User Requirements Document: Telecom Customer Churn Analysis Dashboard

Objective

To build a complete end-to-end telecom customer churn analysis solution that extracts, transforms, and loads (ETL) customer data into a database, applies machine learning models to predict churn, and visualizes insights using Power BI for informed business decision-making.

Problems Identified

The business is struggling to understand:
- Why customers are churning.
- Which customer profiles are more likely to churn.
- How to design targeted retention campaigns.
- How to leverage historical data to predict future churners.

There is currently:
- No centralized data pipeline.
- Limited visibility into churn drivers.
- No predictive capabilities.
- Fragmented data sources and manual analysis.

Target Audience

- Primary – Head of Customer Retention
- Secondary – Marketing Team, Business Analysts, Data Science Team

Use Cases

1. Analyze Customer Data Across Key Segments

User Story:
As the Head of Retention, I want to view customer data segmented by demographic, geographic, account, and service-related details, so that I can understand usage and risk patterns.

Acceptance Criteria:

- - Dashboard should visualize customers by:
    - Age, Gender (Demographic)

- Location, Region (State)
- Monthly charges, contract type, payment method (Payment & Account Info)
- Services subscribed (phone, internet, tech support, streaming, etc.)
- Filters should be provided for interactive analysis.

2. Profile Churners to Identify Key Risk Factors

User Story:
As a Marketing Analyst, I want to understand the typical profile of customers who churn so that I can design targeted retention campaigns.

Acceptance Criteria:

- - Dashboard shows churners vs. non-churners by key attributes.
  - Identify top factors correlated with churn.
  - Display churn rate across different customer groups.

3. Predict Future Churners Using Machine Learning

User Story:
As a Data Scientist, I want to build and deploy a machine learning model to predict churn so that the business can proactively retain at-risk customers.

Acceptance Criteria:

- - A predictive churn model using classification techniques is created.
  - Model outputs probability of churn for each customer.
  - Results are visualized in the dashboard.
  - Metrics such as Accuracy, Recall and F1 Score are presented.

Success Criteria

The stakeholders can:
- Understand customer base through demographic and behavioral insights.
- Identify at-risk customer segments.
- Visualize real-time churn metrics.
- Act on ML-driven predictions to reduce churn rate.
- Use insights to shape retention campaigns and improve ROI.

Metrics Required

- Total Customers
- Total Churners
- Churn Rate
- New Joiners
- Monthly Revenue (optional)

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- Churn by Contract Type, Payment Method, Service Type, Region

Information Needed

- Customer ID
- Gender, Age, Region, Tenure
- Contract Type, Monthly Charges, Payment Method
- Services subscribed (Internet, Phone, Streaming, etc.)
- Churn Label (Yes/No)

Data Quality Checks

- Row count check
- Null value check
- Data type check
- Unique key check (CustomerID)

Additional Requirements

- End-to-end ETL process documented (SQL scripts, transformations).
- Power BI dashboard published and shareable via workspace or embedded link.
- Machine learning code version-controlled in GitHub (e.g., logistic regression, decision tree, etc.).
- ML pipeline documented for reproducibility and scalability.
- Option to refresh Power BI data daily or weekly.