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Ev Sales Analysis by SQL,POWER BI

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**"I have analyzed EV sales data
using SQL and Power BI,
providing actionable insights
through data visualization
and optimizing sales
strategies."**

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EV Sales Data Summary

- **Date:** EV sales trends analyzed over specific time periods (monthly, quarterly, yearly).
- **State:** Sales performance broken down by geographical regions, identifying top-performing and underperforming states for EV adoption.
- **Vehicle Class:** Sales distribution across different classes, such as compact, mid-size, luxury, and SUV categories, highlighting popular vehicle classes.
- **Vehicle Category:** Analysis by vehicle category, comparing electric passenger cars, commercial vehicles, and two-wheelers, showing demand across these segments.
- **Vehicle Type:** Detailed insights into specific EV types (e.g., hybrid, plug-in hybrid, and fully electric), revealing shifts in consumer preferences.
- **EV Sales Quantity:** Total number of EVs sold, with trends showcasing growth patterns, peak sales periods, and potential areas for market expansion.

checking nulls values from the data set / blank Values

```
select `date`  
from ev_dataset  
where `date` is null;
```

```
select ev_sales_quantity  
from ev_dataset  
where ev_sales_quantity is null;
```

```
select state  
from ev_dataset  
where state is null;
```

```
-- insights : there no null values in any of the column
```

dropping the column year and month name

```
alter table ev_dataset  
drop column `Year`;
```

```
alter table ev_dataset  
drop column Month_Name;
```

changing format of date column varchar to date

```
UPDATE ev_dataset  
SET `Date` = STR_TO_DATE(`Date`, '%d-%m-%Y');
```

```
alter table ev_dataset  
modify `Date` DATE;
```

```
select * from ev_dataset;
```

changing format of date column vachar to date

```
UPDATE ev_dataset  
SET `Date` = STR_TO_DATE(`Date`, '%d-%m-%Y');
```

```
alter table ev_dataset  
modify `Date` DATE;
```

```
select * from ev_dataset;
```

changing the column names from upper case to lower case

```
alter table ev_dataset
rename column `Date` to `date`;

alter table ev_dataset
rename column State to state;

alter table ev_dataset
rename column Vehicle_Class to vehicle_class;

alter table ev_dataset
rename column Vehicle_Category to vehicle_category;

alter table ev_dataset
rename column Vehicle_Type to vehicle_type;

alter table ev_dataset
rename column EV_Sales_Quantity to ev_sales_quantity;
```

date	state	vehide_class	vehide_category	vehide_type	ev_sales_quantity
2014-01-01	Andhra Pradesh	ADAPTED VEHICLE	Others	Others	0
2014-01-01	Andhra Pradesh	AGRICULTURAL TRACTOR	Others	Others	0
2014-01-01	Andhra Pradesh	AMBULANCE	Others	Others	0
2014-01-01	Andhra Pradesh	ARTICULATED VEHICLE	Others	Others	0
2014-01-01	Andhra Pradesh	BUS	Bus	Bus	0
2014-01-01	Andhra Pradesh	CASH VAN	Others	Others	0
2014-01-01	Andhra Pradesh	CRANE MOUNTED VEHICLE	Others	Others	0
2014-01-01	Andhra Pradesh	EDUCATIONAL INSTITUTION BUS	Bus	Institution Bus	0
2014-01-01	Andhra Pradesh	EXCAVATOR (COMMERCIAL)	Others	Others	0
2014-01-01	Andhra Pradesh	FORK LIFT	Others	Others	0

1. Summary statistics of EV sales quantity

```
SELECT
    MIN(EV_Sales_Quantity) AS min_sales,
    MAX(EV_Sales_Quantity) AS max_sales,
    AVG(EV_Sales_Quantity) AS avg_sales,
    SUM(EV_Sales_Quantity) AS sum_sales
FROM
    ev_dataset;
```

min_sales	max_sales	avg_sales	sum_sales
0	20584	37.1089	3593811

insights : In the above query result we have the results of min_sales max with high % , average and the sum of sales in good numbers too.

2. Sales trend over time (yearly or monthly)

```
SELECT
    EXTRACT(YEAR FROM `date`) AS sales_year,
    SUM(ev_sales_quantity) AS sum_sales
FROM
    ev_dataset
GROUP BY EXTRACT(YEAR FROM `date`)
ORDER BY sales_year;
```

sales_year	sum_sales
2014	2392
2015	7805
2016	49855
2017	87420
2018	130254
2019	166819
2020	124684
2021	331498
2022	1024723
2023	1525179
2024	143182

insights : As we see here that sum of the sales on the basis of years EV market has increases with the high margins over the years

3. State-wise Sales Distribution

```
SELECT
    state, SUM(EV_Sales_Quantity) AS total_sales
FROM
    ev_dataset
GROUP BY state
ORDER BY total_sales DESC;
```

state	total_sales
Delhi	268538
Rajasthan	228573
Bihar	213465
Tamil Nadu	206902
Gujarat	176713
Assam	151917
Kerala	133246
Madhya Prad...	133182
Odisha	86823
Haryana	85250
West Bengal	78112
Andhra Prad...	77356
Chhattisgarh	75275
Uttarakhand	57606
Punjab	49285
Jharkhand	47871
Tripura	18346

insights : as we can see UP has on top by ev vehicles sales

4. Top Vehicle Classes with total sales

```
SELECT
    Vehicle_Class, SUM(EV_Sales_Quantity) AS total_sales
FROM
    ev_dataset
GROUP BY Vehicle_Class
ORDER BY total_sales DESC;
```

Vehicle_Class	total_sales
M-CYCLE/SCOOTER	1697373
E-RICKSHAW(P)	1408127
MOTOR CAR	130676
E-RICKSHAW WITH CART (G)	90656
THREE WHEELER (PASSENGER)	76132
MOPED	61253
THREE WHEELER (GOODS)	44974
MOTORISED CYCLE (CC > 25CC)	36390
MOTOR CAB	18681
MOTOR CYCLE/SCOOTER-USED FOR HIRE	11765
BUS	6891
GOODS CARRIER	6322
M-CYCLE/SCOOTER-WITH SIDE CAR	1324
TRAILER (COMMERCIAL)	565
CONSTRUCTION EQUIPMENT VEHICLE	484
THREE WHEELER (PERSONAL)	421
LUXURY CAB	418
FORK LIFT	310

insights : As we see here that M-cycle/scooter ,e-rikshaw,motor -car etc, are in top 5

5. Vehicle Category Insights with the total_sales

```
SELECT
    Vehicle_Category, SUM(EV_Sales_Quantity) AS total_sales
FROM
    ev_dataset
GROUP BY Vehicle_Category
ORDER BY total_sales DESC;
```

Vehicle_Category	total_sales
2-Wheelers	1808105
3-Wheelers	1620310
4-Wheelers	149775
Others	8612
Bus	7009

insights : As we see here that **2-Wheelers,3-Wheelers and 4-Wheelers** , are in top 3

6. State-wise Performance for Each Vehicle Class

```
SELECT
    state, Vehicle_Class, SUM(EV_Sales_Quantity) AS total_sales
FROM
    ev_dataset
GROUP BY state , Vehicle_Class
ORDER BY total_sales DESC;
```

state	Vehicle_Class	total_sales
Uttar Pradesh	E-RICKSHAW(P)	596325
Maharashtra	M-CYCLE/SCOOTER	330422
Karnataka	M-CYCLE/SCOOTER	254789
Bihar	E-RICKSHAW(P)	174880
Tamil Nadu	M-CYCLE/SCOOTER	160096
Gujarat	M-CYCLE/SCOOTER	141152
Assam	E-RICKSHAW(P)	137982
Delhi	E-RICKSHAW(P)	134439
Rajasthan	M-CYCLE/SCOOTER	129813
Kerala	M-CYCLE/SCOOTER	107840
Delhi	M-CYCLE/SCOOTER	85189
Uttar Pradesh	M-CYCLE/SCOOTER	80864
Odisha	M-CYCLE/SCOOTER	72089
Madhya Prad...	M-CYCLE/SCOOTER	70077
Rajasthan	E-RICKSHAW(P)	67795
Andhra Prad...	M-CYCLE/SCOOTER	64662
Madhya Prad...	E-RICKSHAW(P)	52657

insights : As we see here that States like UP,Mahrashtra,Karnataka etc are in top 5

7. Sales Growth Rate by on yearly basis

```
with yearly_sales as (  
  select extract(year from `date`) as sales_year,  
  sum(ev_sales_quantity) as total_sales  
  from ev_dataset  
  group by extract(year from `date`)  
)  
select sales_year,total_sales,  
lag(total_sales) over( order by sales_year) as previous_salesyear,  
round((total_sales - lag(total_sales) over(order by sales_year)) /  
lag(total_sales) over( order by sales_year)*100,2) as growth_rate  
from yearly_sales  
order by sales_year;
```

sales_year	total_sales	previous_salesyear	growth_rate
2014	2392	NULL	NULL
2015	7805	2392	226.30
2016	49855	7805	538.76
2017	87420	49855	75.35
2018	130254	87420	49.00
2019	166819	130254	28.07
2020	124684	166819	-25.26
2021	331498	124684	165.87
2022	1024723	331498	209.12
2023	1525179	1024723	48.84
2024	143182	1525179	-90.61

insights : As there are high and lows year by year as we can see here

8. Most Popular EV Types top 3

```
SELECT
    Vehicle_Type, SUM(EV_Sales_Quantity) AS total_sales
FROM
    ev_dataset
GROUP BY Vehicle_Type
ORDER BY total_sales DESC
LIMIT 3;
```

Vehicle_Type	total_sales
2W_Personal	1796340
3W_Shared_LowSpeed	1408127
4W_Personal	130676

insights : In the above result 2w personal are in the top then four wheelers

9 Sales Share by Vehicle Class Over Time

```
with monthly_sales as (  
  select extract( year from `date`) as sales_year,vehicle_class  
  sum(ev_sales_quantity) as class_sales  
  from ev_dataset  
  group by extract( year from `date`) ,vehicle_class  
)  
total_sales as (  
  select extract(year from `date`) as sales_year,  
  sum(ev_sales_quantity) as total_sales  
  from ev_dataset  
  group by extract(year from `date`)  
)  
select m.sales_year,m.vehicle_class,m.class_sales,  
round((m.class_sales / t.total_sales) * 100,2) as sales_share  
from monthly_sales m  
join total_sales t on m.sales_year = t.sales_year  
order by m.sales_year,sales_share desc;
```

sales_year	vehide_class	class_sales	sales_share
2014	M-CYCLE/SCOOTER	1526	63.80
2014	MOTOR CAR	482	20.15
2014	MOPED	149	6.23
2014	TRAILER (COMMERCIAL)	57	2.38
2014	TRAILER (AGRICULTURAL)	37	1.55
2014	FORK LIFT	32	1.34
2014	AGRICULTURAL TRACTOR	28	1.17
2014	GOODS CARRIER	19	0.79
2014	MOTOR CAB	16	0.67
2014	CAMPER VAN / TRAILER (PRIVATE USE)	12	0.50
2014	THREE WHEELER (PASSENGER)	7	0.29
2014	MAXI CAB	4	0.17
2014	TRACTOR (COMMERCIAL)	4	0.17

insights : In the above result vehicle class share has been increases accordingly with highs and lows



**Thank
You !**

REPORT OF EV VEHICLE'S SALES

vehicle_type

All

2M

Sum of ev_sales_quantity

date

01-01-2014

01-01-2024

2-Wheelers

846862

Sum of ev_sales_quantity

3-Wheelers

688835

Sum of ev_sales_quantity

4-Wheelers

71128

Sum of ev_sales_quantity

Bus

3141

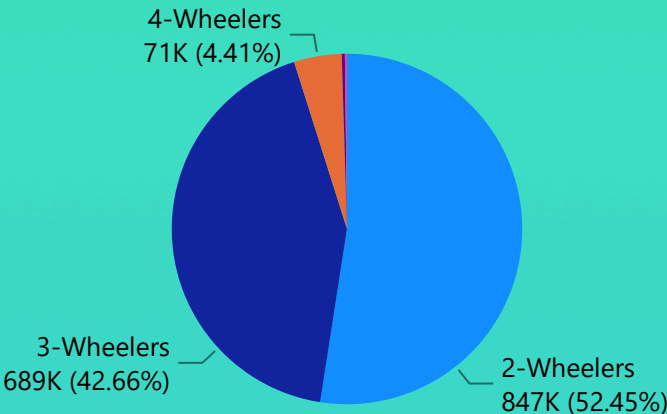
Sum of ev_sales_quantity

Others

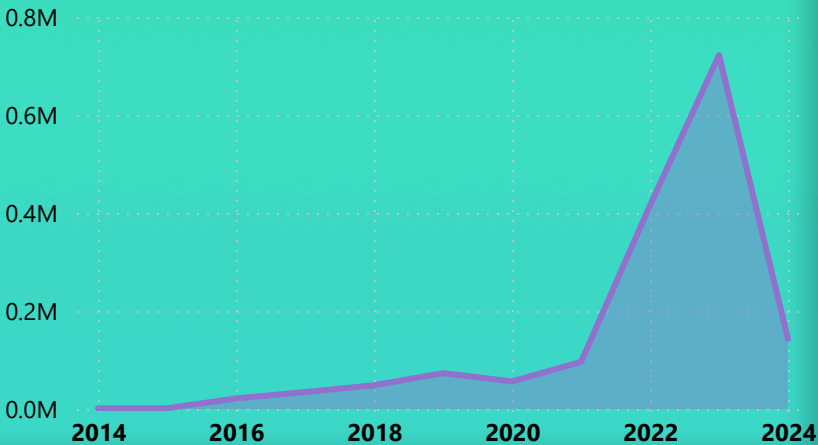
4577

Sum of ev_sales_quantity

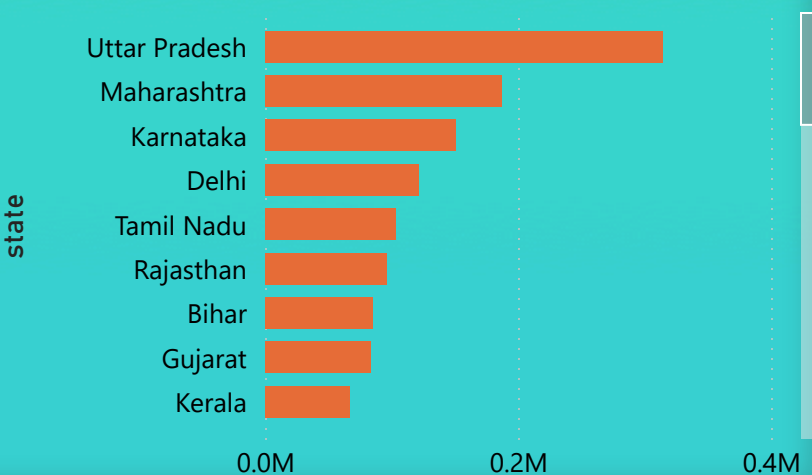
ev_sales_quantity by vehicle_category



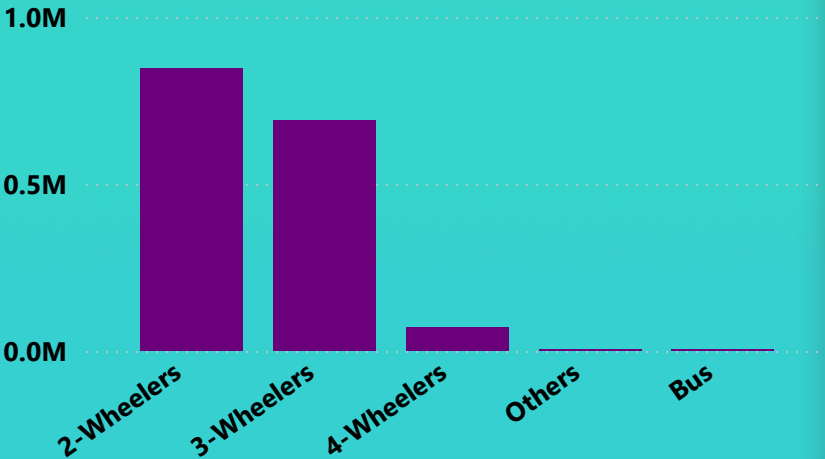
ev_sales_quantity by Year



ev_sales_quantity by state



ev_sales_quantity by vehicle_category



Year state vehicle_class Sum of ev_sales_quantity

2014	Andaman & Nicobar Island	AMBULANCE	0
2014	Andaman & Nicobar Island	BUS	0
2014	Andaman & Nicobar Island	EARTH MOVING EQUIPMENT	0
2014	Andaman & Nicobar Island	EXCAVATOR (COMMERCIAL)	0
2014	Andaman & Nicobar Island	GOODS CARRIER	0
2014	Andaman & Nicobar Island	MAXI CAB	0
2014	Andaman & Nicobar Island	M-CYCLE/SCOOTER	0
2014	Andaman & Nicobar Island	M-CYCLE/SCOOTER-WITH SIDE CAR	0
2014	Andaman & Nicobar Island	MOPED	0
2014	Andaman & Nicobar Island	MOTOR CAB	0
2014	Andaman & Nicobar Island	MOTOR CAR	0
2014	Andaman & Nicobar Island	MOTOR CYCLE/SCOOTER-USED FOR HIRE	0

Total 1614543