Telecom Churn Analysis

Project Type: End-to-End Data Analytics Project
Tools Used: Excel (Power Query), SQL (MySQL), Power BI
Focus Areas: ETL, EDA, Customer Churn Profiling, Dashboarding, and Actionable Recommendations
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1. Objective

In today's highly competitive business landscape, customer retention is crucial. This project aims to analyze customer churn in a telecom company and uncover the **drivers of churn**. The outcome of this project is a **data-driven dashboard** and strategic recommendations to reduce churn and improve retention.

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2. Project Goals

- Build a complete ETL pipeline for customer churn data.
- Visualize and analyse the data across:
    - Demographics
    - Geography
    - Services and Accounts
    - Payments and Contracts
- Identify churn patterns and high-risk customers.
- Quantify **revenue lost** and **customer segments at risk**.
- Provide actionable insights and recommendations.

🧹 Step 1: Data Collection & Cleaning (Excel - Power Query)

- Cleaned raw data in Excel using **Power Query**.
- Handled missing values:
    - Replaced nulls in categorical columns with "Not defined".
    - Marked churn_category and churn_reason as "Not applicable" for non-churned customers.
- Standardized data types.
- Performed initial exploration using PivotTables (e.g., churn distribution by gender, contract type).

🔍 Step 2: Data Exploration (SQL)

Database Setup

```
CREATE DATABASE customer_churn;

USE customer_churn;
```

-- Created and imported the dataset as `churn` table.

🔶 **Key SQL Explorations:**

- **Churn by Gender**:

SELECT gender, COUNT(*) FROM churn WHERE customer_status = 'Churned' GROUP BY gender;

- **Churn by Contract Type**:
    - Month-to-Month contracts → highest churn (46.5%)
- **Average Monthly Charges (Churned)**: ₹73.1
- **Churn by Tenure**:
    - Majority churned after ≥24 months
- **Churn by Payment Method**:
    - Mailed Check: 37.8%
    - Bank Withdrawal: 34.4%
- **Revenue Lost**: ₹3.41 million

🔶 **SQL Views Created**

- churned_stayed_cus
- joined_cus

These help speed up queries for churners vs. loyal customers.

📊 **Step 3: Dashboard Development (Power BI)**

🔗 **Data Transformation in Power BI**

- Created DAX columns:
    - Churn Status: 1 if churned, 0 otherwise
    - Age Group, Tenure Group, Monthly Charge Range
- Created Measures:

DAX

Total Customers = COUNT(Customer_ID)

Total Churn = SUM(Churn Status)

Churn Rate = [Total Churn] / [Total Customers]

Lost Revenue = SUM(total_revenue where customer_status="Churned")

- **Unpivoted service columns** for service-wise churn analysis.

📈 **Step 4: Power BI Visuals**

🎯 **KPI Cards**

- Total Customers: **6,418**

- Total Churned: **1,732**
- Churn Rate: **27%**
- New Joiners: **411**

Demographic Insights

- **Churn by Gender**:
  - Female: 64.1%
  - Male: 35.8%
- **Age 51+** segment → highest churn rate (31.6%)

Geographic Insights

- Top churn states:
  1. **Jammu and Kashmir** – 59%
  2. **Assam**
  3. **Jharkhand**

Account & Payment

- **Month-to-Month** → highest churn rate (46.5%)
- **Mailed Check** & **Bank Withdrawal** → highest churned payment methods

Service Analysis

- Customers using **streaming services** or **internet bundles** have higher churn rates.

Revenue Impact

- **Lost Revenue**: ₹3.41 million
- **Retained Revenue**: Visualized by gauge chart
- **Top 5 loyal customers** table with highest contribution to total revenue

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Key Insights

1. **27% churn rate**, indicating major retention issues.
2. **Senior citizens (51+) churn the most**.
3. **Month-to-Month contracts** are risk-heavy; lock-in contracts fare better.
4. **Females churn more than males**, especially in married category.
5. **Tenure** affects churn: highest at ≥24 months and 6–12 months.
6. **Payment via Mailed Check** is linked to the highest churn.
7. **Streaming services** + poor customer support = churn catalyst.
8. **Churn due to competition** is the top reason.
9. **States with lowest churn**:

- **Uttarakhand** – 20.0%
- **Maharashtra** – 21.6%
- **Madhya Pradesh** – 22.4%

10. Customers using **Fiber Optic internet** show the highest churn at **49.5%**, followed by **Cable** at **29.2%**. **DSL users** have the lowest churn at **2.3%**.
11. Streaming services usage also correlates with churn, especially among Fiber Optic users.
12. Users with **streaming services (TV, Music)** tend to **stay longer**, whereas those without these services churn more—suggesting bundled entertainment services contribute to customer retention.
13. Customers who had subscribed to **Internet services, phone service, unlimited data, and paperless billing** were **more likely to churn** compared to those who did not subscribe to these services.
    On the contrary, customers **not subscribed to value-added services** such as:

- **Online Backup**
- **Online Security**
- **Premium Support**
- **Streaming Music**
- **Streaming TV**
- **Device Protection Plan**

showed a **notably higher churn rate**, indicating that **lack of service bundling or perceived value** may be contributing to attrition.

💡 **Strategic Recommendations**

1. **Strengthen Long-Term Contracts**
    - Incentivize customers to shift from **Month-to-Month** to **Annual/Two-Year contracts** through discounts, loyalty points, or bundled services.
    - Consider automatic renewal benefits with opt-out features to reduce accidental churn.
2. **Optimize Retention for High-Risk Demographics**
    - Launch targeted campaigns for **senior citizens (51+)** and **females**, such as simplified support, personalized offers, and emotional branding.
    - For **high-churn states** (e.g., J&K, Assam), consider regional campaigns, localized pricing, or service quality improvements.
3. **Improve Payment Experience**
    - Encourage digital payment methods (credit/debit cards, UPI) through cashback or exclusive offers, reducing churn seen with **mailed checks and bank withdrawals**.
4. **Proactive Churn Risk Identification**
    - Flag users with:
        - **Tenure >24 months**
        - **High monthly charges (>₹70)**
        - **Fiber Optic plans without streaming bundle**
    - Introduce personalized retention offers before contract expiry or at service anniversaries.
5. **Competitive Benchmarking & Pricing Optimization**

- Analyze competitors' pricing and service bundles to mitigate churn due to competitor influence.
- Use customer feedback from churned users to refine pricing tiers and plan features.

6. **Enhanced Customer Support for Dissatisfied Segments**
    - Implement sentiment analysis tools to detect dissatisfaction early.
    - Introduce dedicated relationship managers or chatbots for high-revenue or long-tenure customers.
7. **Track and Improve Service Reliability**
    - Investigate and address service quality concerns among Fiber Optic users.
    - Consider bundling value-added services like streaming with data plans to increase stickiness.
    - Promote subscriptions to **Online Security**, **Premium Support**, and **Backup Services** through discounts or trial periods. Customers without these services are more likely to churn.