Data Warehouse for Airline System

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Dimensional Modeling Process:

1: Business Process:

- Flight Activity
- Reservation
- Customer Care

2: Fact tables & Grain Level:

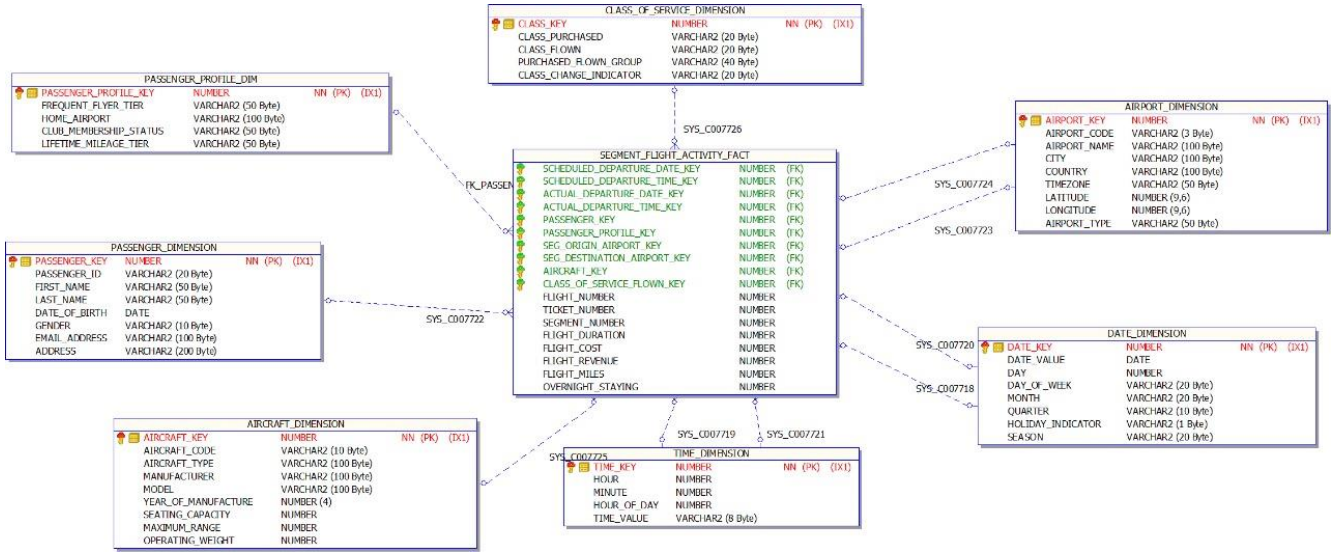
- Flight Activity Fact: per trip level
- Reservation Fact: per reservation
- Customer Care Fact: per customer interaction

3: Dimension Tables:

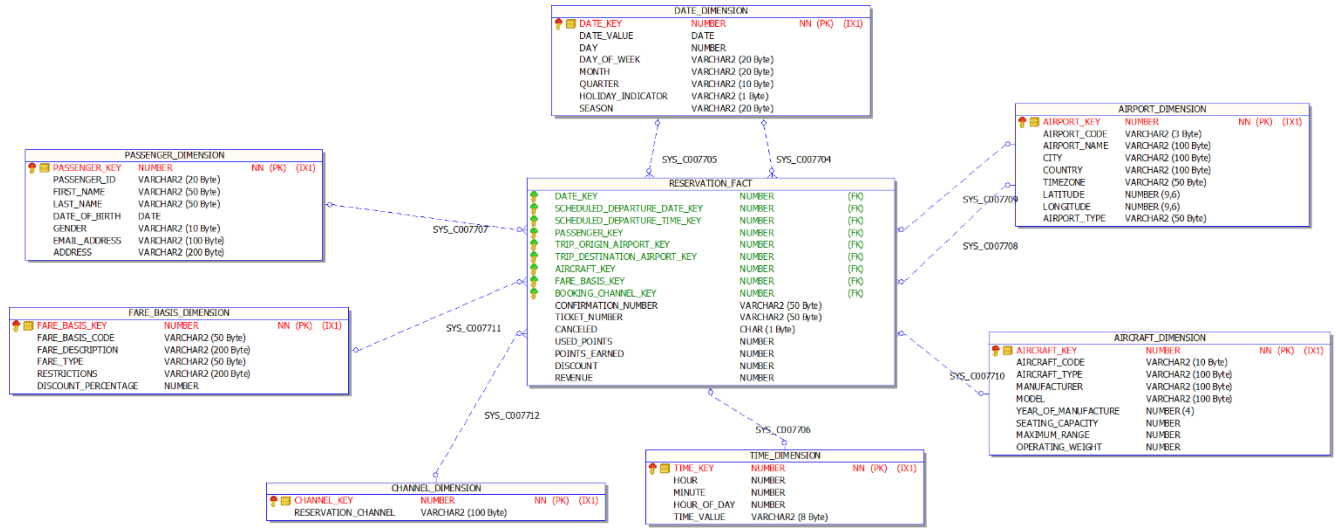
- Date Dimension
- Time Dimension
- Airport Dimension
- Passenger Dimension
- Passenger Profile Dimension
- Aircraft Dimension
- Fare basis Dimension
- Class of Service Flown Dimension
- Channel Dimension
- Interaction Dimension
- Customer Service Dimension
- Problem Dimension

Logical Model:

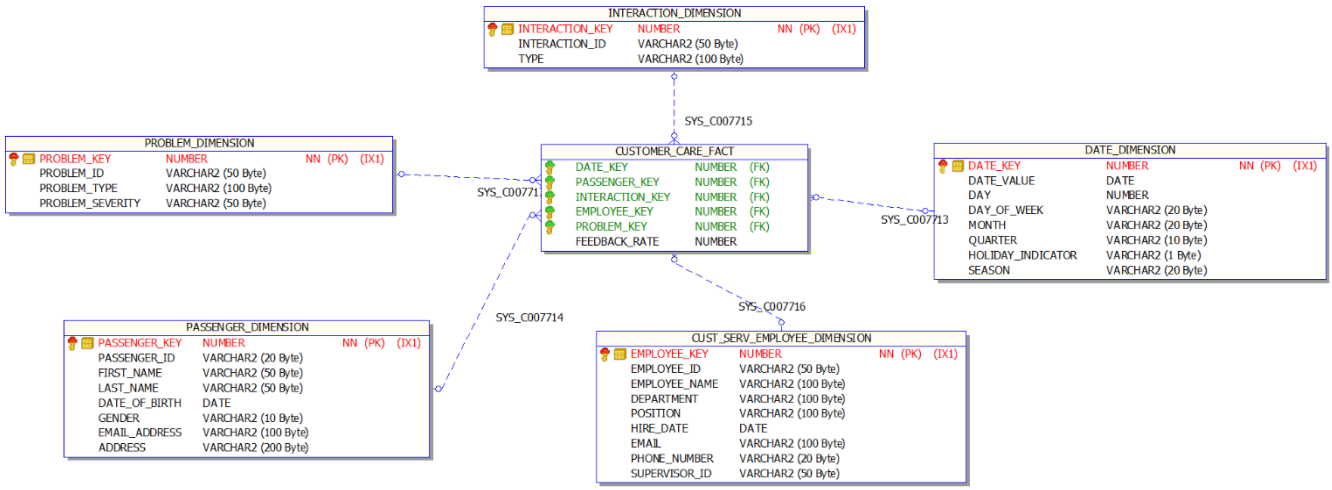
1: Flight Activity:



2: Reservation:



3: Customer Care:



Tables Identification:

1: Passenger Dimensions:

- Include passengers' details.

PASSENGER_KEY	PASSENGER_ID	FIRST_NAME	LAST_NAME	DATE_OF_BIRTH	GENDER	EMAIL_ADDRESS	ADDRESS
1	P001	John	Doe	5/15/1990	Male	john.doe@example.com	123 Main St, Anytown, USA
2	P002	Jane	Smith	8/20/1985	Female	jane.smith@example.com	456 Oak St, Othertown, USA
3	P003	Michael	Johnson	3/10/1978	Male	michael.johnson@example.com	789 Elm St, Anothercity, USA
4	P004	Emily	Williams	11/25/1992	Female	emily.williams@example.com	321 Pine St, Somewhere, USA
5	P005	David	Brown	7/8/1980	Male	david.brown@example.com	987 Cedar St, Anywhere, USA
6	P006	Sarah	Martinez	2/18/1989	Female	sarah.martinez@example.com	654 Maple St, Nowhere, USA
7	P007	Christopher	Jones	9/30/1975	Male	christopher.jones@example.com	852 Birch St, Elsewhere, USA
8	P008	Amanda	Garcia	6/12/1987	Female	amanda.garcia@example.com	741 Walnut St, Noctown, USA
9	P009	Matthew	Rodriguez	4/5/1983	Male	matthew.rodriguez@example.com	369 Spruce St, Everywhere, USA
10	P010	Jessica	Hernandez	12/28/1995	Female	jessica.hernandez@example.com	159 Fir St, Anyplace, USA
11	P011	Ryan	Lopez	10/14/1986	Male	ryan.lopez@example.com	246 Cedar St, Somewheretown, USA
12	P012	Megan	King	2/22/1993	Female	megan.king@example.com	135 Oak St, Otherplace, USA
13	P013	Daniel	Young	7/29/1979	Male	daniel.young@example.com	753 Elm St, Nowaytown, USA
14	P014	Emily	Walker	5/7/1988	Female	emily.walker@example.com	852 Pine St, Anyplace, USA
15	P015	Justin	Scott	9/18/1984	Male	justin.scott@example.com	369 Maple St, Elsewhere, USA
16	P016	Hannah	Green	3/26/1990	Female	hannah.green@example.com	741 Birch St, Anotherville, USA
17	P017	Nathan	Hill	11/9/1981	Male	nathan.hill@example.com	159 Walnut St, Anyburg, USA
18	P018	Emma	Carter	4/17/1996	Female	emma.carter@example.com	654 Fir St, Anytown, USA
19	P019	Brandon	Wright	8/5/1987	Male	brandon.wright@example.com	987 Cedar St, Somewhereville, USA
20	P020	Olivia	Mitchell	12/31/1982	Female	olivia.mitchell@example.com	852 Pine St, Nowhereville, USA
31	P031	Ethan	Perez	5/26/1989	Male	ethan.perez@example.com	369 Oak St, Anotherplace, USA
32	P032	Ava	Roberts	3/15/1992	Female	ava.roberts@example.com	753 Cedar St, Nowheretown, USA
33	P033	Liam	Turner	11/3/1984	Male	liam.turner@example.com	159 Fir St, Anywhereville, USA

2: Passenger Profile Dimensions:

- Include data about status, club membership, and mileage tier.

PASSENGER_PROFILE_KEY	FREQUENT_FLYER_TIER	HOME_AIRPORT	CLUB_MEMBERSHIP_STATUS	LIFETIME_MILEAGE_TIER
1	Gold	Airport1	Basic	Bronze
2	Gold	Airport1	Basic	Gold
3	Gold	Airport1	Basic	None
4	Gold	Airport1	Basic	Silver
5	Gold	Airport1	None	Bronze
6	Gold	Airport1	None	Gold
7	Gold	Airport1	None	None
8	Gold	Airport1	None	Silver
9	Gold	Airport1	Premium	Bronze
10	Gold	Airport1	Premium	Gold
11	Gold	Airport1	Premium	None

3: Airport Dimension:

- Include airports' details.

AIRPORT_KEY	AIRPORT_CODE	AIRPORT_NAME	CITY	COUNTRY	TIMEZONE	LATITUDE	LONGITUDE	AIRPORT_TYPE
1	JFK	John F. Kennedy International Airport	New York	United States	America/New_York	40.6413	-73.7781	International
2	LHR	Heathrow Airport	London	United Kingdom	Europe/London	51.47	-0.4543	International
3	CDG	Charles de Gaulle Airport	Paris	France	Europe/Paris	49.0034	2.5735	International
4	SYD	Sydney Airport	Sydney	Australia	Australia/Sydney	-33.9399	151.1753	International
5	DXB	Dubai International Airport	Dubai	United Arab Emirates	Asia/Dubai	25.2522	55.3644	International
6	HND	Haneda Airport	Tokyo	Japan	Asia/Tokyo	35.5494	139.7798	International
7	PEK	Beijing Capital International Airport	Beijing	China	Asia/Shanghai	40.0799	116.6031	International
8	ATL	Hartsfield-Jackson Atlanta International Airport	Atlanta	United States	America/New_York	33.6407	-84.4277	International
9	ICN	Incheon International Airport	Incheon	South Korea	Asia/Seoul	37.4692	126.4505	International
10	AMS	Amsterdam Airport Schiphol	Amsterdam	Netherlands	Europe/Amsterdam	52.3086	4.7639	International
12	ORD	O'Hare International Airport	Chicago	United States	America/Chicago	41.9742	-87.9073	International
13	FRA	Frankfurt Airport	Frankfurt	Germany	Europe/Berlin	50.0333	8.5706	International
14	DFW	Dallas/Fort Worth International Airport	Dallas	United States	America/Chicago	32.8998	-97.0403	International
15	MUC	Munich Airport	Munich	Germany	Europe/Berlin	48.3537	11.7751	International
16	CAN	Guangzhou Baiyun International Airport	Guangzhou	China	Asia/Shanghai	23.3924	113.2991	International
17	IST	Istanbul Airport	Istanbul	Turkey	Europe/Istanbul	41.2756	28.7519	International
18	DXB	Dubai International Airport	Dubai	United Arab Emirates	Asia/Dubai	25.2522	55.3644	International
19	BKK	Suvarnabhumi Airport	Bangkok	Thailand	Asia/Bangkok	13.6902	100.7501	International
20	SYD	Sydney Airport	Sydney	Australia	Australia/Sydney	-33.9399	151.1753	International

4: Aircraft Dimension:

- Include aircrafts' details.

AIRCRAFT_KEY	AIRCRAFT_CODE	AIRCRAFT_TYPE	MANUFACTURER	MODEL	YEAR_OF_MANUFACTURE	SEATING_CAPACITY	MAXIMUM_RANGE	OPERATING_WEIGHT
1	A320	Narrow-body	Airbus	A320-200	1998	180	5700	42.6
2	B737	Narrow-body	Boeing	737-800	1997	189	5300	41.4
3	A330	Wide-body	Airbus	A330-300	2003	277	11750	120
4	B777	Wide-body	Boeing	777-200ER	1996	440	14115	158.8
5	A380	Wide-body	Airbus	A380-800	2005	555	15200	276.8
6	B787	Wide-body	Boeing	787-9	2014	296	15700	127
7	MD-11	Wide-body	McDonnell Douglas	MD-11	1990	285	12250	147
8	B747	Wide-body	Boeing	747-400	1988	416	13400	183.3
9	E190	Regional jet	Embraer	E190	2002	114	3700	44.4
10	CRJ900	Regional jet	Bombardier Aerospace	CRJ900	2003	90	2843	22.5
11	A319	Narrow-body	Airbus	A319	1996	124	3750	37.7
12	B757	Narrow-body	Boeing	757-200	1983	239	7222	62.3
13	A340	Wide-body	Airbus	A340-600	2001	475	13600	277
14	B767	Wide-body	Boeing	767-300ER	1988	269	9700	127
15	A350	Wide-body	Airbus	A350-900	2013	325	15700	115.7
16	B737	Narrow-body	Boeing	737-700	1997	126	6125	35.3
17	A330	Wide-body	Airbus	A330-200	1998	293	13400	124.1
18	B747	Wide-body	Boeing	747-8	2012	467	14200	222.7
19	E195	Regional jet	Embraer	E195	2006	124	3060	44.5
20	CRJ700	Regional jet	Bombardier Aerospace	CRJ700	2001	78	2827	22.5

5: Date Dimension:

- Include date and related attributes.

DATE_KEY	DATE_VALUE	DAY	DAY_OF_WEEK	MONTH	QUARTER	HOLIDAY_INDICATOR	SEASON
20240101	1/1/2024	1	MONDAY	JANUARY	Q1	N	Winter
20240102	1/2/2024	2	TUESDAY	JANUARY	Q1	N	Winter
20240103	1/3/2024	3	WEDNESDAY	JANUARY	Q1	N	Winter
20240104	1/4/2024	4	THURSDAY	JANUARY	Q1	N	Winter
20240105	1/5/2024	5	FRIDAY	JANUARY	Q1	N	Winter
20240106	1/6/2024	6	SATURDAY	JANUARY	Q1	N	Winter
20240107	1/7/2024	7	SUNDAY	JANUARY	Q1	N	Winter
20240108	1/8/2024	8	MONDAY	JANUARY	Q1	N	Winter
20240109	1/9/2024	9	TUESDAY	JANUARY	Q1	N	Winter
20240110	1/10/2024	10	WEDNESDAY	JANUARY	Q1	N	Winter
20240111	1/11/2024	11	THURSDAY	JANUARY	Q1	N	Winter
20240112	1/12/2024	12	FRIDAY	JANUARY	Q1	N	Winter
20240113	1/13/2024	13	SATURDAY	JANUARY	Q1	N	Winter
20240114	1/14/2024	14	SUNDAY	JANUARY	Q1	N	Winter
20240115	1/15/2024	15	MONDAY	JANUARY	Q1	N	Winter
20240116	1/16/2024	16	TUESDAY	JANUARY	Q1	N	Winter
20240117	1/17/2024	17	WEDNESDAY	JANUARY	Q1	N	Winter
20240118	1/18/2024	18	THURSDAY	JANUARY	Q1	N	Winter
20240119	1/19/2024	19	FRIDAY	JANUARY	Q1	N	Winter
20240120	1/20/2024	20	SATURDAY	JANUARY	Q1	N	Winter

6: Time Dimension:

- Include Time and related attributes.

TIME_KEY	HOUR	MINUTE	HOUR_OF_DAY	TIME_VALUE
0	0	0	0	00:00:00
100	0	1	0	00:01:00
200	0	2	0	00:02:00
300	0	3	0	00:03:00
400	0	4	0	00:04:00
500	0	5	0	00:05:00
600	0	6	0	00:06:00
700	0	7	0	00:07:00
800	0	8	0	00:08:00
900	0	9	0	00:09:00
1000	0	10	0	00:10:00

7: Fare basis Dimension:

- Include fare basis codes and related information.

FARE_BASIS_KEY	FARE_BASIS_CODE	FARE_DESCRIPTION	FARE_TYPE	RESTRICTIONS	DISCOUNT_PERCENTAGE
1	YUP21	Economy Unrestricted Promo 21-...	Economy	21-day advance purchase required, non-refundable, non-changeable	
2	BUSFLEX	Business Flex Fare	Business	Fully flexible fare, refundable, changeable without penalty	
3	FC100	First Class Standard Fare	First Class	No advance purchase required, fully refundable, changeable with minimal penalty	
4	ECO50	Economy Discount Fare	Economy	50% off standard fare, non-refundable, changeable with penalty	50
5	YUP14	Economy Unrestricted Promo 14-...	Economy	14-day advance purchase required, non-refundable, non-changeable	
6	BUSSTD	Business Standard Fare	Business	Standard business fare, non-refundable, changeable with penalty	
7	FC75	First Class 75% Off Fare	First Class	75% off standard fare, non-refundable, changeable with penalty	75
8	ECO21	Economy Promo 21-Day Advance ...	Economy	21-day advance purchase required, non-refundable, changeable with penalty	
9	PREMDISC	Premium Economy Discount Fare	Premium Economy	25% off standard fare, non-refundable, changeable with penalty	25

8: Problem Dimension:

- Include problem type and its severity.

PROBLE...	PROBLEM_ID	PROBLEM_TYPE	PROBLEM_SEVERITY
1	P001	Flight Delay	High
2	P002	Baggage Handling Issue	Medium
3	P003	Cabin Crew Dispute	High
4	P004	Technical Malfunction	High
5	P005	Overbooking Situation	Medium
6	P006	Lost Luggage	Medium
7	P007	Security Check Issue	High

9: Interaction Dimension:

- Include data about different types of interactions with customer services.

INTERACTION_KEY	INTERACTION_ID	TYPE
1	INT001	Phone Call
2	INT002	Email
3	INT003	Live Chat
4	INT004	Social Media Message
5	INT005	In-person Meeting
6	INT006	SMS
7	INT007	Web Form Submission
8	INT008	Video Call
9	INT009	Fax
10	INT010	Letter

10: Channel Dimension:

- Represents reservation channels.

CHANNEL_KEY	RESERVATION_CHANNEL
1	Online Booking
2	Travel Agency
3	Mobile App
4	Phone Booking
5	Corporate Booking
6	In-person Reservation
7	Third-party Website
8	Chatbot Reservation
9	Email Reservation
10	Kiosk Reservation

11: Customer Service Employees Dimension:

- Include data about customer service employees.

EMPLOYEE_KEY	EMPLOYEE_ID	EMPLOYEE_NAME	DEPARTMENT	POSITION	HIRE_DATE	EMAIL	PHONE_NUMBER	SUPERVISOR_ID
1	CS001	John Smith	Customer Service	Customer Service Representative	5/10/2015	john.smith@example.com	123-456-7890	
2	CS002	Emily Johnson	Customer Service	Customer Service Representative	8/22/2016	emily.johnson@example.com	987-654-3210	CS001
3	CS003	Michael Williams	Customer Service	Customer Service Representative	3/17/2017	michael.williams@example.com	456-789-0123	CS001
4	CS004	Emma Brown	Customer Service	Customer Service Representative	11/28/2018	emma.brown@example.com	789-012-3456	CS002
5	CS005	William Davis	Customer Service	Customer Service Representative	6/15/2019	william.davis@example.com	012-345-6789	CS002

12: Class of Service Flown Dimension:

- Include class upgrades data.

CLASS_KEY	CLASS_PURCHASED	CLASS_FLOWN	PURCHASED_FLOWN_GROUP	CLASS_CHANGE_INDICATOR
1	economy	economy	economy-economy	no class change
2	economy	premeconomy	economy-premeconomy	upgrade
3	economy	business	economy-business	upgrade
4	economy	first	economy-first	upgrade
5	premeconomy	economy	premeconomy-economy	downgrade
6	premeconomy	premeconomy	premeconomy-premeconomy	no class change
7	premeconomy	business	premeconomy-business	upgrade

13: Flight Activity Fact:

- Contain detailed data about flight segments.

Column Name	I.	Pk	Null?	Data Type	Default	Histogram	Encryption Alg	Salt	Seq/Trigger
SCHEDULED_DEPARTURE_DATE_KEY	1		Y	NUMBER		None		☐	☐
SCHEDULED_DEPARTURE_TIME_KEY	2		Y	NUMBER		None		☐	☐
ACTUAL_DEPARTURE_DATE_KEY	3		Y	NUMBER		None		☐	☐
ACTUAL_DEPARTURE_TIME_KEY	4		Y	NUMBER		None		☐	☐
PASSENGER_KEY	5		Y	NUMBER		None		☐	☐
PASSENGER_PROFILE_KEY	6		Y	NUMBER		None		☐	☐
SEG_ORIGIN_AIRPORT_KEY	7		Y	NUMBER		None		☐	☐
SEG_DESTINATION_AIRPORT_KEY	8		Y	NUMBER		None		☐	☐
AIRCRAFT_KEY	9		Y	NUMBER		None		☐	☐
CLASS_OF_SERVICE_FLOWN_KEY	10		Y	NUMBER		None		☐	☐
FLIGHT_NUMBER	11		Y	NUMBER		None		☐	☐
TICKET_NUMBER	12		Y	NUMBER		None		☐	☐
SEGMENT_NUMBER	13		Y	NUMBER		None		☐	☐
FLIGHT_DURATION	14		Y	NUMBER		None		☐	☐
FLIGHT_COST	15		Y	NUMBER		None		☐	☐
FLIGHT_REVENUE	16		Y	NUMBER		None		☐	☐
FLIGHT_MILES	17		Y	NUMBER		None		☐	☐
OVERNIGHT_STAYING	18		Y	NUMBER		None		☐	☐

14: Reservation Fact:

- Include reservation-related information like passenger details, booking channel, price.

Column Name	I.	Pk	Null?	Data Type	Default	Histogram	Encryption Alg	Salt	Seq/Trigger
DATE_KEY	1		Y	NUMBER		None		☐	☐
SCHEDULED_DEPARTURE_DATE_KEY	2		Y	NUMBER		None		☐	☐
SCHEDULED_DEPARTURE_TIME_KEY	3		Y	NUMBER		None		☐	☐
PASSENGER_KEY	4		Y	NUMBER		None		☐	☐
TRIP_ORIGIN_AIRPORT_KEY	5		Y	NUMBER		None		☐	☐
TRIP_DESTINATION_AIRPORT_KEY	6		Y	NUMBER		None		☐	☐
AIRCRAFT_KEY	7		Y	NUMBER		None		☐	☐
FARE_BASIS_KEY	8		Y	NUMBER		None		☐	☐
BOOKING_CHANNEL_KEY	9		Y	NUMBER		None		☐	☐
CONFIRMATION_NUMBER	10		Y	VARCHAR2 (50 Byte)		None		☐	☐
TICKET_NUMBER	11		Y	VARCHAR2 (50 Byte)		None		☐	☐
CANCELED	12		Y	CHAR (1 Byte)		None		☐	☐
USED_POINTS	13		Y	NUMBER		None		☐	☐
POINTS_EARNED	14		Y	NUMBER		None		☐	☐
DISCOUNT	15		Y	NUMBER		None		☐	☐
REVENUE	16		Y	NUMBER		None		☐	☐

15: Customer Care Fact:

- Stores information about interactions between customers and customer care, including problem severity, interaction type.

Column Name	I.	Pk	Null?	Data Type
DATE_KEY	1		Y	NUMBER
PASSENGER_KEY	2		Y	NUMBER
INTERACTION_KEY	3		Y	NUMBER
EMPLOYEE_KEY	4		Y	NUMBER
PROBLEM_KEY	5		Y	NUMBER
FEEDBACK_RATE	6		Y	NUMBER

Physical Model:

- All files will be attached with the document.

Assumptions:

- **Reservations:**
  - The customer starts by reserving a flight in a specific date, Each Customer has his own ID and other related information.
  - A Fare Basis code is an alphabetic or alpha-numeric code used by airlines to identify a fare type and allow airline staff and travel agents to find the rules applicable to that fare.
  - **Frequent flyer miles' points:** Customers earn Points based on flights' miles (# of trips) also they can use points to get discounts on reserved flights.

- **Flight Activity:**
  - Any flight data will be recorded.
  - If Customer changed his class, this action can be known by the customer service employees key.
  - Customers are divided into profiles according to the passenger profile key.
  - The flight cost measure describes the amount the airline costs for the flight.

- **Customers Care:**
  - The airline considers customers' problems and suggestions by giving them the option to call a customer service agent.

Business Questions:

```sql
--1.Find the total number of reservations made per day:
SELECT
    dd.DATE_VALUE AS Reservation_Date,
    COUNT(*) AS Total_Reservations
FROM
    RESERVATION_FACT rf
JOIN
    DATE_DIMENSION dd ON rf.DATE_KEY = dd.DATE_KEY
GROUP BY
    dd.DATE_VALUE
ORDER BY
    dd.DATE_VALUE;
```

RESERVATION_DATE	TOTAL_RESERVATIONS
1/1/2024	9
1/2/2024	7
1/3/2024	4
1/4/2024	10
1/5/2024	9
1/6/2024	10
1/7/2024	9
1/8/2024	13

```
--2.Identify the top 5 airports with the highest number of departures:
SELECT
    ad.AIRPORT_NAME,
    COUNT(*) AS Departure_Count
FROM
    RESERVATION_FACT rf
JOIN
    AIRPORT_DIMENSION ad ON rf.TRIP_ORIGIN_AIRPORT_KEY = ad.AIRPORT_KEY
GROUP BY
    ad.AIRPORT_NAME
ORDER Departure_Count DESC;
```

AIRPORT_NAME	DEPARTURE_COUNT
Dubai International Airport	144
Sydney Airport	139
Amsterdam Airport Schiphol	82
Hong Kong International Airport	79
Charles de Gaulle Airport	79
Istanbul Airport	76
O.R. Tambo International Airport	76
Adolfo Suárez Madrid–Barajas Airport	76

```
--3.Find the total revenue generated from reservations for each month in the year:
SELECT
    TO_CHAR(dd.DATE_VALUE, 'YYYY-MM') AS Reservation_Month,
   ROUND( SUM(rf.REVENUE)) AS Total_Revenue
FROM
    RESERVATION_FACT rf
JOIN
    DATE_DIMENSION dd ON rf.DATE_KEY = dd.DATE_KEY
GROUP BY
    TO_CHAR(dd.DATE_VALUE, 'YYYY-MM')
ORDER BY
    Reservation_Month;
```

RESERVATION_MONTH	TOTAL_REVENUE
2024-01	309928
2024-02	228315
2024-03	253301
2024-04	209381
2024-05	265454
2024-06	230414
2024-07	278956
2024-08	244295

```
--4.Calculate the average feedback rate for interactions of each type:
SELECT
    id.TYPE AS Interaction_Type,
    ROUND(AVG(ccf.FEEDBACK_RATE)) AS Avg_Feedback_Rate
FROM
    CUSTOMER_CARE_FACT ccf
JOIN
    INTERACTION_DIMENSION id ON ccf.INTERACTION_KEY = id.INTERACTION_KEY
GROUP BY
    id.TYPE;
```

INTERACTION_TYPE	AVG_FEEDBACK_RATE
Web Form Submission	46
In-person Meeting	47
Email	51
Social Media Message	50
Live Chat	49
SMS	44
Phone Call	46
Fax	51

```
--5.Calculate the average flight duration and revenue per flight segment:
SELECT
    sfa.FLIGHT_NUMBER,
   ROUND( AVG(sfa.FLIGHT_DURATION)) AS Avg_Flight_Duration,
  ROUND(  AVG(sfa.FLIGHT_REVENUE)) AS Avg_Flight_Revenue
FROM
    SEGMENT_FLIGHT_ACTIVITY_FACT sfa
GROUP BY
    sfa.FLIGHT_NUMBER
ORDER BY
    sfa.FLIGHT_NUMBER;
```

FLIGHT_NUMBER	AVG_FLIGHT_DURATION	AVG_FLIGHT_REVENUE
2626858.99877677	16	1251
3378830.99842661	0	2184
3549917.99834694	4	1849
3646469.99830198	12	4693
3677805.99828739	13	4892
5548617.99741622	6	2291
6409737.99701523	1	3453
7141159.99667464	1	1847

```sql
--6.Find the total revenue generated from reservations for each day of the week:
SELECT
    dd.DAY_OF_WEEK,
   ROUND( SUM(rf.REVENUE)) AS Total_Revenue
FROM
    RESERVATION_FACT rf
JOIN
    DATE_DIMENSION dd ON rf.DATE_KEY = dd.DATE_KEY
GROUP BY
    dd.DAY_OF_WEEK
ORDER BY
    Total_Revenue DESC;
```

DAY_OF_WEEK	TOTAL_REVENUE
SUNDAY	451854
FRIDAY	438553
TUESDAY	433520
THURSDAY	424002
MONDAY	420939
SATURDAY	398223
WEDNESDAY	396842

```sql
--7. the total revenue generated from reservations for each airline:
SELECT
    ad.MANUFACTURER AS Airline_Name,
    ROUND(SUM(rf.REVENUE), 2) AS Total_Revenue
FROM
    RESERVATION_FACT rf
JOIN
    AIRCRAFT_DIMENSION ad ON rf.AIRCRAFT_KEY = ad.AIRCRAFT_KEY
GROUP BY
    ad.MANUFACTURER
ORDER BY
    Total_Revenue DESC;
```

AIRLINE_NAME	TOTAL_REVENUE
Boeing	1224319.18
Airbus	976235.99
Bombardier Aerospace	326987.77
Embraer	293085.05
McDonnell Douglas	143305.98

```
--8. the average flight duration for each destination airport
SELECT
    AIRPORT_DEST.AIRPORT_NAME AS DESTINATION_AIRPORT,
    AVG(SFA.FLIGHT_DURATION) AS AVERAGE_FLIGHT_DURATION
FROM
    SEGMENT_FLIGHT_ACTIVITY_FACT SFA
JOIN
    AIRPORT_DIMENSION AIRPORT_ORIGIN ON SFA.SEG_ORIGIN_AIRPORT_KEY =
AIRPORT_ORIGIN.AIRPORT_KEY
JOIN
    AIRPORT_DIMENSION AIRPORT_DEST ON SFA.SEG_DESTINATION_AIRPORT_KEY =
AIRPORT_DEST.AIRPORT_KEY
GROUP BY
    AIRPORT_DEST.AIRPORT_NAME;
```

DESTINATION_AIRPORT	AVERAGE_FLIGHT_DURATION
Frankfurt Airport	8.30046461471356
Miami International Airport	9.30797802020485
Istanbul Airport	8.76579939539377
San Francisco International Airport	8.8823482483692
Heathrow Airport	8.53664134980204
Amsterdam Airport Schiphol	8.16931643220596
Indira Gandhi International Airport	9.56023143346168
John F. Kennedy International Airport	7.20538941609265

```
-- 9:Find the total revenue generated from reservations for each class of service purchased:
SELECT
    fbd.FARE_DESCRIPTION AS Offer_Type_Purchased,
    ROUND(SUM(rf.REVENUE), 2) AS Total_Revenue
FROM
    RESERVATION_FACT rf
JOIN
    FARE_BASIS_DIMENSION fbd ON rf.FARE_BASIS_KEY = fbd.FARE_BASIS_KEY
GROUP BY
    fbd.FARE_DESCRIPTION
ORDER BY
    Total_Revenue DESC;
```

OFFER_TYPE_PURCHASED	TOTAL_REVENUE
First Class Standard Fare	259211.59
First Class 50% Off Fare	245222.45
First Class 75% Off Fare	238594.44
Economy Promo 21-Day Advance Purchase	234204.27
Business Flex Fare	229591.12
Economy Unrestricted Promo 14-Day Advance Purchase	220831.06
Economy Discount Fare	218385.47

```sql
--10: Find the total number of reservations made per passenger gender:
SELECT
    pd.GENDER AS Passenger_Gender,
    COUNT(*) AS Total_Reservations
FROM
    RESERVATION_FACT rf
JOIN
    PASSENGER_DIMENSION pd ON rf.PASSENGER_KEY = pd.PASSENGER_KEY
GROUP BY
    pd.GENDER;
```

PASSENGER_GENDER	TOTAL_RESERVATIONS
Male	1013
Female	987