

The background of the slide is a light blue and white pattern of thin, intersecting lines. Overlaid on this are several blue-toned graphics: a large satellite dish on the left, a faint world map in the center, and a collection of icons at the bottom including a globe, a mobile phone, and several computer monitors. The main title is centered over the world map.

# **Churn Analysis And Prediction In The Telecom Sector**

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# INTRODUCTION

## Project Goal

- Understand customer churn drivers and predict potential churners.

## Tools & Techniques

- SQL for data retrieval, cleaning, and analysis.
- DAX in Power BI for detailed metric calculations and visualizations.
- Python for building a predictive churn model.

## Key Takeaways:

- Patterns and factors affecting churn.
- Predictive model identifying at-risk customers for targeted retention.

# DATA OVERVIEW

## Dataset Source

- Telecom customer dataset with demographic, service, and financial details.

## Key Features

- Demographic Details: Gender, Age, Marital Status.
- Service Details: Internet type, Online Security, Multiple Lines.
- Financial Data: Monthly charges, Total revenue, Refunds.

## Data Volume

- Total Customers: 6,418
- Churned Customers: 1,732 (26.99% churn rate)

# DATA PREPARATION USING SQL

## Data Cleaning

- SQL processes for handling missing data, type conversions, and deduplication.

## Feature Engineering

- Tenure groups (e.g., <6 months, 6-12 months).
- Payment types and churn category splits.

## Initial Insights Extraction

- SQL queries to calculate churn rate, tenure averages, and segmentation by demographics.



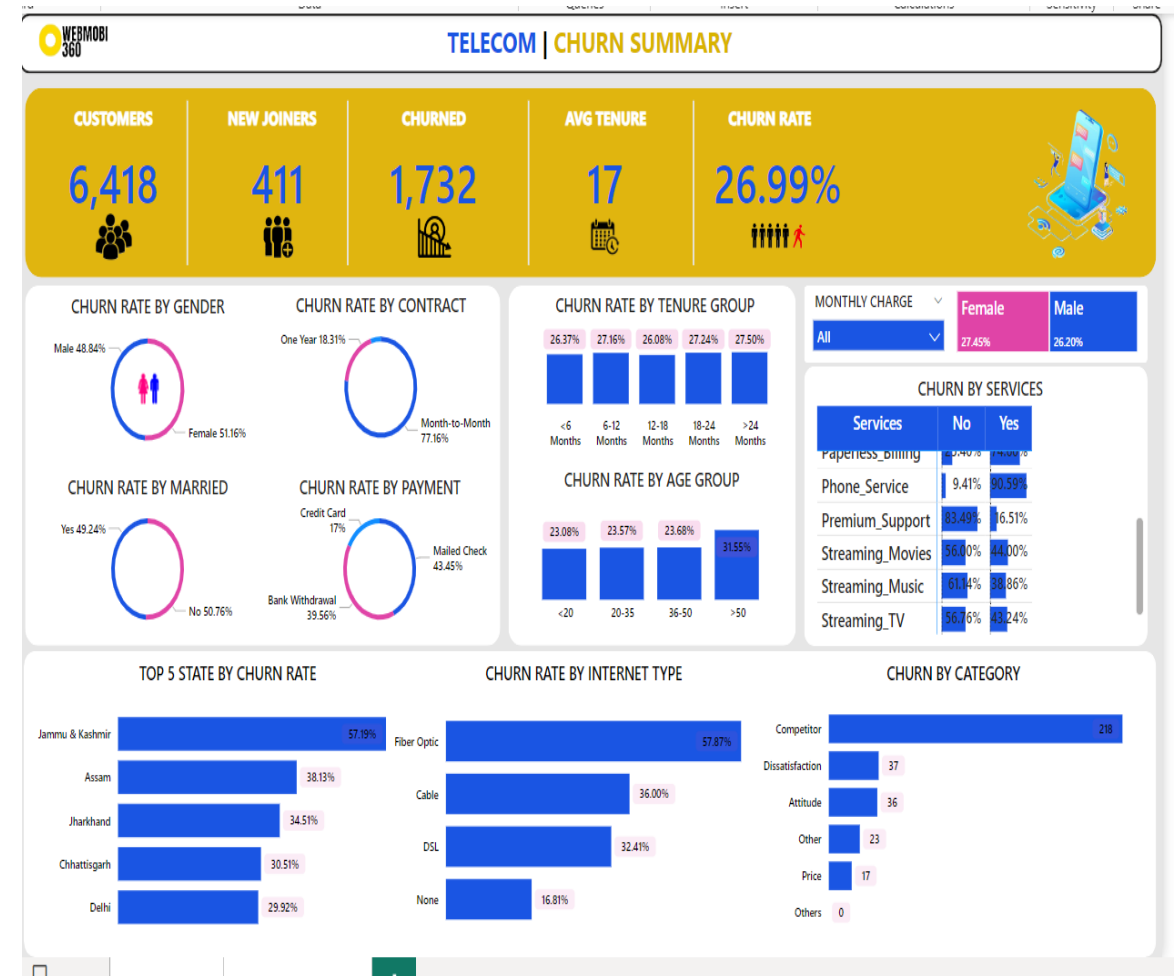
# EXPLORATORY DATA ANALYSIS IN POWER BI

## Key Churn Insights

- Gender: Female (51.16%) vs. Male (48.84%) churn rates.
- Age Group: Higher churn among customers over 50 (31.55%).

## Contract & Payment Method

- Highest churn in Month-to-Month contracts (77.16%).
- Mailed Check: 43.45% churn.



# CHURN FACTORS BY SERVICE TYPE

## Internet Type

- Fiber Optic (57.87%) shows highest churn.

## Service-Based Churn

- Device Protection Plan: No (71.02%) churns higher than Yes.

## DAX Calculations:

- Churn Rate =  $\frac{[Total\ Churn]}{[Total\ Customer]}$

## Recommendation

- Improve or bundle high-churn services.

Services	No	Yes
Device_Protection_Plan	71.02%	28.98%
Internet_Service	6.29%	93.71%
Multiple_Lines	54.79%	45.21%
Online_Backup	71.88%	28.12%
Online_Security	84.64%	15.36%
Paperless_Billing	25.40%	74.60%
Phone_Service	9.41%	90.59%
Premium_Support	83.49%	16.51%
Streaming_Movies	56.00%	44.00%
Streaming_Music	61.14%	38.86%
Streaming_TV	56.76%	43.24%
Unlimited_Data	19.92%	80.08%

# FINANCIAL ANALYSIS IN POWER BI

## Revenue Insights

- Total Revenue: \$19M, Average Monthly Charges: \$64.

## Revenue Breakdown

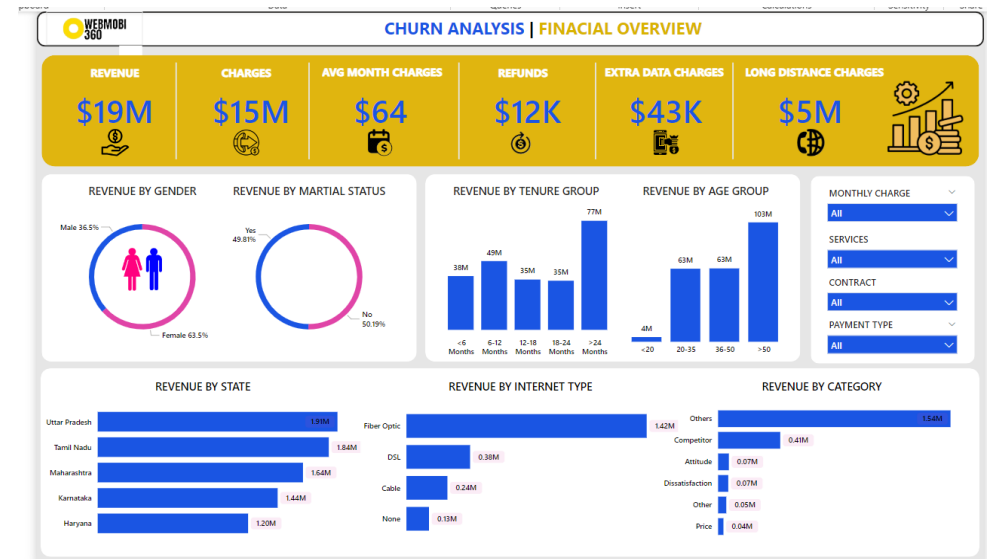
- By Internet Type, Age Group, and State.

## DAX Measures for Financial Metrics

- AVG MONTHLY CHARGES =  
`AVERAGE('telecom_churn_churn_data'[Monthly_Charge])`

## Suggestions

- Focus on high-revenue segments for retention.



# Churn Prediction Model In Python

## Objective

- Predict customers likely to churn.

## Model Choice

- Random Forest Model.

## Data Preparation

- Feature selection: Monthly charges, tenure, payment method.

## Model Results

- Accuracy (85%) and key features impacting churn





# PREDICTED CUSTOMER PROFILES AT RISK

## High-Risk Profiles

- Customer ID, monthly charges, tenure, refunds.

## Example Profile

- Customer ID: 27561-UTT, Monthly Charge: \$20.25, Tenure: <6 months.

## Recommendations for Retention

- Discounts or loyalty offers for at-risk profiles.

CUSTOMERS AT RISK				
COUNT OF PREDICTED CHURNERS : 378				
Customer_ID	Monthly Charge	Total Revenue	Total Refunds	Number of Referrals
79700-KER	107.95	456.10	0.00	5
28281-KAR	80.35	402.69	0.00	8
39623-HAR	74.60	387.58	0.00	2
21956-JHA	82.30	369.31	0.00	10
12056-WES	90.40	362.89	0.00	2
26448-BIH	75.30	361.07	0.00	10
84789-PUN	107.95	356.58	0.00	9
19747-WES	64.50	356.05	0.00	15
19811-MAH	89.85	348.30	0.00	10
19998-AND	85.70	346.27	0.00	0
13666-UTT	95.40	344.18	0.00	15
71197-PUN	77.40	339.41	0.00	0
51214-MAH	73.60	324.52	0.00	12
78220-TAM	89.85	319.75	0.00	14
74804-WES	69.60	314.31	0.00	0
97828-MAH	92.00	313.60	0.00	0
66413-TAM	80.50	312.93	0.00	12
52279-TAM	80.70	310.61	0.00	15
44208-AND	69.15	307.84	0.00	2
28237-JHA	69.85	304.13	0.00	7

# KEY TAKEAWAYS

## Insights on Retention

- High churn in specific contracts/services.
- Impact of demographic and financial factors on churn.

## Predictive Model Success

- Identifies at-risk customers for retention strategies.

## Next Steps

- Continuous monitoring, A/B testing on retention actions.