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## Do Guest Reviews Really Matter? Linking Social Media and Operations Data

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### ABSTRACT

Hotels and casinos have long suspected that guest comments and ratings posted on review sites influence key operating metrics like future bookings. Recent developments in social media analytics have finally provided the opportunity to firmly establish this relationship, and understand the conditions under which the relationship holds. In this session, you learn how to incorporate operational data into social media analytics. We discuss emerging categories of social media analytics for hospitality, which operational data sources are most closely linked to social media, and how to determine whether there is a statistically significant relationship between guest sentiment and future bookings.

### INTRODUCTION

As hotels and casinos become more comfortable with maintaining an online presence and responding to guest comments and issues, they are beginning to wonder where the next opportunity will come from. Key metrics like Revenue per Available Room (RevPAR), Occupancy, Average Daily Rate (ADR), Satisfaction, Gross Operating Profit per Available Room (GOPAR), Booking Pace, and Volume and Market Share are assumed to have some connection with social media activity, but the relationship is still unclear.

Recent advances in social media analytics have resulted in the development of meaningful social media metrics. Now, in addition to comparing quantity of reviews, average user ratings, or numbers of friends and followers, the content of the user reviews can be mined and quantified, enabling inclusion in traditional analytical applications. Operators are justifiably excited about the opportunity to connect Social data to other data sources, primarily because they can finally begin to prove out an ROI on what has been a significant investment. However, it is important to step back and think through which connections are actually meaningful.

In this paper, I will discuss the types of social media metrics that are available, review the current research into links between social media and operational data, and identify the metrics that should be included in this type of analysis. A framework for approaching the problem will be presented, and opportunities for future research will be uncovered.

### SOCIAL MEDIA<sup>1</sup>

Social media (SM) refers to a group of Internet-based applications that allow the creation and exchange of user-generated content (Kaplan and Haenlein 2010). SM expedites conversation as opposed to traditional media, which delivers content but doesn't allow the consumer, whether reader, viewer or listener, to participate in the development and dissemination of the content. SM sites come in a number of forms, including strictly review sites (e.g., TripAdvisor and Yelp), social networks and microblogging sites (e.g., Facebook, Twitter), news sites (e.g., Digg), social sharing (e.g., Flickr, YouTube), social bookmarking (e.g., Delicious, Faves), and purchase/review sites (e.g., Amazon and Travelocity) (Jones 2009). The common feature of these diverse SM applications is that they encourage discussion, feedback, voting, comments, and sharing of information from all interested parties.

SM is moving so quickly that any statistics provided here will be out of date before long. That said, as of late 2010, Facebook had more than 500 million active users, adding 700,000 new members per day, and 50% of active users log on to the site in any given day. Each day, more than 3 million photos are uploaded to Flickr, bloggers post nearly a million new articles, and 5 million Tweets are sent (Bodnar 2010). As of May 2010, YouTube exceeded 2 billion views a day, with 24 hours of videos uploaded each minute (Goldberg 2010; Zibreg 2010).

Despite what is still to be learned about this emerging area, most industry insiders agree that social media provides a tremendous opportunity for listening and responding to customer issues, as well as a new channel to reach guests with marketing offers and PR campaigns. The viral impact of negative press has been demonstrated over and over again. Based on these initial opportunities, hotel and casino managers are beginning to expand the use of social media across the enterprise, and to attempt to understand how social media data relates to and influences other

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<sup>1</sup> Much of this section is adapted from Noone, McGuire and Rohlf's forthcoming paper for the *Journal of Pricing and Revenue Management*.

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performance metrics. The first step in understanding how to incorporate social data in analyses across the enterprise is to identify the data and analytics available with social media.

## AVAILABLE DATA

Data that can be gathered from Social Media sites includes:

- **Unstructured text data:** Reviews, comments, blogs, microblogs, and forum posts.
- **Connections:** Numbers of friends (i.e., Facebook) or followers (i.e., Twitter).
- **Impact:** The number of times content is accessed, referred to, or sent to other users (i.e., “hits”, ReTweets or blog links).
- **Ratings:** User-generated quantitative opinions on characteristics of a product, service, or comment (i.e., four out of five stars, a “like” on Facebook, or how many people found a review or comment helpful).
- **Demographics:** User-provided characteristics, generally used to help other participants determine the relevancy or credibility of that user’s content.

## ANALYTICS TECHNIQUES

There are three categories of analysis that can be applied to social media data. The first is using **market research** techniques to establish an online personality and channel strategy, and the second applies basic **descriptive statistics** and **data visualization** to tactically monitor and manage channel strategies. The third category is the use of **text analytics** and **social networking** to mine the content and structure of social channels to glean valuable insights about connections and topics. Those insights can be used for strategic initiatives like improving brand reputation, conducting market research, and evaluating the success of promotions and PR efforts.

Companies need to be disciplined in their approach to developing an online personality and establishing a channel strategy for social media. In this medium, genuine interactions are valued, and deviations are quickly punished. An online personality congruent with the brand promise must be developed in order to reinforce marketing efforts and to respond appropriately to guest posts. Information about the usage and demographic composition of each social media channel should be compared to internal customer demographic information to determine which channels the company’s customer base is using, for what, and how often. Trends should be carefully monitored to identify emerging opportunities, and the right individuals should be identified internally—individuals who can develop and manage the social media program on an ongoing basis. Many companies hire an agency to help them in these efforts.

In the manage and monitor stage, a significant array of tools is available for SM-related data capture, quantitative analysis, and data visualization. Web-based tools such as HootSuite and Google Analytics can be used to capture usage statistics and metrics. Customer metrics can also be tracked via user-review sites (e.g., TripAdvisor’s customer satisfaction index). Some tools also enable competitor benchmarking. For example, TripAdvisor provides the capability to benchmark a property’s customer satisfaction rank against a competitor and against the aggregate rank of its market. Tools like ReviewAnalyst can be used to track and aggregate customer reviews and ratings from TripAdvisor, Expedia, Priceline, and other major OTAs. These tools provide a single view of the activity across multiple sites and provide basic descriptive statistics, primarily calculated from quantitative metrics like ratings and activity.

The next level of analysis comes from the application of social network analysis and text analytics. Social network analysis analyzes the links between and interactions among participants in social networks. **Influence scores** are calculated for each participant based on the depth of connections within the networks, the frequency with which the participants are referred to (retweeted, linked to, or clicked on), the volume of participation, and their reach within the community. Text analytics, primarily **text mining** and **sentiment analysis**, such as SAS<sup>®</sup> Social Media Analytics, can also be employed to quantify the content of unstructured text. These algorithms understand how language is used in context, and they can compare word and phrase usage within text documents either to each other or to a standard such as positive or negative sentiment.<sup>2</sup>

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<sup>2</sup> The validity of customer reviews is a legitimate concern for hotel organizations. On one hand, it could be argued that, unless some means is employed to identify false reviews and discount them from a sentiment analysis, that analysis will yield erroneous results. However, it could also be argued that it is what consumers believe, their “reality” (whether based on false reviews or not), that really counts. If consumers regard false reviews as credible, then management needs to understand the content of those reviews such that appropriate strategies can be deployed to offset any negative consumer reaction they may engender.

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**Text mining**, much like data mining, uncovers relationships within volumes of unstructured text data. It can quantify volume of conversation, identify major conversation topics, and establish statistically significant links among phrases or topics. You could search for concepts linked to pricing and value, or discover what topics bloggers are most interested in. Text mining helps to identify words and phrases most associated with your brand overall or within a specific type of channel (forums, review sites, blogs), which can guide strategic marketing campaigns (Figure 1).

**Sentiment analysis** mines the content of unstructured text documents to uncover the way that writers feel about the subjects they are discussing. Using natural language processing, sentiment analysis looks for the context in which issues are discussed and determines whether the comment is positive, negative, or neutral. Once you determine the elements of the product or service that are important to you (or using text mining, to the customer base), sentiment analysis can be used to determine how guests feel about these elements. Best of all, social data is public data, so the same analysis that you performs on your social data can be conducted on you major competitors' data, allowing for an apples-to-apples comparison across key topics or categories.

The outputs of social network analysis and social media analytics include:

- **Influencer Scores:** Based on connections within networks, these scores indicates the degree to which participants influence others within a network, based on their numbers of friends and followers, their activity within the community, and how often their opinions are referred to by others (retweet, links, etc.).
- **Concept linking:** The results of text mining algorithms uncover links between topics of conversation as well as volume of conversation (so conversations containing the phrase "loyalty program" might frequently also contain the phrase "Brand X", but not "Brand Y"). For example, Figure 1 shows the results of text mining applied to an open-ended question about the future of Revenue Management Technology. Respondents spoke about improvement in technology. Also, a link to mobile technology is clearly evident—as well as to the thought that RM technology will be more automated in the future (Kimes 2010).
- **Sentiment:** Natural language processing algorithms identify the sentiment associated with either a document in general, or topics within that document. Sentiment is typically classified as positive, negative, or neutral. Results of sentiment analysis are expressed as percentage of total. (80% of TripAdvisor reviews are positive, 30% of reviews about service are negative.)

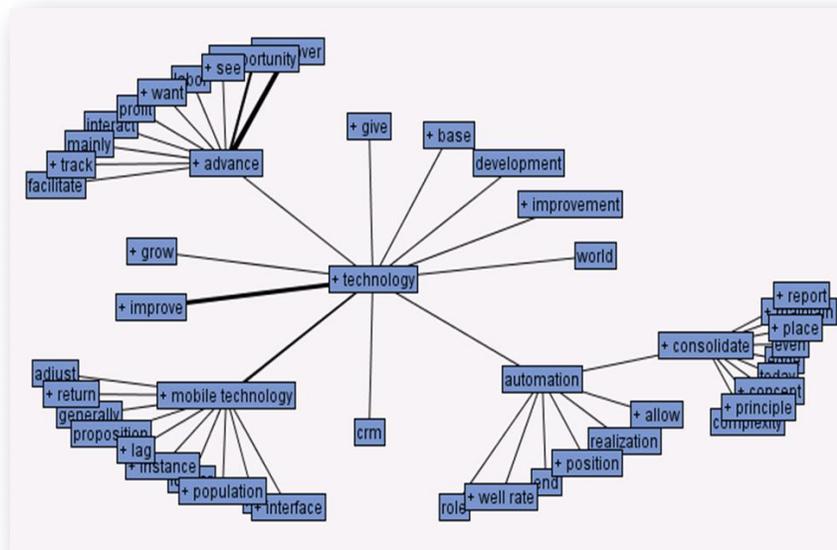


Figure 1. Results of a Qualitative Study on the Future of Revenue Management (Kimes 2010)

## RESEARCH REVIEW

In this section, we will discuss research findings that are relevant to social media for hotels and casinos. Some researchers have attempted to connect social data to operational metrics, but have been limited by their ability to

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access the operational data (e.g., Ye, Law, and Gu 2010). Most social media research has been experimental or scenario based, using consumer self-reports rather than actual behavioral indications.

Findings so far about the impact of social media seem to indicate that the quality and quantity of reviews matter. Readers are more likely to find the review credible if there is some personal information about the reviewer available, and where the review is posted also influences credibility. Negative reviews have a larger impact than positive reviews, but only in the extreme (one out of five stars versus five out of five stars). More specifics, along with citations, are given in the sections below.

## **MOTIVATION AND USE**

Consumers seek the opinions of others online to reduce their risk, because others do it, to secure lower prices, to get information easily, by accident (unplanned), because it is cool, because they are stimulated by off-line inputs such as TV, and to get pre-purchase information (Goldsmith and Horowitz 2006; Hennig-Thurau and Walsh 2003). Online travel reviews are primarily used for hotel booking as opposed to airline booking or other en route travel options (Gretzel and Yoo 2008). Travel purpose also influences the use of social media. Decisions about business travel rely less on online research and social media than leisure travel (McCarthy, Stock and Verma 2010).

## **CREDIBILITY**

The credibility of the reviewer and the review content is an important element in the evaluation of user-generated content. Research has shown that the presence of personal identification information (such as purpose for travel, gender, etc.) increases the perceived credibility of online reviews (Hui et al, 2011), and when the reviews are ambivalent or negative, the presence of personal identification lowers hotel booking intentions. When negative reviews are posted in a personal blog, readers are more likely to attribute the review to circumstances, and are less likely to recommend the product than readers who are exposed to the product on an independent review site or on the brand's Web site (Lee and Youn 2009).

## **INFLUENCE ON PURCHASE INTENT**

Yuanyuan, Peng, Yijun, and Qiang (2009) studied the impact of online movie reviews on ticket sales. They found that by the third week after release, online movie review valence (positive or negative) began to show a significant impact on sales. Further, the negative effect of extreme negative reviews (1 star) exceeded the positive effect of extreme positive reviews (5 star) on ticket sales, but non-extreme reviews (2-4 stars) had no effect. This effect of extreme reviews was also found in a 2006 study of online book reviews (Chevalier and Mayzlin 2006).

The perceived quality of an online review has a positive impact on purchase intent (Park et al. 2007). Purchase intent increases as the number of reviews increases (Park et al. 2007). Customers with limited experience with the product are influenced by the quantity of reviews rather than quality, whereas experienced customers are likely to be influenced by the quantity only when the quality is high (Park et al. 2007; Lee, Park, and Han 2008; Park and Kim 2008). A large number of ratings can overcome the negative impact of unfavorable reviews, particularly for experience-based products, as they can be considered a signal of the quality or popularity of the product or service (Yang and Mai 2010). When a positive review is combined with negative aggregate ratings, consumers will attribute the positive review to non-product related factors, but when the review is negative, this does not occur (Qui and Li 2010).

## **SOCIAL MEDIA AND OPERATIONAL DATA**

This section will lay the foundation for establishing relationships between social media data and operational data generated by a hospitality or gaming organization. As with any type of analysis, the goal of the research and the level of detail required to make sound decisions will ultimately dictate the type of data that must be collected and the analysis that should be conducted. Along with presenting options for tying social media to key operational metrics, I will discuss the managerial implications of this type of analysis. Finally, I will present a framework for evaluating opportunities to leverage social media across the framework, which will help to organize and direct analyses, and I will list some opportunities for future research in this area

## **DEFINING THE RIGHT LEVEL OF DETAIL**

As with any other analysis, the appropriate type and level of data needs to be considered before the analysis can begin. There is arguably a macro relationship between overall sentiment at a brand level, and financial performance metrics like share price, top line revenue, and profits. Marketers have researched the implications of brand recognition and brand reputation, and there is clearly a link between the power of the brand and financial performance. Including overall brand sentiment in a traditional performance analysis can show the strength of this relationship. As with any type of analysis, in order to make a valid comparison, date ranges must match, so ensure that the data included in the sentiment analysis matches the date ranges of the performance metrics.

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At a more granular level, many operators suggest a link between Average Daily Rate (ADR) or occupancy and social media data. These metrics are used to evaluate the revenue-generating capacity of individual properties, markets, or brands. Establishing a link between social media sentiment and these performance indicators would provide evidence to justify the investment in social media programs and would also contribute valuable insight to price optimization strategies. There is some validity to this comparison, but the analysis is not as straightforward as it appears. In order to definitively establish these relationships, and also generate actionable insights, hotels and casinos must identify the right level and type of data for the analysis.

### Social Channels and Segmentation

All social media probably contributes to an overall brand reputation impression, but when the rubber hits the road—that is, at the time that a potential guest is making the decision to book a room, what information are they actually using? The social media data that is most influential in the actual travel purchase decision is user-generated reviews and ratings, possibly including pictures and videos (McCarthy et al. 2010). Bookings can come from the call center, the brand's Web site, a travel agent, groups, hosts, or online travel agencies. Not all of these channels display user reviews at the time of purchase, and might not even be indirectly influenced by impressions gained in advance of the booking decision. Leisure travelers, specifically those not tied to a particular brand or property, or those traveling to a location for the first time, might rely heavily on user-generated content like reviews, photos, and videos. However, most corporate business is given little choice of where they book, as they are required to use negotiated rates at company-selected properties. Wholesale business buys a package, sometimes blind to the actual property where they will be staying. Corporate transient business is likely more influenced by the loyalty program they belong to than any sentiment about the hotel (McCarthy et al. 2010).

Thus, travel purpose probably impacts the likelihood that social media is used in the booking decision. The same individual could be a heavy user of social media for certain travel purposes, and not at all for others. Routine business travel could be driven more by location or corporate regulations than traveler reviews. Group or conference business is influenced by the location of the event and by the rates that were negotiated by the meeting planners (who might have been influenced by social media). Leisure travel, on the other hand, could be heavily influenced by social media (McCarthy et al. 2010).

Given these factors, a city center hotel catering primarily to group or corporate travel probably has far fewer bookings influenced by social media than a resort property. Branded properties might be less influenced by social media than an independent, depending on the power of their loyalty programs and their market penetration.

Therefore, the first step in this process is to separate out the segments that are likely to be influenced by social media, to what degree their booking decision is influenced by social media, and which social media channels they are using.

### Social Sentiment and Price

While most analysts want to start with ADR as the metric to represent price, because it is an easily accessible and commonly understood metric, ADR is an average of all the rates charged for a stay during a specified period (per day, week, or month). This could include corporate negotiated rates, groups, wholesalers, and transient business. As discussed earlier, many of these bookings were likely not influenced by social media. Further, ADR is calculated at the time or after the rate is actually paid (or booked, in the case of a forecasted ADR). For example, the ADR for October 14<sup>th</sup> was \$150.30, the ADR for October was \$156.73, and the projected ADR for November is \$163.22, based on what is on the books right now. However, the room nights that go into the ADR calculation could have been booked at any time leading up to the actual night's stay. For example, some of the people who stayed in the hotel on October 14<sup>th</sup> could have booked their rooms over the summer, some in September, and some on October 12<sup>th</sup>. The social media available on October 14<sup>th</sup> is very likely not the same as it was over the summer, in September, or even on October 12. It is important to understand 1) which rates could be influenced by social media, 2) which rates were displayed at the time the booking decisions were made (which rates the influenced customers chose to pay), and 3) user-generated content displayed at the time they made the decision to book the room.

This means that in order to have a valid comparison between revenue and social media, you need to isolate the channels and segments that are most influenced by social media, determine the social media sentiment by day on each of those channels, identify the price that was available on that channel on that date, and figure out how many bookings were generated by the site by day. To ensure a fair comparison, several factors will need to be controlled for:

- How many reviews travelers read before they make a decision to book or not. There is no point in calculating review sentiment on three years of data if travelers only read the first 10 reviews.
- The volume of activity on that site for that day (or that period) to adjust for seasonality and other patterns in bookings. This will likely need to be calculated on a market level as well, and adjusted for share, accounting for competitive set and hotel type.

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- The hotel or casino's price offered through that channel on that day.
- Competitive intensity and competitor offerings. The amount of competition in the market, competitor pricing, and any attribute differences, such as location, that might influence bookings.

This analysis requires access to historical data about channels, competitors, and market performance. A hotel or casino company is likely not collecting all this data themselves. Further, many social media technology vendors do not store social media data past 90 days or so. A partnership with a data provider like Rubicon will provide not only the competitor rate information but also demand patterns at a market level by date for the periods in question. SAS<sup>®</sup> for Social Media Analytics stores data and calculates sentiment for three to four years of historical data across all social media channels, permitting this kind of historical analysis.

A potential extension of this analysis is to look at the specific content of the reviews and to determine the impact of elements within the reviews on booking decisions or pricing strategies. For example, are users more likely to book when the reviewers make positive comments about the comfort of the rooms or when they make positive comments about the level of service? Which is more likely to turn away a potential booking, comments about cleanliness or comments about bad service? What is the uplift in rate you can expect to charge when the sentiment about your beds is positive (relative to your competition)? How much of a discount in rate (over your competition) do you need to offer to make up for negative reviews about your service?

### **Influence**

Hotel and casino managers are concerned about how to account for the influence a particular guest may have over a network of potential future customers. If hotels or casinos could put a value on the potential that a guest has to generate incremental bookings for the hotel based on the guest spreading positive word of mouth through their network, they could make better marketing and pricing decisions about that guest. Influencer scores, which represent the amount and type of influence each user has over the networks they participate in, could be translated into an expected value of influenced bookings and could be used as a part of the customer value calculation. This would then allow hotels and casinos to compare the value of an active social participant, a frequent traveler, and a guest who is expected to generate significant incremental revenue through ancillary purchases (restaurant, spa, retail), and to determine which guest to say yes to.

### **MANAGERIAL IMPLICATIONS**

Armed with insights into the connections between social data and key performance metrics like rate, booking behavior, and channel performance, hotels and casinos can make both tactical and strategic operational decisions. Pricing and allocation strategies by channel can be adjusted to reflect the prevailing sentiment and activity. Promotional strategies targeted at high-valued influencers can generate additional bookings through positive word of mouth (provided they are satisfied with their experience, of course). Internal initiatives aiming at improving the elements of the guest experience that influence sentiment and rates can be designed, such as improving the bed or providing better training to housekeepers or front desk agents. Changes in sentiment before and after the initiatives should be added to the analysis of the effectiveness of these initiatives.

With all the opportunity to leverage social media data, managers need to be organized and disciplined in their selection of projects to undertake. Most importantly, managers need to keep in mind that social media should be considered as a tool to accomplish overall business strategies, not a strategy within itself. Managers should think how social media can be leveraged to accomplish overall marketing strategy, human resource strategy, or revenue management strategy. Too much focus on developing a "social media strategy" without understanding how that strategy will contribute to the firm's overall business strategy will result in sub-optimal results. The framework presented in the next section will help firms organize their thinking about leveraging social media across the enterprise.

### **A FRAMEWORK FOR UNDERSTANDING SOCIAL MEDIA OPPORTUNITIES**

Table 1 provides examples of revenue management opportunities that utilize social media, but other functional areas within the organization can apply a similar framework in their thinking about leveraging social media data and analytics in their business strategy. The framework classifies SM-related opportunities across two dimensions: (1) information flow, and (2) time orientation. Information flow is categorized as inbound or outbound. Inbound information refers to customer-generated content, such as user reviews, ratings, photos, videos, and comments. Dominant sources of customer-generated content currently include user-generated content sites (e.g., TripAdvisor and WikiTravel), reviews on online travel agent (OTA) sites (e.g., Expedia), social networks and microblogging sites (e.g., Facebook, Twitter), and media/video sharing sites (e.g., YouTube). Outbound information flow refers to firm-generated content that is communicated to the consumer using SM. This includes, for example, promotions, special offers, and press releases via SM channels such as Facebook and Twitter, firm-sponsored blogs (e.g., Bill Marriott's "On the Move"), video-content (e.g., YouTube), and response to consumer reviews (e.g., via TripAdvisor) (Noone et al. 2011).

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Time orientation refers to the time scope of the activities and decisions that SM has the potential to support. Short-term orientation relates to the short-term, tactical activities and decisions that SM can support, while long-term orientation encompasses activities with a long-term, strategic focus (Noone et al. 2011).

TIME ORIENTATION			
		SHORT TERM	LONG TERM
INFORMATION FLOW	INBOUND Customer-generated content	<u>Inform promotional and pricing decisions</u>  1. Configuration and pricing of promotions and packages	<u>Inform strategy development</u>  1. Pricing 2. Customer relationship development 3. Distribution channel management
	OUTBOUND Firm-generated content	<u>Drive demand creation and build brand awareness</u>  1. Execution of push strategies: rooms and ancillary revenue streams	<u>Drive customer development and retention</u>  1. Development of micro-sites targeted at specific customer groups 2. Engagement in social blogging

**Table 1. Evaluating SM Opportunities (Adapted from Noone et al., 2011)**

For example, in the short-term inbound communication quadrant, the content of user-generated documents is used to uncover needs and preferences that can be used to design packages and promotions. Comments about the cost (or inefficiency) of breakfast could result in a breakfast-inclusive package that masks the cost of breakfast, or the promotion of a breakfast buffet that saves time in the morning. Following a group of customers that is interested in hiking might result in a package at a property near a good hiking location, with maps, bottled water, and trail mix included—offered at a premium over a normal night's stay. Good revenue management techniques will ensure that these opportunities are offered in a way that generates incremental revenue rather than displacing more-valuable business.

## FUTURE RESEARCH

Clearly, there is much work still to be done in this area before the industry truly understands these complex relationships. The following projects would be useful to contribute to the overall knowledge about the relationship between social media and other performance metrics. These will probably need to be done at an industry level, or at an industry segment level, rather than by an individual hotel or casino.

- Which social sites influence travel decisions versus general brand impressions?
- What information do guests use to actually make the booking decision—just ratings and reviews, or all other social sites (Facebook, Twitter, YouTube, etc.)?
- To what degree does a loyalty program member use consumer reviews or social media (segmented by travel purpose) to make booking decisions, and to what degree does that member participate in social media?
- How many times does a traveler need to stay with a brand or at a particular property before they are no longer influenced by other's opinions? (I always stay with Hilton when I travel, so I never pay attention to reviews for any particular Hilton.)
- How many reviews does a traveler read before making a booking decision?

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- How much business does Facebook, Twitter or TripAdvisor actually drive (given that these sites do not generally contain booking engines)?
- To what extent does brand influence the purchase decision? (Would brand override negative reviews for an individual property?)
- Which elements of the service are most influential within the content of the reviews? For example, which positive or negative comments—those about the bed, the service, the cleanliness of the rooms, or the location—change booking behavior or pricing the most?

## CONCLUSION

As social media becomes increasingly incorporated in the way that business is done in the hotel and casino industry, managers are becoming more interested in how to use the data and information generated from social media activities. There are many opportunities to connect social media to traditional operating metrics, provided careful thought is given to the metrics that are used in the analysis. Understanding the type of bookings that are most likely to be influenced directly by social media, as well as the social media content that was available and utilized during the booking decisions, will help operators to finally establish the role of social media in the booking process. In addition, hotels and casinos can understand the impact of social media the rates that can be charged through social media-influenced channels and ultimately, how to leverage social media to improve the revenue generating capacity of the company. More research will need to be done, but emerging social media analytics are available to assist in establishing these important relationships.

Many companies make the mistake of concentrating on developing a “social media strategy”, as opposed to considering how social media supports existing business strategies across the enterprise. While there might be job functions or even entire departments dedicated to supporting social media programs, in order to fully take advantage of the opportunities afforded by social media, it should be thought of and treated as another data source and communications channel.

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