation in technology has followed. The first part of the book, **New Analytics for a New Environment**, outlines how today's revenue management systems should take advantage of innovations in analytics, processing power, data management, and data visualization. I take a broad approach to this discussion so that revenue managers can be prepared to participate in conversations not just about the revenue management system, but about the hotel's broader data and technology strategy.

Chapter 2: Demystifying Price Optimization covers the analytic implications of price transparency, by describing the differences between price optimization and traditional inventory optimization. It identifies when applying price optimization is appropriate, and when traditional inventory optimization is still needed. By understanding these concepts, revenue managers will be better equipped to effectively apply them, or to evaluate a vendor that claims to do so.

Now that the variety, velocity, and volume of data available to hotels are expanding, it is important to understand how to capture, store, and access this data, and how to identify opportunities to leverage it to improve decision making in revenue management, but also, across the organization. Revenue management has always been a "big data" problem, so much so that traditional revenue management systems had to make sacrifices to overcome technology constraints that limited the amount of data that could be processed in time to deliver a price recommendation. In **Chapter 3: Big Data, Big Analytics, and Revenue Management**, I describe the innovations in data management and analytics that are enabling revenue management algorithms to handle more data faster, providing more profitable pricing recommendations and new opportunities for understanding demand. Evolving

consumer behavior creates new data and new influences on pricing. I also talk about how to evaluate new data sources to understand their place in the revenue management decision.

The second part of the book, **The Expanding Role of Revenue Management**, describes how revenue management's role in the organization has expanded over the past few years to meet the needs of an evolving marketplace. Revenue management is incorporating new impacts into pricing tactics and pricing strategies to help others understand how to take a revenue management approach to their areas of responsibility. This part identifies opportunities for revenue management to work across functional areas to generate additional value for the organization. It focuses on expanding the pricing strategy to include new data and new functions.

The biggest change in the hotel environment recently is the emergence of the social web. With the growing popularity of review and rating sites, consumers have a new source of information to rely on when making a hotel purchase. The question for revenue managers is: How are consumers using all of this information, with price, to make a purchase decision? **Chapter 4: Hotel Pricing in a Social World** describes the results of some research I conducted with Dr. Breffni Noone to answer this question. This chapter teaches revenue managers how to use user-generated content in a pricing strategy.

Chapter 5: Integrated Revenue Management and Marketing presents the opportunities that come from revenue management and marketing working closely together. Revenue management is responsible for demand control, and marketing is responsible for demand generation. These functions are really two sides of the same coin. Working closely together, revenue management and marketing can achieve the vision of "intelligent demand management," with marketing only generating demand during need periods, and revenue management ensuring that promotional demand is accounted for in pricing and allocation decisions. This improves the effectiveness of pricing strategies.

Discussions about "intelligent demand management" and synchronizing decision making across departments lead naturally into the concept of total hotel revenue management. With the success of hotel room

revenue management, hoteliers naturally see an opportunity to extend the practice beyond rooms. **Chapter 6: Total Hotel Revenue Management** provides a framework for applying revenue management to other revenue-generating assets, and explores the role of the guest in total hotel revenue management. I talk about the importance of an integrated revenue culture across all departments in the hotel and provide tips about how to start your organization moving in this direction. This chapter expands pricing strategy to new revenue-generating areas.

The final part, **The Future of Revenue Management: Pricing as a Business Strategy**, provides advice to revenue management to elevate the discipline to the level of an overall business strategy. Price can be an important strategic lever and an important component to support the success of an overarching business strategy. This part describes how revenue management can align itself to the organization's overarching strategy, both overall and at the level of an all-encompassing initiative like personalization.

Chapter 7: Pricing as a Strategic Tool describes the opportunities to elevate the pricing discipline to the strategic level and outlines how revenue managers should position themselves to take on a more strategic role in the organization.

Consumers today expect that the companies they do business with will treat them as individuals instead of a member of a large market segment. As distribution costs rise and alternatives flood the market, hotels must create an experience that differentiates the brand to stay competitive, and one that can only be accessed by booking directly with the hotel. Many hotel companies are beginning personalization initiatives to engage with their guests at a more individual level. In **Chapter 8: The Path to Personalization**, I present a vision for personalization in the hospitality industry and describe revenue management's crucial role in the creation and execution of personalization initiatives. I emphasize throughout the importance of finding the balance between providing that excellent guest experience and "crossing the line to creepy."

The final chapter in the book, **Chapter 9: The Future of Revenue Management**, describes the skills and competencies that will be required for the revenue manager of the future. At the same time, as hotel companies struggle to redefine the function to meet the needs

of the changing marketplace, it is important to also understand how that impacts the skills required to be a successful revenue manager. This chapter helps hotels define the new role of a revenue manager, understand how to attract and retain top talent into the discipline, and organize revenue management departments to take best advantage of the talent that is available.

Throughout the book, I provide examples, quotes, and testimonials from revenue leaders who are helping their organizations to meet some of these challenges.

I hope that this book inspires revenue managers to continue to evolve the discipline with the changing marketplace and changing consumer. It is an exciting time to be in revenue management, but it's also a critical one. Unless revenue leaders are equipped to manage pricing in a social world, they and their companies will fall behind.