TELECOM CUSTOMER CHURN ANALYSIS

Analyzing key factors driving customer churn and retention in a telecom business

An Analytical Study by Ishita Mishra

OBJECTIVE

To analyze telecom customer data to identify patterns and factors that drive churn, and to provide actionable insights that help improve customer retention, optimize contracts, and enhance overall business performance using SQL and Power BI.

PROBLEM STATEMENT

Telecom companies face significant revenue loss due to customer churn, especially among short-term contract holders and high-risk segments. The challenge is to understand which customers are likely to churn, why they leave, and how to implement data-driven strategies to increase loyalty and reduce attrition.

TOOLS

Purpose	Tool	Used
Data Storage & Querying	MY SQL	
Data Visualization	Power BI	
Dataset Source	Kaggle	

DATA FLOW

Customer Info

customerID, gender, SeniorCitizen, Partner, Dependents

Service Info

PhoneService, MultipleLines, InternetService, OnlineSecurity, OnlineBackup, DeviceProtection, TechSupport, StreamingTV, StreamingMovies

Contract & Payment

Contract, PaperlessBilling, PaymentMethod

Financial Info

MonthlyCharges, TotalCharges

Churn
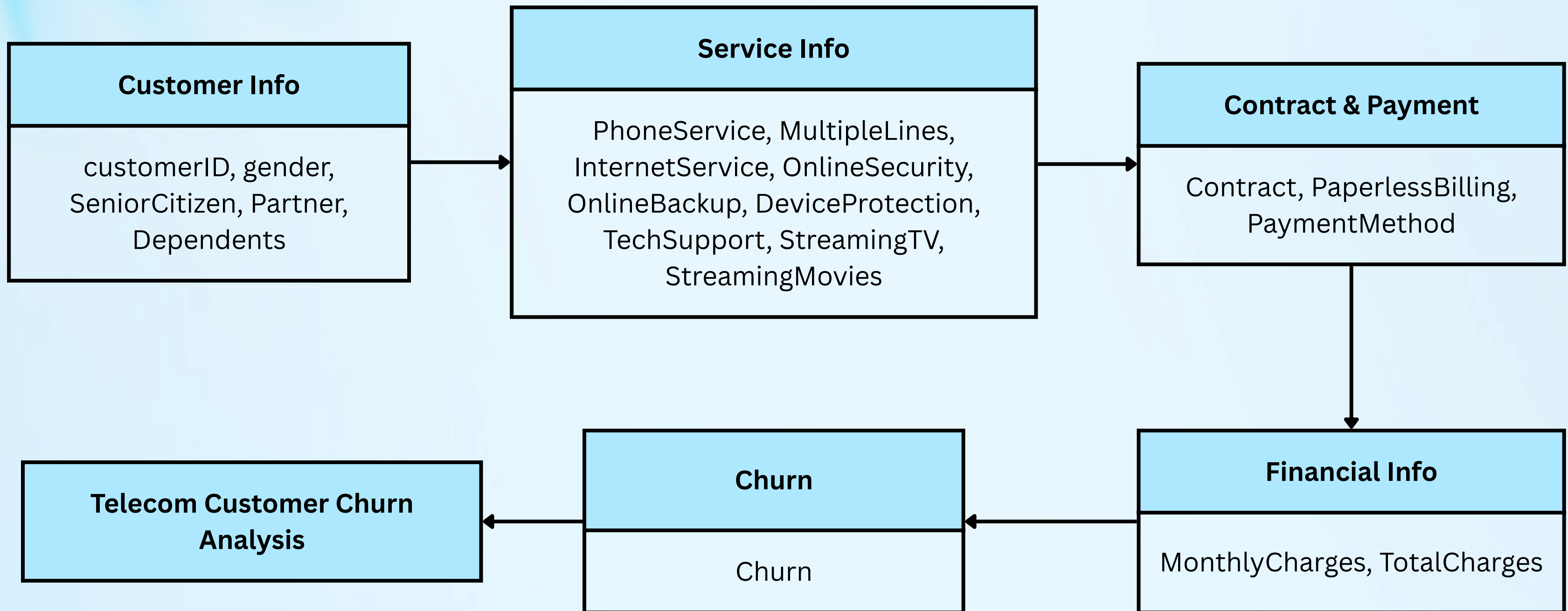
Churn

Telecom Customer Churn Analysis

total_customers	churned_customers
7043	1869

	churn_rate_percent
▶	26.54

	avg_monthly_charge	total_monthly_revenue
▶	64.76	456116.60

- Churn Rate is 26.54%, over 1 in 4 customers are leaving, signaling retention risks.

- Average monthly revenue ₹64.76, total ₹456K, highlighting high-value customers.

- Strengthen loyalty programs, contract incentives, and auto-pay adoption to improve retention.

gender	total_customers	churned	churn_rate_percent
Female	3488	939	26.92
Male	3555	930	26.16

PaymentMethod	churn_rate_percent
Electronic check	45.29
Mailed check	19.11
Bank transfer (automatic)	16.71
Credit card (automatic)	15.24

Contract	total_customers	churned	churn_rate_percent
Month-to-month	3875	1655	42.71
One year	1473	166	11.27
Two year	1695	48	2.83

- Female customers churn rate is 26.92%, indicating slightly over one-fourth of female users leave; gender alone doesn't show a drastic difference in churn.

- Month-to-month contracts have a high churn rate of 42.71%, showing short-term plans are less sticky.

- Customers using Electronic Check have the highest churn (45.29%), suggesting manual payment methods may drive dissatisfaction or friction.

SQL INSIGHTS

InternetService	churn_rate_percent
Fiber optic	41.89
DSL	18.96
No	7.40

tenure_group	total_customers	churned_customers	churn_rate_percent
0–12 months	2186	1037	47.44
13–24 months	1024	294	28.71
25–48 months	1594	325	20.39
49+ months	2239	213	9.51

SeniorCitizen	Partner	Dependents	churn_rate_percent
1	No	No	49.20
1	Yes	No	36.33
0	No	No	31.15
1	No	Yes	25.00
1	Yes	Yes	24.10
0	No	Yes	21.25
0	Yes	No	20.81
0	Yes	Yes	13.75

- Internet Service fiber optic users have the highest churn (41.89%).

- Tenure:
  1. **0–12 months:** 47.44% churn
  2. **13–24 months:** 28.71% churn
  3. **25–48 months:** 20.39% churn
  4. **49+ months:** 9.51% churn
→ Longer tenure reduces churn significantly.

- Customer Profile (Senior, Partner, Dependents):
  1. Highest churn senior, no partner/dependents (49.20%)
  2. Lowest churn, non-senior, with partner/dependents (13.75%)
→ Family presence and non-senior status correlate with lower churn.

SQL INSIGHTS

customerID	TotalCharges	MonthlyCharges	tenure
2889-FPWRM	8684.80	117.80	72
0201-OAMXR	8127.60	115.55	70
3886-CERTZ	8109.80	109.25	72
1444-VVSGW	7968.85	115.65	70
5271-YNWVR	7856.00	113.15	68
8199-ZLLSA	7804.15	118.35	67
9053-JZFKV	7752.30	116.20	67
1555-DJEQW	7723.90	114.20	70
3259-FDWOY	7723.70	106.00	71
7317-GGVPB	7690.90	108.60	71

customerID	MonthlyCharges	Churn
9237-HQITU	70.70	Yes
9305-CDSKC	99.65	Yes
7892-POOKP	104.80	Yes
0280-XJGEX	103.70	Yes
6467-CHFZW	99.35	Yes
6047-YHPVI	69.70	Yes
5380-WJKOV	106.35	Yes
8168-UQWWF	97.85	Yes
7760-OYPDY	80.65	Yes
9420-LOJKX	99.10	Yes

| Contract	churn_rate_percent	avg_tenure	avg_total_charges
Month-to-month	42.71	18.04	1369.25
One year	11.27	42.04	3034.68
Two year	2.83	56.74	3728.93

- Customers with high TotalCharges and long tenure (e.g., 67–72 months) contribute significantly to revenue.

- Many churned users have moderate MonthlyCharges (≈70–106), showing churn is not limited to high-paying customers.

- Contract impact:
1. **Month-to-month:** 42.71% churn, avg tenure 18 months, avg total charges 1369.25
2. **One-year:** 11.27% churn, avg tenure 42 months, avg total charges 3034.68
3. **Two-year:** 2.83% churn, avg tenure 57 months, avg total charges 3728.93
- → Longer contracts lead to lower churn, longer tenure, and higher revenue.

Contract Type Impact on Churn
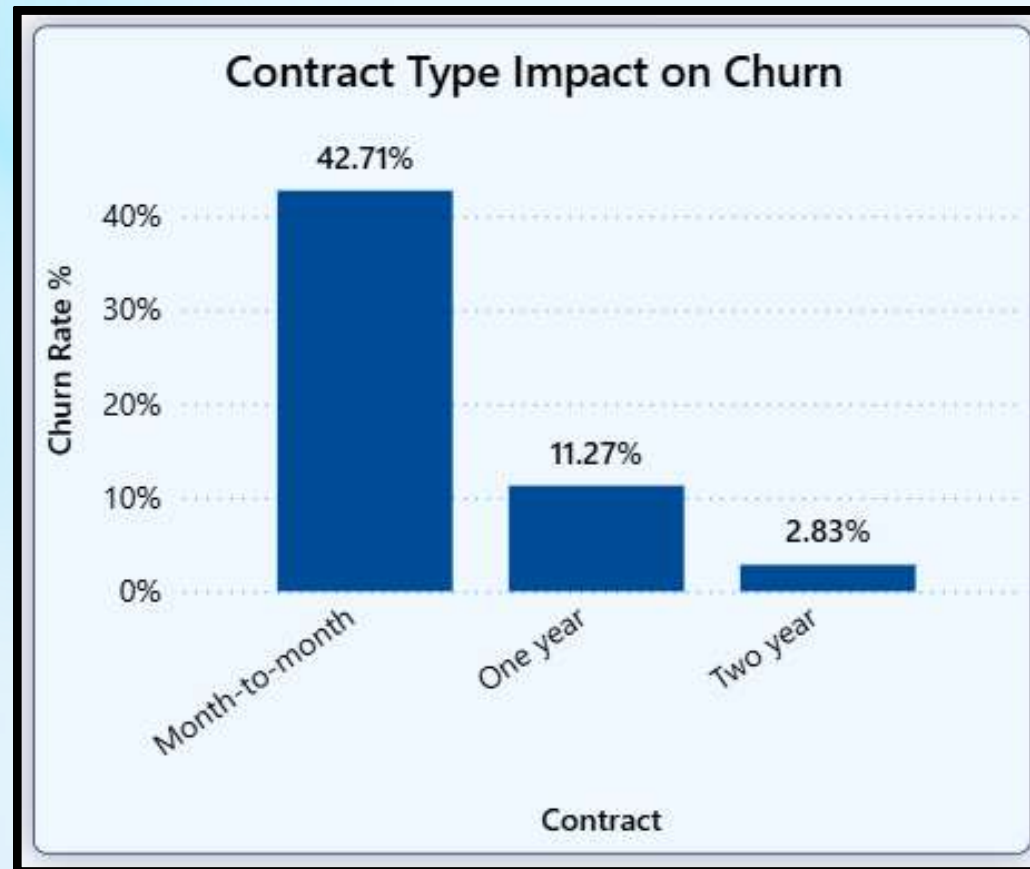
- Month-to-month customers churn the most (42.71%).
- Longer contracts reduce churn; two-year contracts have the lowest (2.83%).
- Longer contracts improve retention — incentives for extended plans help reduce churn.

- Non-senior customers have higher churn (666) than senior customers (476).
- Churn is more common among non-seniors, possibly due to higher expectations or alternatives.
- Senior customers show better retention, likely due to loyalty or lower switching.

Churn Rate: Senior vs Non-Senior Customers

Customer Churn by Gender

3.49K
(49.52%)

Gender
● Male
● Female
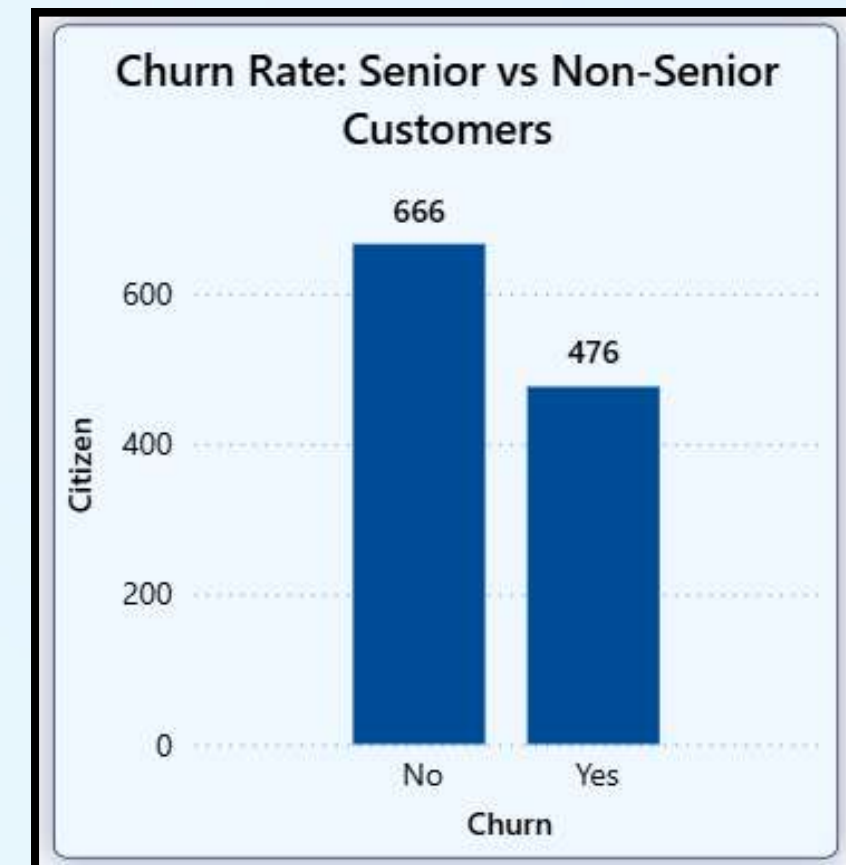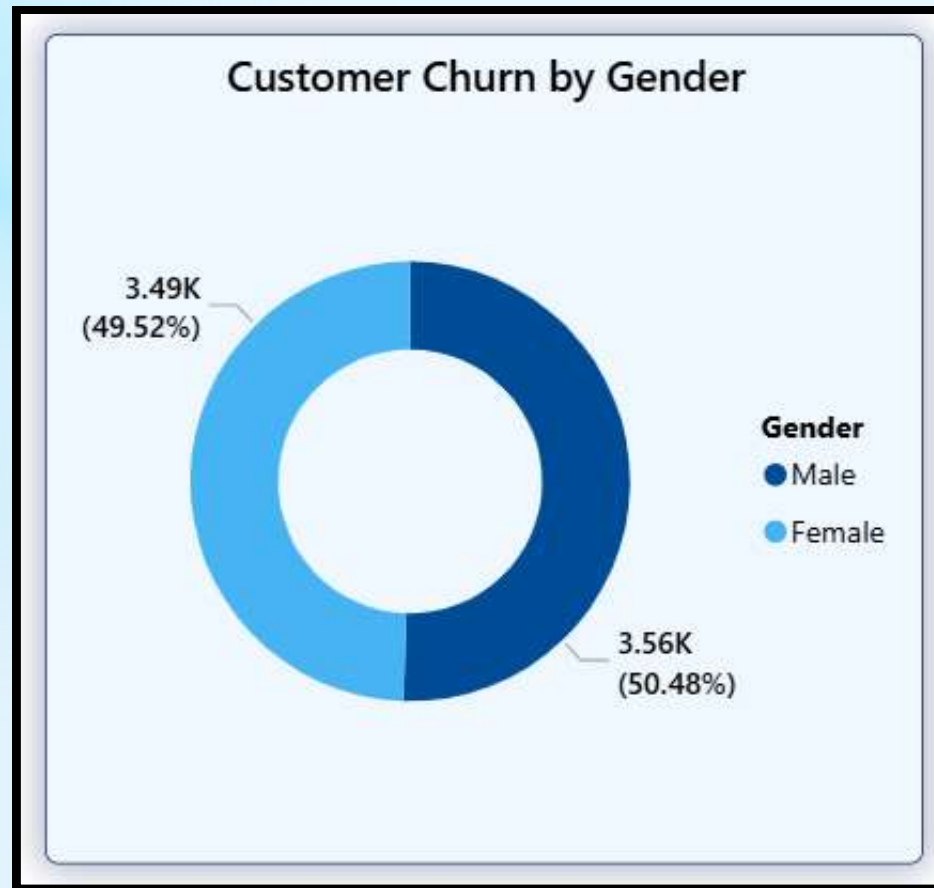
3.56K
(50.48%)

- Female customers 50.48% (3.56K) of churn; males 49.52% (3.49K).
- Churn is nearly equal across genders.
- Retention strategies should focus on service and plans, not gender.

Churn Rate by Customer Tenure

47.44%

28.71%

20.39%

9.51%

40%

20%

0%

Churn Rate %

0–12 Months (New) | 13–24 Months (Early Loyal) | 25–48 Months (Establishe...) | 49+ Months (Long-term Loyal)

Tenure Bucket

- 47.44% of new customers churn within the first year.
- Churn decreases to 28.71% for 13–24 months customers and 9.51% for long-term loyal customers.
- Early engagement and loyalty programs help reduce churn and retain customers.

Churn Rate by Family Status
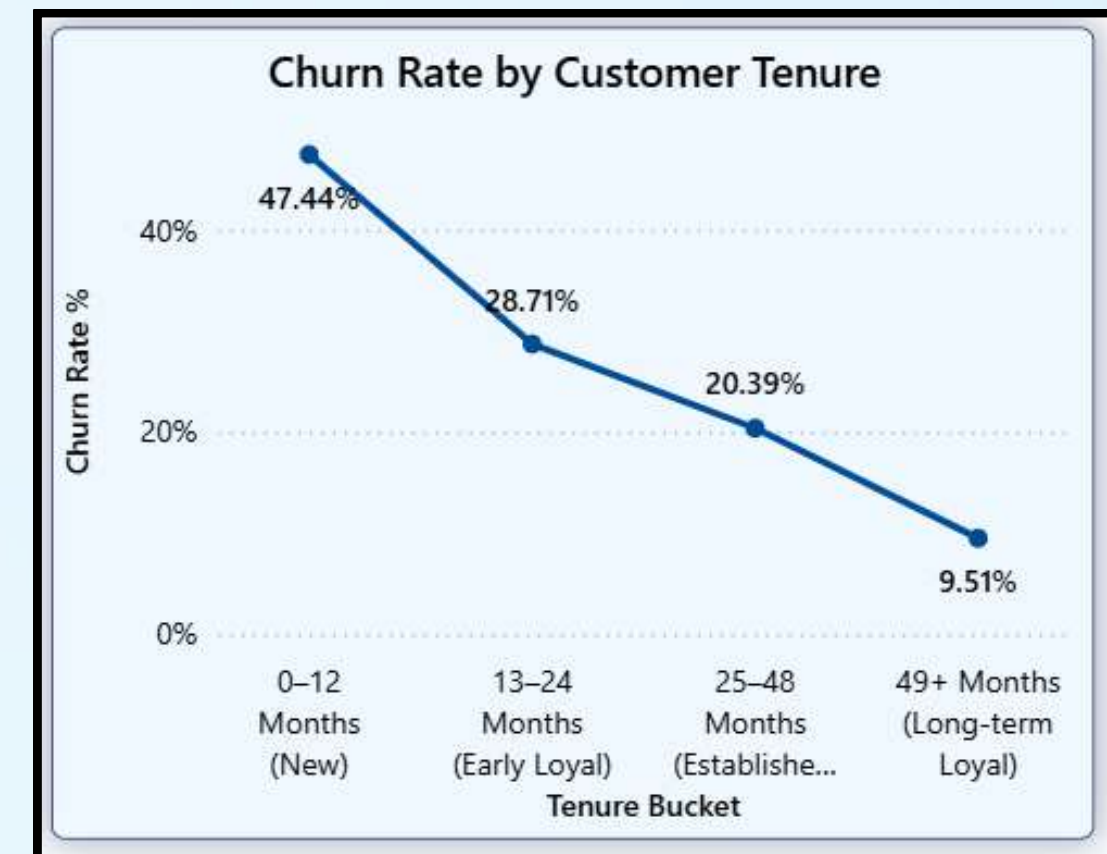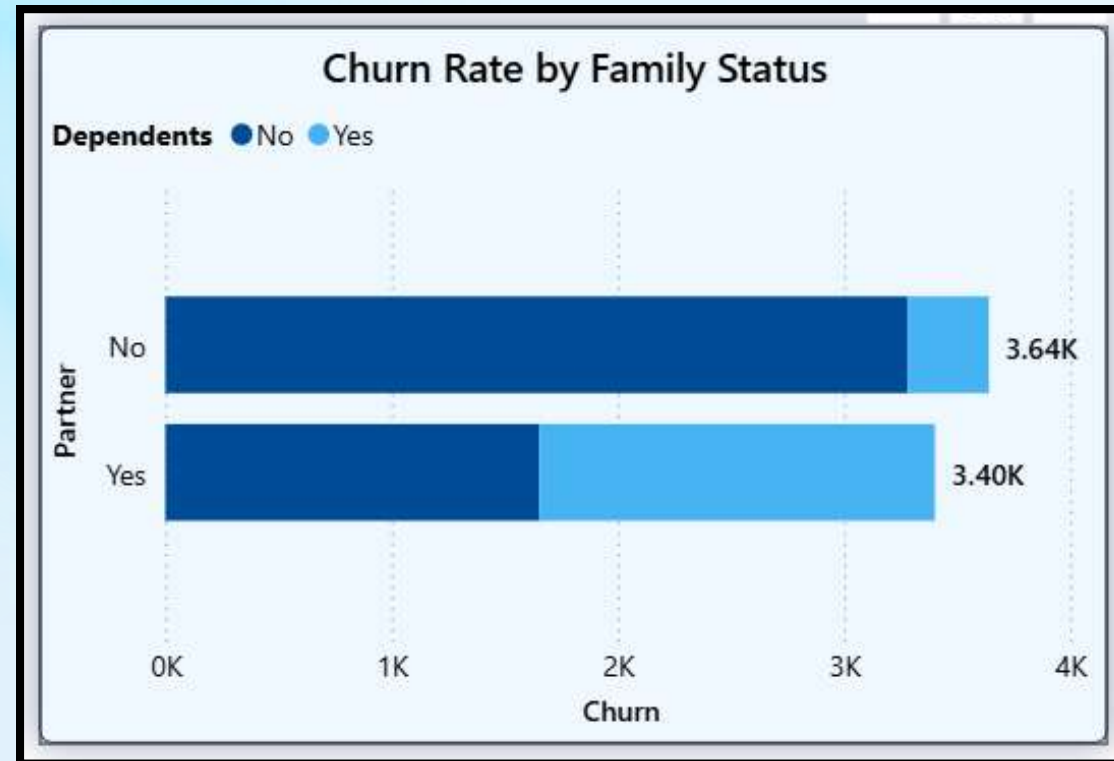
- Customers without partners/dependents churn more (3.64K) than those with family (3.40K).
- Having a partner or dependents is linked to lower churn.
- Offering family/multi-user plans can improve retention among single customers.

Churn Rate by Payment Method

- Electronic Check users have the highest churn (2.4K).
- Mailed Check shows moderate churn (1.6K); Auto Payment (Bank/Credit Card) has lowest churn (1.5K each).
- Encouraging automatic/digital payments can improve retention and convenience.
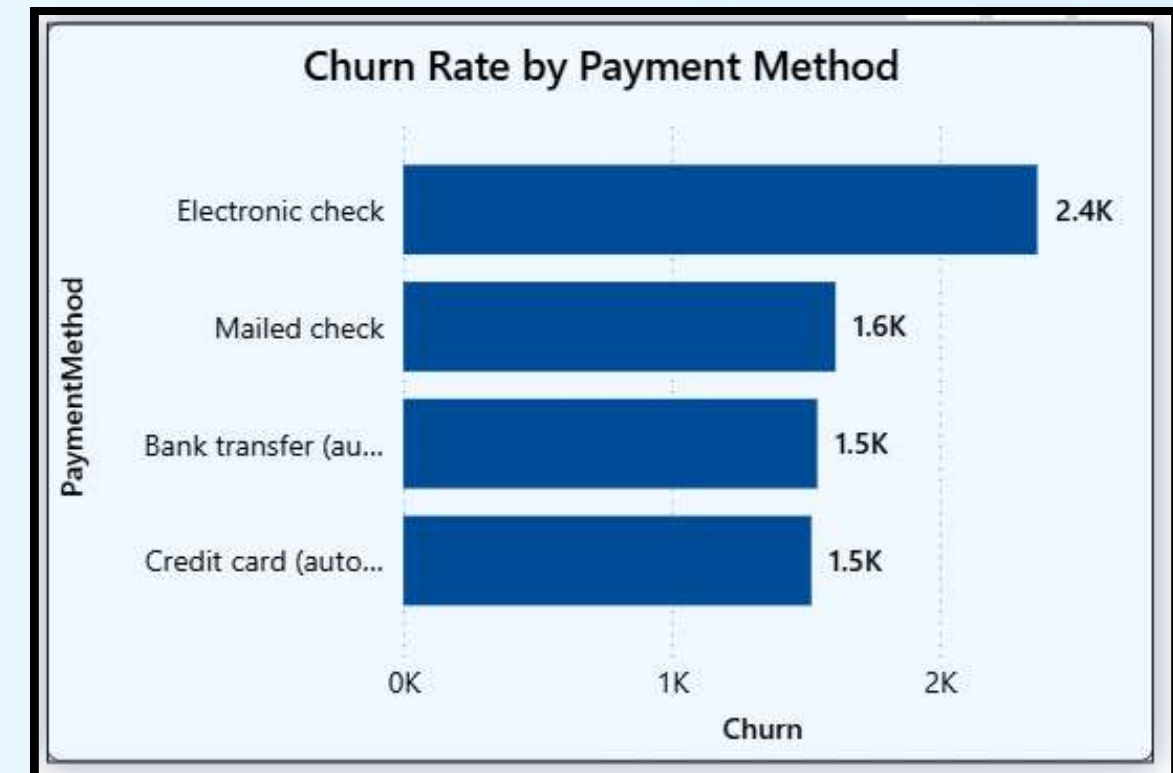
Customer Tenure vs Monthly Charges
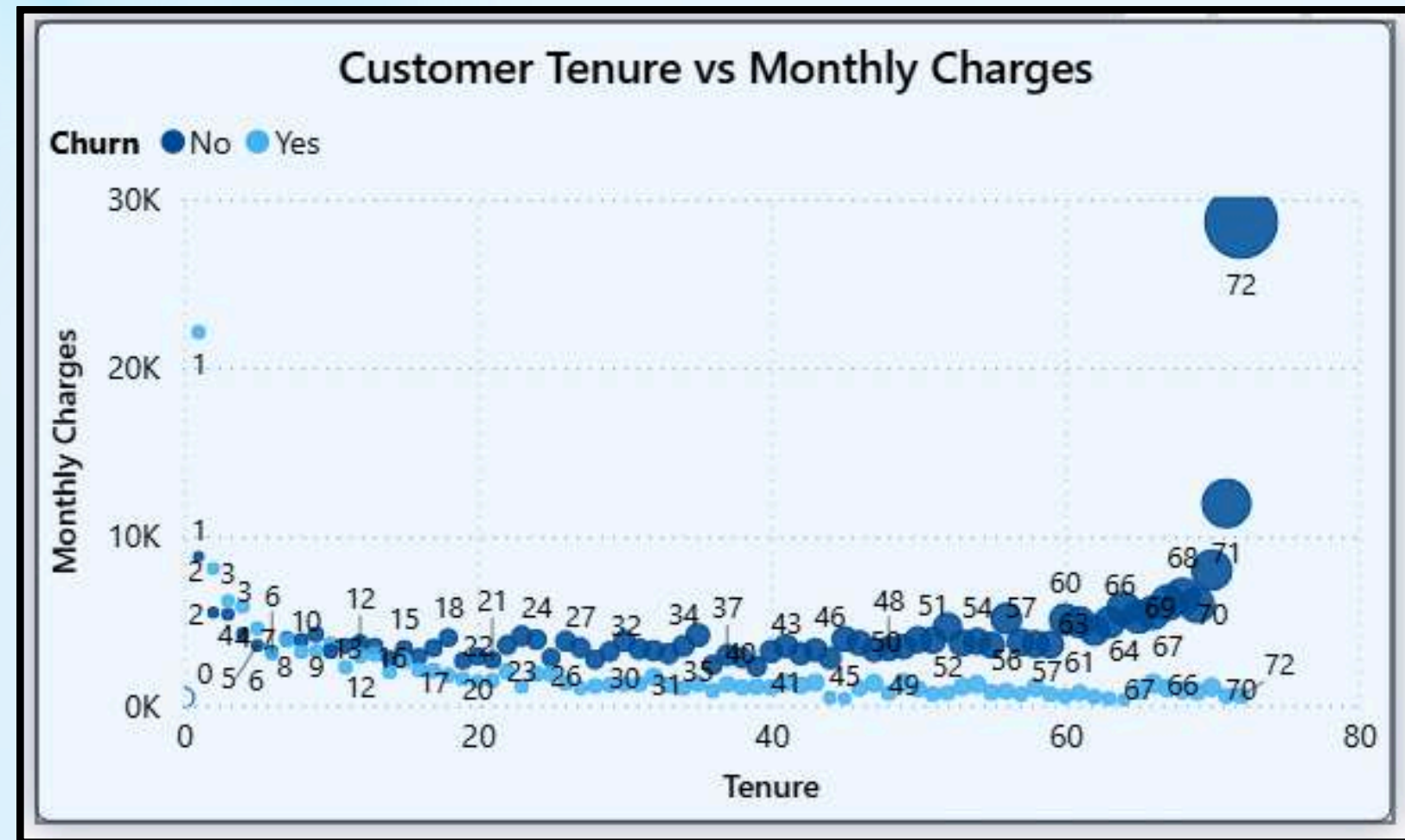
- New customers (under 20 months) with high monthly charges are more likely to churn.
- Loyal customers (60+ months) generally stay even with moderate to high monthly charges, reflecting trust and satisfaction built over time.
- To reduce churn, focus on optimizing initial pricing or offering discounts in early months to improve retention among new high-paying customers.

RECOMMENDATIONS

- **Promote Long-Term Contracts:** Encourage customers to switch from **month-to-month** plans to 1-year or 2-year **contracts to improve retention.**

- **Encourage Auto-Pay Adoption:** Customers paying via **automatic methods (Bank Transfer, Credit Card)** show **lower churn.** Incentivize **auto-pay** to reduce cancellations.

- **Focus on High-Risk Segments:** Target **new customers (0–12 months tenure)** and **high-paying customers** with personalized onboarding and **engagement programs.**

- **Bundle Services for Families:** Customers with **partners or dependents** are more loyal —offer service bundles or family plans to **increase retention.**

- **Monitor Churn Drivers:** Keep track of **Internet service type, payment method, and monthly charges** to proactively address potential churn.

CONCLUSION

- The overall **churn rate is 26.54%**, highlighting that over **1 in 4 customers are leaving** the telecom service.

- **High-risk segments** identified include **month-to-month contracts, electronic check payment users, and new customers (0–12 months tenure).**

- **Revenue impact analysis** shows **high-value customers are at risk**, emphasizing the need for targeted retention strategies.

- As a **Data Analyst, SQL and Power BI** were used to extract **actionable insights**, summarize **KPIs**, and **create a dashboard** that helps **business stakeholders make data-driven decisions.**

THANK YOU