



Telco Customer Churn

Hakam Raves

Problem solver who leverages skillset



Target-oriented, fast learner and competitive team player, shaped by 10 years as a student-athlete with notable achievements and hands on job experience.

Personal Information

raves.hakam@gmail.com

+6282311117335 (Whatsapp)

Jakarta Barat, Indonesia

Education

Bachelor of Computer Science – Pertamina University 2023

Master of Computer Science – Binus University 2026(Expected)

Master of Applied Economy – Padjajaran University 2026(Expected)

Find Me On

linkedin.com/in/hakamraves

github.com/ravssh

Skills

Data Science

Data Analyst

Machine Learning

Data Viz

Business Intelligence

Internet of Things

Econometrics

Tools

Python/R Studio

SQL

Looker Studio

Power BI

Streamlit

Arduino IDE

Microsoft Excel (Pivot Table & Chart,

Data Analysis, Vlookup & Hlookup)

Telco Customer Churn with Data Analyst and Machine Learning

Telecommunication company have **customer** data that contain customer demographic, service subscriptions, contract, payment details and churn status.

	customerID	gender	SeniorCitizen	Partner	Dependents	tenure	PhoneService	MultipleLines	InternetService	OnlineSecurity	OnlineBackup	DeviceProtection	TechSupport	StreamingTV	StreamingMovies	Contract	PaperlessBilling	PaymentMethod	MonthlyCharges	TotalCharges	Churn
0	7590-VHVEG	Female	0	Yes	No	1	No	No phone service	DSL	No	Yes	No	No	No	No	Month-to-month	Yes	Electronic check	29.85	29.85	No
1	5575-GNVDE	Male	0	No	No	34	Yes	No	DSL	Yes	No	Yes	No	No	No	One year	No	Mailed check	56.95	1889.5	No
2	3668-QPYBK	Male	0	No	No	2	Yes	No	DSL	Yes	Yes	No	No	No	No	Month-to-month	Yes	Mailed check	53.85	108.15	Yes
3	7795-CFOCW	Male	0	No	No	45	No	No phone service	DSL	Yes	No	Yes	Yes	No	No	One year	No	Bank transfer (automatic)	42.30	1840.75	No
4	9237-HQITU	Female	0	No	No	2	Yes	No	Fiber optic	No	Yes	No	No	No	No	Month-to-month	Yes	Electronic check	70.70	151.65	Yes
5	9305-CDSKC	Female	0	No	No	8	Yes	Yes	Fiber optic	No	No	Yes	No	Yes	Yes	Month-to-month	Yes	Electronic check	99.65	820.5	Yes
6	1452-KIOVK	Male	0	No	Yes	22	Yes	Yes	Fiber optic	No	Yes	No	No	Yes	No	Month-to-month	Yes	Credit card (automatic)	89.10	1949.4	No
7	6713-OKOMC	Female	0	No	No	10	No	No phone service	DSL	Yes	No	No	No	No	No	Month-to-month	No	Mailed check	29.75	301.9	No
8	7892-POOKP	Female	0	Yes	No	28	Yes	Yes	Fiber optic	No	No	Yes	Yes	Yes	Yes	Month-to-month	Yes	Electronic check	104.80	3046.05	Yes
9	6388-TABGU	Male	0	No	Yes	62	Yes	No	DSL	Yes	Yes	No	No	No	No	One year	No	Bank transfer (automatic)	56.15	3487.95	No
10	9763-GRSKD	Male	0	Yes	Yes	13	Yes	No	DSL	Yes	No	No	No	No	No	Month-to-month	Yes	Mailed check	49.95	587.45	No
11	7469-LKBCI	Male	0	No	No	16	Yes	No	No	No internet service	No internet service	No internet service	No internet service	No internet service	No internet service	Two year	No	Credit card (automatic)	18.95	326.8	No
12	8091-TTVAX	Male	0	Yes	No	58	Yes	Yes	Fiber optic	No	No	Yes	No	Yes	Yes	One year	No	Credit card (automatic)	100.35	5681.1	No
13	0280-XJGEX	Male	0	No	No	49	Yes	Yes	Fiber optic	No	Yes	Yes	No	Yes	Yes	Month-to-month	Yes	Bank transfer (automatic)	103.70	5036.3	Yes
14	5129-JLPIS	Male	0	No	No	25	Yes	No	Fiber optic	Yes	No	Yes	Yes	Yes	Yes	Month-to-month	Yes	Electronic check	105.50	2686.05	No
15	3655-SNQYZ	Female	0	Yes	Yes	69	Yes	Yes	Fiber optic	Yes	Yes	Yes	Yes	Yes	Yes	Two year	No	Credit card (automatic)	113.25	7895.15	No
16	8191-XWSZG	Female	0	No	No	52	Yes	No	No	No internet service	No internet service	No internet service	No internet service	No internet service	No internet service	One year	No	Mailed check	20.65	1022.95	No
17	9959-WOFKT	Male	0	No	Yes	71	Yes	Yes	Fiber optic	Yes	No	Yes	No	Yes	Yes	Two year	No	Bank transfer (automatic)	106.70	7382.25	No
18	4190-MFLUW	Female	0	Yes	Yes	10	Yes	No	DSL	No	No	Yes	Yes	No	No	Month-to-month	No	Credit card (automatic)	55.20	528.35	Yes
19	4183-MYFRB	Female	0	No	No	21	Yes	No	Fiber optic	No	Yes	Yes	No	No	Yes	Month-to-month	Yes	Electronic check	90.05	1862.9	No
20	8779-QRDMV	Male	1	No	No	1	No	No phone service	DSL	No	No	Yes	No	No	Yes	Month-to-month	Yes	Electronic check	39.65	39.65	Yes

I provide in-depth business insight and solve the problem by **analyze** customer data by customer profiling, **predict** churn and strategy to **improve** retention rate.

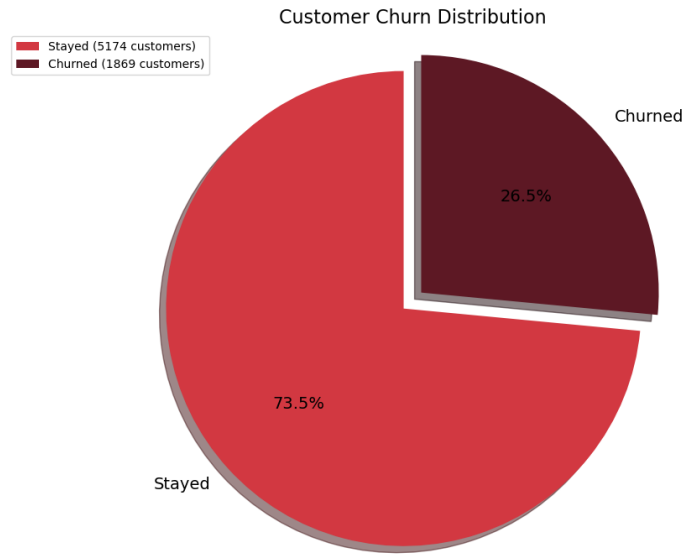
Tools

-Python
-Microsoft Excel

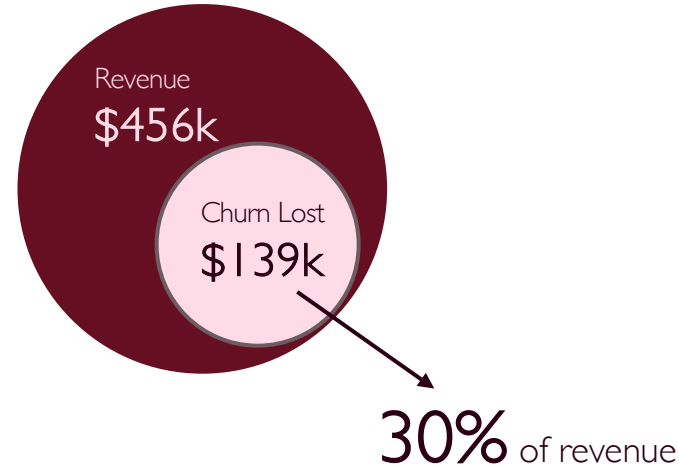
Full project repository

github.com/ravsssh/TelcoCustomer

26% of churned customer represent \$139,000 in monthly charges lost



While retain **73.5%** of customers, the remaining churn presents a room for improvement.



Each churned customer on avg a loss of approx **\$74/month**

Churn -> Dissatisfaction or unmet needs. This can lead the company vulnerable to competitors who might offer better **service, pricing, or features**.

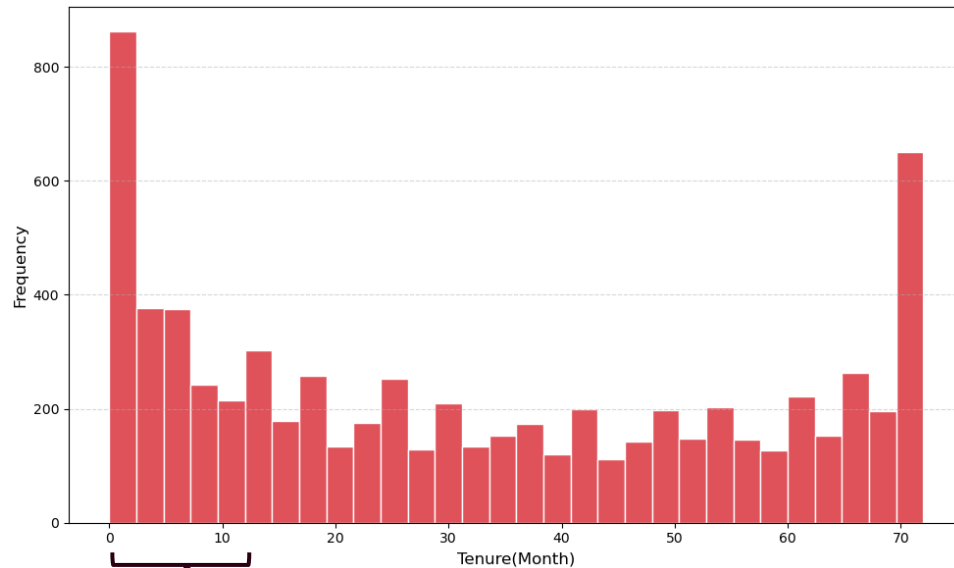
Problem Statement

- Reducing churn protects **30% monthly revenue** and strength **market share**
- Understanding customer churn **factor** and **retention** strategy
- Realtime churn prediction to overcome churn customer

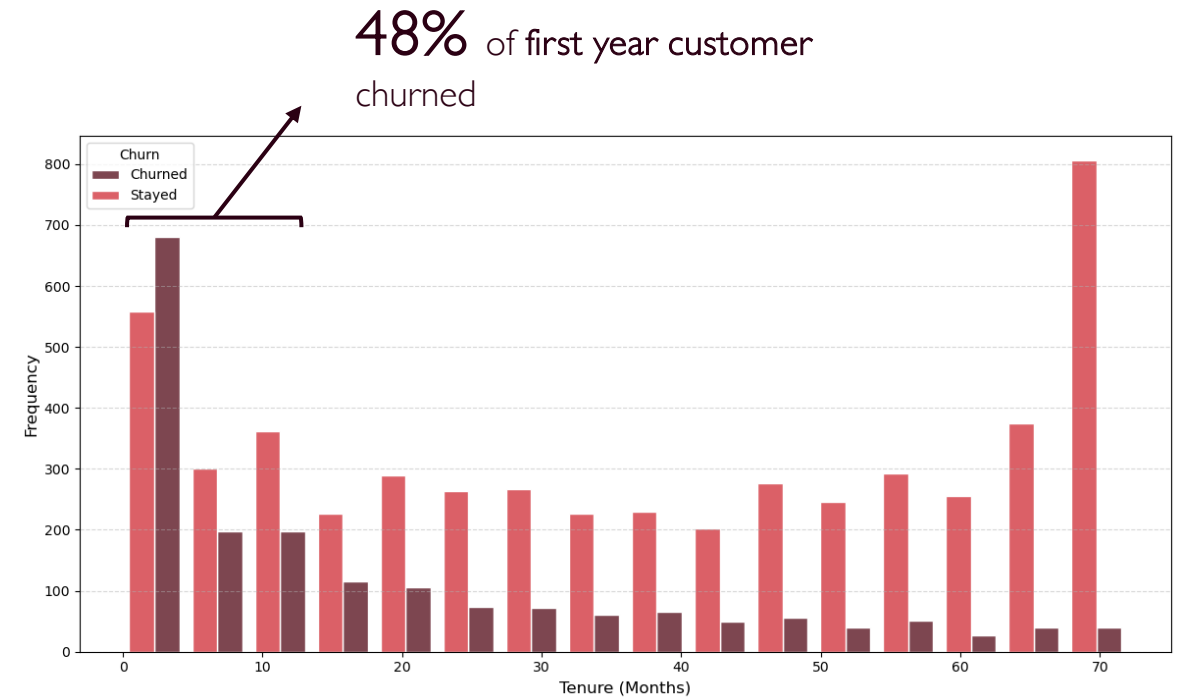


Strategic Pillar	Objective Goal
Customer Profiling	Insights why customers churn and stay
Churn Prediction	Predict customer churn and Risk Level
Action to customer	Reduce churn rate

New and loyal customer is the majority, which new customer tend to churn and loyal customer tend to stay



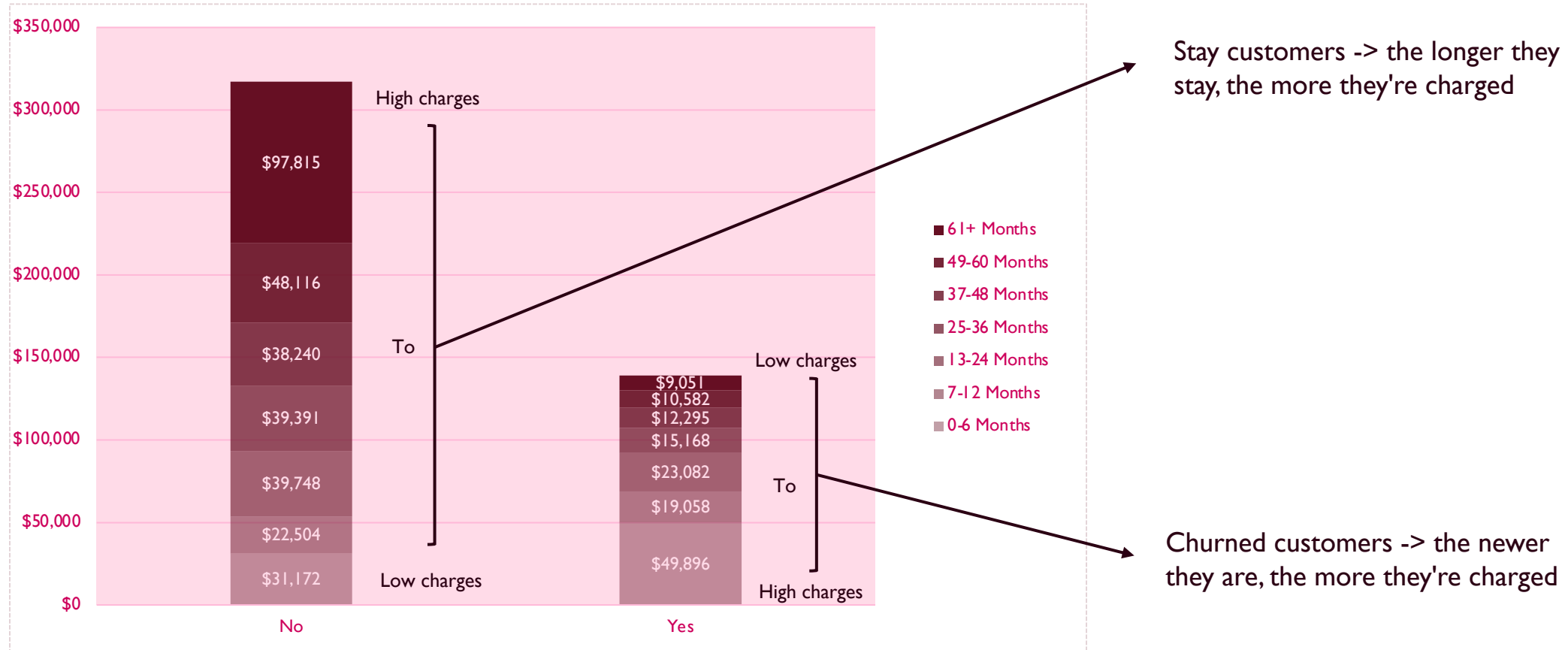
29% is first year customer



Key Insights

- Target **first month customer experience** and **bonus for loyal customer**
- New customer tend to churn and loyal customer tend to stay

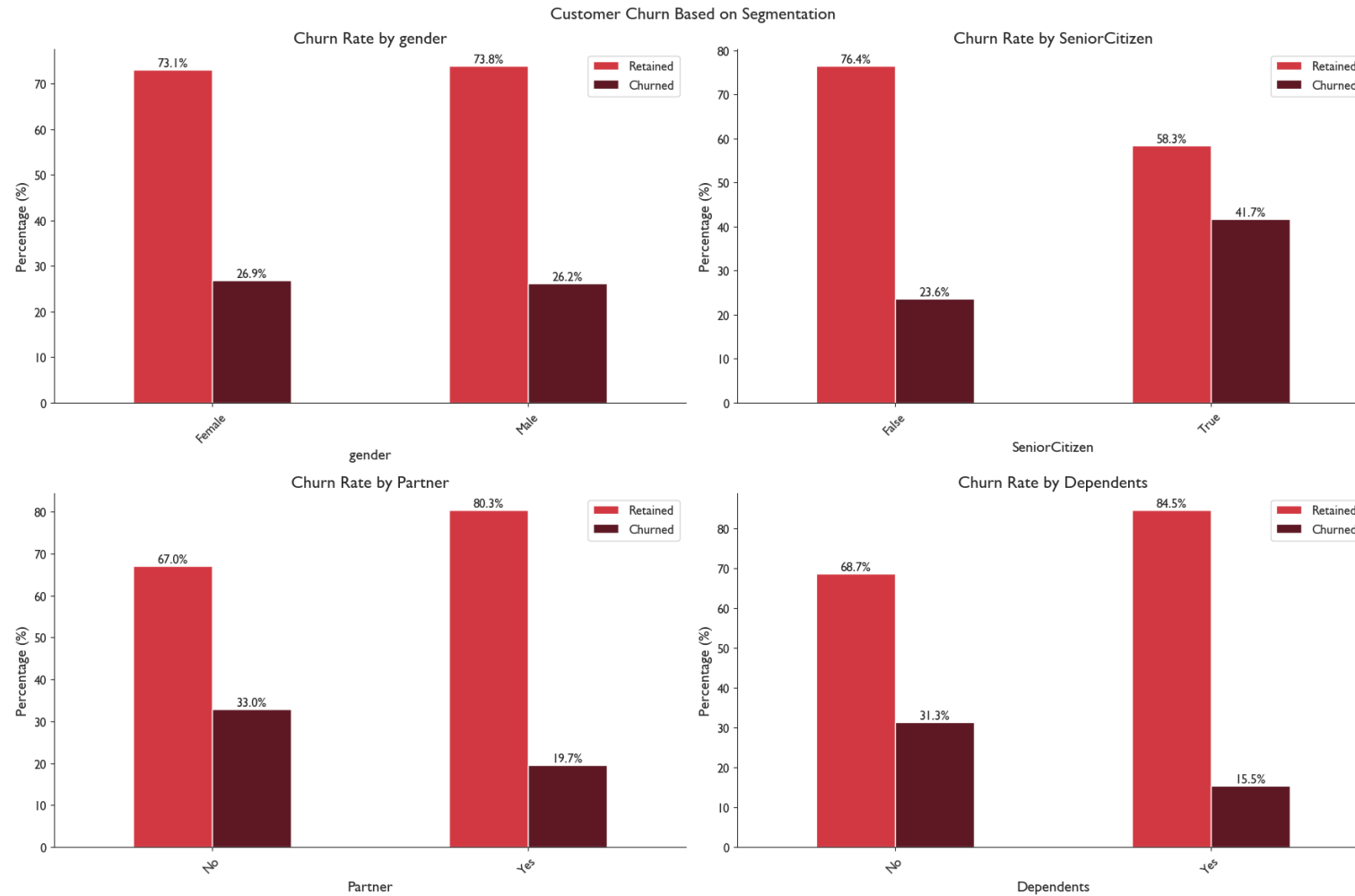
Pricing tolerance develops with tenure and relationship, New customers pay more when they leave



Key Insights

- Total churned monthly revenue originates from newest customers (0-6 months) for nearly **36% (\$49,896)** of all lost monthly charges
- Stayed customer monthly charges low to high by tenure but churned customer vice versa
- New customers leave when overcharged while loyal customer stay despite higher prices

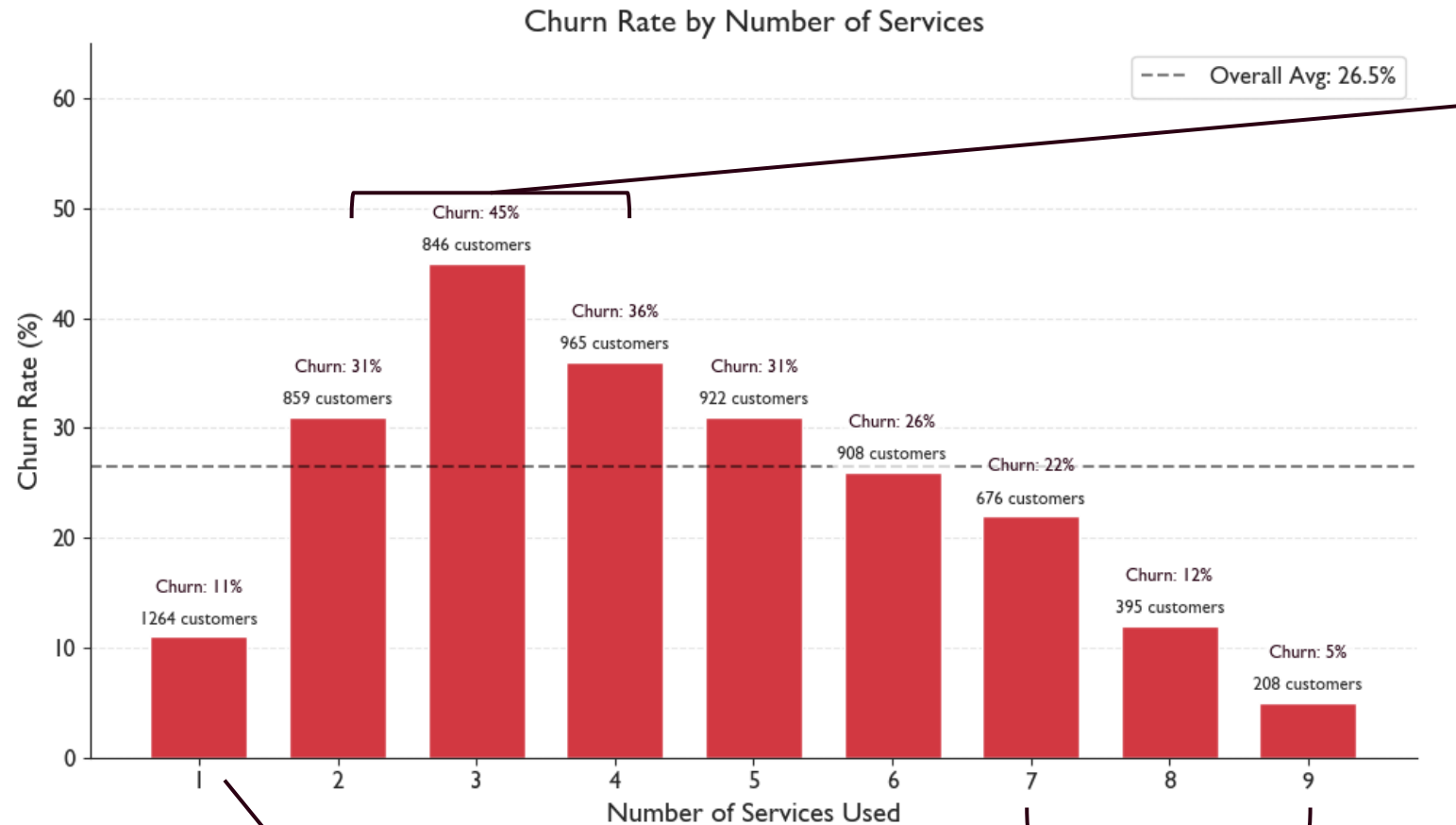
Churned customer affected by partner, dependents and senior status



Key Insights

- Gender has **nothing** with churn
- Senior citizen affect by almost **20%** customer churn
- Partner and dependents status by average affect **13-15%** customer churn

Dangerous service acquisition trap



Highest churn rate occur at 2-4 service usage not single-service customer.

While successfully upselling customer into more service, but they becoming more likely to churn.

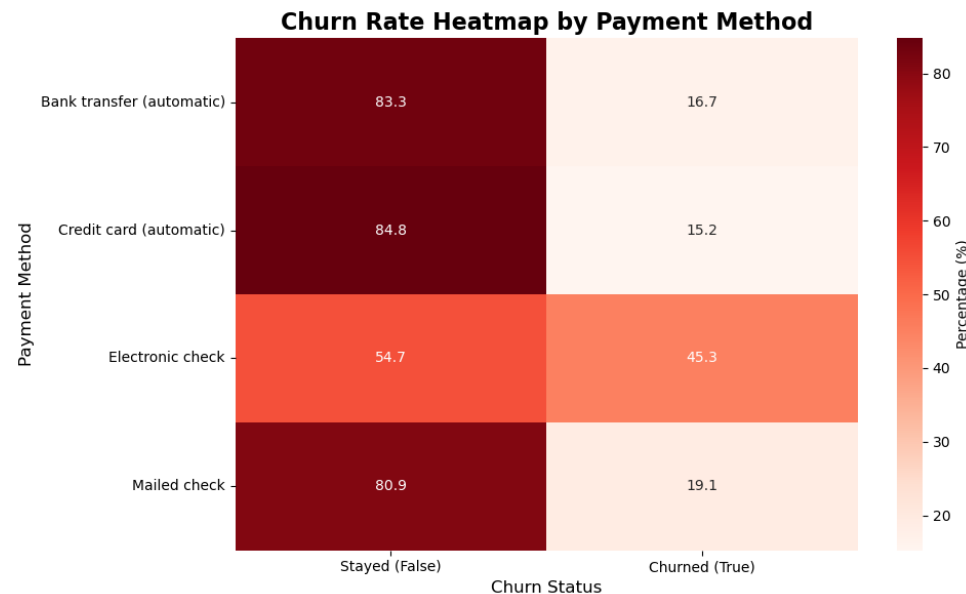
Key Insight

- Fiber optic is consistently show high churn in every service combination
- The more service customer use the more loyal
- Online Backup, Online Security, Device Protection and Tech Support is services that most retained customer

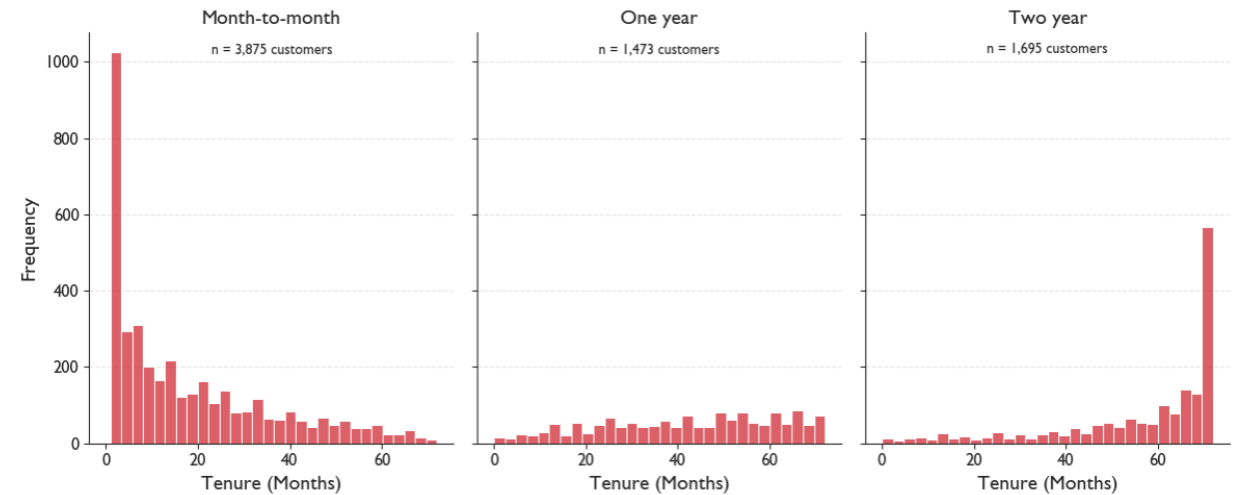
Mostly one service usage customer is phone service user only

High service usage customer is the most loyal.

Most popular, yet most risky: E-Check and Month-to-month Contract



The most used payment method is E-Check

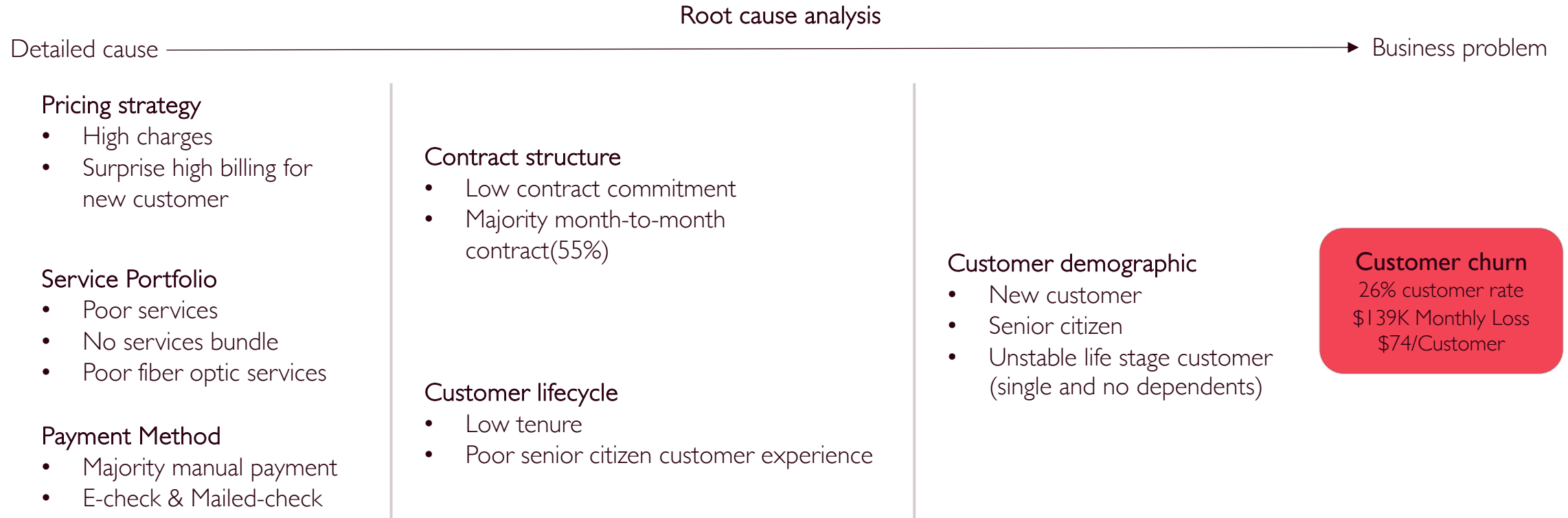


The most used contract method is Month-to-month

Key Insights

- Except e-check other payment method have low churn rate
- Two year contract customer mostly loyal customer
- Most popular, yet most risky

What makes customer churn



What makes customer stay

Service optimization

- Multi-service adoption
- Service satisfaction
- Full ecosystem
- Support service

Relationship Maturity

- High tenure
- Price tolerance (low charges to high charges)
- Engagement depth

Customer demographic

- Non-senior citizen
- Partnered customer
- Stabil customer (dependents)

Commitment structures

- Long contract
- Payment method (automatic payment)
- Switching cost

Prediction Model (ANN)

Model 93% detecting churn customer in data test (Recall 93%).

Predicted churn customer categorize to:

- High risk -> 70% probability
- Medium risk -> 50% probability
- Low-medium risk -> 30% probability
- Low Risk -> under 30%



	CustomerID	Actual_Churn	Churn_Probability	Predicted_Churn_0.15_threshold	Risk_Level
0	7590-VHVEG	0.0	0.792	1	High Risk
1	5575-GNVDE	0.0	0.004	0	Low Risk
2	3668-QPYBK	1.0	0.559	1	Medium Risk
3	7795-CFOCW	0.0	0.003	0	Low Risk
4	9237-HQITU	1.0	0.935	1	High Risk
5	9305-CDSKC	1.0	0.980	1	High Risk
6	1452-KIOVK	0.0	0.482	1	Low-Medium Risk
7	6713-OKOMC	0.0	0.259	1	Low Risk
8	7892-POOKP	1.0	0.912	1	High Risk
9	6388-TABGU	0.0	0.013	0	Low Risk

Top 3 features driving churn:

- Tenure
- Month-to-month contract
- Fiber optic internet service

Top 3 features prevent churn:

- Bank transfer (automatic)
- Online security
- Tech support

Action suggestion

- Enhance onboarding program and built customer relationship that develop tenure and price tolerance
- Enhance customer support for senior citizen
- Review pricing strategy and service portfolio with customer demographic need matching (family plan or partner plan)
- Audit fiber optic service, investigate service quality, pricing and customer satisfaction
- Create loyalty bonus program
- Redesign service bundling, create pathways that move customers directly from one service to 7+ (full ecosystem)
- Revamp ux for improvement in payment and contract to aim longer and automatic payment with added incentive
- Implement machine learning model in customer relationship management dashboard for early warn

Still much to go!



Personal Information

raves.hakam@gmail.com

+6282311117335 (Whatsapp)

Jakarta Barat, Indonesia

Thank You!

Find Me On

linkedin.com/in/hakamraves

github.com/ravsssh