Executive Summary

End-to-end analytics workflow: Python (data prep) → Tableau (decision dashboards)

Business Context

- Customer churn is a critical challenge for telecom operators, impacting recurring revenue, customer lifetime value (CLTV), and long-term profitability.

- This project identifies churn patterns, quantifies revenue at risk, and prioritizes retention actions through an interpretable BI workflow.

- The solution is designed as a Business Intelligence system (not a black-box model), emphasizing executive usability and decision support.

Analytical Architecture

- Raw Customer Data → Python Analytics → Tableau Dashboards → Retention Insights

- Python is used for data ingestion, validation, and feature engineering to ensure reproducibility.

- Tableau is used for KPI monitoring, segmentation, and interactive exploration for stakeholders.

Dashboard Suite Overview

Four dashboards in a single Tableau workbook/story for end-to-end decision support.

- Executive Overview — KPI tiles, churn rate, revenue at risk, churn by contract/tenure/CLTV segment, and risk bucket distribution.

- Churn Drivers & Segmentation — churn reasons (churned customers only), operational drivers (billing/support), and revenue exposure by risk bucket.

- Geo & Demographics — churn rate by city (map), plus churn by gender, senior status, and household composition.

- Risk & Retention Strategy — risk concentration, revenue-at-risk prioritization, and a retention panel translating insights into actions.

How to Use These Dashboards

- Start at Executive Overview to understand churn magnitude and financial exposure (churn rate + revenue at risk).

- Use the right-side filters sparingly: Contract, Internet Service, Risk Bucket (and optionally Tenure Group for lifecycle checks).

- Move to Churn Drivers to diagnose *why* churn happens: churn reasons are captured only for churned customers; interpret them accordingly.

- Use Geo & Demographics to locate concentrations (where) and vulnerable profiles (who).

- Finish with Risk & Retention Strategy to prioritize: focus on segments where risk and revenue overlap (e.g., High Risk + High CLTV).

Interpretation tip: churn rate is calculated as AVG(ChurnFlag); customer counts use COUNTD(CustomerID) to avoid duplicates.

Design Philosophy

- Interpretability First: outputs are human-readable segments, not opaque model scores.

- Separation of Concerns: Python builds the analytic dataset; Tableau focuses on visualization and slicing.

- Action-Oriented: every visual supports a retention decision (who, why, where, and what action).

Risk Framework

- This project uses an existing "Churn Score" to segment customers into actionable risk buckets.

- RiskBucket definitions:

- • High Risk: churn score $\geq$ 70

- • Medium Risk: churn score 40–69

- • Low Risk: churn score < 40

- This provides predictive flavor without requiring additional modeling.

Key Finding 1 — Churn Propensity

Full customer base

- Churn rates are highest among senior customers and customers without partners.

- Early-lifecycle customers (tenure 0–6 months) show elevated churn risk, suggesting onboarding-related issues.

- Geographic patterns indicate churn is concentrated in specific urban regions (captured in the Geo & Demographics dashboard).

Key Finding 2 — Churn Drivers

Churned customers only

- Service dissatisfaction and lack of technical support are the most frequent reported churn reasons.

- Operational drivers (contract type, support availability, billing behavior) explain churn more strongly than demographics once churn occurs.

- Important distinction:

- • Demographic churn rates use the full customer population.

- • Churn reasons are populated only for churned customers.

Key Finding 3 — Revenue Concentration

- A relatively small High Risk segment accounts for a disproportionate share of revenue at risk.

- High-risk customers without technical support represent the most financially impactful retention opportunity.

- Focusing on revenue at risk (not churn rate alone) materially changes prioritization decisions.

Retention Recommendations

Target retention actions where churn risk and financial impact intersect.

- **High Risk + Month-to-month Contract**
  → Incentivize conversion to longer-term contracts (discounts or bundles).

- **High Risk + No Tech Support**
  → Proactive technical outreach + bundled support to reduce service friction.

- **High Risk + Senior Customer**
  → Simplified support processes, proactive check-ins, senior-friendly communication.

- **High CLTV + High Risk**
  → Priority retention strategy with personalized offers and dedicated support.

Business Value

- Moves beyond descriptive churn metrics to risk- and revenue-aware prioritization.

- Highlights which customers matter most from a financial perspective (High CLTV + High Risk).

- Enables leaders to focus retention budgets where ROI is highest.

- Immediately usable by non-technical stakeholders through four executive-ready dashboards.

Next Steps

- Predictive churn modeling and uplift analysis for more precise targeting.

- Campaign tracking to measure retention effectiveness over time.

- Automated monitoring and alerting pipelines for churn early warning.

Closing Statement

- This project demonstrates a production-minded BI analytics workflow: reproducible Python-based prep, interpretable segmentation, and executive-ready Tableau dashboards.

- It reflects the responsibilities and decision-making mindset expected of an Applied Data Scientist / BI Analyst in a real enterprise environment.