DATA WAREHOUSE AND BI DESIGN - BODEA HOTEL

MIS 636A

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Hotel Reservations

BUSINESS PROCESS

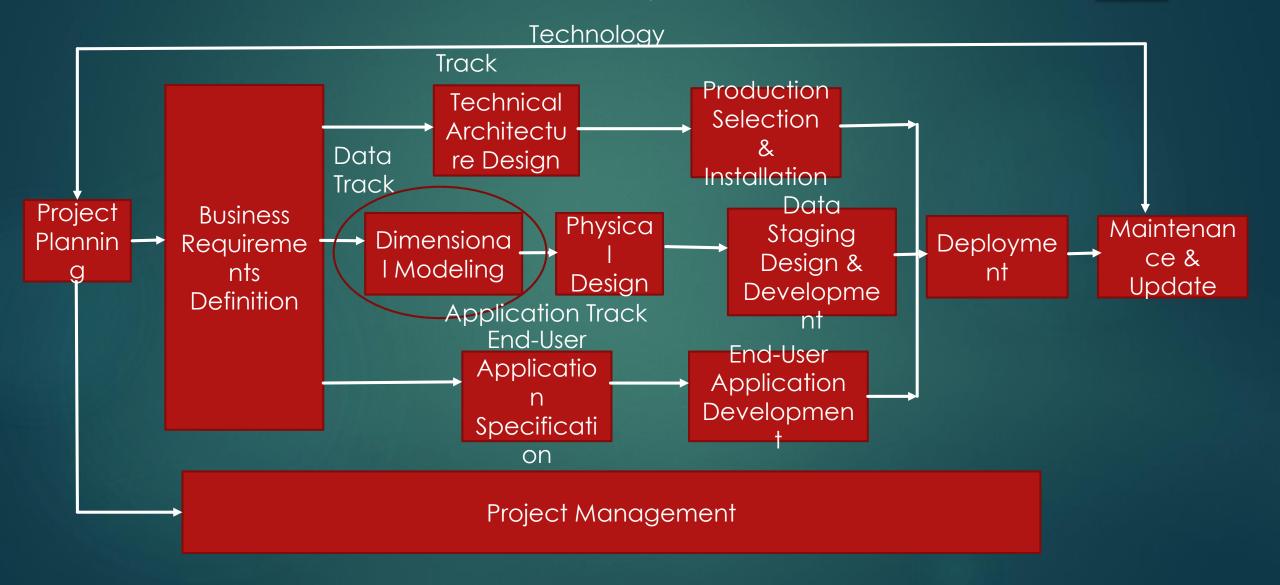
▶ The business process is related to a Hotel. The multi-dimensional model involves reservation of rooms for accommodation or reservation of tables for dining at the hotels restaurant. It contains data for managing reservations and storing guest data.

Data source

▶ Data was obtained from the following website:

http://www8.gsb.columbia.edu/cprm/research/datasets

Business Dimensional Lifecycle



Bus Matrix

Dimension/Business Process	Online Reservation	Check-in process	Room Service	Ordering	Deposit Return
Guest	X	X	X	X	X
Check-in date	X	X			
Check-out date	X				
Department			X		X
Rooms	X		X		
Rooms Type					
Manager		X	X		X
Hotel Staff		X			
Restaurant Staff				X	

Opportunity Matrix

Business process	Guest Services	Financial	Housekeeping	Reservations	Back office	Marketing
Online reservation	•	•	•	•		
Confirm reservation	•	•	•	•		
Check-in process	•	•			•	
Room service	•				•	
Ordering	•	•				
Check-out process	•	•				
Deposit return		•	•			
Feedback process	•		•	•		•

Ansoff Matrix for Opportunities - Sales

Product

Market penetration

- Easiest way to grow in a expanding market.
- Can be increased by promoting and improving quality of service.
- Improved efficiency and no down time would be a great benefactor

Market development

- BI tools to have a deeper insight to explore new customers.
- Tracking the condition and performance of assets.

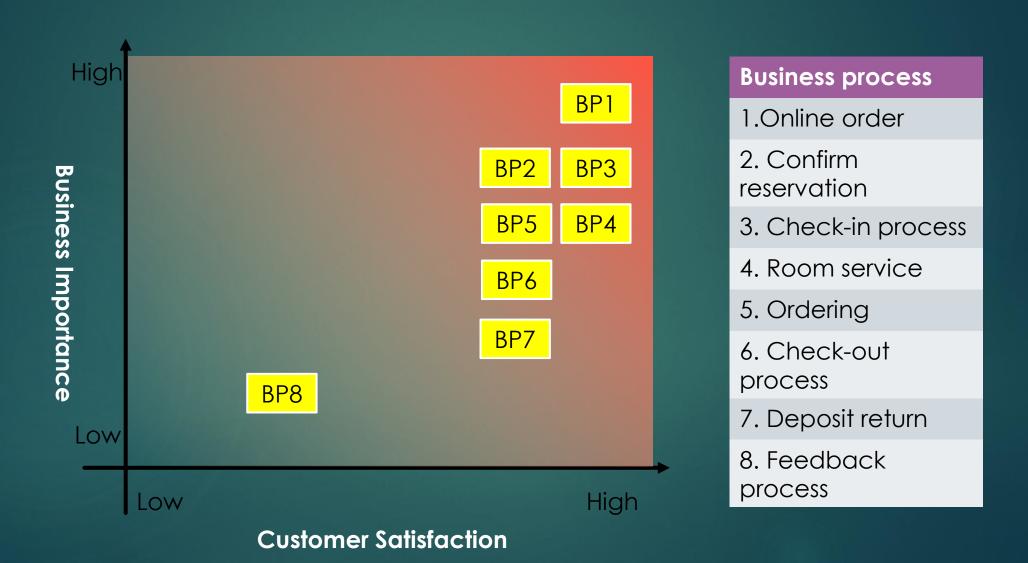
Product development

- Increased data analytics of the customers wants and needs.
- This helps in the change of modifying the needs of customers, and provide new suitable products.

Diversification

- New different types of products, new service, and new data streams are formed.
- Asset monitoring helps to transform the business models.

Prioritization Grid



Steps To Dimensional Modelling

Choose a Business Process and its data:
Order, check in/out etc.



Choose the Grain of the Business Process:
Per order, per guest etc.



Choose the measured Facts: Rooms count, Days stay



Choose Dimensions of the Business Process:
Guest, Room, Date etc.

DETAILED BUS MATRIX

D			Dimension					
Business Process Fact Table		Granularity	Guest	Check in Date	Check out Date	Departmen t	Rooms	Manager
Online Reservation			$\sqrt{}$. [
	Hotel information	Per room booked	V	V	V		V	
Check-in Process	Billing and invoicing	Per check-in		$\sqrt{}$				$\sqrt{}$
Room service	Order amount	Per order	$\sqrt{}$				$\sqrt{}$	$\sqrt{}$
	Order billing	Per order						
Ordering	Order amount	Per order						
	Order billing	Per order						
Deposit return	Return transaction	Per transaction	$\sqrt{}$			$\sqrt{}$		$\sqrt{}$

Fact and Dimension Tables

FACT TABLES

- ▶ The Accommodation Reservation fact table is for making reservations for rooms in the Hotel.
- ▶ The primary keys of each dimension table associated with a fact table are included in the fact table as foreign keys. The primary key for fact table is the composite key made up of all its foreign keys.
- ► The fact table also has numerical attributes for reporting and aggregation. For example, Accommodation Reservation fact table has the attributes Total no. of rooms, Total no. of guests, Days of Stay, Total Amount.

DIMENSION TABLES

- ▶ Dimension tables for the Accommodation Reservation fact table are Guest, Room, Hotel Staff, Department and Time.
- ▶ There are conformed dimension such as Time, Guest, Department and Manager.

HIGH LEVEL MODEL DIAGRAM **Hotel Staff** Room Type Room Accommodation Reservation Fact Table Department Time Manager Guest Restaurant Reservation Fact Table Restaurant Staff Order Table

Star Schema

Room Type

Room Type ID(PK)

Room Rate Description

Hotel Staff

Hotel Staff ID(PK)

Department ID(FK)

Manager ÍD(FK)

Name

Address

Zip code

Phone #

Position Salary

Department

Department ID(PK)

Department
Name
Description
Manager ID (FK)

Rooms

Room ID(PK)

Room Type ID(FK) Floor Room Status

Manager-Bridge

Manager ID(PK)
Staff ID(PK)

Levels from Parent Bottom Flag Top Flag

ms

Accommodation Reservation Fact Table

Room ID (FK)
Guest ID (FK)
Check –In Time (FK)
Check-Out Time (FK)
Manager ID (FK)

Total No. of Guests Days of Stay Total Amount

Check-Out Date

Check-Out Time (PK)

Check-Out Year
Check-Out Month
Check-Out Day
Check-Out Hours
Check-Out Minutes
Check-Out Seconds

Guest-Bridge

Primary Guest ID (PK) Secondary Guest ID(PK) No. of levels

Bottom Flaa

Check-In Date

Check –In Time (PK)

Check –In Year Check –In Month Check –In Day Check –In Hours Check –In

Minutes Check –In Seconds

Guest

Guest ID(PK)

Guest Name
Address
Zip code
Phone #
Gender
Membership

Time

Time (PK)

Year Month Day Hours Minutes Seconds

Accommodation Reservation Detail Diagram

Attributes, Keys and Grain

ATTRIBUTES AND KEYS

- ► Composite primary keys are present in each fact table, consisting of all foreign keys from the dimension tables.
- ▶ Room dimension contains foreign key of Room Type ID from the Room Type dimension describing the rooms.
- ▶ Department Dimension contains the Manager ID foreign key to show the manager for each department.
- ► For conformed dimensions, primary keys are also surrogate keys.

GRAIN

▶ The grain is a one time reservation of a room . It is measured at an the instantaneous point of time.

Aggregate Table

Rooms

Room ID
Room Type ID
Floor
Room Status
Room Rate
Description

Daily

Rooms available
Room service
Rooms checked in
Coming orders
Check out orders
Pending orders
Revenue

Guest

Guest ID
Guest Name
Address
Zip code
Phone #
Gender
Membership

Hotel Staff

Hotel Staff ID
Department ID
Name
Address
Zip code
Phone #
Position
Salary

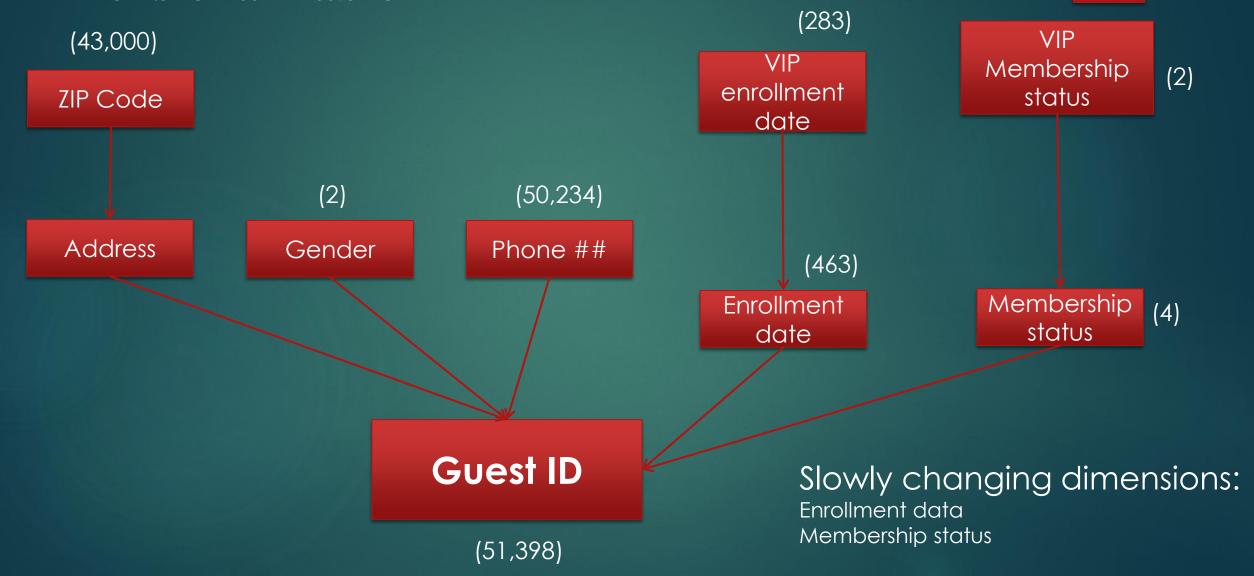
Check-Out Date

Check-Out Time
Check-Out Year
Check-Out
Month
Check-Out Day
Check-Out Hours
Check-Out
Minutes
Check-Out
Seconds

Check-In Date

Check -In Time
Check -In Year
Check -In Month
Check -In Day
Check -In Hours
Check -In
Minutes
Check -In
Seconds

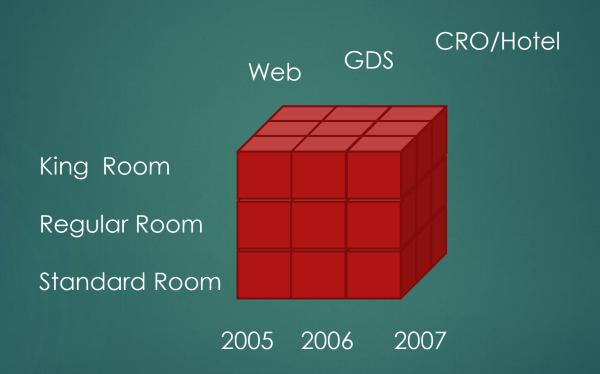
Dimensional Table Diagram: Guest Attribute Dimensional Table



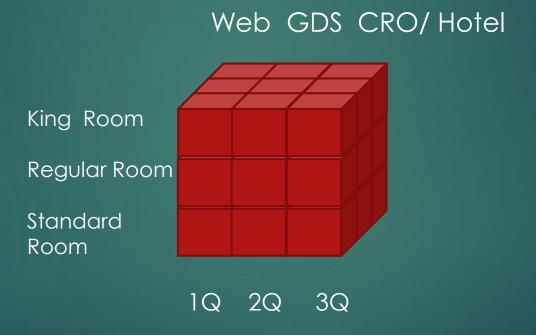
Attribute Dimension Table

Dimension	Attribute Description	Slowly Changing Dimension	Cardinality	Sample Values
Guest ID	Every guest has a unique ID	Not updated	51,398	1004, 1005, 1006
Address	The guest address	Overwritten		169 Lincoln Street, Jersey City
Zip Code	The guest zip code	Overwritten	43,000	07307
Phone #	The guest contact information	Overwritten	50,234	+1(613)-567-7985
Gender	The guest gender	Not updated	2	M or F
Membership Status	Membership status of the guest	Type 2	4	0,1,2,3
Enrolment Date	Enrolment Date for Membership	Type 2	463	01/01/2014
VIP Membership status	VIP Membership status of guest	Type 2	2	0,1
VIP Enrolment Date	Enrolment Date for VIP Membership	Type 2	283	02/03/2014

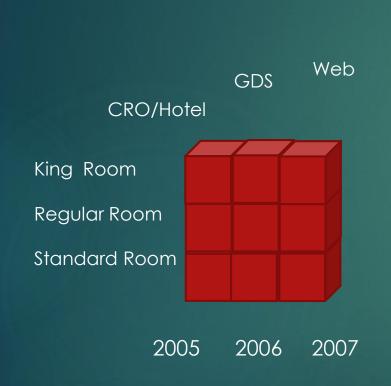
Bodea Hotel's Cube

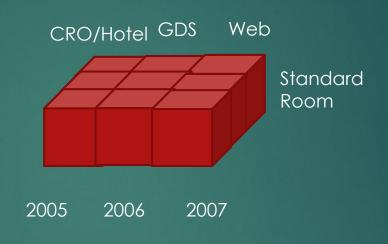


Bodea Hotel's Cube-Drill Down



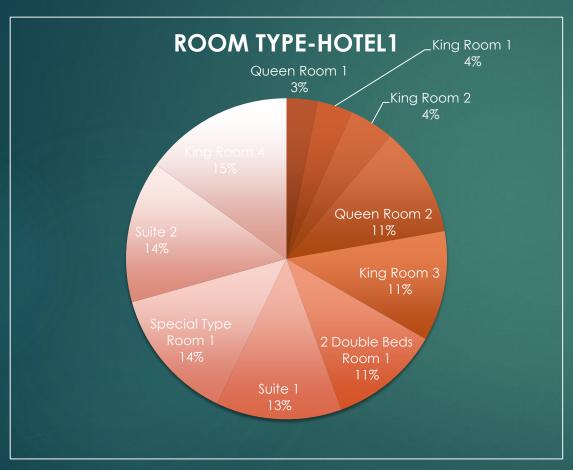
Bodea Hotel's Cube Slicing and Dicing

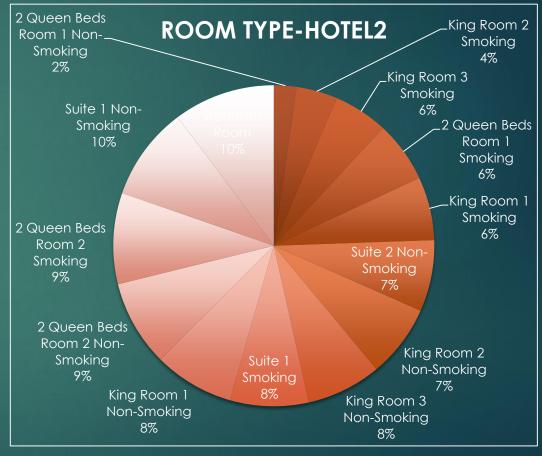


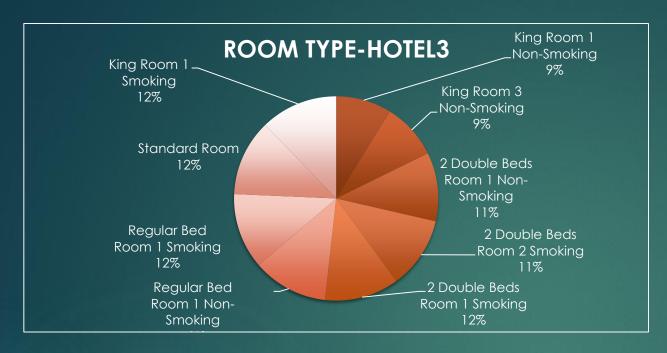


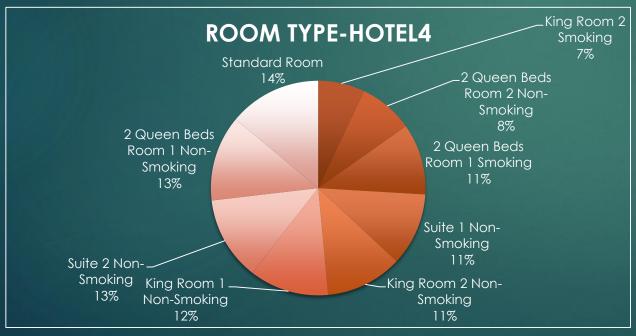


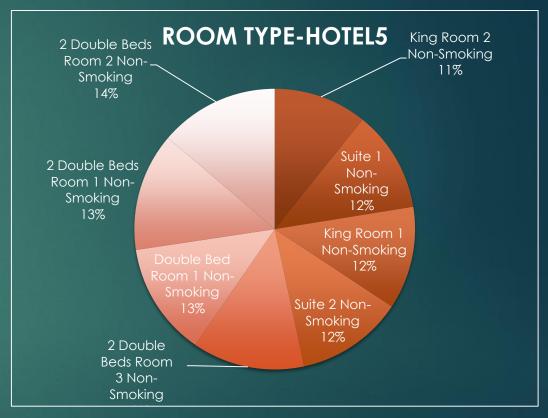
Room Type Analysis & Contrast

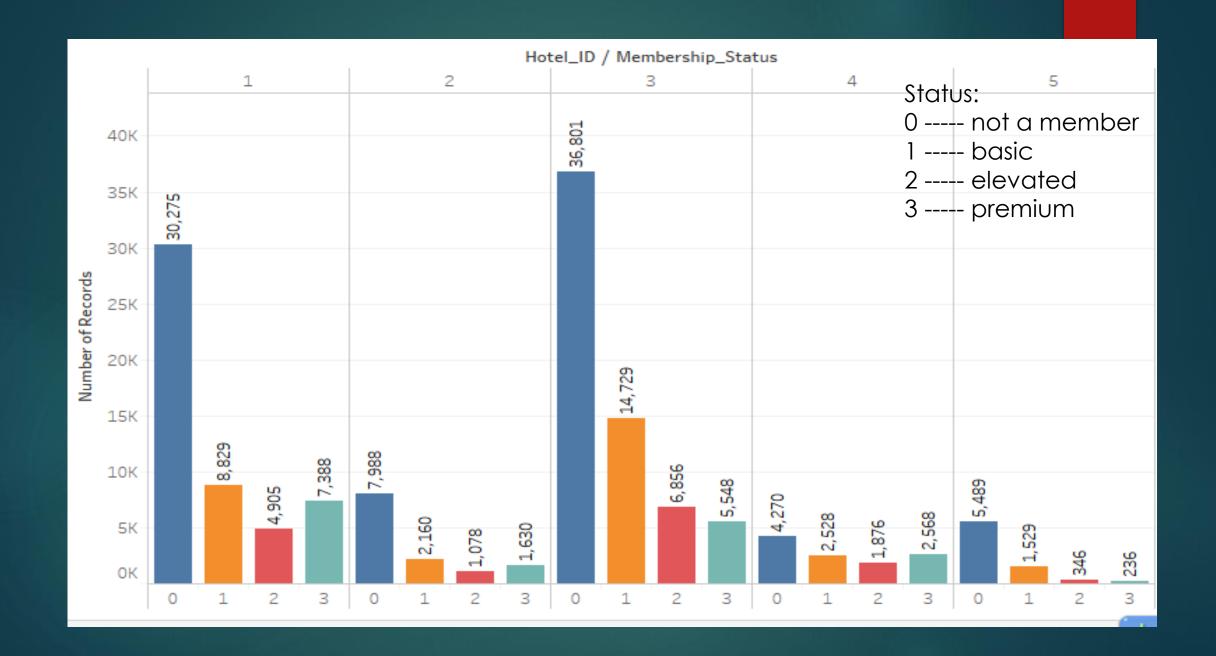


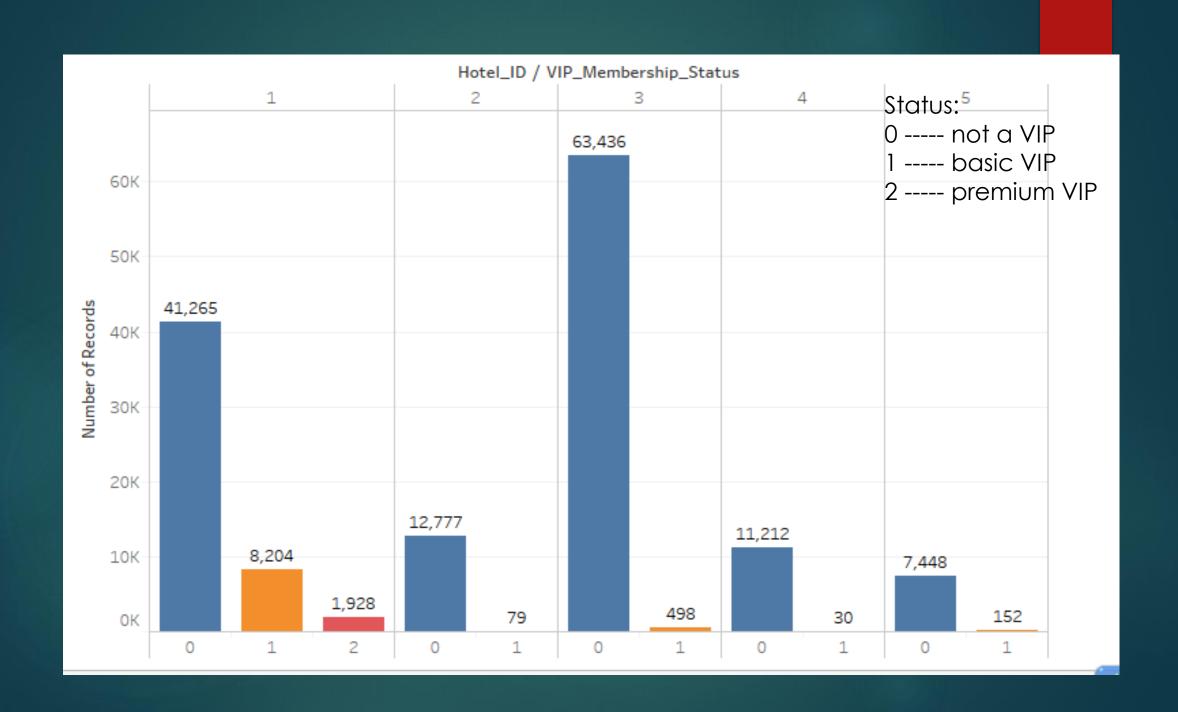


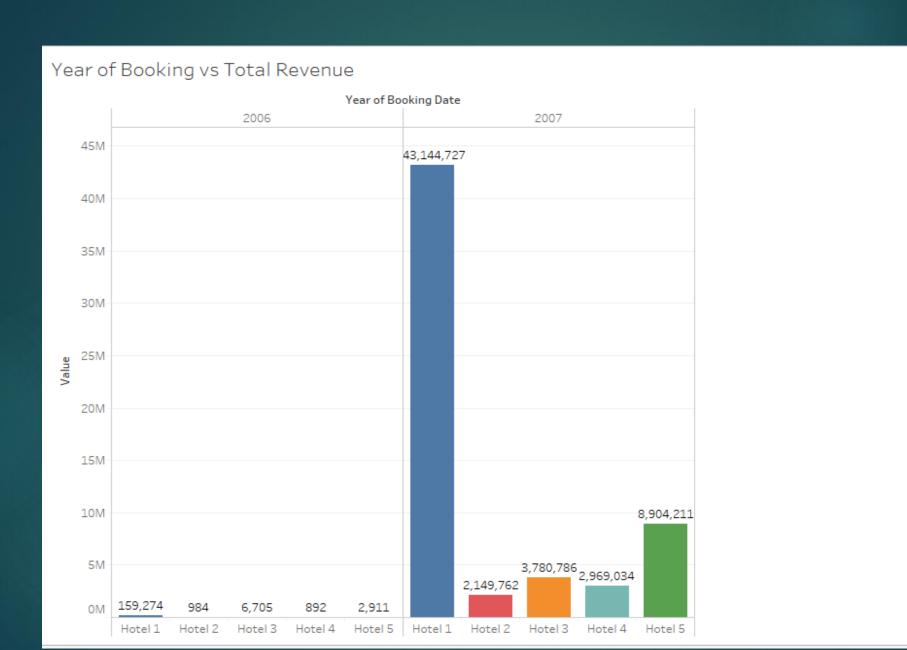














THANK YOU