# CUSTOMER CHURN ANALYSIS



Manali Gohil  
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<mailto:manaligohil06@gmail.com>| [linkedin.com/in/manaligohil06](https://www.linkedin.com/in/manaligohil06/)

# **Problem Statement**

##### Customer retention is the critical challenge in highly competitive telecom industry. With Numerous service provider offering similar plans, customer frequently switch providers due to dissatisfaction with service quality, pricing or customer support. It is known as Customer Churn. The objective of this project is to analyze historical customer data to identify key factors influencing churn behavior and provide actionable insights to improve customer retention strategy.

# **Dataset Used**

##### Dataset used in this project was obtained from open-source telecom customer churn simulation dataset. This dataset is not confidential and is commonly used for educational, analytical, and machine learning purposes. It closely resembles datasets found on platform like Kaggle. It is containing 6417 records and 32 attributes. This data captures customer demographics, service details, billing and charges, tenure and contracts and churn information.

##### Key Attributes:

##### Customer Demographics: Gender, Age, Married, State, Number\_of\_Referrals

##### Service Details: Phone\_Service, Internet\_Type, Streaming\_TV, Online\_Security, etc.

##### Billing and Charges: Monthly\_Charge, Total\_Charges, Total\_Revenue, Payment\_Method

##### Tenure and Contracts: Tenure\_in\_Months, Contract, Paperless\_Billing

##### Churn Information: Customer\_Status, Churn\_Category and Churn\_Reason

# **Data Prepocessing**

# To ensure data was cleaned, complete and ready for analysis, several preprocessing steps were performed using SQL. These steps focused on computing data distribution, handling missing values and preparing the data for loading into power BI.

##### 1. Data Distribution :

##### Aggregation queries were run to understand the distribution of key features such as Gender, Value\_Deal, State, Internet\_Type, Contract, Payment\_Method, Customer\_Status, and Churn\_Category. The churn rate for each category was calculated by dividing the group count by the total number of records.

##### 2. Missing Value Analysis :

##### A null check was performed across all 32 fields to identify attributes with missing data. Fields like Value\_Deal, Internet\_Type, Churn\_Category, and Churn\_Reason were found to have significant missing values.

##### 3. Handling Missing Values :

##### Missing values were handled using SQL ISNULL() function with logical replacements: Categorical fields such as Value\_Deal, Internet\_Type, Churn\_Category, and Churn\_Reason were filled with 'Others'. Service-related fields like Online\_Security, Streaming\_TV, etc., were filled with 'No' assuming service was not subscribed. Multiple\_Lines was also filled with 'No' where missing. No rows were dropped; instead, null values were imputed to retain the complete dataset.

##### 4. Data Loading :

##### Cleaned and transformed data was loaded into a new table named prod\_Churn in the db\_Churn database using a SELECT INTO operation. This created a production-ready dataset with consistent, complete records suitable for analysis. Then it was loaded into Power BI through SQL server database.

# **EDA**

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#### **1. Overall Churn Metrics**

* **Total Customers**: 6,418
* **Total Churned Customers**: 1,732
* **Overall Churn Rate**: **27.0%**
* **New Joiners**: 411 customers recently added

**2**. **Churn rate by payment method**

* **Highest churn** was observed among customers using **Mailed Check (37.8%)** and **Bank Withdrawal (34.4%)**.
* **Credit Card** users showed a much lower churn rate (**14.8%**), indicating possible loyalty due to auto-payments or getting reward like coins, cashback etc.

#### **3.** **Churn Rate by Age Group**

* Churn increased with age, especially in customers **over 50**, where churn rate reached **31%**.
* The **20–50** age group had a moderate churn rate (~24%).
* For users over 50, **free subscriptions** to health and fitness apps, yoga and meditation apps, or entertainment apps can be provided to **reduce the churn rate**.
* For users between 20-50, free courses on finance, career development can be provided to reduce churn rate.

**4. Churn Rate by state**

* States like **Jammu & Kashmir (57.2%)** and **Assam (38.1%)** had the highest churn.
* These regional trends can help focus retention efforts on high-risk states.
* States like Jammu & KashmirandAssam mightface challenges due to **security-related shutdowns**, **frequent power outages**, **poor infrastructure**, and **administrative delays**, which further hinder **stable** and **widespread network access**.
* **To reduce churn** in regions like **Jammu & Kashmir** and **Assam**, **telecom providers** should focus on improving **service reliability** through investment in **resilient infrastructure**and **alternative connectivity solutions** (e.g., **satellite** or **wireless mesh**). Additionally, offering **region-specific incentives** such as **free data** during **outages**, **low-cost recharge plans**, or **local language support**can help **retain users**and build **loyalty.**

**5. Churn Rate by Internet Type**

* **The highest churn** **(41.1%)** in **fiber optic services** and **moderate churn (25.7%)** in **cable** might be due to **higher costs**, **slow and unhelpful customer service**, and users **not receiving the advertised speeds.**
* **To reduce churn**, providers should offer **flexible pricing**, improve **customer support**, ensure **consistent speed delivery**, and introduce **loyalty rewards** and **personalized plans**.

#### **6. Churn Rate by Contract Type**

* **Month-to-month** customers had a significantly higher churn rate (**46.5%**) than those on **One-year (11%)** or **Two-year (2.7%)** contracts.
* This highlights the importance of long-term plans for retention.
* To **reduce churn** among **monthly contract users**, providers should offer **retention incentives**, promote **upgrades to longer-term plans**, ensure a **positive early experience**, and maintain **regular engagement** through **personalized offers** and **reminders**.

**7. Churn Rate by Tenure group**

* **Churn rate is consistently high** across all tenure groups — **even among long-term customers**.
* To **reduce churn**, offer **exclusive discounts**, **anniversary rewards**, or **VIP support** to **recognize** and **retain long-term customers**.

**8. Churn by churn category/ churn resasons**

* The top churn reasons category were:

1. **Competitor-Driven**: **More than 40% of churn is due to external competition –** customers are switching to competitors offering better deals or services.
2. **Attitude-related (poor experience)**: **Customer service behavior ("Attitude") is a major internal factor**, leading to nearly 18% of churn.
3. **Service Dissatisfaction**: **Service-related issues ("Dissatisfaction") make up another ~17%** of churn — this points to performance or reliability problems.

* To **reduce** **churn**, launch **competitive matching programs**—such as **matching offers** from top **competitors** for **loyal customers**. Conduct **empathy** and **resolution training** for **support teams**, and set up a **feedback loop** after every **support interaction**. Additionally, improve **network reliability**, **issue resolution**, and **product usability**.

#### **9.** **Churn by Services**

* **Customers who did not use value-added services** like **Online Security (84.6%)**, **Device Protection (71.9%)**, **Premium Support (83.5%)**, and **Online Backup (71.9%)** showed **significantly higher churn**.
* To **reduce churn** among customers **not using value-added services**, providers should **promote awareness**, **bundle key services into plans**, **personalize recommendations**, and clearly **communicate the benefits and protection** these services offer.

# **Summary**

Based on the churn analysis, key reasons for **customer churn** include **poor support experience**, **better offers from competitors**, **service dissatisfaction**, **high pricing**, and **underutilization of value-added services**. To reduce churn, the company should **enhance customer service training**, offer **competitive and customizable plans**, **improve network reliability**, **simplify pricing**, and **promote value-added services** like **Online Security** and **Device Protection**. Additionally, encouraging **long-term contracts** and targeting **high-churn regions** with **focused improvements** can significantly improve **customer retention**.