**Introduction** This is the last phase of the Hokie Resort Hotels Data Warehouse project, where we show the value of our data warehouse by producing reports and visualizations to answer the main management issues found in Milestone 1. Using ROLLUP and CUBE tools, we have run SQL searches to examine the data and produced visualizations offering management decision-making practical insights.

**Query 1: Revenue Optimization by Hotel Brand, Season, and Room Type  
File: Revenue Optimization by Hotel Brand, Season, and Room Type.sql** The question offers a hierarchical study of income performance over room kinds, seasons, and hotel brands. At each level of aggregation, the ROLLUP operator creates subtotals that let management spot trends at several degrees of accuracy.  
The query results displayed in Revenue by Hotel Brand and Season.png (54 KB) and Revenue Analysis by Hotel Brand and Season.png (60 KB) let us observe:  
  
Luxury Collection hotels bring in far more overall ($12,625) than Business Class hotels ($5,770).  
Luxury Collection hotels keep good performance throughout High Season with $4,640 even if they perform better during Off Season with $10,305 in income.  
The data also split down room kinds inside every brand and season, offering thorough analysis of which lodging generates the greatest income.

**Query 2: Customer Satisfaction Analysis by Loyalty Tier and Hotel Brand  
Customer Satisfaction Analysis by Loyalty Tier and Hotel Brand.sql** This question examines consumer satisfaction trends over loyalty levels and hotel brands using ROLLUP. Customer Satisfaction Analysis by Loyalty Tier and Brand.png (66 KB) and Customer Satisfaction Analysis by Loyalty Tier and Hotel Brand.png (61 KB) show us that:  
  
At Luxury Collection hotels, platinum members say they are most satisfied—9/10.  
Between Luxury Collection (8/10) and Business Class (6/10) establishments, gold members show varied degrees of pleasure.  
Silver members exhibit the biggest variation; their pleasure at Luxury Collection hotels (5/10) is much lower than that of Business Class resorts (7/10).  
  
Revealing that Platinum members have the highest total satisfaction (9/10), followed by Gold (7/10) and Silver (6/10), the ROLLUP feature also offers aggregated information for each loyalty tier across all companies. Over all levels and brands, the average satisfaction score is 7/10.

**Query 3: Cross-Selling Opportunities Analysis by Room Type and Booking Channel  
Cross-Selling Opportunities Analysis by Room Type and Booking Channel.sql** This question crosses-tabulates supplementary expenditure trends across room types and booking channels using the CUBE operator. Two important revelations come from the Cross-Selling Opportunities Analysis by Room Type and Booking Channel.png (63 KB) and Cross-Selling Opportunity Analysis by Room Type and Booking Channel 2.png (0 KB).  
  
With a considerable ancillary percentage (41.26%), Ocean View Suite reservations via Phone create the most auxiliary income ($980).  
With the greatest ancillary percentage (52.50%), mobile app reservations for Deluxe rooms indicate this channel clearly pushes extra services.  
Bookings for Executive Suites through Corporate channels had the lowest ancillary percentage (10.92%), suggesting unrealized cross-selling potential  
  
The CUBE feature enables a thorough investigation of cross-selling prospects by aggregating for every kind of room across all booking channels, every channel across all room types, and any unique combination.  
  
**Visualization 1: Revenue Analysis by Hotel Brand and Season  
Revenue Analysis by Hotel Brand and Season.png**

Revenue performance throughout several hotel brands and seasons is seen in the column chart graphic. With the number of bookings shown at the top of each column, the stacked columns amply demonstrate the difference between room revenue and auxiliary income.  
Important realizations from this visualization:  
  
Luxury Collection hotels bring far more overall income than Business Class hotels.  
Off Season generates more absolute income for Luxury Collection, however during High Season the ratio of auxiliary to room income is somewhat larger.  
Although there is no data for High Season in our sample, Business Class hotels demonstrate good performance during Off Season.  
  
By stressing seasonal trends and separating performance among hotel brands, this representation immediately answers the first management concern about income optimization.

**Visualization 2: Customer Satisfaction by Loyalty Tier  
Customer Satisfaction Analysis by Loyalty Tier and Hotel Brand.png**

The radar map graphically shows trends in satisfaction across hotel brands and loyalty levels. Every loyalty tier is shown on the chart by a separate colored region, which facilitates the comparison of satisfaction levels among several categories.  
Important revelations from this picture:  
  
Particularly in luxury collection hotels, platinum members regularly score the highest satisfaction levels—9/10.  
At Luxury Collection resorts, silver members exhibit much less pleasure (5/10) than in Business Class hotels (7/10).  
Across all brands, gold members show modest happiness; their Luxury Collection (8/10) score above their Business Class (6/10).  
  
By pointing out opportunities for development and pinpointing important elements influencing customer happiness over the hotel portfolio, this radar graphic immediately answers the second management question.

**Visualization 3: Cross-Selling Opportunities Analysis**

**Cross-Selling Opportunities Analysis by Room Type and Booking Channel.png**

For various room type and booking channel combinations, this visualizes ancillary income versus ancillary percentage. Every point's size represents the amount of bookings, therefore offering a multi-dimensional perspective on cross-selling performance.  
Important observations from this visualization:  
  
Phone-generated Ocean View Suite and Suite bookings result in both high proportion of room income (41%) and substantial ancillary income ($980, $580).  
While Executive Suite reservations via Corporate channels exhibit the lowest ancillary percentage (10.9%), demonstrating this channel excels at upselling, Mobile App bookings for Deluxe rooms show the greatest ancillary percentage (52.5%). suggesting this channel has great scope for focused cross-selling techniques.  
Generally speaking, website reservations across several room categories demonstrate only modest performance.  
  
By spotting particular cross-selling potential across room types and booking channels that can be used to boost supplementary income, this visualization directly answers the third management issue.  
  
**Cross-Selling Opportunities by Room Type and Booking Channel (continued)**  
 Plotting ancillary income versus ancillary percentage for various room type and booking channel combinations, the bubble chart shows Every bubble's size represents the amount of bookings, therefore offering a three-dimensional perspective of cross-selling capability.  
Important observations from this visualization:  
  
Phone-generated Ocean View Suite and Suite bookings result in both high proportion of room income (41%) and substantial ancillary income ($980, $580).  
While Executive Suite reservations via Corporate channels exhibit the lowest ancillary percentage (10.9%), demonstrating this channel excels at upselling, Mobile App bookings for Deluxe rooms show the greatest ancillary percentage (52.5%). suggesting this channel has great scope for focused cross-selling techniques.  
Generally speaking, website reservations across several room categories demonstrate only modest performance.  
  
By spotting particular cross-selling potential across room types and booking channels that can be used to boost supplementary income, this bubble chart directly answers the third management issue.

**Conclusions and Recommendations**  
 The SQL searches and visualizations produced allow us to provide the management of Hokie Resort Hotels with the following observations and advice:  
 **Revenue Optimization  
1. Seasonal Strategy:** While Luxury Collection hotels make greater overall income during off-peak seasons, the somewhat larger ratio of ancillary to room income during high season points to possible opportunities for best pricing policies to increase total income during peak periods.  
2. **Room Type Focus**: The thorough analysis of room types exposes particular kinds of housing that generate disproportionate income. Management should think about increasing the range of these top-notch room designs.  
3. **Brand Differentiation**: Strong off-season performance of business class hotels indicates they might be promoted as bargain options during this time.

**Customer Satisfaction   
1. Tier-Specific Experiences**: Particularly at Luxury Collection locations, the notable variation in satisfaction throughout loyalty levels points to a need for more customized experiences for every tier.  
2. **Silver Member Improvement**: The much lower satisfaction of silver members at Luxury Collection hotels (5/10) as compared to Business Class (7/10) points to a possible mismatch of expectations. Management should look at whether this segment's demands for price, marketing message, or service delivery call for changes.

3. **Platinum Program Enhancement**: With always high satisfaction (9/10), the Platinum tier program is successful and may be a model for raising additional levels.

**Cross-Selling Opportunities**1. **Channel Optimization**: With the greatest ancillary percentage (52.5%), mobile app reservations indicate that this channel should be enlarged, and its effective upselling strategies examined and implemented to other channels.

2. **Corporate Account Strategy**: Executive Suite reservations made through corporate channels show a notable increase in potential based on the low ancillary proportion (10.9%). Targeted business packages with complementary services might raise this indicator.

3. **Phone Booking Success**: Ocean View Suite's significant supplementary income from phone reservations shows good staff training for this channel. Management should record and then copy these effective sales strategies.

Final Summary  
The data warehouse Hokie Resort Hotels uses offers insightful information immediately addressing the three main management questions raised in Milestone 1. By means of SQL searches employing ROLLUP and CUBE capabilities and understandable representations, we have found trends in revenue performance, customer happiness, and cross-selling prospects that could direct strategic decisions.  
These data-driven insights will enable Hokie Resort Hotels to maximize income, improve customer happiness, and seize cross-selling prospects as it continues to combine its newly purchased hotels. As additional data is gathered, the data warehouse structure lets one continuously analyzes it, therefore offering a durable competitive edge in the hotel sector.  
Completing this milestone successfully shows the worth of the data warehouse design and ETL procedures created in the past milestones, therefore helping the project to assist strategic decision-making by data analysis.