

Data Science Case Study: From Data Audit to Decision Insights

Nationwide telecom subscriber dataset (20k rows, 30 features) progressed through audit, quality checks, EDA, statistical testing, clustering, and retention scoring to inform executive decisions.

Executive Summary

- Analysed 20,000 subscribers with an overall churn rate of 25.4% and average monthly revenue of \$ 30.33.
- Mobile app adoption at 77.6% cuts churn from 33.7% to 23.0%.
- High-support customers churn 34.2% vs 24.7% for low-touch peers.
- K-means identifies a 19% Premium Data cluster driving \$ 70.17 future spend.
- Propensity scoring surfaces the riskiest 25.0% of accounts for concierge retention pilots.

Key Insights

Retention & Experience

- ? App-less customers churn 10.7 pts more; digital adoption remains the single strongest lever.
- ? Support-heavy cohorts carry ~1.39x churn odds, validating concierge outreach.
- ? 5.5k high-risk accounts combine support load and low app usage?prime targets for the retention pilot.

Revenue & Usage

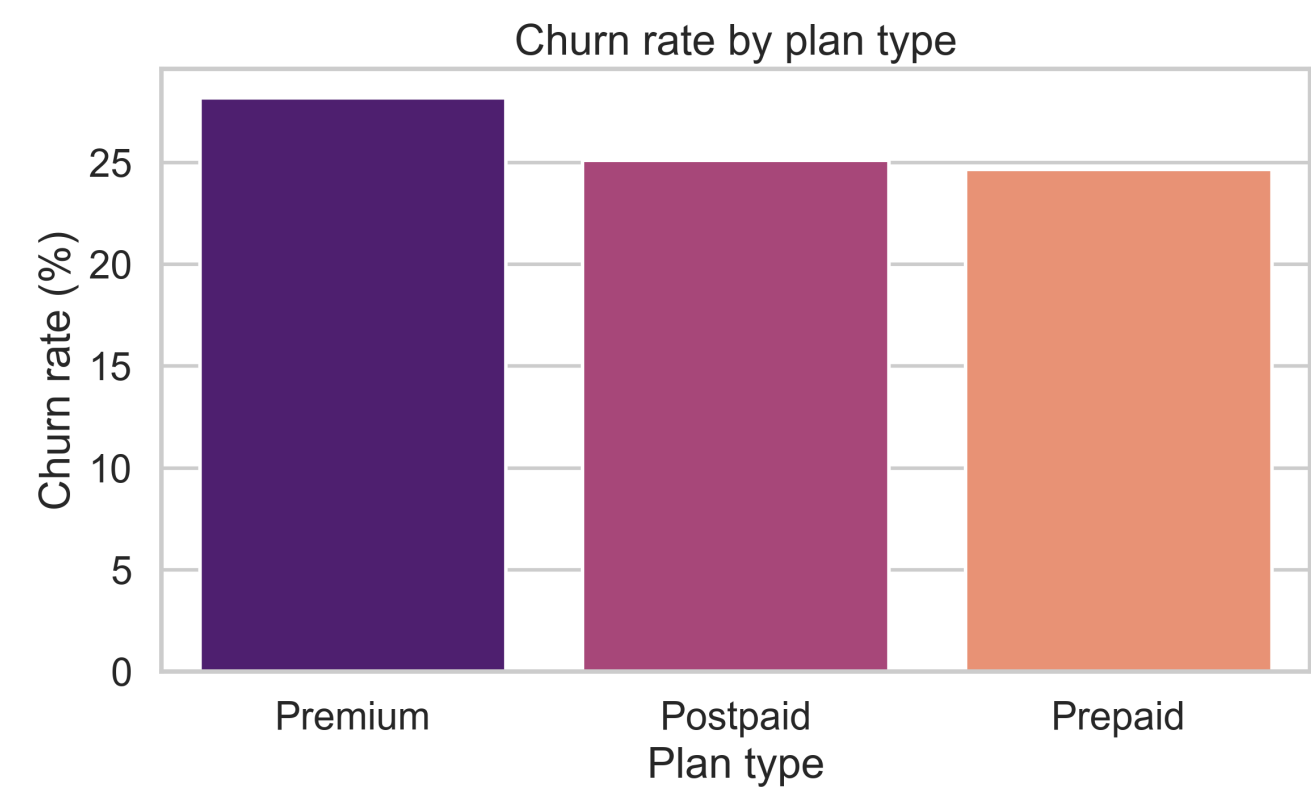
- ? Premium Data Power Users (Cluster 0) spend \$ 70.17 monthly with highest charges and engagement.
- ? Value Seekers (Cluster 2) mirror low-spend users but generate more tickets?bundle upgrades plus app education improve margin.

Geography & Trends

- ? Matabeleland North and Manicaland exhibit the steepest churn pockets needing localised retention squads.
- ? Mid-2025 churn spikes coincide with spend dips, reinforcing proactive monitoring via the dashboard filters.

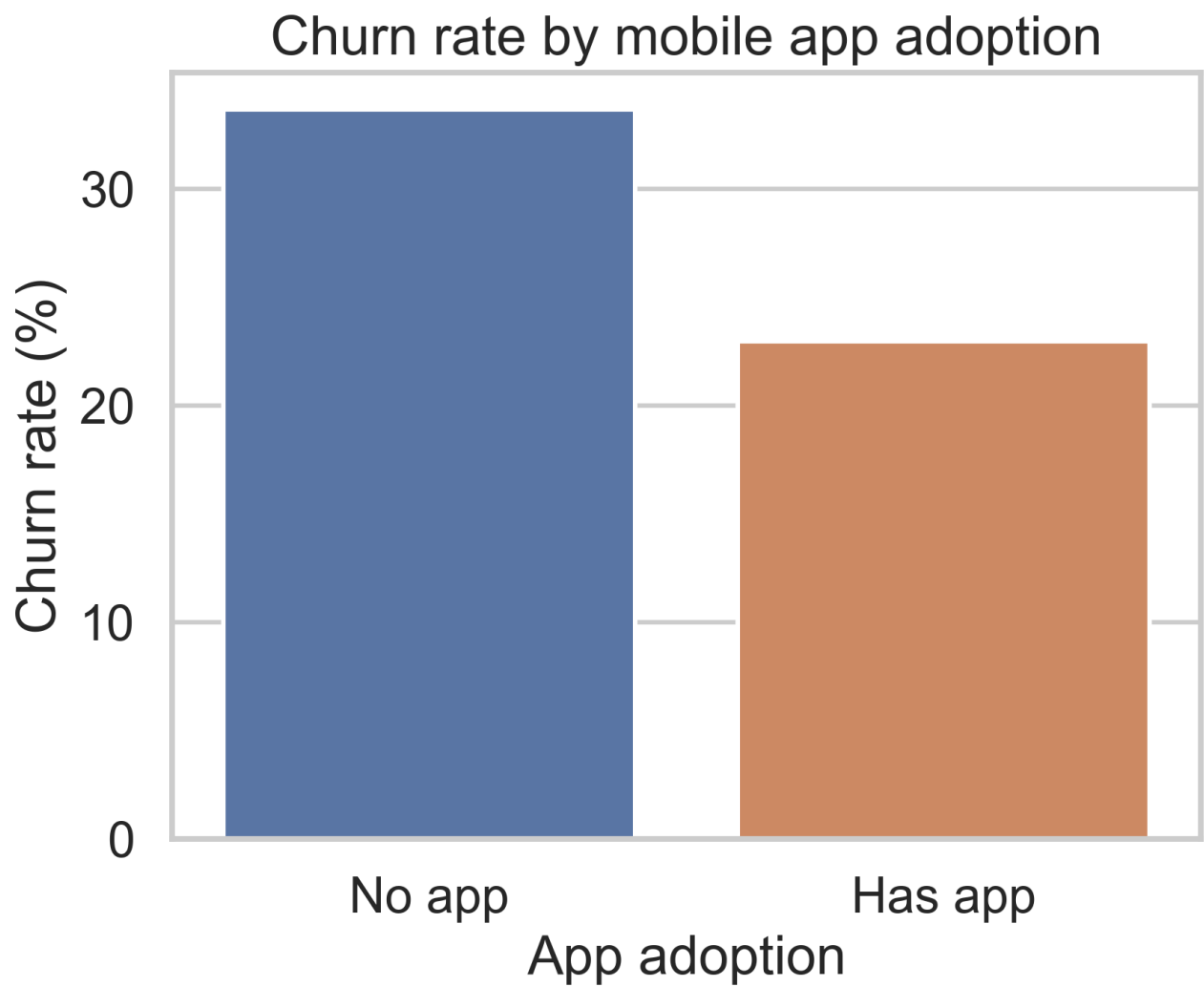
Visual Evidence

Churn by Plan Tier



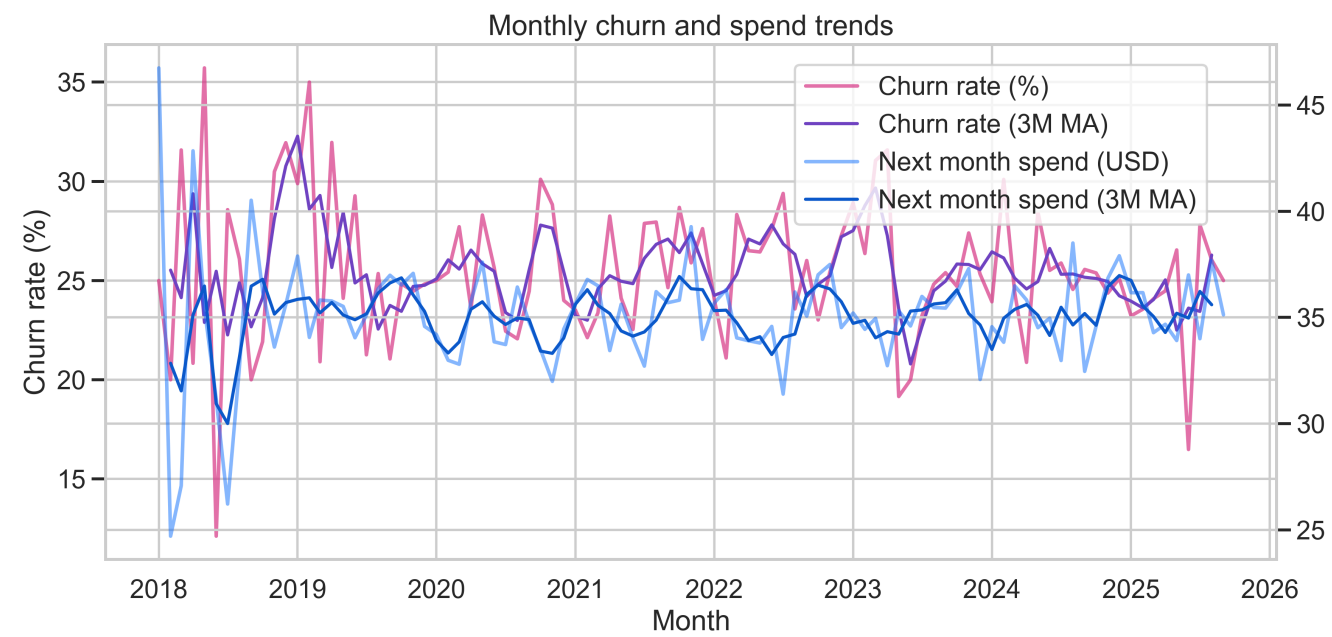
Visual Evidence

Churn Reduction from App Adoption



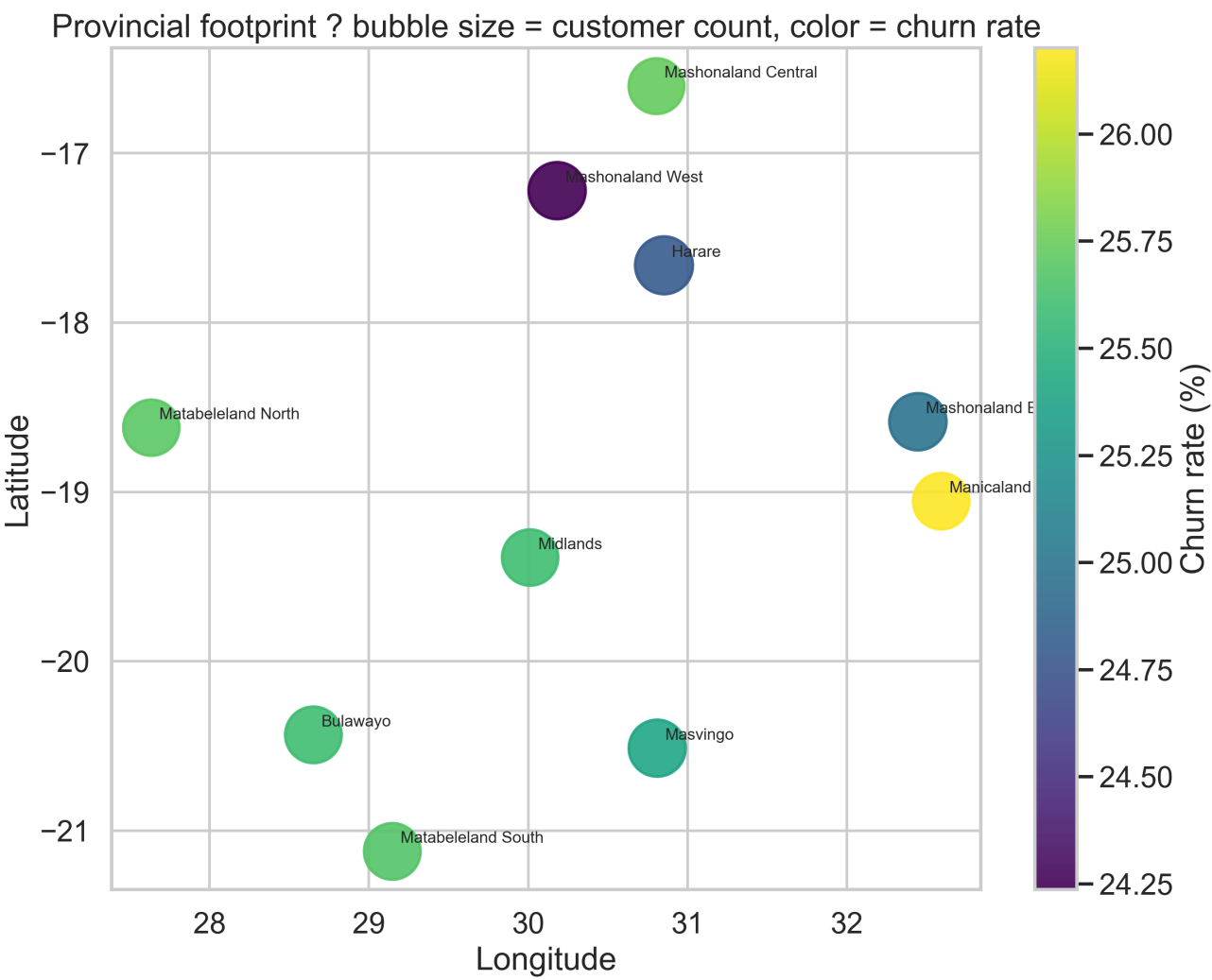
Visual Evidence

Monthly Churn & Spend Trend



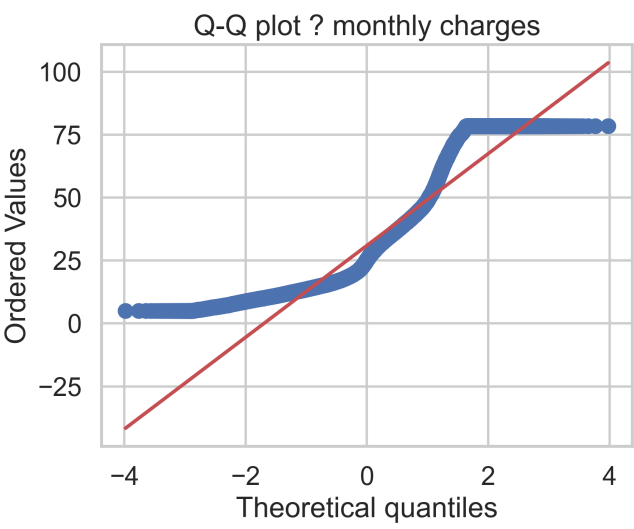
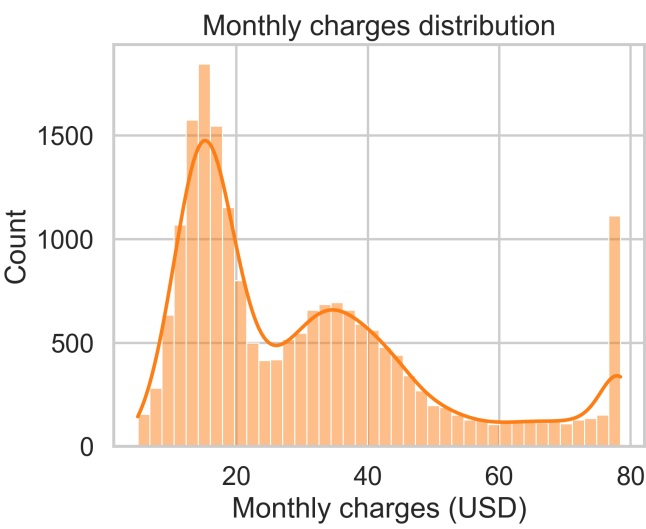
Visual Evidence

Provincial Churn Hotspots



Visual Evidence

Monthly Charges Distribution



Recommendations

- Launch the 4-week concierge retention pilot targeting 5,557 high-risk accounts with segment-specific treatments.
- Bundle loyalty perks for Premium Data Power Users to protect \$70+ monthly spend while deepening digital engagement.
- Scale mobile app adoption incentives for the 22% of the base still offline, tied to data/top-up rewards.
- Automate support ticket velocity alerts to intervene before churn spikes.
- Embed the interactive dashboard into weekly revenue-ops cadences to track churn and spend jointly.

Limitations & Next Steps

- Single snapshot data?seasonality and campaign impacts require longitudinal validation.
- Logistic propensity model offers +0.02 AUC lift; explore gradient boosting and survival analysis for stronger ranking.
- Support taxonomy lacks qualitative root causes?integrate ticket text analytics next.
- Pricing sensitivity not modelled; incorporate spend-to-income ratio into elasticity testing.