Starfleet RESEARCH



The 2021 Hotel Recovery Edition

The Sky's the Limit:

Taking Hotel Revenue Performance to Higher Levels of Success

Understanding the Unique Benefits of AI-Powered "True Cloud" Revenue Management

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The research findings featured in this study are derived from the Hospitality Revenue Management online survey conducted by Starfleet Research in Q2 2021. The survey was completed by 290 qualified respondents across multiple job titles, hotel property sizes and categories and geographic regions.



AI-Powered “True Cloud” Revenue Management: No All Clouds Are Equal

For most of the past decade, hotels and resorts were enjoying year-over-year revenue growth and record profitability. Major brands saw their revenue numbers increase by millions of dollars. Smaller properties, too, achieved substantial gains in top-line revenue growth. The trajectory was expected to continue for years to come. Of course, that was before the global pandemic brought the entire hospitality industry to a standstill. With travel coming to an abrupt halt in the early months of 2020, and guest room occupancy at record lows for the better part of the next year and a half, the rules of the game for revenue management went all but out the window.

Next-generation revenue management solutions, fueled by advanced technologies and data analytics, had served to improve hotel revenue performance and, in many ways, transform the industry as a whole. In "normal" times, the best of these solutions could automatically calculate demand forecasts for future use of every guest room, recommending appropriate selling strategies and overbooking levels to maximize yield and deliver unprecedented financial gains. But their value quickly dwindled as hoteliers scrambled *en masse* to reduce operating costs — even, in many cases, temporarily shuttering their properties.

However, that did not quash technology innovation on the part of forward-thinking solution providers. On the contrary, some best-of-breed solutions grew in sophistication, functionality and agility. New algorithms were designed to help hoteliers navigate unexpected and extreme market conditions that may potentially arise in the future. Enhanced dashboards were developed to provide revenue managers with a better understanding of data, with frequently updated forecasts and greater insights into a broader array of factors driving demand. By the time the industry came roaring back in many parts of the world in the summer of 2021 — at least with respect to the leisure market (with expectations that international business travel and group bookings for conferences and other events would soon follow suit) — revenue management once again took center stage.

"Best-of-breed solutions grew in sophistication, functionality and agility, with new algorithms designed to help hoteliers navigate unexpected and extreme market conditions that may potentially arise in the future."

The groundswell of technology innovation, both before and during the pandemic, was enabled first and foremost by advances in cloud computing. Only by building the revenue management solution on an AI-powered "true cloud" platform does it become possible to automate pricing recommendations and other decision-making processes that sit at the heart of increased guest room occupancy, revenue and profitability.

The oft-cited benefits of the cloud cannot be overstated, particularly in the context of recent events. These benefits include elimination of on-site server hardware (and the day-to-day maintenance that goes with it) and the fact that software is continually updated — remotely — with the latest features and functionality without the need to purchase and install each new release. Importantly, a cloud solution allows for nimble technology stacks; if part of the integrated system becomes obsolete or fails, new software can be readily plugged in to replace it.

"The oft-cited benefits of the cloud cannot be overstated, particularly in the context of recent events."

With a "true cloud" solution, it also becomes much easier to integrate relevant data from a multitude of different technologies and data sources, from any location and across any number of properties. Data integration is a key success factor with revenue management. Only by capturing, integrating and fully utilizing all relevant data can hoteliers hope to achieve the ultimate promise of revenue optimization: *to sell the right space at the right price at the right time to the right guest*.



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Percentage of large and full-service hotels (compared to 68% of mid-size and limited-service hotels) that improved financial results prior to the pandemic as a result of having recently upgraded to a next-generation revenue management solution

These days, practically all hospitality solution providers tout their software as cloud-based. But buyer beware: Many solutions are, in reality, built on software originally designed to run on-premise. A "true cloud" (or "pure cloud") solution is built from the ground up, coded to perform as a fully-hosted cloud solution and optimized for tablet and mobile use. The solution provider hosts the software across hundreds of servers and with multiple levels of data redundancy in a multi-tenant cloud environment.

This is fundamentally different from a legacy solution that has been merely upgraded with a web front-end interface, which provides access via an internet browser on a computer, tablet or mobile device to the back-end software but remains hosted on a local, on-premise server. This hybrid approach to hospitality software in which certain critical elements continue to reside on-premise — including, in many cases, the actual mission-critical databases — have inherent constraints and limitations.

"A "true cloud" solution is built from the ground up, coded to perform as a fully-hosted cloud solution and optimized for tablet and mobile use."

With a "true cloud" platform, users typically access the same solution via an internet browser, allowing for instantaneous product upgrades, while a customization platform maintains property-specific changes. As a result, they gain immediate access to the latest functionality without having to re-implement custom changes and integrations. This is essential, given the sheer volume of data and the amount of effort involved in configurating the data inputs driving the forecasting and demand reports that inform better pricing and inventory control decisions. As top-performing hoteliers can attest, such advantages only scratch the surface when it comes to the benefits of a "true cloud" solution in the context of revenue management.





AI-Powered “True Cloud” Revenue Management: The Benefits of Machine Learning

The cloud has played an instrumental role in the evolution of hotel revenue management capabilities. So, too, has artificial intelligence. What makes an AI-enabled system "smart" is its ability to leverage machine learning to gain knowledge and insights that enable the system to progressively improve the accuracy of its price optimization capabilities, dynamic forecast models and pricing recommendations.

Some solutions can automatically process and analyze data for every reservation made by every hotel guest across every consumer segment and over a period of multiple years. Some solutions can generate precise demand forecasts for every night of the year across every room type, season and day of the week. Today, a state-of-the-art solution can generate tens of thousands of optimal pricing decisions on a daily basis.

"An AI-enabled solution tends to be less dependent on historic data — which, as we know all too well from recent events, can be a poor predictor of future market conditions."

An AI-enabled solution detects emerging patterns related to guest bookings faster than was ever before possible. This gives hoteliers the ability to enact strategies that are proactive rather than reactive. An AI-enabled solution also tends to be far more accurate and also a lot quicker to react to unexpected situations that may precede sudden drops or spikes in room demand than ones that lack the power of artificial intelligence. Importantly, an AI-enabled solution also tends to be less dependent on historic data — which, again, as we know all too well from recent events, can be a poor predictor of future market conditions.

In fact, no revenue management solution was equipped to handle the unprecedented challenges unleashed by the global pandemic. However, with some solution providers having spent months during that period of turmoil and uncertainty adapting and strengthening their forecasting calculations, the best of these solutions can now quickly recalibrate to *the new normal*. By incorporating a next-generation forecasting algorithm designed to automatically detect unusual scenarios and respond to emerging trends, including ones that threaten to upend the entire

industry, along with a break-though methodology for ADR and revenue forecasting, the most advanced of these solutions can now automatically handle even the most unusual and extreme market conditions.

These solutions infuse a host of other forecasting algorithms, including dynamic trend modelling, into an integrated and adaptive learning and forecasting engine. When the algorithms are applied, the solution recalculates a full new forecast. As the models begin to learn of new business trends, the forecast immediately adapts to unexpected market changes and responds accordingly. Machine learning makes it possible for algorithms to evaluate and integrate market changes over time. Importantly, the algorithms also integrate all predictive modeling mistakes. This enables the solution to become progressively smarter while, at the same time, avoiding the possibility of making the same errors in the future.

"In good times and bad, optimization remains the overriding objective."

In good times and bad, optimization remains the overriding objective. Optimization includes channel management. If, for example, the forecasting algorithms determine that there exists sufficient guest room demand from sources other than OTAs, then the solution can automatically apply the right strategy to funnel business through the most profitable channels. In this case, it is not a question of OTA versus direct business. Rather, it is about optimizing decisions based on the relative value of all distribution channels, weighing how much each channel drives demand.



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Percentage of hoteliers who "agree" or "strongly agree" that a next-generation revenue management solution can improve the accuracy of pricing and distribution decisions



AI-Powered “True Cloud” Revenue Management: Better Technology and Data Integration

It's been said that all the knowledge is in the connections. To that point, another key component of revenue management success relates to seamless technology and data integration. The property management system (PMS), central reservations system (CRS) or channel manager, and revenue management solution all need to seamlessly connect and share data —preferably, in a real-time manner. Inventory-related data needs to flow into all distribution channels, including direct booking platforms and call centers, as well as the global distribution system (GDS) and OTAs.

For its part, the PMS needs to incorporate data streams from all point of sale (POS) systems in order to capture ancillary spending on food and beverage purchases as well as all PMS modules and point solutions (function and event space, spa, golf courses, etc.). Technology platform interoperability is most easily achieved by implementing a "true cloud" platform that is as open as possible with bi-directional APIs. Cloud connectivity eliminates disparate solutions and fractioned data while opening the door to the latest technology capabilities, including new innovations that may yet be on the horizon.

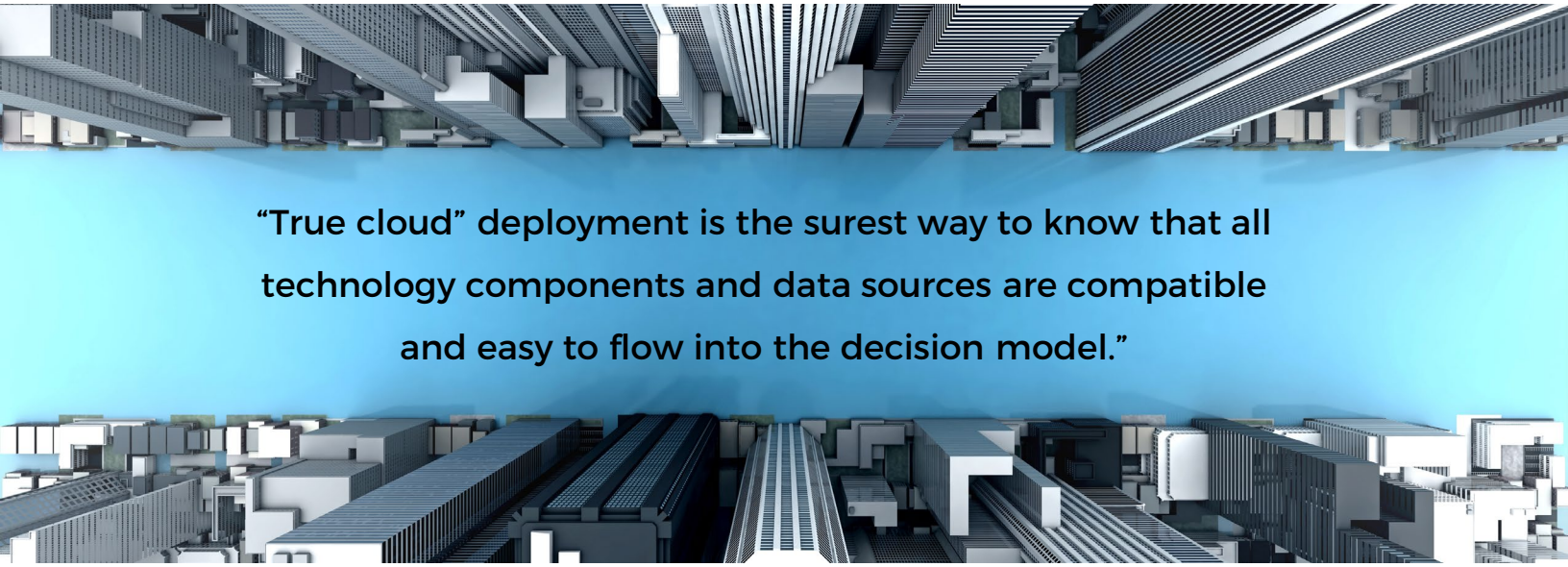
"Technology platform interoperability is most easily achieved by implementing a a 'pure cloud' platform that is as open as possible with bi-directional APIs."

The challenge for many hoteliers lies in the fact that existing technology solutions, including these function-specific modules, often consist of on-premise installations, with standalone databases that tend to be incompatible with one another. The end result is an ungovernable mass of data spaghetti. Relevant data that resides in multiple different silos is the enemy of next-generation revenue management.

Hoteliers need access to a single version of the truth. That means stitching together all of the data silos, which, in many cases, can present an enormous challenge — or, better yet, upgrading to an end-to-end hospitality infrastructure built natively for the cloud, which makes the grand movement to unify the fragmented technologies and data silos an achievable goal.

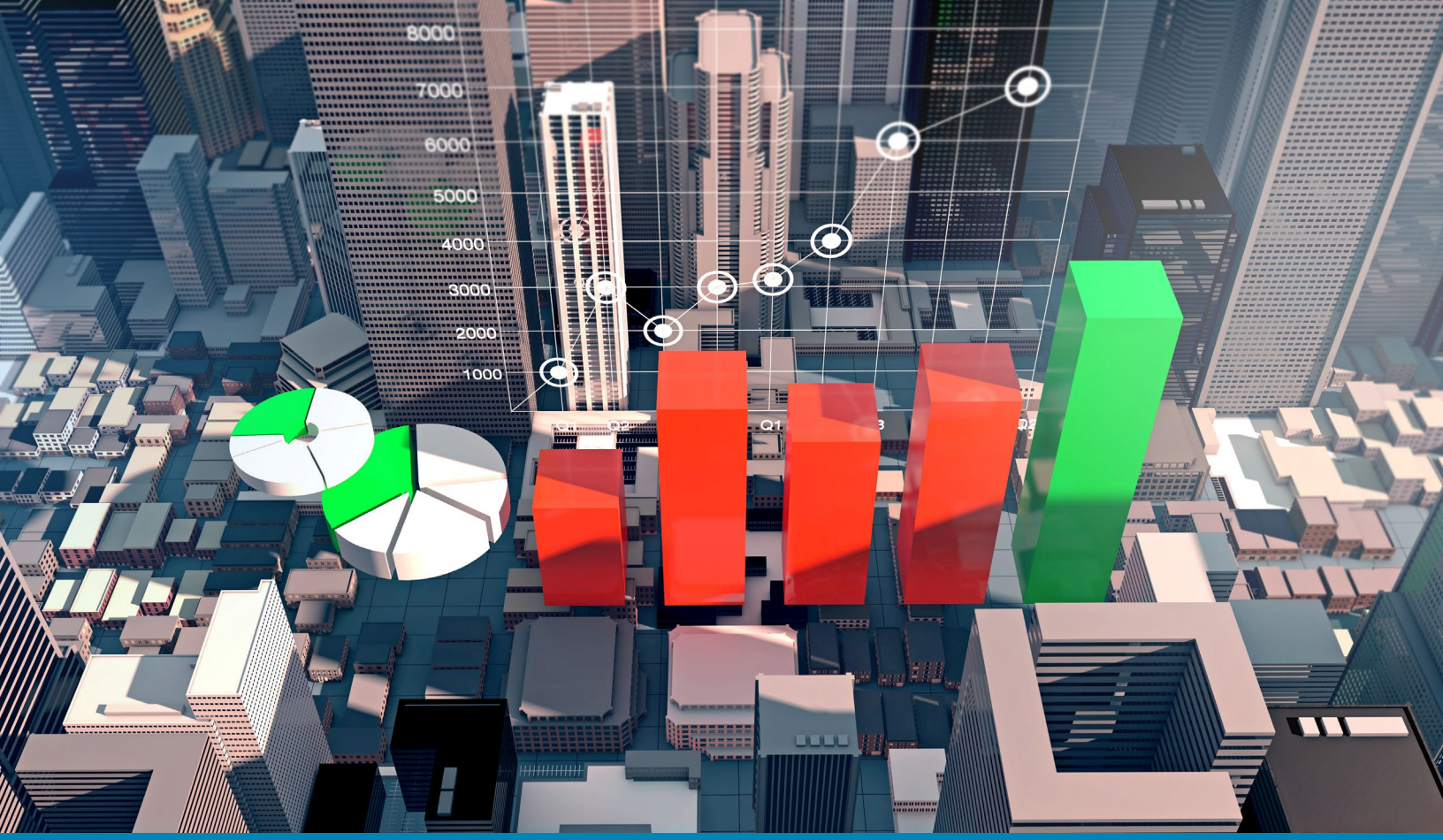
When it comes to data, revenue managers today have an embarrassment of riches. There is practically no end to the number of internal and third-party data sources at their disposal. The question is: What data is relevant to the model? Almost everyone would agree that the volume and depth of clean historical data related to occupancy, rate and revenue figures (including booking dates, rate codes, arrival dates, departure dates and revenue by day) provides the strongest basis for forecasting accuracy. Market-level data, including publicly available competitor rate information, also ranks as a must-have data source.

Flight demand, weather reports and geographical information may be used for forecasting purposes. Web shopping data may also provide some insights into current and future room demand as well as price sensitivity. The important point is that, whatever the data sources are used, no revenue management solution can be treated as a standalone application. It needs to seamlessly integrate with multiple data streams.



“True cloud” deployment is the surest way to know that all technology components and data sources are compatible and easy to flow into the decision model.”

There are significant cost benefits associated with a “true cloud” hospitality technology infrastructure that enables "centralized shopping" of data through seamless interaction between the CRS, PMS and all other data sources. For starters, it reduces potential data disparity issues around “last room availability,” oversold rooms, etc., which can be costly. It also enables real-time integration of customer lifetime value into pricing and availability algorithms, and guest loyalty and total property spend data into the rate decision model. All of which serve as key inputs into the dynamic forecast models that enable accurate pricing recommendations — and, ultimately, increased hotel revenues and profitability.



AI-Powered “True Cloud” Revenue Management: More Processing Power

Knowledge is power. When it comes to revenue management, it can also be said that power is knowledge because achieving optimal outcomes means having the requisite amount of processing power. Simply put, processing power is a function of how fast a machine or system can perform an operation to achieve the desired result. In this case, processing power is determined by the speed by which an advanced revenue management solution can process data through demand forecasting and optimization algorithms to make accurate pricing recommendations.

It only stands to reason that faster processors can handle more calculations per second than slower ones. Today's revenue management solutions need to be able to process enormous volumes of data, and faster than ever, and handle extremely complex calculations. For a large property, the totality of the data set may include dozens of guest segments, a dozen or more room types, several years of historical booking and reservations data, and upwards of a dozen length-of-stay buckets.

"Today's revenue management solutions need to be able to process enormous volumes of data, and faster than ever, and handle extremely complex calculations."

The good news is that AI-enabled "true cloud" revenue management employs demand forecasting and optimization algorithms that are dramatically faster and more accurate than systems from even a few years ago and capable of performing highly sophisticated analytical calculations in lightning speed. The result is timely, accurate and exact pricing recommendations. In fact, the processing power of such a system now enables near-real-time calculations and recommendations.

The sheer complexity of these calculations can be breathtaking. Some solutions support "what if" scenario analyses, making it possible for revenue manager to change a key input or output and instantly see the results across all of the impact days. Some calculations incorporate competitive rate data, demand data and multi-market economic data. Some calculations incorporate real-time integration of customer lifetime value (CLV) data and model consumer behavior from click-stream data and integrate loyalty and total property spend data.

Combining all these data sets for just one hotel can easily amount to several hundred million calculations. Generating the pricing and distribution recommendations means thousands of decisions being generated each day and for every day into the future. Multiply that number for a hotel brand with dozens or even hundreds of properties, and one can appreciate the magnitude of the undertaking. As an example, one major hotel brand recently revealed that it generates more than 45 million forecasts nightly for each hotel, segment, room type, and channel for the next 365-day period.

Given all that, it becomes clear that hotel revenue management is a big data challenge that requires enormous processing power. Today's algorithms require an enormous amount of data storage and processing capacity to do their jobs. While even global hotel brands may not have data processing requirements that are in the same league as, say, Amazon, Apple, Facebook or Google, their data processing needs are certainly large enough to constantly stretch if not exceed the limits of on-premise data storage and computing capacity. Hence the need to migrate to a cloud-based deployment model — and, preferably, an end-to-end "pure cloud" hospitality infrastructure.

"Hotel revenue management is a big data challenge that requires enormous processing power."

Total profitability goes beyond guest rooms. In addition to filling empty rooms with paying guests in the most profitable way possible, hotel revenue management also means focusing on ancillary revenue opportunities.

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Percentage of hoteliers who "agree" or "strongly agree" that technology platform interoperability is a key success factor for hotel performance improvement



Almost every hotel has untapped revenue potential in the form of event function space, recreational facilities, spas and restaurants. With many properties, upwards of half of their total revenue came from non-room revenue streams prior to the pandemic. When optimized, these assets can play a key role in boosting overall hotel profitability. The good news is that the same revenue management solution used for RevPAR may be used to execute a "total revenue management" approach.

An AI-powered "true cloud" solution engineered from the ground up to handle the rigors of big data processing and complex pricing calculations in highly compressed timeframes — and that allows hoteliers to confidently set pricing strategies from anywhere, at anytime, while quickly navigating through rapid changes in market conditions and demand trends — can take a hotel much closer to the aforementioned goal of revenue management. Such a solution is critical in an industry where pricing sets hoteliers apart from competitors and where the name of the game is to maximize occupancy revenue and overall profitability.



Total Revenue Management: 4 Tips

1. Don't just look at room rate when deciding what business to accept. Also look at the ancillary revenue that each segment typically brings. Holding out for demand from the segments that drive more ancillary revenue can be a good way to increase profitability.

2. Don't just forecast room revenue, but also other revenue categories, as well. A hotel may already be achieving optimal results during busy times, and should focus its growth shoulder nights and other slower periods.

3. Don't just consider the capacity constraints on your room inventory, but also in F&B outlets, spa, golf course, anywhere where there is more demand for a facility than the hotel can accommodate.

4. Don't ignore the contribution margins of different types of revenue. Just as distribution costs should guide room revenue strategy, so should the costs associated with delivering ancillary revenue, such as the real cost of food, spa products, and labor.



AI-Powered “True Cloud” Revenue Management: Better Answers, Better Decisions

With the industry still reeling from a year and a half of pandemic-related financial losses, there has been no better time for hoteliers to take advantage of next-generation revenue management capabilities. Given access to the right data sets, an AI-powered "true cloud" solution may well be a big part of the answer to every hotelier's prayers as the industry rebounds from its darkest chapter and prepares for a brighter future.

For revenue managers, a next-generation solution should go a long way toward answering all of their day-to-day pricing and other questions. These questions might include: By how much should we increase or decrease our rates for a given type of room? With the return of business travel, how many customer groups, and what size groups, should we accept on a given day? How much should we charge walk-in customers? What should be the floor and ceiling for our rate range? Are the changes in demand and bookings likely to represent a short-term or long-term pattern – and, if the latter, what actions should we take response?

"There has been no better time for hoteliers to take advantage of next-generation revenue management capabilities."

Other questions might include: To what extent should we discount negotiated rates? What should be our rack rates for the coming year? What discounts and promotions, and to what target customer segments, are likely to perform well right now and in the near-future? What discounts would likely dilute profits and should we therefore avoid? To what extent should we mark up our premium rooms, based the current and near-term demand patterns? What, if any, competitors' price moves would likely affect these demand patterns and how should we respond should those possible moves become reality?

Knowing the answers these questions, and any others that may arise, can move mountains — or at least move the needle on the financial performance of a property, oftentimes very substantially, taking it to ever-higher levels of success.

The following are a few key capabilities and considerations for hotel decision makers to keep in mind when evaluating an AI-enabled "true cloud" revenue management solution:

Database loading and consolidation. An integral part of modeling and forecasting functionality, allows for highly detailed analysis of transactional data through a multitude of reporting options.
Demand modeling. Automatically analyzes and evaluates all PMS and user data, and uses unique algorithms to create property-specific unconstrained demand models.
Demand forecasting. Provides up-to-date constrained as well as unconstrained forecasts of room nights, total revenue, cancellations, no-shows, arrivals, departures, and much more.
Optimization. Solves revenue optimization problem with a set of innovative algorithms that optimally balance demand and supply, resulting in a set of controls and recommendations.
Controls and recommendations. Automatically translates recommendations into controls for all interfaced and non-interfaced systems to ensure optimization of all distribution channels.

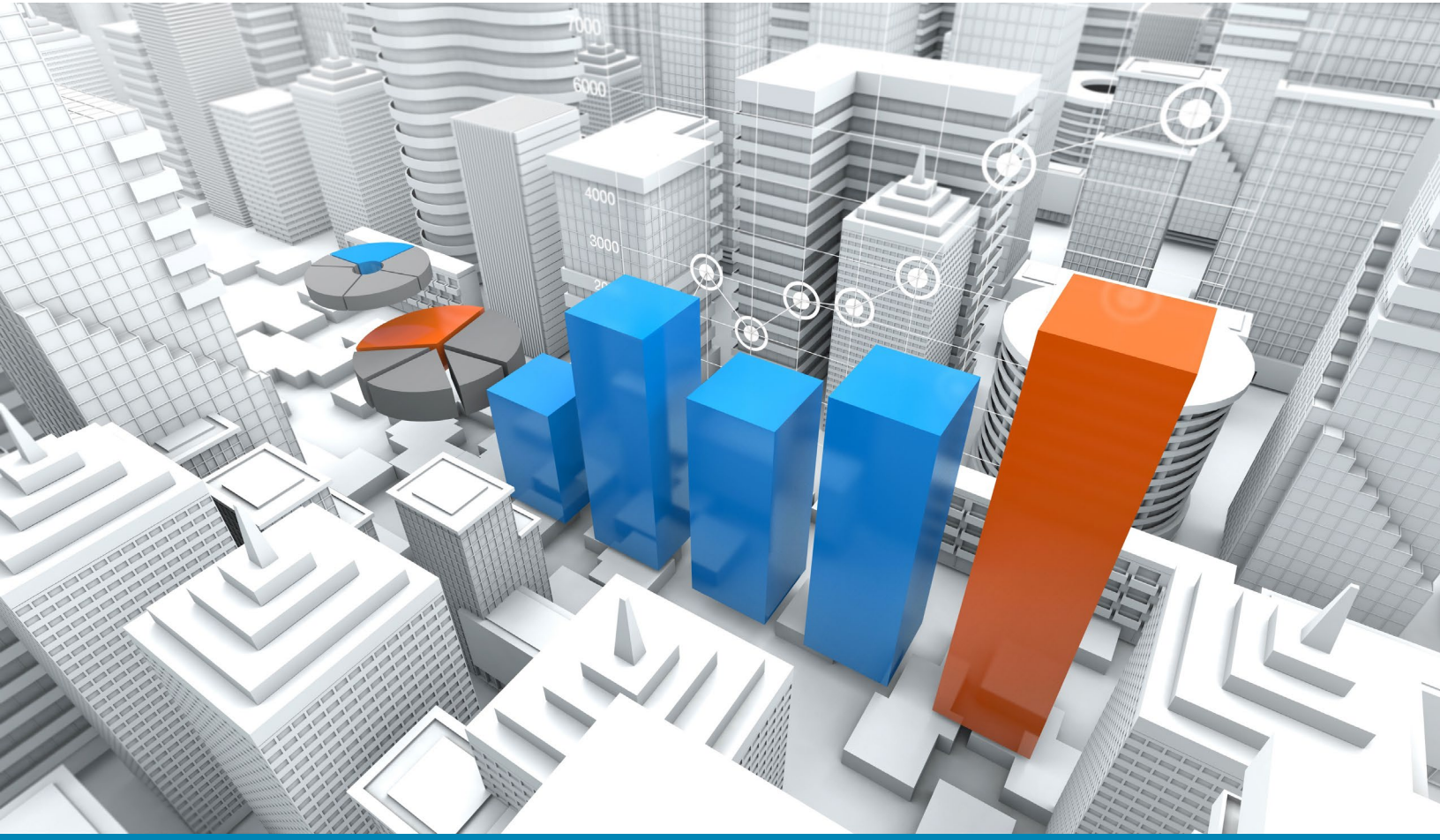
A state-of-the-art solution should also provide a rich set of mobile app features, including:

Smart KPIs. Provides a view of the most important business metrics through comparisons of past performance and future forecasts presented in figures and charts.
Customizable Views and Dashboards. Allows the user to configure and customize how they view information and data, based on their preferences. Data can be sorted by Pick-Up Information, Day, Month, Calendar View, Actuals, On-The-Books, Forecasts and more.
Updated Recommendations. With PMS and CRS integration, all information is kept up-to-date; users can view recommendations and competitor analysis to make informed pricing decisions.
Instant Notifications. Provides updates and notifications for changes that may have an impact on the business, and the data accessible on mobile devices.



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Percentage of hoteliers that say that one of the biggest benefits to be gained from a next-generation revenue management solution is a reduction in time and costs associated with traditional pricing tactics



About Starfleet Research

Starfleet Research, the IT market research arm of Starfleet Media, provides in-depth perspectives and insights into the hospitality technology. Each year, our Smart Decision Guides benchmark best practices in technology-enabled business initiatives across thousands of hotels. We also publish *Hotel Technology News*. Tens of thousands of executives read our premium content assets to gain actionable insights and make smarter business decisions.

Contact Starfleet Research
219 W. Chicago Ave., Suite 400
Chicago, IL 60654

www.starfleetresearch.com
research@starfleetmedia.com

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Contact Infor
641 Avenue of the Americas
New York, NY 10011

www.infor.com
hospitaity@infor.com

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