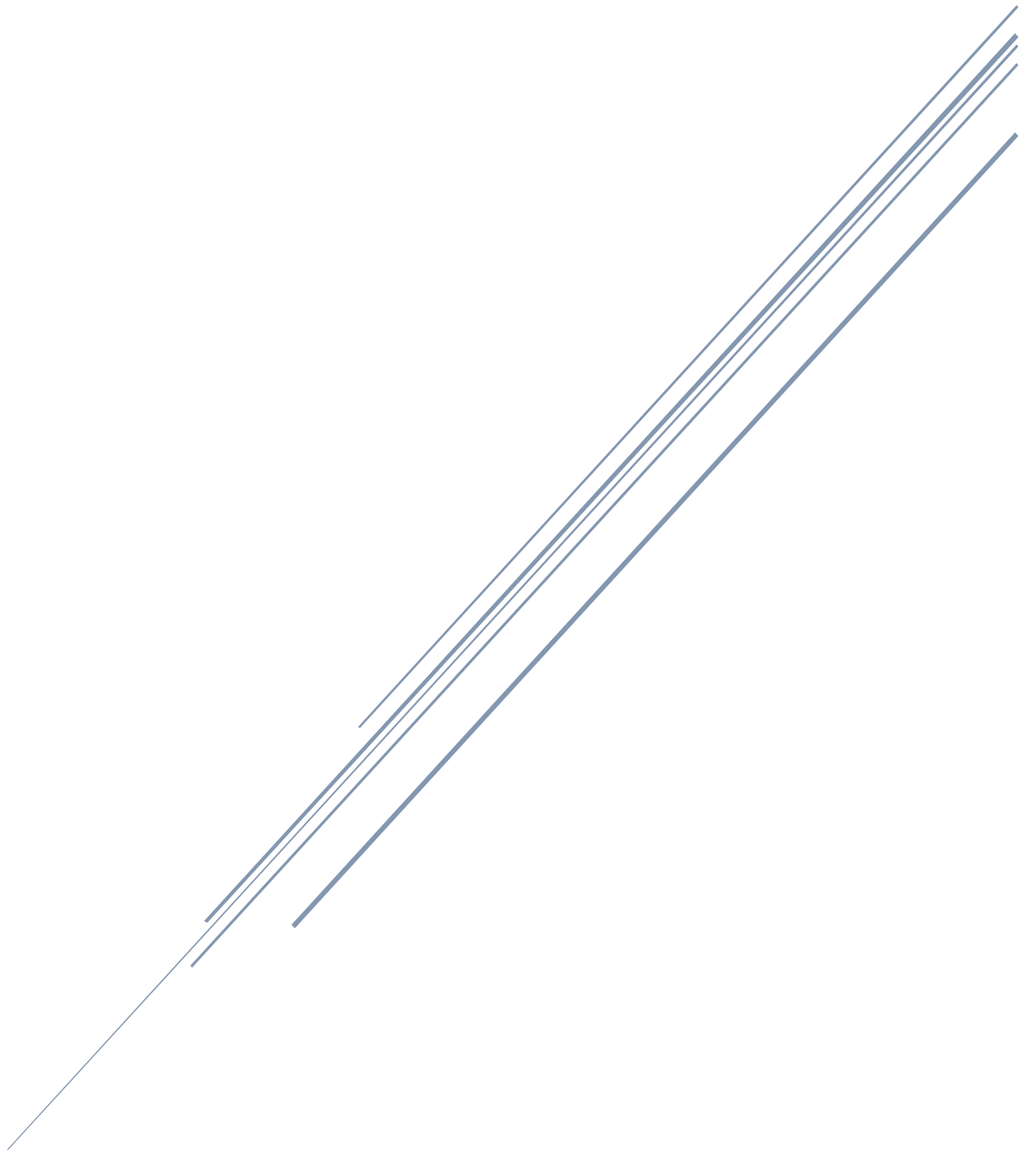# CHURN ANALYSIS

Churn Analysis :

📌 **Step 1: Loading the Data**

The first step in churn analysis is to load data from the source file. For this, we used **Microsoft SQL Server**, a widely adopted industry solution that ensures efficient data handling, scalability, and seamless integration with Power BI for visualization.

Welcoming to the data:

```sql
--CREATE DATABASE db_churn          // this is used to create database
-- // below query is used to select the correct database
USE db_churn;
GO
SELECT * FROM dbo.stg_churn;
```

	Customer_ID	Gender	Age	Married	State	Number_of_Referrals	Tenure_in_Months	Value_Deal	Phone_Service	Multiple_Lines	Internet_Service	Internet_Type	Online_Security	Online_Ba
1	11098-MAD	Female	30	Yes	Madhya Pradesh	0	31	Deal 1	Yes	No	Yes	Fiber Optic	Yes	Yes
2	11114-PUN	Male	51	No	Punjab	5	9	Deal 5	Yes	No	Yes	DSL	No	No
3	11167-WES	Female	43	Yes	West Bengal	3	28	Deal 1	Yes	Yes	Yes	Fiber Optic	Yes	Yes
4	11179-MAH	Male	35	No	Maharashtra	10	12	NULL	Yes	No	Yes	DSL	Yes	Yes

Data Exploration:

Question 1:

What Is the total count and percentage distribution of each Gender in dataset?

```sql
-- What is the total count and percentage distribution of each Gender in the dataset?
select Gender , count(Gender) as 'Total_Count',
CAST(ROUND((COUNT(Gender) * 100.0 / (SELECT COUNT(*) FROM dbo.stg_churn)), 2) AS DECIMAL(10,2)) AS Percentage
from dbo.stg_churn
group by Gender;
```

Gender	Total_Count	Percentage
Male	2370	36.93
Female	4048	63.07

Question 2: What is total count and percentage distribution of each Contract Type in Dataset?

```sql
--  What is the total count and percentage distribution of each Contract type in the dataset?
select Contract , count(Contract) as Total_count ,
CAST(ROUND((COUNT(Contract) * 100.0 / (SELECT COUNT(*) FROM dbo.stg_churn)), 2) AS DECIMAL(10,2))AS Percentage
from dbo.stg_churn
group by Contract
```

133 %

Results | Messages

	Contract	Total_count	Percentage
1	Month-to-Month	3286	51.20
2	One Year	1413	22.02
3	Two Year	1719	26.78

Question3:

What Is total count of customers, total revenue and percentage contribution of total revenue for each Customer_status?

```sql
-- What is the total count of customers, total revenue, and the percentage contribution of total revenue for each (
select Customer_Status , count(Customer_Status) as Total_count,SUM(Total_Revenue) as TotalRev,
CAST(ROUND((SUM(Total_Revenue) * 100.0 / (SELECT SUM(Total_Revenue) FROM dbo.stg_churn)), 2) AS DECIMAL(10,2))AS Pe
from dbo.stg_churn
group by Customer_Status
```

33 %

Results | Messages

	Customer_Status	Total_count	TotalRev	Percentage
1	Joined	411	49281.5598697662	0.25
2	Churned	1732	3411960.5796299	17.52
3	Stayed	4275	16010148.2622757	82.22

Question 4:

What is Total count and percentage distribution of customer across Different States?

```
--What is the total count and percentage distribution of customers across different states?
select top 5
state , count(state) as Total_Count ,
CAST(ROUND((count(state) * 100.0 / (SELECT count(state) FROM dbo.stg_churn)), 2) AS DECIMAL(10,2))AS Percentage
from dbo.stg_churn
group by state
```

	state	Total_Count	Percentage
1	Uttar Pradesh	629	9.80
2	Tamil Nadu	600	9.35
3	Maharashtra	504	7.85
4	Karnataka	470	7.32
5	Haryana	398	6.20

Question5:

What is the the total number of customers for each state along with the percentage contribution of each state to the overall customer base?

```
--What is the total count of customers per state, and what is the percentage share of each state relative to the
--total customer base?"
SELECT TOP 8
    State,
    COUNT(Customer_ID) AS Total_Customers,
    CAST(ROUND(COUNT(Customer_ID) * 100.0 / (SELECT COUNT(*) FROM dbo.stg_churn), 2) AS DECIMAL(10,2)) AS Percentage
FROM dbo.stg_churn
GROUP BY State
ORDER BY Percentage desc
```

	State	Total_Customers	Percentage
1	Uttar Pradesh	629	9.80
2	Tamil Nadu	600	9.35
3	Maharashtra	504	7.85
4	Karnataka	470	7.32
5	Haryana	398	6.20
6	Andhra Pradesh	395	6.15
7	West Bengal	368	5.73
8	Punjab	342	5.33

Question 6:

```sql
--What is the average age of customers grouped by their Customer_Status?
select Customer_Status , avg(age) as Average_Age
from dbo.stg_churn
group by Customer_Status
```

133 %

Results | Messages

	Customer_Status	Average_Age
1	Joined	43
2	Churned	50
3	Stayed	46

Question7:

```sql
-- For each Customer_Status, what are the minimum, maximum, and average Tenure_in_Months?"
select Customer_Status,
min(Tenure_in_Months) as min_tenure, max(Tenure_in_Months) as max_tenure,avg(Tenure_in_Months) as avg_tenure
from dbo.stg_churn
group by  Customer_Status
```

3 %

Results | Messages

	Customer_Status	min_tenure	max_tenure	avg_tenure
	Joined	1	36	16
2	Churned	1	36	17
3	Stayed	1	36	17

Data Handling:

```
    -- The below code is to check for null values in column ( similar to df.isnull() in python)
SELECT
    SUM(CASE WHEN Customer_ID IS NULL THEN 1 ELSE 0 END) AS Customer_ID_Nulls,
    SUM(CASE WHEN Gender IS NULL THEN 1 ELSE 0 END) AS Gender_Nulls,
    SUM(CASE WHEN Age IS NULL THEN 1 ELSE 0 END) AS Age_Nulls,
    SUM(CASE WHEN Married IS NULL THEN 1 ELSE 0 END) AS Married_Nulls,
    SUM(CASE WHEN State IS NULL THEN 1 ELSE 0 END) AS State_Nulls,
    SUM(CASE WHEN Number_of_Referrals IS NULL THEN 1 ELSE 0 END) AS Number_of_Referrals_Nulls,
    SUM(CASE WHEN Tenure_in_Months IS NULL THEN 1 ELSE 0 END) AS Tenure_in_Months_Nulls,
    SUM(CASE WHEN Value_Deal IS NULL THEN 1 ELSE 0 END) AS Value_Deal_Nulls,
    SUM(CASE WHEN Phone_Service IS NULL THEN 1 ELSE 0 END) AS Phone_Service_Nulls,
    SUM(CASE WHEN Multiple_Lines IS NULL THEN 1 ELSE 0 END) AS Multiple_Lines_Nulls,
```

Customer_ID_Nulls	Gender_Nulls	Age_Nulls	Married_Nulls	State_Nulls	Number_of_Referrals_Nulls	Tenure_in_Months_Nulls	Value_Deal_Nulls	Phone_Service_Nulls	Multiple_Lines_Nulls	Internet_Service_Nu
0	0	0	0	0	0	0	3548	0	622	0

Solution all missing values gone:

```
SELECT
    Customer_ID,
    Gender,
    Age,
    Married,
    State,
    Number_of_Referrals,
    Tenure_in_Months,
    ISNULL(Value_Deal, 'None') AS Value_Deal,
    Phone_Service,
    ISNULL(Multiple_Lines, 'No') AS Multiple_Lines,
    Internet_Service,
```

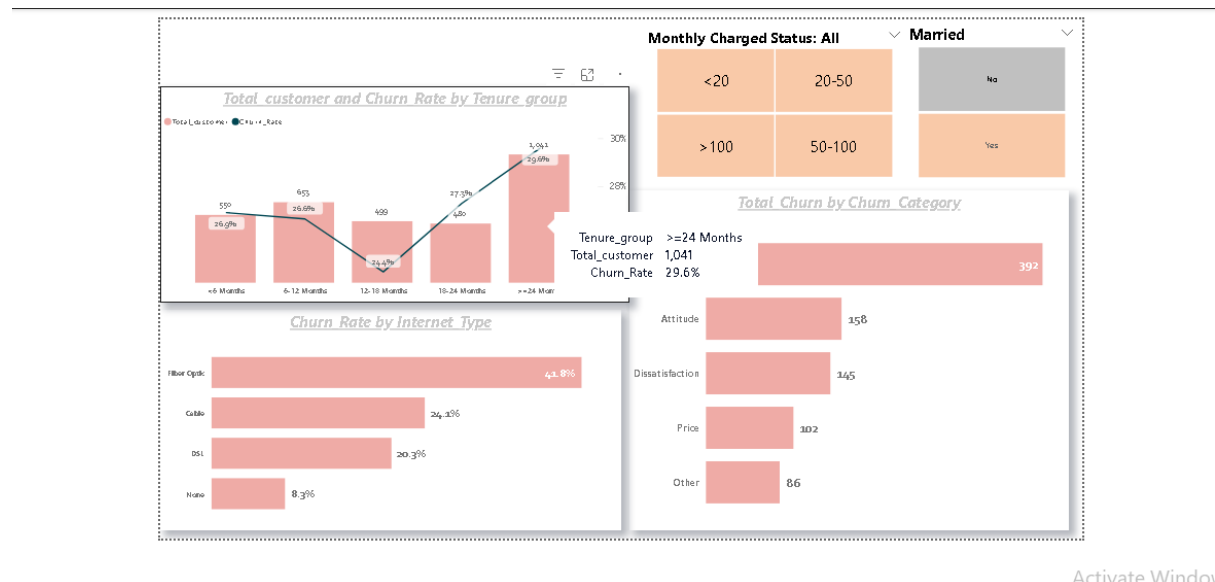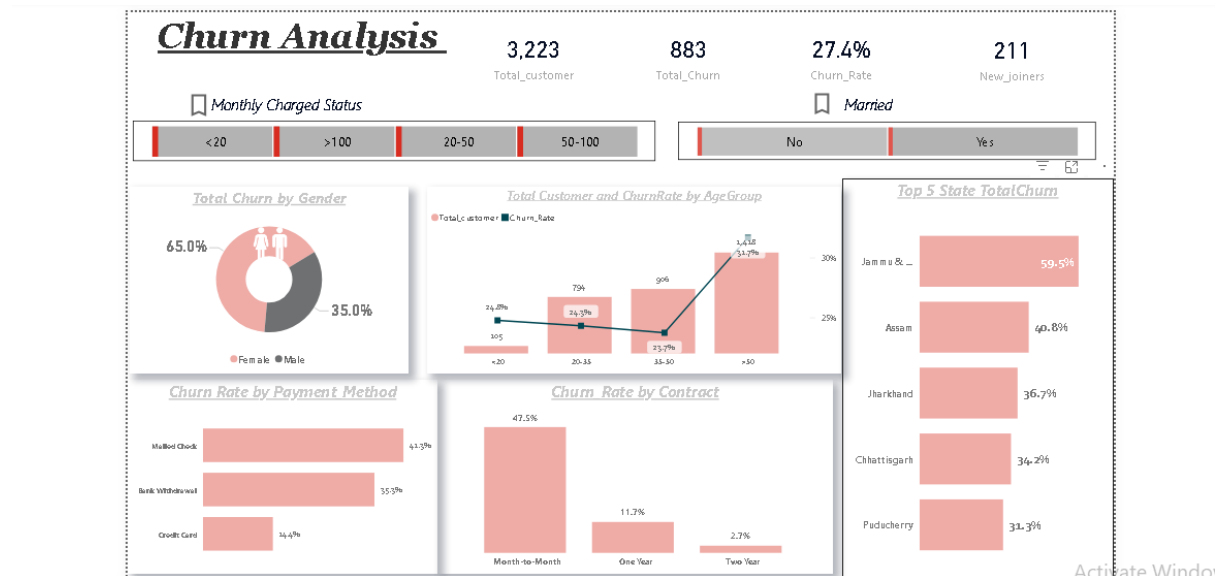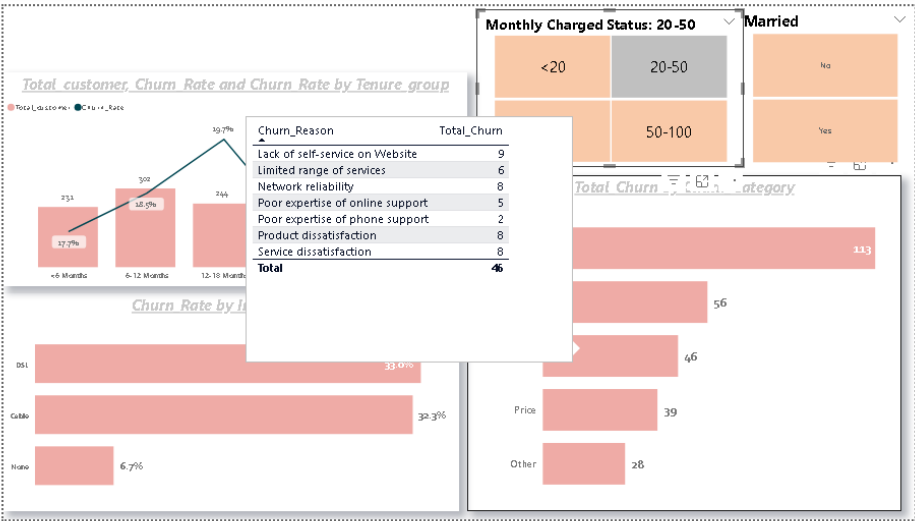|	Customer_ID	Gender	Age	Married	State	Number_of_Referrals	Tenure_in_Months	Value_Deal	Phone_Service	Multiple_Lines	Internet_Service	Internet_Type	Online_Security	Online_Ba
1	11098-MAD	Female	30	Yes	Madhya Pradesh	0	31	Deal 1	Yes	No	Yes	Fiber Optic	Yes	Yes
2	11114-PUN	Male	51	No	Punjab	5	9	Deal 5	Yes	No	Yes	DSL	No	No
3	11167-WES	Female	43	Yes	West Bengal	3	28	Deal 1	Yes	Yes	Yes	Fiber Optic	Yes	Yes

View :

```
create view vw_churn_data as
select * from dbo.prod_churn  where Customer_Status in ('Churned' , 'Stayed')


create view vw_join_data as
select * from dbo.prod_churn  where Customer_Status = 'Joined'
```

Power bi Analysis

Churn Analysis

3,223	883	27.4%	211
Total_customer	Total_Churn	Churn_Rate	New_joiners

Monthly Charged Status

| <20 | >100 | 20-50 | 50-100 |

Married

| No | Yes |

Total Churn by Gender
65.0% 35.0%
Female Male

Total Customer and ChurnRate by AgeGroup
Total_customer Churn_Rate

Top 5 State TotalChurn
Jammu & ... 59.5%
Assam 40.8%
Jharkhand 36.7%
Chhattisgarh 34.2%
Puducherry 31.3%

Churn Rate by Payment Method
Mailed Check 41.3%
Bank Withdrawal 35.3%
Credit Card 14.4%

Churn Rate by Contract
47.5% Month-to-Month
11.7% One Year
2.7% Two Year

Total_customer and Churn Rate by Tenure group
Total_customer Churn_Rate

Monthly Charged Status: All

| <20 | 20-50 |
| >100 | 50-100 |

Married

| No |
| Yes |

Tenure_group >=24 Months
Total_customer 1,041
Churn_Rate 29.6%

Total Churn by Churn_Category
392
Attitude 158
Dissatisfaction 145
Price 102
Other 86

Churn Rate by Internet Type
Fiber Optic 41.8%
Cable 24.1%
DSL 20.3%
None 8.3%

Total_customer, Churn_Rate and Churn_Rate by Tenure_group

Total_Customer ● Churn_Rate

Churn_Reason	Total_Churn
Lack of self-service on Website	9
Limited range of services	6
Network reliability	8
Poor expertise of online support	5
Poor expertise of phone support	2
Product dissatisfaction	8
Service dissatisfaction	8
Total	**46**

Monthly Charged Status: 20-50

<20	20-50
50-100	

Married

No
Yes

Churn_Rate by I...

DSL	33.0%
Cable	32.3%
None	6.7%

Total_Churn ... ategory

	113
	56
	46
Price	39
Other	28

1**. Age Group Impact**:

- 50+ age group has the highest total customers (2,838), making up 44.22% of the total customer base.
- It is 2,325.64% higher than the <20 age group (117 customers).

  Female customers aged 50+ have the highest churn rate (31.5%).

- A targeted marketing campaign focusing on this segment could help retain these customers.
-

2 **Gender-Based Churn:**

- Females (1,111 churned) have a higher churn rate than males (621 churned), indicating a potential need for gender-specific retention strategies.

3 **Payment Method Impact on Churn:**

- Credit Card users have the lowest churn rate (14.8%), while:
  - Mailed Check users have the highest churn (37.8%)
  - Bank Withdrawal users follow at 34.4%
- Digital payment users are more stable, while traditional payment users churn more.

4. **State**:

The state having highest churn rate is jumma and Kashmir

5**. Contract:**

It shows that Gender female , male have 3 type of contract in which those people having month to month churn more

6. Internet Type & Churn

Fiber optic users have the highest churn rate (41.9%), likely due to pricing or service quality concerns.