DATA WAREHOUSE FINAL PROJECT

MEET OUR TEAM!

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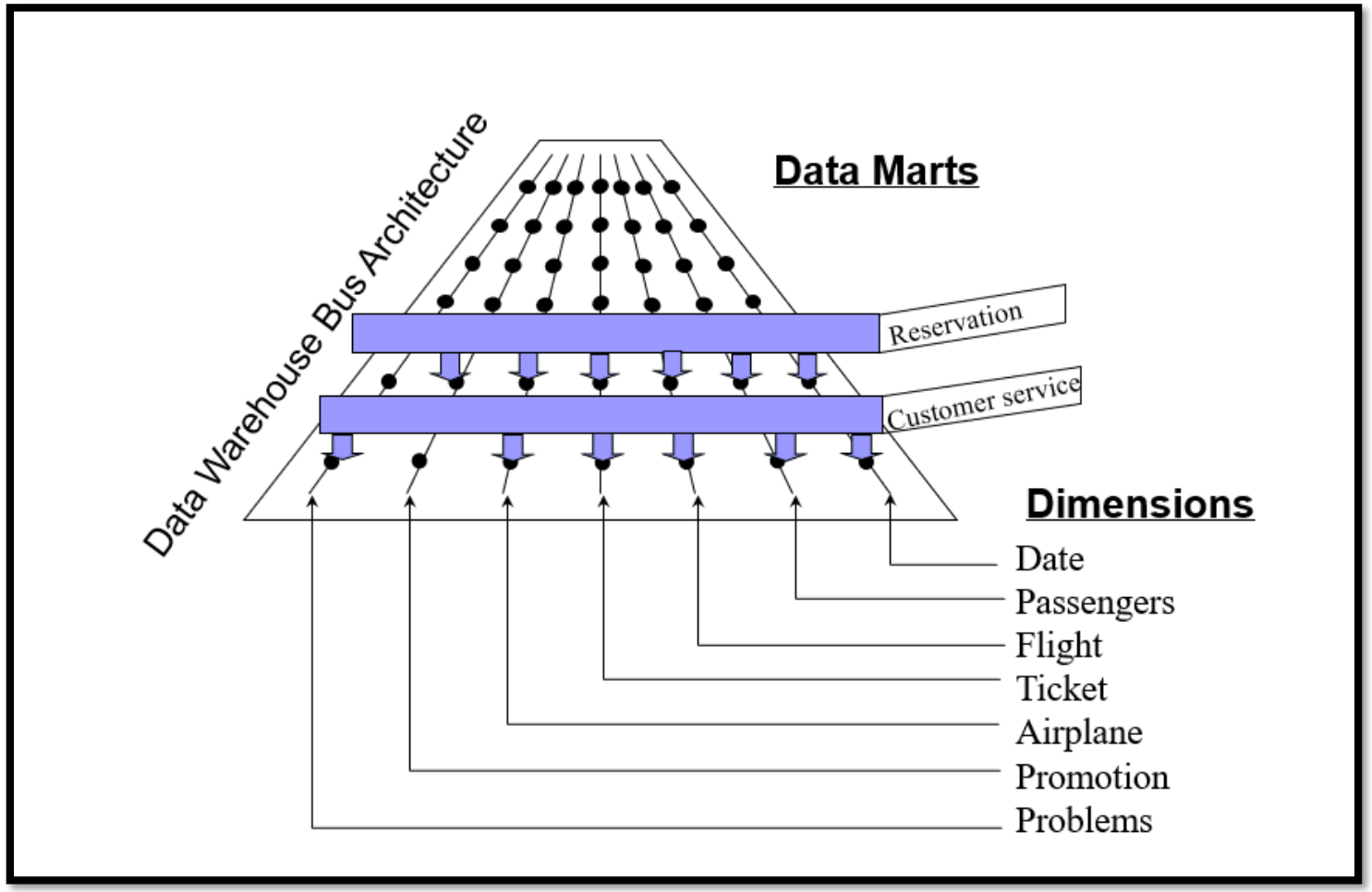
Business Process

- It was about analyzing and monitoring airline company process through out a lot of things and measure the customer satisfaction rate.

Granularity

- We used the atomic approach by using smallest level of details (ticket data) to make it help us in the business process.


Data Warehouse Bus Architecture
Data Marts
Reservation
Customer service
Dimensions
Date
Passengers
Flight
Ticket
Airplane
Promotion
Problems

BUS MATRIX

Modeling

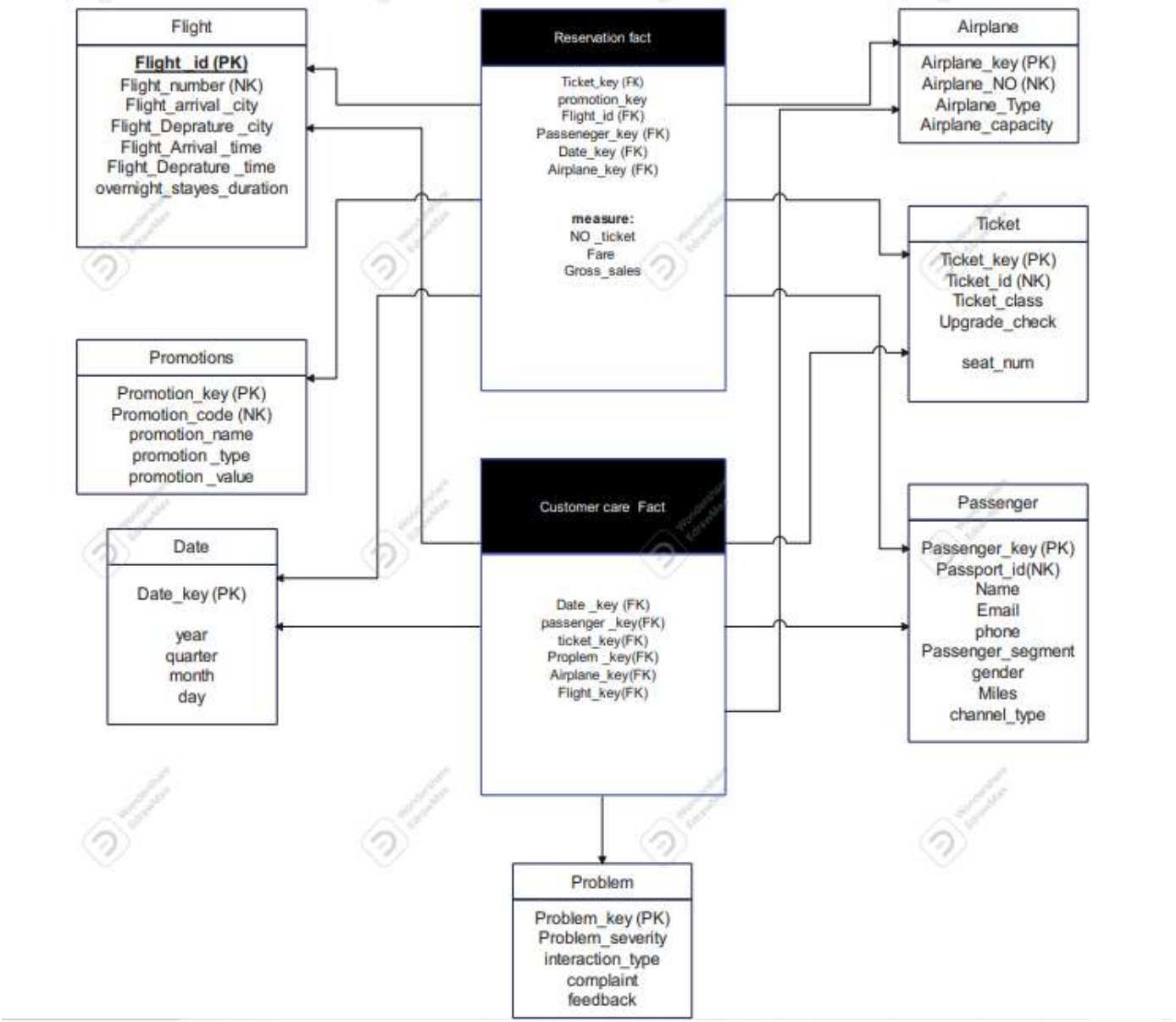
Fact Tables

Reservation -- Customer Care

Dimensions

Date – Passenger – Flight – Airplane – Ticket – Promotions – Problem

So, we made the Galaxy Schema, and it was the best way to model our Business Process.



LOGICAL MODEL

Physical Design

1- Reservation table (fact table)

Column name	Data type	constraint
Ticket_key	Varchar2	FK
Flight_id	Varchar2	FK
Passenger_key	Varchar2	FK
Date_key	Date	FK
Airplane_key	Varchar2	FK
Reservation_key	Varchar2	FK
Promotion_key	Varchar2	FK
Quantity_ticket	Number	
Fare	Number(8,2)	
Gross sales	Number(8,2)	

Reservation Fact Table

- Represents each table transaction by passenger per each flight and including the date and the airplane all the reservation details if the passenger use any promotion.

- The fare column represent the price per ticket also the fact include ticket quantity so we can calculate the gross sales.

2- Customer care (fact table)

Column name	Data type	Constraint
Proplem_key	Varchar2	FK
Passenger_key	Varchar2	FK
Ticket_key	Varchar2	FK
Date_key	Date	FK
Airplane_key	Varchar2	FK
Flight_key	Varchar2	FK

Customer Care Fact Table

- Represents the measurement of the customer satisfaction rate by showing each single problem with below the details.

Flight table

Column name	Data type	constraint
Flight_number	Varchar2	PK
Flight_arrival_city	Varchar2	Not null
Flight_depreture_city	Varchar2	Not null
Flight_arrival_time	Timestamp	Not null
Overnight_stay_duration	Number	Not null

Flight Dimension Table

- Represents the details of every flight as the date and flight number, and anything related to the flight information.

Promotion table

Column name	Date type	constraint
Promotion _code	Varchar2	PK
Promotion _name	Varchar2	Not null
Promotion _type	Varchar2	Not null
Promotion_value	Number	Not null

Promotion Dimension Table

- Represents the offers and details of any discount that the customer can get with all the required details.

Airplane table

Column name	Data type	Constraint
Airplane_number	Varchar2	PK
Airplane_type	Varchar2	Not null
Airplane_capacity	Number	Not null

Airplane Dimension Table

- Represents the details of the plane and it's type and all the information about the plane capacity and so on.

Ticket table

Column name	Data type	Constraint
Ticket_id	Varchar2	PK
Ticket_class	Varchar2	Not null
Seat_number	Varchar2	Not null
Upgrade_check	Boolean	Not null

Ticket Dimension Table

- Table Represents the details of the ticket class and seat number and so on.

Passenger table

Column name	Data type	constraint
Passenger_id	Varchar2	PK
Passenger_name	Varchar2	Not null
Passenger_phone	number	Not null
Passenger_email	Varchar2	Not null
Passenger_address	Varchar2	Not null
gender	char	Not null
Miles	number	Not null
Passenger _segment	Varchar2	Not null
Channel_type	Varchar2	Not null

Passenger Dimension Table

- Represents all the details about the passenger that already has an active ticket and will go on a flight.

Date table

Column name	Date type	Constraint
Date_key	Date	PK
Year	number	Not null
Quarter	Varchar2	Not null
Month_name	Varchar2	Not null
Week _of _month	number	Not null
Day_of_month	number	Not null

Date Dimension Table

- Represents the timing and the accurate details of the flight.

Problem

Column name	Data type	constraint
Problem_key	Varchar2	PK
Problem_severity	Varchar2	
Interaction_type	Varchar2	
complaint	Varchar2	
feedback	Varchar2	

Problem Dimension Table

- Represents any problem that occurs on the flight and the type of interaction that was taken with the problem.

SCREEN SHOOTS FOR SAMPLE DATA OF TABLES

Airplane table

Columns | Indexes | Constraints | Triggers | Data | Script | Grants | Synonyms | Partitions | Subpartitions

Sort by Primary Key Desc
Read Only Auto Refresh

AIRPLANE_KEY	AIRPLANE_NO	AIRPLANE_TYPE	AIRPLANE_CAPACITY
1	A1	AB11	300
2	A2	AB12	500
3	A3	AB13	600
4	A4	AB14	700
5	A5	AB15	750

Customer Care

PROBLEM_KEY	FLIGHT_ID	DATE_KEY	PASSENGER_KEY	TICKET_KEY	AIRPLANE_KEY
1	1	112022	1	1	1
2	1	772022	2	2	1
3	1	522022	3	4	2
6	1	3092022	12	3	2
4	2	26122022	10	5	3
10	3	112022	6	2	5
7	3	522022	9	12	3
5	5	26122022	5	5	5
8	4	3092022	8	8	4
9	1	772022	4	7	4

Date Dimension

Columns | Indexes | Constraints | Triggers | Data | Script | Grants | Synonyms | Partitions | Subpartitions

Sort by Primary Key Desc
Read Only Auto Refresh

DATE_KEY	FULL_DATE	YEAR	QUARTER	MONTH_NAME	DAY_OF_MONTH
112022	01/01/2022	2022	1	JAN	1
522022	05/02/2022	2022	1	Feb	5
772022	07/07/2022	2022	3	Jul	7
3092022	30/09/2022	2022	3	SeP	30
26122022	26/12/2022	2022	4	Dec	26

Flight table

FLIGHT_ID	FLIGHT_NUMBER	ARRIVAL_CITY	DEPRATURE_CITY	FLIGHT_ARRIVAL_TIME	OVERNIGHT_STAY_DURATION
1	F1	Paris	cairo	01/01/2022 5:30:00.000000 AM	1
2	F2	London	cairo	05/02/2022 9:00:00.000000 AM	2
3	F3	Roma	cairo	07/07/2022 11:00:00.000000 AM	2
4	F4	Macca	cairo	30/09/2022 1:35:00.000000 AM	1
5	F5	Tunisa	cairo	26/12/2022 4:00:00.000000 AM	1

Passenger Table

PASSENGER_KEY	PASSPORT_ID	PASSENGER_NAME	PASSENGER_PHONE	PASSENGER_EMAIL	PASSENGER_SEGMENT	GENDER	MILES	CHANNEL_TYPE
1	AO78	Ahmed osama	201100331342	Ahmedo55@gmail.com	gold	M	150000	Web site
2	ES52	Eman mohamed	201100942107	Eman12@gmail.com	gold	F	150000	sky scanner
3	MM50	Mostafa magdy	201009421078	Mosatfa52@gmail.com	Platinum	M	60000	trip advisor
4	MA17	Mohamed ahmed	201234695725	Mo45@gmail.com	Titanum	M	40000	Travelling agency
5	AH70	Ahmed haitham	201146324972	Ahmed_H@gmail.com	Aluminum	M	50000	Airport
6	MO71	mohamed osama	201123467265	mohamed_os45@gm...	Aluminum	M	5000	sky sccaner
7	AS95	Aya salama	201246357822	Aya_salama62@gma...	gold	F	150000	Web site
8	MS60	Mohamed salama	201001678010	Mohamed_s60@gma...	gold	M	150000	trip advisor
9	MO69	Malek osama	201145326762	Malek56@gmail.com	Titanum	M	40000	Web site
10	ZO16	Zahwa osama	201246349752	Zahwa78@gmail.com	gold	F	150000	sky scanner
11	OM66	Osama maher	201607150232	osama_66@gmail.com	gold	M	150000	Sky scanner
12	ET45	Eman talaat	201264359715	Emy45@gmail.com	Platinum	F	60000	Web site
13	AM13	Aya Mamdouh	201123498732	Aya_13@gmail.com	gold	F	150000	trip advisor
14	MM12	Marwan Mahmoud	201146324962	Marawan12@gmail.c...	gold	M	150000	Travelling agency
15	Sh22	Shaimaa salah	201264359725	Shaimaa22@gmail.c...	Titanum	F	40000	Travelling agency
16	MS32	Marwa sabry	201032463546	Marwa32@gmail.com	Titanum	F	40000	Airport
17	MM17	Manar mahmoud	201046326679	manar17@gmail.com	Platinum	F	60000	Airport

Problem Table

PROBLEM_KEY	PROBLEM_SEVERITY	INTERACTION_TYPE	COMPLAINT	FEEDBACK
1	minor	before flight	security issue	solved
2	minor	before flight	lagguge issue	solved
3	critical	within flight	crew issue	pending
4	moderate	after flight	Gate issue	solved
5	critical	before flight	Passport issue	pending
6	critical	within flight	Crew issue	pending
7	moderate	after flight	Visa issue	solved
8	minor	before flight	security issue	solved
9	moderate	after flight	covid rules	solved
10	critical	within flight	health and safty	pending

Promotion Table

PROMOTION_KEY	PROMOTION_CODE	PROMOTION_NAME	PROMOTION_TYPE	PROMOTION_VALUE
1	RED	REDEMPTION	point	0.1
2	CIB	REDEMPTION	point	0.15
3	SP	Special offer	Special fare	0.05
4	SK	Sky Scanner	Discount	0.2
5	IN	Influencer	code	0.02

Reservation Table

FLIGHT_ID	PROMOTION_KEY	DATE_KEY	PASSENGER_KEY	TICKET_KEY	AIRPLANE_KEY	TICKETS_QUANTITY	FARE	GROSS_SALES
1	2	112022	1	1	2	50	15000	750000
1	1	522022	2	2	1	60	9000	540000
2	4	3092022	3	3	1	80	5000	400000
3	1	26122022	2	3	3	80	9000	720000
3	2	772022	17	12	4	100	5000	500000
2	2	112022	1	4	2	60	15000	900000
4	5	3092022	12	5	4	100	9000	900000
5	1	3092022	10	7	5	75	5000	375000
4	2	772022	4	6	4	34	15000	510000
3	3	112022	6	4	4	30	9000	210000
4	5	772022	12	15	3	25	5000	125000
2	5	3092022	13	10	2	42	5000	210000
4	1	112022	2	11	5	20	15000	30000
1	4	26122022	3	14	2	35	9000	315000
5	1	3092022	2	9	3	55	5000	275000

Ticket Table

TICKET_KEY	TICKET_ID	TICKET_CLASS	UPGRADED_CHECK	SEAT_NUMBER
1	TK-123	First class	NO	10A
2	TK-124	business	yes	30B
3	TK-125	Economy	NO	40D
4	TK-126	Economy	NO	75D
5	TK-127	Economy	NO	80A
6	TK-128	First class	NO	11A
7	TK-129	business	yes	81E
8	TK-130	business	NO	50B
9	TK-131	business	NO	55B
10	TK-132	Economy	NO	82E
11	TK-133	First class	NO	20A
12	TK-134	Economy	NO	87E
13	TK-135	business	yes	75B
14	TK-136	First class	NO	25A
15	TK-137	business	yes	80C

SCREEN SHOOTS FOR QUERIES

We need to enhance our marketing and gross sales in order to expanded our business.

Sales View

```
-- count tickets by class

select Ticket_class,count (ticket_key)
from Ticket
group by Ticket_class
```

Data Grid

Data Grid | DBMS Output (disabled) | Query Viewer | CodeXpert | Explain Plan | Script Output

Cancel

TICKET_CLASS	COUNT(TICKET_KEY)
Economy	6
First class	4
business	5

```
-- count of tickets grouped by quarters of year

select quarter, count (Ticket_key)
from Reservation,date_dim
where RESERVATION.DATE_KEY=DATE_DIM.DATE_KEY

group by quarter;
```

Data Grid

Data Grid | DBMS Output (disabled) | Query Viewer | CodeXpert | Explain Plan | Script Output

Cancel

QUARTER	COUNT(TICKET_KEY)
1	5
3	8
4	2

Now we need to make breakdown to our customers view to focused more on their satisfaction and needs,

First we need to know the behavior of our loyal customer and if our offers and promotion meet their needs.

```
--top royal customer using different type of promotion
select passenger_name,promotion_type,count(Reservation.passenger_key) as Amount_of_reservation
from Reservation,Passenger,Promotion
where RESERVATION.PASSENGER_KEY=PASSENGER.PASSENGER_KEY
and   RESERVATION.PROMOTION_KEY = PROMOTION.PROMOTION_KEY

group by passenger_name,promotion_type
order by Amount_of_reservation desc
```

Data Grid

Data Grid | DBMS Output (disabled) | Query Viewer | CodeXpert | Explain Plan | Script Output

Cancel

PASSENGER_NAME	PROMOTION_TYPE	AMOUNT_OF_RESERVATION
Eman mohamed	point	4
Ahmed osama	point	2
Eman talaat	code	2
Mostafa magdy	Discount	2
Manar mahmoud	point	1

regarding this result we need to keep making our promotion program going as to keep out loyal customer as the cuts interact with it and we find it very useful for our marketing goals

now we need to know how long our customer over night stays on our airport

```
--how long our passenger overnight_stay
select Flight_Number,sum (overnight_stay_duration)as overnight_stay_days
from flight
group by flight_Number
order by overnight_stay_days desc
```

Data Grid

Data Grid | DBMS Output (disabled) | Query Viewer | CodeXpert | Explain Plan | Script Output

Cancel

FLIGHT_NUMBER	OVERNIGHT_STAY_DAYS
F2	2
F3	2
F4	1
F1	1
F5	1

so, we need to make on our consideration to provide restrooms for our passengers to make their flight more Comfort.

Details about our customer segment

```
1  --our passenger statues
2  select passenger_segment,count(passenger_key)
3  from passenger
4  group by passenger_segment
```

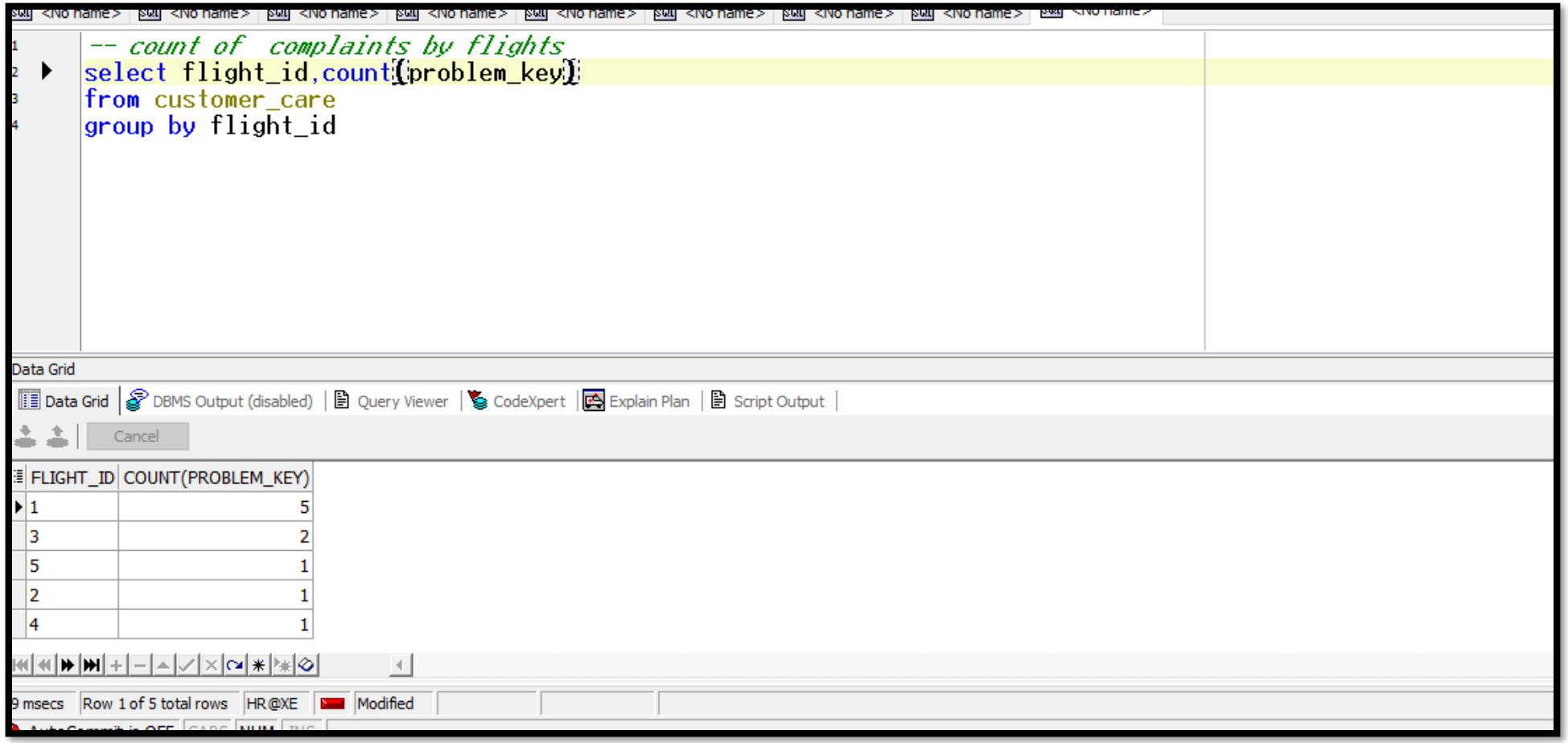
Data Grid

Data Grid | DBMS Output (disabled) | Query Viewer | CodeXpert | Explain Plan | Script Output

Cancel

PASSENGER_SEGMENT	COUNT(PASSENGER_KEY)
Aluminum	2
gold	8
Titanum	4
Platinum	3

Now we need to focused on our customer complains and feedback to enhance our customer satisfaction rate



We need to analyze our problem to know the specific reason and solve it.

Regarding the above analysis Our decision-making team decided to

- Make more promotion and discount to our loyal customer and the new customers to expand our market share.
- Focused more on digital marketing showing out promotion to catch our new customer intention.
- We need to provide our customer with suitable restrooms so they can overstay comfort.
- We need to make training sessions for our crew about customer experience excellent to avoid customer complains.

THANK YOU