Power BI Customer Churn Analysis Report

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1. Introduction & Telecommunication Overview

1.1 PURPOSE OF THE REPORT

This report analyzes customer churn in a telecommunications company using data from 7,032 customers. The goal is to identify churn patterns, provide actionable insights, and recommend strategies to improve customer retention.

1.2 WHAT IS TELECOMMUNICATION?

Telecommunication is the electronic transmission of information over distances, enabling voice, data, and internet services for individuals and businesses.

1.3 WHY CUSTOMER CHURN MATTERS

Churn affects revenue and growth. Understanding why customers leave helps improve service, satisfaction, and loyalty.

1.4 COMMON REASONS FOR CUSTOMER CHURN

- High monthly charges
- Poor customer support
- Service reliability issues
- Competitor offers
- Complicated billing or payments

2. Dataset Overview

2.1 SOURCE OF DATA

The dataset contains customer information for a telecommunications company, with 7,032 records representing individual customers. It includes customer info, service, and subscription-related details.

2.2 DATASET STRUCTURE

- Rows: 7,032 customers
- Columns: 21 attributes (mix of numeric and categorical)

THE DATASET INCLUDES THE FOLLOWING COLUMNS:

- **Customer Info:** customerID, gender, SeniorCitizen, Partner, Dependents
- **Services:** PhoneService, MultipleLines, InternetService, OnlineSecurity, OnlineBackup, DeviceProtection, TechSupport, StreamingTV, StreamingMovies
- **Billing & Subscription:** Contract, PaperlessBilling, PaymentMethod, MonthlyCharges, TotalCharges, tenure, Churn

2.3 KEY OBSERVATIONS

- The dataset includes demographic and service-related details suitable for churn analysis.
- Churn is the target variable, and all other columns act as features influencing customer retention.
- Columns like MonthlyCharges and tenure help identify customer behavior patterns.

3. Data Preparation & Cleaning

This phase prepared the dataset for analysis in Power BI, including loading, cleaning, creating new columns, and defining DAX measures.

3.1 DATA LOADING

The dataset of 7,032 customers with 21 columns was loaded into Power BI, with all data types already correct.

3.2 DATA CLEANING

THE FOLLOWING CLEANING STEPS WERE PERFORMED TO ENSURE DATA QUALITY:

- **Removed Duplicates:** Duplicates in the *MonthlyCharges* column were removed for accurate calculations.
- **Checked Missing Values:** Dataset was reviewed, no missing or inconsistent values were found.
- **Verified Categorical Fields:** Columns like *gender, contract, payment method, and churn were correctly stored as text*.

3.3 DATA TRANSFORMATION

CREATED NEW COLUMNS TO SUPPORT ANALYSIS:

- Tenure Group: Added readable labels for tenure ranges in charts.
- Tenure Group Sort: Ensures correct order of tenure groups in visuals.

3.4 DAX MEASURES CREATED

1. MEASURE NAME: TOTAL CUSTOMERS

- Usage: Counts all customers in the dataset. Provides the total customer base for analysis.

    FORMULA

    Total Customers = COUNTROWS('Telco_Customer_Churn')

2. MEASURE NAME: CHURNED CUSTOMERS

- Usage: Counts customers who have churned. Helps measure customer loss.

    FORMULA

    Churned Customers =
    CALCULATE(
        COUNTROWS('Telco_Customer_Churn'),
        'Telco_Customer_Churn'[Churn] = "Yes"
)

2. MEASURE NAME: CHURN RATE

- Usage: Calculates the percentage of churned customers. Tracks customer retention and identifies risk levels.

    FORMULA

    Churn Rate =
    DIVIDE(
        CALCULATE(COUNTROWS('Telco_Customer_Churn'),
    'Telco_Customer_Churn'[Churn] = "Yes"),
        COUNTROWS('Telco_Customer_Churn'),
        0
)

3.5 FINAL DATASET PREPARATION

- Cleaned, transformed, and validated dataset ready for visualization.
- Ensured all measures, columns, and data types were correct for accurate and reliable analysis in Power BI.

4. Data Modeling

4.1 RELATIONSHIPS

The dataset uses a single-table model, so no relationships were required.

4.2 OPTIMIZATION

Optimization included verifying correct data types and creating only necessary calculated columns and DAX measures.

5. Visualizations & Insights

5.1 KEY METRICS (KPIS)

5.1.1 CARDS – TOTAL CUSTOMERS, CHURNED CUSTOMERS, CHURN RATE

- Total Customers – **7,032**
- Churned Customers – **1,869**
- Churn Rate – **26.6%**

INSIGHTS

7,032 customers in total, with 1,869 churned (26.6%). Retention strategies are needed to reduce churn.

5.1.2 DONUT CHART – CUSTOMER BY CHURN

Customer Base:
- Churned Customers: 1,869 (26.6%)
- Active Customers: 5,163 (73.4%)

INSIGHTS

Over 1 in 4 customers are leaving. Reducing churn should be a priority to support growth.

5.2 CUSTOMER PROFILE ANALYSIS

5.2.1 STACKED BAR CHART – CUSTOMER BY GENDER

Male Customers
- Count: 3,549
- Churn Rate: 26.2%

Female Customers
- Count: 3,483
- Churn Rate: 26.9%

INSIGHTS

The churn rates for both male and female customers are similar. Retention strategies should target both genders to effectively reduce overall churn.

5.2.2 DONUT CHART – CUSTOMERS BY SENIOR CITIZENSHIP

Non-Senior Customers
- Count: 5,890
- Churn Rate: 23.6%

Senior Customers
- Count: 1,142
- Churn Rate: 41.7%

INSIGHTS

Seniors, though fewer in number, have a much higher churn rate. Retention strategies should prioritize seniors, while marketing efforts can address both groups.

5.2.3 STACKED BAR CHART – CUSTOMER BY DEPENDENTS

Non-Dependent Customers
- Count: 4,933
- Churn Rate: 31.3%

Dependent Customers
- Count: 2,099
- Churn Rate: 15.5%

INSIGHTS

Non-dependent customers have a higher churn rate, indicating retention efforts should prioritize them to reduce overall churn.

Partner Customers
- Count: 3,393
- Churn Rate: 19.7%

Non-Partner Customers
- Count: 3,639
- Churn Rate: 33.5%

INSIGHTS

Non-partner customers have a higher churn rate, so retention strategies should prioritize them while keeping partner customers engaged to support growth.

5.3 TENURE & CHURN ANALYSIS

5.3.1 CLUSTERED COLUMN CHART – CUSTOMER BY TENURE GROUP

Tenure (Months)	Customer Count	Churn Rate (%)
1–12	2 175	47.7
13–24	1 024	28.7
25–36	832	21.6
37–48	762	19.0
49–60	832	14.4
61–72	1407	6.6

INSIGHTS

Customers in the early tenure (1–36 months) are at highest risk of leaving, so retention strategies should focus on these groups to reduce churn and improve loyalty.

5.3.2 CLUSTERED BAR CHART – AVERAGE OF TENURE BY CHURN

Average Tenure
- Active Customers: 37.65 months
- Churned Customers: 17.98 months

INSIGHTS

Longer-tenure customers are more likely to stay, while newer customers are at higher risk of churn.

5.3.3 CLUSTERED BAR CHART – CUSTOMERS BY TENURE GROUP AND CHURN

Tenure Group and Churn
- New Customers (0–12 months): Highest churn, especially those using Electronic Check or Fiber Optic.
- Long-Term Customers (61–72 months): Very low churn, commonly use DSL or Automatic Payments.

INSIGHTS

Longer-tenure customers are more likely to stay, while newer customers are at higher risk of churn.

5.4 FINANCIAL & SERVICE ANALYSIS

5.4.1 CLUSTERED COLUMN CHART – AVERAGE MONTHLY CHARGES BY CHURN

Average Monthly Charges
- Churned Customers: 74.4
- Active Customers: 61.31

INSIGHTS

Higher-paying customers are more likely to leave, while lower-paying ones tend to stay.

5.4.2 CLUSTERED BAR CHART – CHURN BY INTERNET SERVICE

Internet Service	Active Customers	Churn Rate (%)
Fiber Optic	3 096	41.9
DSL	2 416	19.0
No Service	1 520	7.4

INSIGHTS

Even though many customers use fiber optic, new or less experienced users are leaving more, likely due to lack of understanding or early difficulties with the service.

5.4.3 STACKED BAR CHART – CHURN BY PAYMENT METHOD

Payment Method	Active Customers	Churn Rate (%)
Electronic Check	2 365	45.3
Bank Transfer Automatic	1 542	16.7
Credit Card Automatic	1 521	15.3
Mailed Check	1 604	19.2

INSIGHTS

Most customers use Electronic Check, but it has the highest churn (45.3%).Automatic payments (bank transfer, credit card) show much lower churn, meaning customers stay longer.

6. Key Findings and Recommendations

OVERALL CHURN LEVEL

- Finding: Total churn rate is 26.6%, indicating a high customer loss.
- Recommendation: Implement strong retention strategies to reduce churn and stabilize customer base.

GENDER-BASED CHURN

- Finding: Male and female customers have similar churn rates.
- Recommendation: Retention strategies should focus on behaviours and service experience rather than gender differences.

SENIOR CITIZENS

- Finding: Seniors show a significantly higher churn rate than non-seniors.
- Recommendation: Introduce senior-friendly support, simpler processes, and dedicated customer assistance.

DEPENDENTS & NON-DEPENDENTS

- Finding: Customers without dependents churn more than those with dependents.
- Recommendation: Provide more personalized communication and engagement to customers living alone or without dependents.

PARTNER STATUS

- Finding: Non-partner customers have a higher churn rate compared to partner customers.
- Recommendation: Focus retention efforts on non-partner customers while maintaining engagement with partnered customers.

CUSTOMER TENURE

- Finding: Early-tenure customers (1–36 months) are the most likely to leave.
- Recommendation: Strengthen onboarding, provide early support, and conduct check-ins during the first service year.

MONTHLY CHARGES

- Finding: Higher-paying customers churn more, while lower-paying customers tend to stay.
- Recommendation: Improve service satisfaction for high-paying customers through loyalty perks, bill flexibility, and better value.

FIBER OPTIC SERVICE

- Finding: Fiber optic is popular, but new fiber users churn early, likely due to setup issues or lack of understanding.
- Recommendation: Offer fiber-specific tutorials, customer education, and faster issue resolution.

PAYMENT METHODS

- Finding: Electronic Check users have the highest churn (45.3%), whereas automatic payments have low churn.
- Recommendation: Encourage customers to adopt automated payment methods using incentives or simplified enrollment.

7. Conclusion

This analysis shows that customer churn is a serious issue, with 26.6% of customers leaving the service. Some groups leave more than others, such as seniors, people without dependents or partners, new customers, high-paying users, fiber-optic users, and customers who use electronic check payments.

To reduce churn, the company should support new customers better, give more value to high-paying customers, help fiber-optic users understand the service, and encourage customers to use automatic payment methods. These steps will help keep more customers, reduce losses, and support the company's growth.