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Data Analytics in Hotel and Integrated Resort Brands: An Evaluation of Past Literature and Proposed Research for the Future

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DATA ANALYTICS IN HOTEL AND INTEGRATED RESORT BRANDS: AN
EVALUATION OF PAST LITERATURE AND PROPOSED RESEARCH FOR THE FUTURE

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Abstract

Data analytics in hotel and integrated resort brands is a growing strategy implemented to support business decisions designed to generate revenue or save costs. This study utilizes a literature review of data analytics related publications to provide recommendations on future research topics to improve the quality of literature related to data analytics in hotel and integrated resort brands. The study is not limited to hospitality specific research and uses research from all industries to identify gaps in publications for hospitality scholars to explore. Three proposed research questions for future exploration were composed based on the comparison of literature written for the hospitality industry versus other industries and based on current deployment of analytics in hotel and integrated resort brands.

Keywords: Brand strategies, data analytics, big data, business intelligence

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Chapter One

A primary objective for any company marketing a product or service to consumers is to fully understand what the customer is interested in and what it will take to establish loyalty with the company. Hotel and integrated resort brands rely on customer loyalty to develop customers into regular contributors to company revenues and use various marketing tactics and rewards programs to maintain strong relationships with their customers (Kandampully et al., 2015). These marketing costs are no small expenditure as the hotel industry spends up to 25% of annual revenue on marketing costs compared to an average of 12% across all industries (Spector, 2018). The complexities and cost of hospitality marketing require companies to have an organized marketing plan to solve business questions related to the most efficient spend of marketing dollars. For example, how can hotel companies determine which customers to target and what marketing techniques have the strongest impacts on customer loyalty? In addition, how can companies determine how much they can spend on specific programs and evaluate the performance of programs designed to increase customer loyalty?

The answers to these questions require companies to fully understand their target customer, and an element that companies can use to gain this understanding is customer data. With customer information, data analytics can be used to identify customer trends to create marketing opportunities that resonate with customers and ultimately build brand loyalty (Yallop & Seraphin, 2020). The goal of data analytics is not only about understanding the historical customer trends, but to develop predictive insight to what is expected in the future. Adequate data collection and analysis techniques can lead to stronger models to forecast demand, pricing, and success of marketing efforts (Bhattacharjee et al., 2020). With enhanced data analysis

capabilities, the expectation is that better business decisions can be made and ultimately drive increased company profits.

Leveraging data to enhance decision making may seem like an essential tool for any company to implement, however, there are challenges in doing so. The quality of data analytics is tied to the ability to collect customer data and data collection can be challenging. Naganathan (2018) breaks down analytics challenges into data, process, and management challenges. Data challenges include the potential issues with the raw data itself and quality of the data. Process challenges relate to the difficulty of translating raw data into something useable. Finally, management challenges involve privacy and security issues that may arise when a company collects a substantial amount of data.

The hospitality industry overall is driven by the customers that the industry serves, and hotel and resort companies must identify what their customers want to create a competitive product offering. A change in demographic is occurring in terms of hotel stays and millennials are the fastest growing customer segment. Millennials are less committed to brand loyalty than prior generations and tend to make decisions based on digital research (Grotte, 2018). Up to this point, little professional research has been conducted about the current state of data analytics in the hotel and resort space. As companies implement more data strategies to understand changing demographics, scholars must evaluate current analytics strategies to improve the educational and applied industry components related to data analytics.

Purpose of the Study

This study aims to discuss the current research on data analytics applications in hotel and integrated resort brands and how data driven strategies can support business decisions. The study will assess the gaps in past analytics research compared to current industry practices to identify

research areas to update or explore. The research objective is to provide recommendations on data analytics research topics based on a literature review of data analytics in all industries to create a wholistic view of the topic. Research gaps will be identified to highlight future opportunities to improve the quality of literature related to data analytics in hospitality.

Conceptual Framework

This study consists of a systematic literature review of scholarly articles to assess the scope of data analytics literature that can apply to hotel and integrated resort brands. The research selected in support of this study are from a limited number of databases: ABI/INFORM Collection, Emerald Tourism, Hospitality & Tourism Complete, ScienceDirect Journals, and Google Scholar. These sources are meant to form a qualitative basis for understanding the usage of data analytics overall and the benefits and challenges of this strategy specifically applied to the hospitality industry. This review includes research not specifically written for a hospitality audience. The concepts of data analytics are not specific to hotels and integrated resorts and the takeaways from this study can apply across all industries.

Problem Statement

Hotel and resort operators spend a considerable amount on marketing costs to attract the most valuable customers in increasingly competitive markets. As marketing strategies become more complex, companies seek a method to identify their most valuable customers and evaluate current marketing systems. Data analytics is a trending business strategy across many industries to identify opportunities for business efficiencies, and its applications in hospitality are rapidly expanding. This study will provide guidance to scholars on unexplored data analytics areas to research. The end goal is for hospitality companies to gain better understanding of the benefits and challenges of data analytics implementation once updated literature is produced based on the

recommendations in this study. Both current and future concepts are examined in this paper to provide the most accurate assessment of analytics implementation in the future.

Limitations

There are a few limitations associated with this research. Much of the research utilized in this study is not written specifically for application to the hospitality industry. As a result, some benefits and challenges of data analytics identified in the research may hold varying importance when applied to hospitality. Another limitation is the research chosen focuses on the benefits and opportunities of data analytics in a qualitative sense. Due to the limited research specifically applied to hospitality, it would be difficult to theorize quantitative benefits in terms of specific revenue lift or cost savings expected from data analytics implementation.

Delimitations

There is an enormous number of techniques and capabilities that are related to data analytics. While specific examples will be utilized to support the study of challenges and opportunities of analytics in a general sense, this paper is not meant to provide considerable analysis in support of one specific technique related to data analytics. For example, this study identifies Structured Query Language (SQL) as a cornerstone of data analytics software, but the pros and cons of SQL are not thoroughly discussed. The insights within this paper are written for research application to hotel and integrated resort brands versus the entire hospitality industry. Some of the information presented may apply to different hospitality entities, however, a narrowed scope will aid scholars in identification of future starting points for research.

Definitions

This study will use the following terms to support its research purpose:

Hospitality Industry: “The hospitality industry is a broad category of fields within service industry that includes lodging, event planning, theme parks, transportation, cruise line, and additional fields within the tourism industry” (Novak, 2017).

Hotel Brand: A company “that binds a group of hotels together in the eyes of the customers” (“Hotel Brand,” 2021)

Integrated Resort: A company that oversees operations of one or more large resorts that include a hotel along with at least one added major amenity such as a casino, convention facilities, shopping, or similar (“Integrated Resort,” n.d.).

Data Analytics: “Data analytics is the pursuit of extracting meaning from raw data using specialized computer systems. These systems transform, organize, and model the data to draw conclusions and identify patterns” (Informatica, 2021).

SQL: “Structured query language, computer language designed for eliciting information from databases” (Encyclopædia Britannica, n.d.).

Chapter Two

The goal of data analytics is to develop business recommendations based on customer data that generate revenue or save costs. Specifically for hotel and resort companies, the data utilized includes customer spending and stay habits with the company tied to customer demographics such as age, location and other personal attributes that can be obtained. These techniques can lead to more sophisticated marketing capabilities to stay competitive in respective markets. Analytics ideally can provide the granular level of understanding required to make informative marketing decisions based on historical data down to the level of a single customer.

There is sufficient research related to data analytics capabilities, however, there is less research directly related to its impact in the hotel and resort space. This literature review first focuses on an overview of data analytics and then discusses the benefits and the challenges of data analytics applied to hotel and integrated resort chains. The literature review concludes with a summary of the literature review findings and a transition to the guiding framework presented in the final chapter of the paper. This literature review provides the evidence required for hospitality research scholars and others interested in the research to understand the current state of data analytics research and what shortfalls exist to explore in the future.

Data Analytics Overview

Data analytics is used across countless industries and the subject has a wide scope of applicability. For example, the same fundamentals of analysis can be applied to industries such as sports and entertainment, energy, government services, and hospitality (“10 Industries Redefined,” 2019). Before the role of analytics in hotels and integrated resorts is explored, it is worth understanding the framework and capabilities of analytics that can be applied across all

industries. This will be accomplished through a review of the definition and capabilities of data analytics.

Definition

The discussion of data analytics would not be complete without an understanding of what is the data that is used in analytics. “Big data” is a term that is often associated with what feeds analytics; however, its size is not the only relevant dimension. Gandomi and Haider (2015) discuss big data in terms of high volume, variety, and velocity. Volume refers to the size of the dataset which may include over millions of records of significant information. Variety relates to if the data is structured or unstructured. Structured data has uniform attributes and is ready to be investigated in an analysis tool. Unstructured data is the collection of text, images, or videos that require additional modification to analyze. Finally, velocity is the rate that new data is generated and analyzed. These attributes show that there is more to data than size: Databases grow every moment and steps must be taken before analysis can begin.

Once data is collected and organized, the next step is analysis. The purpose of data analysis is to draw conclusions based on trends, correlations, and significance of variables identified in the dataset. Analysis can be accomplished through evaluation of tables and graphs, forecasting, hypothesis testing, and model creation (Ott et al., 2016). Specific tools are required to conduct data analysis. Spreadsheet applications such as Microsoft Excel can be used to quickly aggregate data to draw conclusions, however, this tool is best for smaller amounts of data to analyze. Business intelligence tools that leverage the SQL programming language allow companies to assess numerous databases simultaneously which far exceeds the capabilities of what can be done within a workbook. Finally, open-source programs such as R or Python can be used to conduct advanced analysis processes through machine learning (“Top 12 Software &

Tools,” 2021). The key concept of data analysis is that it is the combination of two entities: The data itself and the specific analysis that follows using a tool to develop new insights.

Capabilities

Before the potential applications of data analytics are applied to hotels and integrated resorts it is essential to explore the broad capabilities that are not limited to a single industry. It is important to recognize that the discussion of analytics capabilities overall may identify future data analytics opportunities for hotel and resort companies to implement. The overall goal of data analytics implementation is to provide advanced support for business decisions that otherwise would not exist without data analysis (Davenport, 2014). Three areas to be discussed to understand analytics capabilities are discovery and experimentation, pricing, and customer trends and insights.

Discovery and Experimentation

The goal of discovery is to uncover insights that will improve predictions of customer behavior (Erevelles et al., 2016). Discovery relies on historical data to predict a future outcome. Applicable examples include identifying demographics that drive the success or failure of a product or marketing idea. Experimentation allows companies to test ideas, but only limit implications to a small sample of customers. These test results can then be compared to the performance of the larger population and a business decision can be made (Davenport, 2014).

Pricing

Data analytics can be used to optimize product pricing based on defined independent variables that influence a dependent variable (i.e., price). Changes in customer behavior based on seasonality can be tracked and flexible pricing strategies implemented based on data analysis (Erevelles et al., 2016). Customer review datasets that are aggregated and analyzed may show

what product features have the greatest impact on what customers are willing to pay (Archak et al., 2011).

Customer Trends and Insights

The collection of customer data at specific points in time enables companies to conduct time series analyses to identify changes in customer behavior over time. Based on customer demographic data available this can be summarized into specific customer subsets which gives visibility into what are the key drivers to changes in customer behavior (Khade, 2016). Predictive analytics and machine learning applied to historical trends create opportunities to improve model forecasting which aid in future business decision confidence (Sun & Huo, 2021).

Benefits Applied to Hospitality

One of the principal reasons for hotel and resort companies to implement data analytics strategies is to create competitive advantages over rival companies. A cornerstone of the hotel industry is creating a memorable experience for the guest and personalization aids in accomplishing this goal. Analysis of customer preference data leads to insight on the customer experience and companies can use this information to improve their offerings (Gupta et al., 2017). The hospitality sector has become a leader among industries in collecting customer data due to the technological advances in creating additional digital touch points with customers (Yallop & Seraphin, 2020). With additional digital engagement capabilities, it is critical for resort companies to use all information at their disposal. The first application of data analytics in the resort setting was in revenue management to understand consumer booking behavior to optimize price (Korte et al., 2013). Price optimization is only one example of the capability of analytics and even new advances in revenue management rise as new technologies surface. To

best understand the benefits of analytics for integrated resorts, the topic will again be discussed in terms of discovery and experimentation, pricing, and customer trends and insights.

Discovery and Experimentation

Data discovery is a critical first step for hotel and resort companies to understand who their customer base is before any business decisions can be made. For example, hotels may have a unique mix of business versus leisure travelers and the marketing strategies for each of these demographics is not the same (Korte et al., 2013). Another key element of data discovery is the linking of internal to external data. The degree of positivity in social media content and online reviews can be linked to internal data such as revenue and occupancy rates (Bowen & Whalen, 2017). In this example of social media content, the most meaningful keywords must be identified to minimize noise in the analysis and to ultimately develop clear insights in the end.

Technology advances have led to more data being available for companies to utilize, however, research is scarce on the success or failure of utilizing this additional data to make decisions. The research cited tends to focus on how data can be leveraged and not on if the strategies were successful or not in the end. Davenport (2014) wrote how experimentation can be used to test ideas and limit implications to a small sample of customers, however, this literature was not specific to hotels and integrated resorts. No applicable research on testing and experimentation specific to hospitality was found which highlights the need to apply analytics insights from other industries to this study.

Pricing

One of the first applications of analytics in the resort setting was through revenue management (RM). RM is the optimization of hotel revenues by finding the highest yield between occupancy rate and the daily rate of what customers are charged for a room (“What is

revenue management,” 2021). RM has existed in the hospitality industry since the 1980’s, however, the need to improve predictive modeling has grown due to competition from other resort brands and online travel agents (OTAs) looking to further maximize revenues (Kimes, 2016). Companies have been able to use historical customer data to estimate demand for certain times of the year or days of the week and adjust rates accordingly compared to the past when guests were charged the same rate for each day of a trip (Kimes, 2016). Additional data streams allow hotels to further optimize RM by making booking decisions based on live information on the customer and on the occupancy status of the hotel (Wang et al., 2015).

RM is just one component that analytics has been able to facilitate the growth in optimization over the years. The increased use of internal customer data tied to the traditional use of market conditions and demand in RM has even lead companies such as Marriott to rename their RM department to “Consumer Insights and Revenue Management” (Kimes, 2016). The improvements in pricing due to analytics implementation is well documented in the research cited, however, hotel room revenue is just one revenue stream of many for integrated resorts. There is little research on the growth of marketing analytics which is essentially pricing optimization of non-room related revenue streams such as casino revenues, food and beverage, and other revenues from amenities typically found in integrated resorts. Both Kimes (2016) and Wang et al. (2015) point out that marketing analytics will play a larger role in pricing optimization in the future, however, research on this subject needs to keep pace as the industry deploys these strategies.

Customer Trends and Insights

Korte et al. (2013) suggests that the most important component for modern resort companies to succeed is to use all available data that exists. The foundation of predictive

analytics lies in understanding historical trends in data to make a prediction in the future. Korte et al. (2013) discusses how La Quinta Inn & Suites was able to visualize real time hotel data into reports that show revenue trends compared to what was originally forecasted. These reports could then be customized by analysts to meet executive needs. What makes data analytics so valuable to integrated resorts are the cost savings and revenue generating opportunities that originate from data driven insights. Kahn and Liu (2015) discuss how data analysis of energy consumption by a major hotel chain led to abnormal usage trends detected in certain hotels. These findings resulted in faulty air conditioners detected which ultimately saved the chain millions of dollars upon replacement and brought energy use back in line with other hotels. Additionally, when companies understand the underlying customer data through big data insights, they can design the best marketing strategy to increase the likelihood of creating new customers or retaining existing ones (Gupta et al., 2017).

This research highlights a few examples where analytic insights resulted in a positive change for a hotel or resort chain overall. In contrast to the data analytics overview section of this study where techniques from other industries could be applied to the hotel and resort space, the hotel specific examples cited in this section could be applied to other industries. While analytic research in hospitality is limited, the research that exists shows the cross-industry applicability of analytics techniques. A notable development in analytics that is lacking from the literature reviewed is the growth in data visualization to understand certain trends. Rather than having to manually customize reports that Korte et al. (2013) identified, many hotel and resort chains have implemented new software that is user friendly enough for leaders to customize data visualizations themselves and provide a new benchmark for real time decision making.

Challenges Applied to Hospitality

Up to this point, the selected literature has shown how data analytics can benefit hotel and integrated resort chains along with application and benefits seen in other industries that could be applied to hospitality in the future. As mentioned in the introduction, data analytics challenges must be addressed to fully understand the function of data analytics in any industry. The challenges or risks associated with data analytics are categorized into data, process, and management challenges (Naganathan, 2018). A data challenge is an issue with the data itself and a hospitality example would be the difficulty of aggregating unstructured online reviews from guests into a uniform dataset. Process challenges relate to the actual data analysis and one example specific to hotels and integrated resorts is the limited focus on certain parts of the business such as loyalty program analysis and no analysis on other critical parts of the business (Gupta et al., 2017). Finally, management challenges cover customer information privacy and security, and significant data breaches have already occurred in the hotel space such as the Marriott data breach that occurred from 2014 – 2018. A consequence of additional data collection that is required for data analytics is the increased exposure to data breaches (Yallop & Seraphin, 2020). Existing research related to these three data challenge categories will be used to complete the assessment of the current state of research on data analytics.

Data Challenges

As mentioned, data challenges involve the data itself, but more specifically issues with the three V's of volume, variety and velocity discussed by Gandomi and Haider (2015). Big data volume is expanding much faster than companies can process it into useable raw data. As a result, companies have an overwhelming amount of data to process and much of it goes unused. Along with increasing size, the variety of unstructured data is increasing such as audio, text, and

photos that are associated with social media and online reviews. This type of data cannot be handled by querying tools such as SQL which is only designed for structured data. Finally, if the velocity of data analysis cannot keep up with the inflow of data, the value of the data will decrease over time (Li & Lu, 2014). The function of the three V's together creates a monumental task for companies looking to implement or further expand their analytics capabilities.

The increase in big data not only can overwhelm systems designed to manage the information, but also the employees that work with the data. Saxena and Lamest (2018) studied the impact of data overload on employees in the hospitality sector and found that the trends of increasing digital and qualitative data used in analyses oftentimes overwhelms the employees and managers responsible for working with the data. These employees feel pressure to meet expectations such as maintaining a certain online review response rate which is visible to both company leaders and prospective customers. These findings align with the observations of Li and Lu (2014) where the amount of unstructured data is rapidly increasing and is more difficult to utilize compared to structured data.

There is substantial proof from the above literature that the data utilized in all industries, including hotels and integrated resorts is becoming more complex. Systems and employees alike must keep pace to maintain the flow of information into an actionable insight. Limited research was found on the solutions that companies have implemented to avoid information overload. Cloud based servers and new data focused teams may provide solutions for the data challenges identified which will be discussed in greater detail in chapter three.

Process Challenges

When 80% of analyst worktime is devoted to data discovery and preparation, that leaves little time for analysis and insights to be derived from the data (Vassakis et al., 2017). Process

challenges are directly tied to data challenges in terms of data collection and processing must occur before analysis can begin, especially if the same employees are responsible for both steps in the data lifecycle. This challenge is highlighted in hotel and integrated resort chains when it is acknowledged that a substantial amount of data is collected, but analysis efforts are focused on only a few core areas of the business (Gupta et al., 2017). Vassakis et al. (2017) proposes to mitigate the process challenge by separating the totality of data analytics into two distinct entities: data management and data analytics. Data management addresses data challenges described above, and data analytics is entirely devoted to data modeling and interpretation. If a company separates these responsibilities amongst two groups, process challenges are minimized for employees responsible for data analysis.

While process challenges are theoretically discussed in the research, there are few examples specific to hotel and integrated resorts that discuss the challenges or solutions to mitigate them. Vassakis et al. (2017) identified that data management and data analytics should be separated, however, how this separation is implemented into any industry is not addressed. It is difficult to isolate many process issues in hotel and integrated resort chains when the selected literature only mentions a fraction of business areas such as loyalty program and revenue management analysis (Gupta et al., 2017; Kimes, 2016). The reality is that resort companies devote substantial analytics resources to each area of the business such as hotel, casino, marketing, and food and beverage, in addition to the RM and loyalty areas identified in the literature.

Management Challenges

Two specific management challenges that must be addressed concern data privacy and security. The Marriott data breach was mentioned in the introduction of challenges for data

analytics, however, this breach is not the only example to impact hotel or resort brands.

Companies such as Hilton, Hyatt, and MGM Resorts International have lost sensitive customer data due to data breaches. The widespread point-of-sales systems found in integrated resorts create additional vulnerabilities compared to other industries (Gwebu & Barrows, 2020).

Another limitation concerning the use of data is the developing requirement for companies to be more transparent in how data is used by both consumer and government entities. Company leaders such as Mark Zuckerberg (Facebook) have testified before U.S. Congress about data use and protection policies (Line et al., 2020). Strict internal data governance protocols are required to address government and consumer concern; however, it is unlikely all parties will be entirely satisfied with expanded use of customer data (Yallop & Seraphin, 2020).

Data collection is a necessity for improving the guest experience at hotels and integrated resorts. The most valuable customers can be identified through customer data which can help refine customer engagement (Line et al, 2020). Customers do not see data use in this light where 71% of customers believe data is used unethically and 58% refuse to use digital services over privacy concerns (Vassakis, 2017). While research highlights the concerns of data privacy and security, the solutions are relatively unexplored. Hotels and resorts typically incentivize guests to supply more information about themselves than is required through discounts post loyalty program signup or even after providing a valid email address. Specific data governance and incentive programs should be highlighted in future research to explore impact of such programs on consumer perception.

Summary

The capabilities of data analytics are not specific to any one industry and research done outside hospitality can be used as a guide for future data analytics research focused on hotels and

integrated resorts. The data available is constantly growing and strategies must be derived to avoid information overload as companies look to keep pace with data analysis. Data discovery, price optimization, and trend analysis are three subject areas that data analytics supports business decisions through, however, many other subject areas remain unexplored. Research exists on the role of data analytics applied to specific hotel and resort applications such as revenue management, social media, and online reviews, however, there are future research opportunities to investigate analytics impacts on other areas of the hotel business. Data, process, and management challenges concerning data analytics are interconnected, and further research must be conducted to evaluate hotel and resort solutions to these data challenges. A synergetic relationship between industry professionals and scholars is required for hospitality scholars to keep pace with rapid advancements of data analytics within hotel and integrated resort chains.

Chapter Three

The concluding chapter of the study on research concerning data analytics in hotels and integrated resort brands begins with a review of the research objective specified in chapter one. The summary of takeaways identified in chapter two are directly applied to the research objective to formulate an assessment of the literature review. These results are interpreted through an analysis of current hotel and integrated resort analytic capabilities versus scholarly research on data analytics. A set of research questions are proposed for future research based on the findings in this study. Limitations of the research objective and literature review are discussed, and the study concludes with a discussion of the future relationship between data analytics in the industry and research published.

Review of Research Objective

The research objective stated verbatim from chapter one is as follows: “The research objective is to provide recommendations on data analytics research topics based on a literature review of data analytics in all industries to create a wholistic view of the topic. Research gaps will be identified to highlight future opportunities to improve the quality of literature related to data analytics in hospitality.”

The literature review contains sufficient research to form a baseline of understanding of the current state of research on data analytics in hotels and integrated resorts. The study also assesses the differences in research on analytics within hospitality compared to other industries. These components of the research objective are discussed in the results summary. Additional research gaps are identified through the results interpretation, and recommendations on data analytics research topics are provided through three proposed research questions concerning data analytics in hotels and integrated resorts.

Literature Results Summary

A purpose of the literature review conducted was to understand what current research exists on the topic of data analytics in the hospitality industry compared to other industries to identify any research gaps specific to hospitality. From the sources reviewed, there was substantially more research available pertaining to other industries outside of hospitality. A comparison of the research available is discussed through the lens of the data analytics capabilities, benefits, and challenges subsections of the literature review.

Capabilities

The research available to assess data analytics capabilities tends to focus on a theoretical concept of application rather than a specific industry application. Erevelles et al. (2016) highlights how a purpose of data discovery is to improve predictions of consumer behavior. This finding was not applied to a specific industry, however, its application to a hotel or resort chain may differ from any other industry. Also, data analytics methods were discussed at a high level rather than applied to a specific business application. Sun and Huo (2021) mentions how machine learning can improve model forecasting, but the concept may be hard to grasp without a specific case to test improvement. It would be beneficial for hospitality researchers to explore direct applications of these analytics methods and their applicability to hotels and integrated resorts.

Benefits

The analytics research area within hospitality that has the most comprehensive array of publications is revenue management. Kimes (2016) connected the importance of historical data to RM and acknowledged that marketing analytics is a growing component for hotel chains. Korte et al. (2013) and Kahn and Liu (2015) brought up specific cases where the presence of data

analytics facilitated cost saving and revenue generating opportunities for specific companies. Kimes (2016) alluded to additional analytics functions in the hotel space, but it would be valuable to explore the application of data analytics in all other areas outside of RM. In addition, as more advanced technologies such as machine learning begin to play a larger role in hotel and resort chain analytics, these capabilities should be included in hospitality specific research.

Challenges

A strong area of research volume exists on the topic of data privacy and security in hotels and integrated resorts, and other industries could expand on the lessons learned through the existing research on hotel data breaches. Outside of the management challenge research, much of the discussion on other data challenges is viewed from a theoretical standpoint. For example, Vassakis et al. (2017) proposes the separation of data analytics into data management and data analytics to create more time for analysts to generate insights. The reality is separation of data responsibilities has already been accomplished at certain resort companies to increase the productivity of analysis. The following section on results interpretation expands on other analytics practices that are already deployed at certain hotel and resort brands.

Literature Results Interpretation

Certain hotel and integrated resort chains have relied on data analytics long before data strategies became a trending strategy across all industries. The former CEO of Caesars Entertainment, Gary Loveman, made the usage of analytics a priority during his tenure with the company since the early 2000's to predict and drive consumer behavior (Loveman, 2003). Research cited in this study tends to recommend seemingly basic analytics strategies for companies to implement, however, many companies have already gone far beyond the

recommendations found in this research. The results interpretation will focus on a few select research areas compared to current industry function.

A common theme among recommendations is for hospitality companies to expand analytics to areas beyond revenue management and marketing strategies (Gupta et al., 2017; Kimes, 2016). In addition, the data management and data analytics recommendation from Vassakis et al. (2017) has been thoroughly discussed in the prior section. These strategies have long been implemented at several resort companies which highlights the lag between industry and research. Analytics departments in hospitality have grown to the point where a chief executive position is essential to lead these departments which can number hundreds of employees. Resort companies have specific analytics teams dedicated to data management, gaming, casino marketing, hospitality, and marketing among others. The scope of analytics coverage goes far beyond what was discussed in the research in this study.

Research on management challenges related to data analytics focuses primarily on data privacy and security concerns. While these are critical issues that must be addressed, one management challenge not discussed is the high cost of payroll associated with analytics positions. A data analyst is a highly skilled individual with highly marketable technical skills typically in excel and one or more types of querying software. The skillset grows as one transitions to an analytics manager or data scientist, and these are positions that command high compensation even at the analyst level. In the hospitality space, some companies consider a data analyst to be in the management band of employee types. Analyst retention is a documented challenge in resort companies and is a challenge that should be further researched in the future.

Proposed Research Questions

Based on the literature results summary and interpretation, three research questions are proposed for hospitality research scholars to investigate and expand on the quality of literature related to data analytics in hotels and integrated resorts.

RQ1. How have specific analytics strategies been deployed in hotels and integrated resort brands and how do these strategies differ in the hospitality space versus other industries?

The goal of this research question is to connect the theoretical framework of analytics strategies discussed in the literature review results summary to real application in the industry. There is an opportunity through a case study analysis to evaluate levels of success of certain strategies compared to others specifically applied to hotels and integrated resorts.

RQ2. What departments in hotels and integrated resorts currently rely on data analytics for business decisions and are there other areas of the business to expand these strategies?

The literature review implications identified that there is a knowledge gap between researched scope of analytics in companies versus what is occurring in the industry. It would be useful to update current research and conduct a trend analysis to reflect the advancements occurring in the hospitality industry concerning analytics.

RQ3. What is the average tenure of data analysts in the hospitality industry compared to other industries and what factors drive employee turnover?

Data management challenges related to employee turnover and payroll should be investigated in terms of average salaries of analysts in hospitality versus other industries to determine if turnover is a challenge that plays a bigger role in the hospitality industry. This research could be beneficial to companies making payroll determinations for certain analytics positions.

Limitations of Research

The research utilized in this study came from a limited number of databases that were identified in chapter one and as a result, this study is not comprehensive of all research that has been written about data analytics in hotels and integrated resorts. It is also understood that a lag in research will always exist as the industry carves out new techniques related to data analytics and substantial time is required to study new developments in the industry. Finally, scholars are limited in data related to specific company techniques due to confidentiality concerns amongst competitors.

Future Implications and Conclusion

Data analytics has been and will continue to be the key to identifying new customer trends and providing support for business decisions based off those trends. As hotel and integrated resort companies grow and increase efforts to stay competitive in the industry, adequate support must be in place to test and validate decisions. Analytics can provide a company with robust quantitative reasoning to reduce the guesswork in decision making and have a strong idea on the outcome before the idea is implemented. It is essential for scholars to keep pace with the rapid developments related to data analytics to maintain the symbiotic bond between data professional and researcher.

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