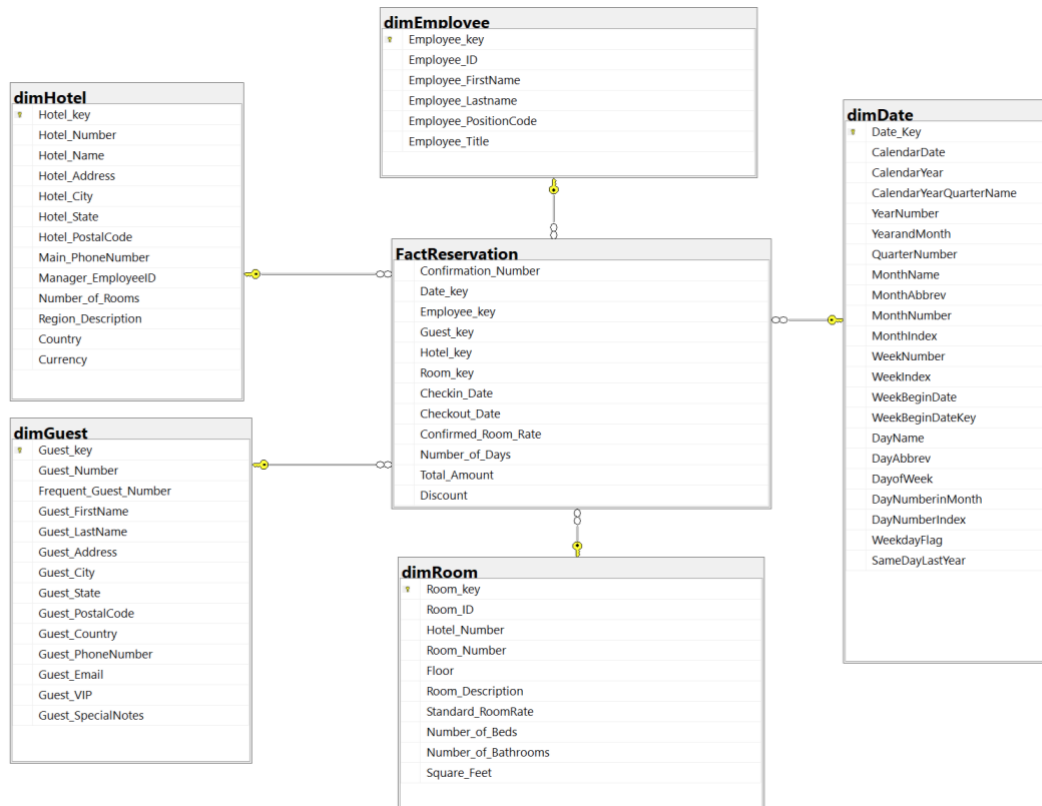


Data Warehousing Spring 2021 – Final Project

Hotel Heaven

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Design-Star Schema



Requirements

- Created new dimension tables for each dimension dimEmployee, dimHotel, dimGuest, dimRoom and Fact Table FactReservations.
- Combined the Tables Hotel and Region to dimHotel with common Region_code field in each table for easy approach.
- Combined HotelRoom and RoomType with common Room_TypeCode.
- Transferred data from the TPS tables to Star Schema tables by ETL process through SQL queries.
- Connected tables to form star schema diagram by connecting primary keys of dim tables as foreign keys to Fact Table.
- In FactReservation added field Number of Days which is [Checkout_Date-Checkin_Date]
- In FactReservation added total amount which is [Confirmed_Room_Rate * Number_of_Days]

- Discount is a new added field (for Question R1) which is the discount given over a room rate to the guests so total amount is the final amount after discount.
- In data cube Calculated

Average number of days = $\text{SUM}([\text{Measures}].[Number\ of\ Days]) / (\text{SUM}([\text{Measures}].[Fact\ Reservation\ Count]))$

- In data cube Calculated

Average Room Rate = $\text{SUM}([\text{Measures}].[Total\ Amount]) / \text{SUM}([\text{Measures}].[Number\ of\ Days])$

1. Design a data warehouse to waken Hotel Heaven from nightmares

Operational measures (O)

O1) Booked revenue – Total revenue based on the room rate that was confirmed at time of reservation

- Table O1(1) shows the total revenue generated by each guest. The total Amount is calculated by their Confirmed Room Rate multiplied by their number of days of stay. The grand total generated by all the guests is \$11,880

Guest Name	Confirmed Room Rate	Number Of Days	Total Amount
Kadeem McGowan	\$560	2	\$1,120
Lucius Farrell	\$295	5	\$1,475
Madaline Dejesus	\$585	5	\$1,470
Nash Romero	\$875	7	\$2,130
Odessa Cox	\$880	7	\$2,040
Troy Giles	\$575	10	\$2,845
Zenia Stuart	\$800	2	\$800
Grand Total	\$4,570	38	\$11,880

- Table O1(2) shows the total revenue generated by each Hotel with their respective guests. This elaborates which guests have spent what amount in the specific hotels.

Hotel Name	Total Amount
Camden Inn	
Lucius Farrell	\$1,475
Madaline Dejesus	\$570
Troy Giles	\$1,960
Zenia Stuart	\$100
Dover	
Madaline Dejesus	\$900
Nash Romero	\$260
Odessa Cox	\$1,180
Four Seasons	
Kadeem McGowan	\$1,120
Nash Romero	\$1,280
Troy Giles	\$885
Zenia Stuart	\$700
Ritz Carlton	
Nash Romero	\$590
Odessa Cox	\$860
Grand Total	\$11,880

O2) Days booked – This can be the average number of days rooms are booked (reserved)

- **Average Days**

$$\text{SUM}([\text{Measures}].[Number\ of\ Days])/([\text{Measures}].[Fact\ Reservation\ Count])$$

- Table O2(1) shows the Average number of days booked categorizing by the Room descriptions.

Room Description	Number Of Days	Average Days
Garden Room Double Beds	6	3.0
King-size Bed	13	2.6
Luxury Penthouse	3	1.5
Queen-size Bed	16	3.2
Grand Total	38	2.7

- Table O2(2) shows the Average number of days booked by each Guest through room descriptions and Table O2(3) shows the Average number of days booked categorizing by the Room descriptions expanded through their hotels.

Room Description	Average Days	Room Description	Average Days
Garden Room Double Beds		Garden Room Double Beds	
Lucius Farrell	5.0	Camden Inn	3.0
Zenia Stuart	1.0	King-size Bed	
King-size Bed		Dover	3.5
Madaline Dejesus	3.0	Four Seasons	3.0
Odessa Cox	2.3	Ritz Carlton	1.5
Troy Giles	3.0	Luxury Penthouse	
Luxury Penthouse		Four Seasons	1.5
Kadeem McGowan	2.0	Queen-size Bed	
Zenia Stuart	1.0	Camden Inn	4.5
Queen-size Bed		Dover	1.0
Madaline Dejesus	2.0	Four Seasons	4.0
Nash Romero	2.3	Ritz Carlton	2.0
Troy Giles	7.0		
Grand Total	2.7	Grand Total	2.7

O3) Room rate – This can be the average rate per day on reservations

➤ Average Room Rate

$SUM([Measures].[Total\ Amount])/SUM([Measures].[Number\ of\ Days])$

- Table O3(1) shows the Average rate per day for each Room Description. This is the Total amount generated by each room type multiplied by the number of days the room type was booked.

Room Description	Total Amount	Number Of Days	Average Room Rate
Garden Room Double Beds	\$1,575	6	262.5
King-size Bed	\$3,825	13	294.2
Luxury Penthouse	\$1,820	3	606.7
Queen-size Bed	\$4,660	16	291.3
Grand Total	\$11,880	38	312.6

- Table O3(2) shows the Average rate per day for each Room Description by each guest.
➤ Table O3(2) shows the Average rate per day for each Room Description for each Hotel.

Room Description	Average Room Rate	Room Description	Average Room Rate
Garden Room Double Beds		Garden Room Double Beds	
Lucius Farrell	295.0	Camden Inn	262.5
Zenia Stuart	100.0	King-size Bed	
King-size Bed		Dover	297.1
Madaline Dejesus	300.0	Four Seasons	295.0
Odessa Cox	291.4	Ritz Carlton	286.7
Troy Giles	295.0	Luxury Penthouse	
Luxury Penthouse		Four Seasons	606.7
Kadeem McGowan	560.0	Queen-size Bed	
Zenia Stuart	700.0	Camden Inn	281.1
Queen-size Bed		Dover	260.0
Madaline Dejesus	285.0	Four Seasons	320.0
Nash Romero	304.3	Ritz Carlton	295.0
Troy Giles	280.0	Grand Total	312.6
Grand Total	312.6		

O4) Number of rooms booked – Hotel Heaven needs to look at the number of rooms reserved, at each hotel and by type of room (King-size bed, Luxury Suite, etc.).

- Table O4(1) shows the count of rooms reserved in each Hotel for each Room Description.
- Table O4(2) shows the count of rooms reserved through each type of room Description categorized over each hotel they are in.

Hotel Name	Count Reserved Rooms	Room Description	Count Reservations
Camden Inn		Garden Room Double Beds	
Garden Room Double Beds	2	Camden Inn	2
Queen-size Bed	2	King-size Bed	
Dover		Dover	2
King-size Bed	2	Four Seasons	1
Queen-size Bed	1	Ritz Carlton	2
Four Seasons		Luxury Penthouse	
King-size Bed	1	Four Seasons	2
Luxury Penthouse	2	Queen-size Bed	
Queen-size Bed	1	Camden Inn	2
Ritz Carlton		Dover	1
King-size Bed	2	Four Seasons	1
Queen-size Bed	1	Ritz Carlton	1
Grand Total	14	Grand Total	14

Marketing (M)

M1) Value – This is the total value of bookings that have been made by each guest (or customer).

➤ Table M1(1) shows the overall total amount of amount paid by each Guest.

Guest Name	Total Amount
Kadeem McGowan	\$1,120
Lucius Farrell	\$1,475
Madaline Dejesus	\$1,470
Nash Romero	\$2,130
Odessa Cox	\$2,040
Troy Giles	\$2,845
Zenia Stuart	\$800
Grand Total	\$11,880

➤ Table M1(2) shows the total amount of amount paid by each Guest in each Hotel.

Guest Name	Total Amount
Kadeem McGowan	
Four Seasons	\$1,120
Lucius Farrell	
Camden Inn	\$1,475
Madaline Dejesus	
Camden Inn	\$570
Dover	\$900
Nash Romero	
Dover	\$260
Four Seasons	\$1,280
Ritz Carlton	\$590
Odessa Cox	
Dover	\$1,180
Ritz Carlton	\$860
Troy Giles	
Camden Inn	\$1,960
Four Seasons	\$885
Zenia Stuart	
Camden Inn	\$100
Four Seasons	\$700
Grand Total	\$11,880

M2) Frequency - The number of customers who have made a single reservation and never come back, the number who have made two reservations, three reservations, and so on.

➤ Table M1(2) shows the number of reservations made by each Guest in each Hotel.

Guest Name	Count Reservations
Kadeem McGowan	1
Lucius Farrell	1
Madaline Dejesus	2
Nash Romero	3
Odessa Cox	3
Troy Giles	2
Zenia Stuart	2
Grand Total	14

Pricing (P)

P1) For our purposes we can define this rate as the percent of rooms in a hotel that have been reserved (or booked).

➤ Table P1(1) shows the Total number of rooms in each Hotel and the number of reservations made in those Hotels.

Hotal Name and Num of Rooms	Count Reservations
<input type="checkbox"/> Camden Inn	
48	4
<input type="checkbox"/> Dover	
97	3
<input type="checkbox"/> Four Seasons	
82	4
<input type="checkbox"/> Ritz Carlton	
105	3
Grand Total	14

Repeat Business (R)

R1) Hotel Heaven does not know what data they will need for this purpose, and so R1 is not defined as the items above are. Therefore, this requirement gives you the latitude to define what you believe would be useful and build it into your design.

While the other requirements all need to be based on the reservations database for this project, you may add columns to the tables in the database for R1. If you do, then add a few rows of data to them for the implementation part of this project.

- Table R1(1) shows the Guest name and the Discounts they were given for their past reservations in each Room Description or each room type.
- Table R1(2) shows the Guest name, the number of times they made a reservation and the Total Discount they were given for their reservations.
- Discounts and offers are a best way to attract good number of guests. They can look at the discounts given to their guests and if they can lure them for expensive/luxury rooms for discounts and can offer them more to offer them membership or make them frequent guests.
- Also, they can look at the Discounts and offers are a best way to attract good number of guests. They can look at the number of reservations over the discounts given and find if more discounts have led to more reservations.

Guest Name	Discount		
Kadeem McGowan	Luxury Penthouse	\$20.00	
Lucius Farrell	Garden Room Double Beds	\$5.00	
Madaline Dejesus	King-size Bed	\$15.00	
	Queen-size Bed	\$10.00	
Nash Romero	Queen-size Bed	\$30.00	
Odessa Cox	King-size Bed	\$45.00	
Troy Giles	King-size Bed	\$15.00	
	Queen-size Bed	\$10.00	
Zenia Stuart	Garden Room Double Beds	\$5.00	
	Luxury Penthouse	\$20.00	
Grand Total		\$175.00	

Guest Name	Count Reservations	Discount
Kadeem McGowan	1	\$20.00
Lucius Farrell	1	\$5.00
Madaline Dejesus	2	\$25.00
Nash Romero	3	\$30.00
Odessa Cox	3	\$45.00
Troy Giles	2	\$25.00
Zenia Stuart	2	\$25.00
Grand Total	14	\$175.00

Additional (A)

A1) This is for any other requirements beyond those listed above that you believe would be useful for Hotel Heaven and that you are able to define and incorporate in your design.

One way to approach this would be to look up metrics and measures used by hotels on the web, and then make sure those you choose can be calculated using only data you have in the reservations database for this project.

- Table A1(1) shows the Guest name and the number of days they made reservations in each month. The Hotel can look for the Months that attract maximum crowds and can start notifying their previous guests just before these months.
- Table A1(2) shows the Guest name and the number of days they made reservations in each quarter over years. They can compare different years and the Quarter of year that carry maximum reservations. They can contact their frequent guests and ask for pre-booking because of the crowds.

Guest Name	Number Of Days	Guest Name	Count Reservations
Kadeem McGowan		Kadeem McGowan	
March	2	2020-Q1	1
Lucius Farrell		Lucius Farrell	
March	5	2019-Q1	1
Madaline Dejesus		Madaline Dejesus	
April	2	2019-Q2	1
June	3	2020-Q2	1
Nash Romero		Nash Romero	
April	1	2019-Q2	1
January	2	2020-Q1	1
May	4	2020-Q2	1
Odessa Cox		Odessa Cox	
April	1	2018-Q2	1
December	2	2019-Q4	1
March	4	2020-Q1	1
Troy Giles		Troy Giles	
February	10	2019-Q1	2
Zenia Stuart		Zenia Stuart	
January	1	2018-Q4	1
October	1	2019-Q1	1
Grand Total	38	Grand Total	14

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