

# Unlocking the Bottom Line: Analyzing Customer Churn in Telecommunications

Link to Analysis:

- [Colaboratory](#)
- [Spreadsheet](#)



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# Table of Contents

## Introduction

01

## Executive Summary

02

## Methodology

03

## Data Scope

04

## Analysis

05

## Business Recommendation

06

# XYZ Telecommunications

**Our company** is a prominent player in the telecommunications sector, serving millions of customers across the region. We've seen significant growth in our customer base over the years and have established a strong presence in the market.



**Our marketing division runs extensive campaigns to retain customers**

**Customer behavior** are evolve rapidly, it is essentials for us to adapt our marketing strategies

**Our Challenge** is for deeper understanding the **behavior of customer churn**, which is when our customers choose to leave our services and convince them to stay

## Analysis Objectives

Analyzing Customer Churn Impact on Profitability and Enhancing Services Based on Churned Customer Behavior

# Executive Summary

- **Company performance by the end of Q3 by facing challenges in customer churn, 26% customer churned causing a revenue loss of about 30.5%**
- **The Ineffective marketing strategy cause customer churn to face challenge in competing in the market**
  - We provide analysis based on the data we have that covers customer segmentation
  - Several factors that cause increased churn include: no customer segmentation, no personalization campaign, and lack of systematic approach for market opportunity
- **The significant differences in behavior between new customers and old customers**
  - Old customers have a CLTV value that is very different from customers with tenure months under 4 months (> 6500 Avg. of CLTV thousand IDR)
- **Customer churn behavior: high purchases, low average CLTV, and short life span**
  - Churn customers have higher average monthly purchase with more than 95 thousand IDR but lower average CLTV than not churn customers due to low number of transactions. Their high monthly purchases are not sustainable
  - 41% of the customers with High-End Devices are churned and 45% of the customers using pulsa as payment method are churned
- **Customer segmentation**
  - We divide the customers into 3 segments: The Challenging Churners, The Loyal Shoppers and The High-Value. Each segment is differentiated based on CLTV value and tenure months value
- **Recommendation options**
  - We provide a priority matrix to decide which actions may consider to take
  - Recommendation is considering to respond the churners who take only when the promo is given, personalized campaign based on each segment, etc.

# Methodology

**Data  
Preparation**

**Business  
Understanding**

**Clustering**

**Recommendation**

**Data  
Discovery**

Prepare the data for  
detect patterns and  
gain insights

**EDA**

To understand the  
current situation  
and problem

**Segmentation**

To aggregate buyers  
into groups with  
common needs

**Marketing  
Strategy**

Proposed  
personalized  
marketing

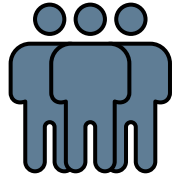
# Data Scope

## Time



Q3 in particular  
year

## Total Customers



7041 customers

## Total Product Type



Our customers use our  
service for use on 4 products:  
Music, Games, Video,  
Education

## Total Tenure Months



Our customers have a  
tenure months range  
of 0-72 months

**26% customer** churned by the end of Q3 causing a revenue loss of about **30.5%**

**Churn Rate = 26.54%**

1869 out of 7043 customers were churned

Churn Label	Total CLTV (Predicted Thou. IDR)	Total of Monthly Purchase (Thou. IDR)
Not Churn	30,206,835.10	412,081.48
<b>Churn</b>	<b>10,081,832.80</b>	<b>180,870.11</b>

**30.5%** Revenue loss from customer churn

Total Revenue: 592,951.58 (Monthly Purchase)

Total CLTV: 40,288,667.90

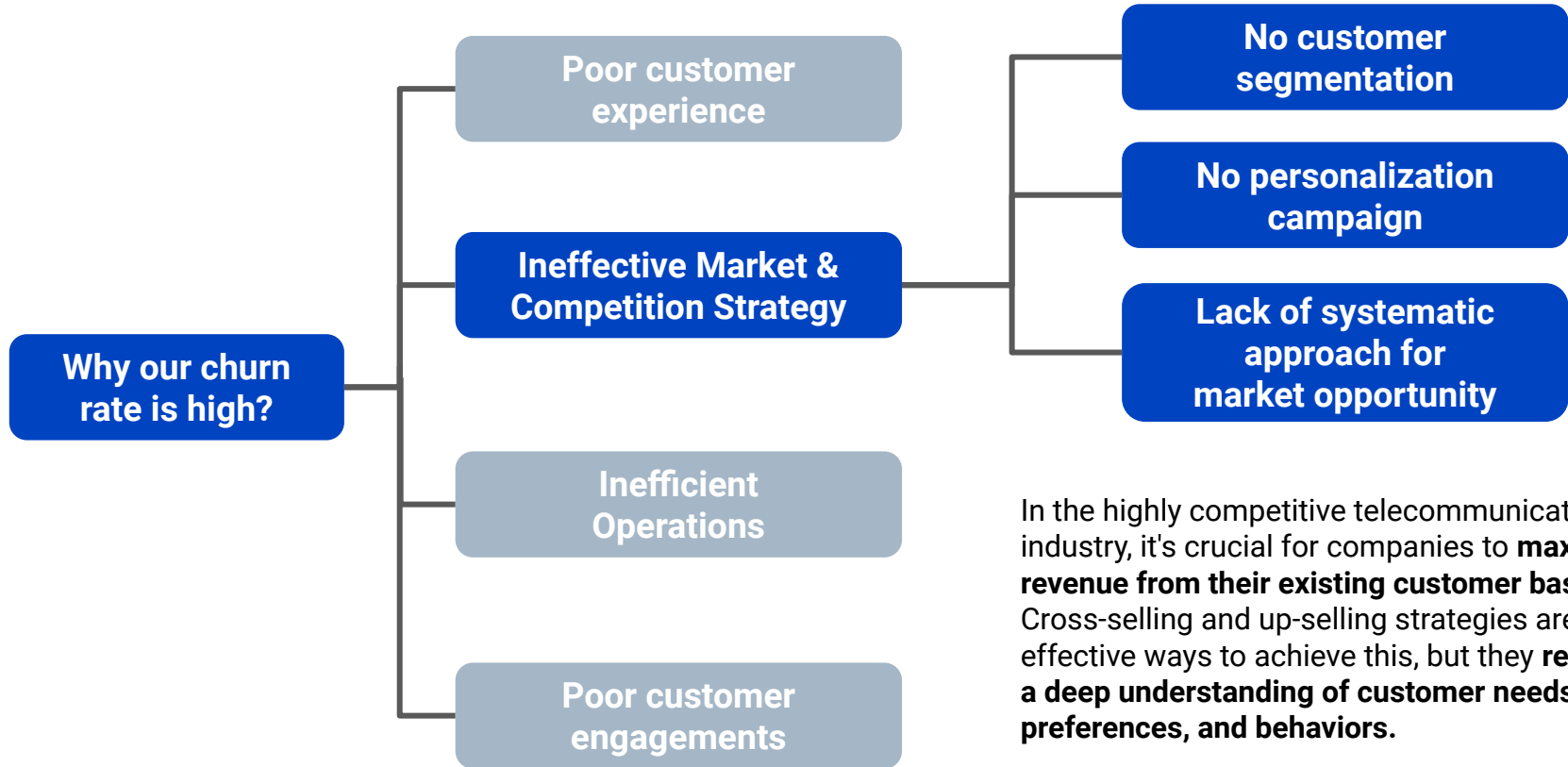
More than **590 million revenue gain** by the end of Q3 and we will **lose 180 million in the next quarter** because the customer loss

# Analysis

- Root Cause Analysis
- Churn Behavior
  - Monthly Purchase and CLTV
  - Device Class
  - Payment Method
- Clustering
  - Segments profile
  - Segments behavior



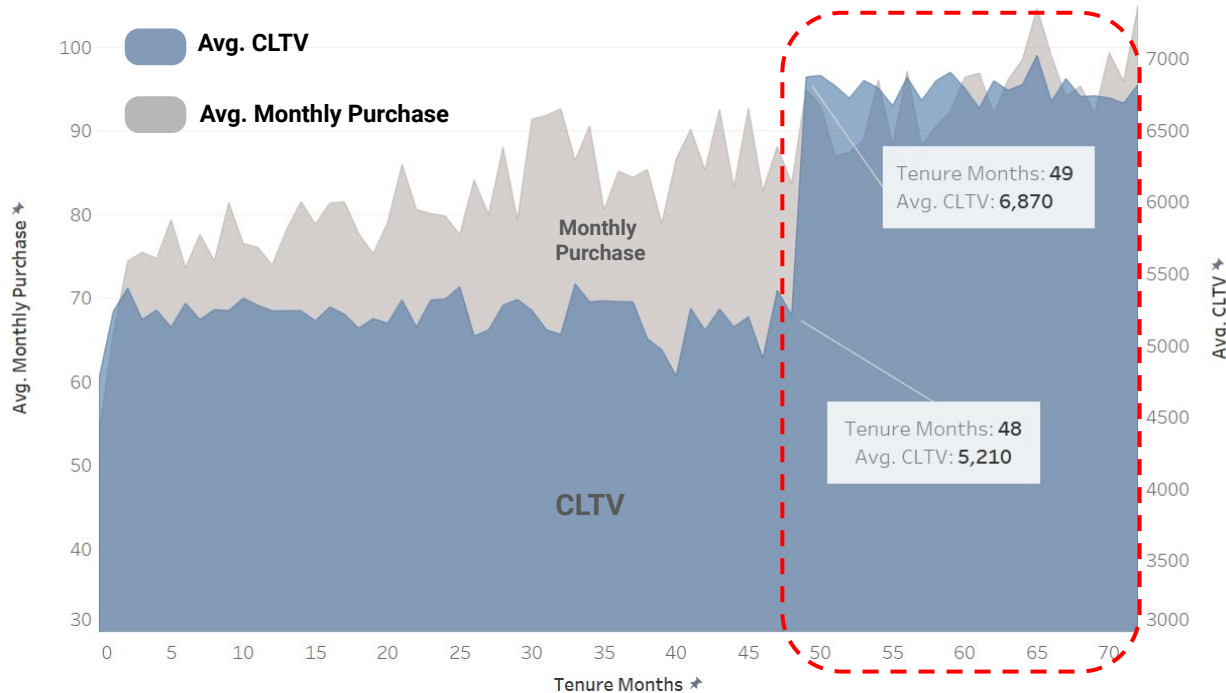
# Customer churn due to **ineffective marketing strategy**



In the highly competitive telecommunications industry, it's crucial for companies to **maximize revenue from their existing customer base**. Cross-selling and up-selling strategies are effective ways to achieve this, but they **require a deep understanding of customer needs, preferences, and behaviors**.

# The differences in behavior between New Customers vs Old Customers

**Avg Monthly Purchase and Avg. CLTV**



There are significant different CLTV behavior in customer with tenure more than 48 months

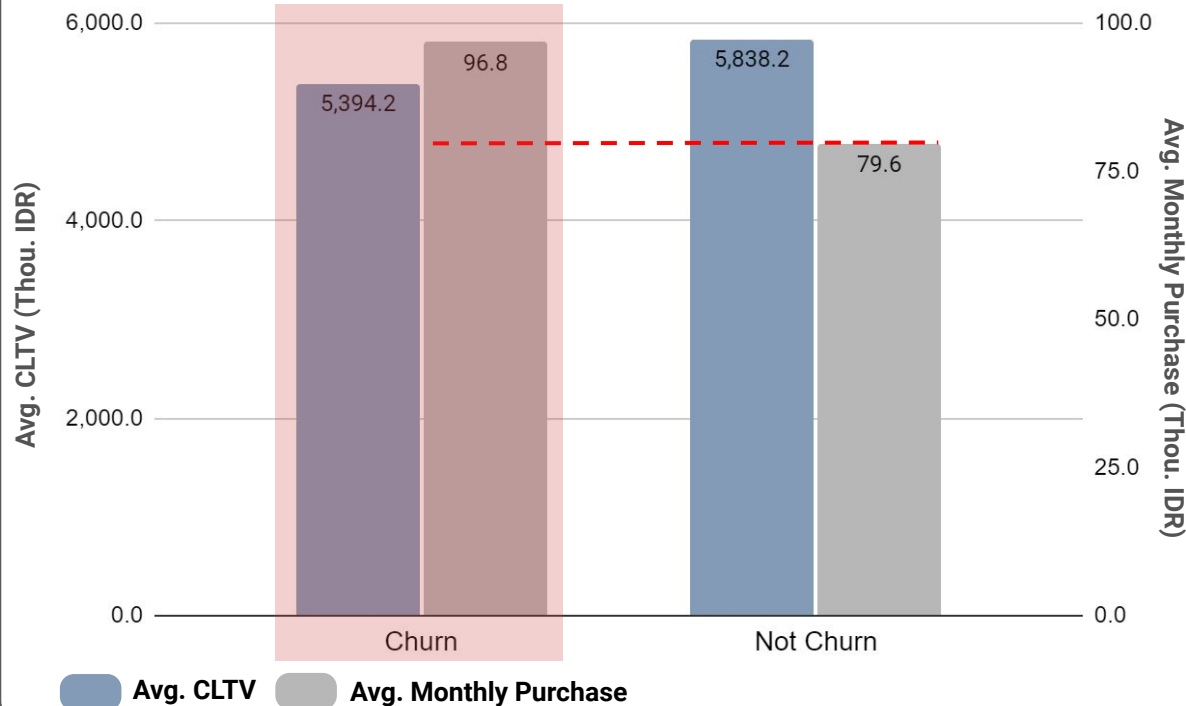
- The average CLTV is more than 6,500 thousand IDR
- These are the customers who contribute the most to the company
- High differences due to high monthly purchases and the number of transactions

Monthly purchases tend to increase linearly

- The longer the tenure, the higher the average monthly purchases

# Churn customer: lower CLTV but higher Monthly Purchase

Average value between **churn** and not churn



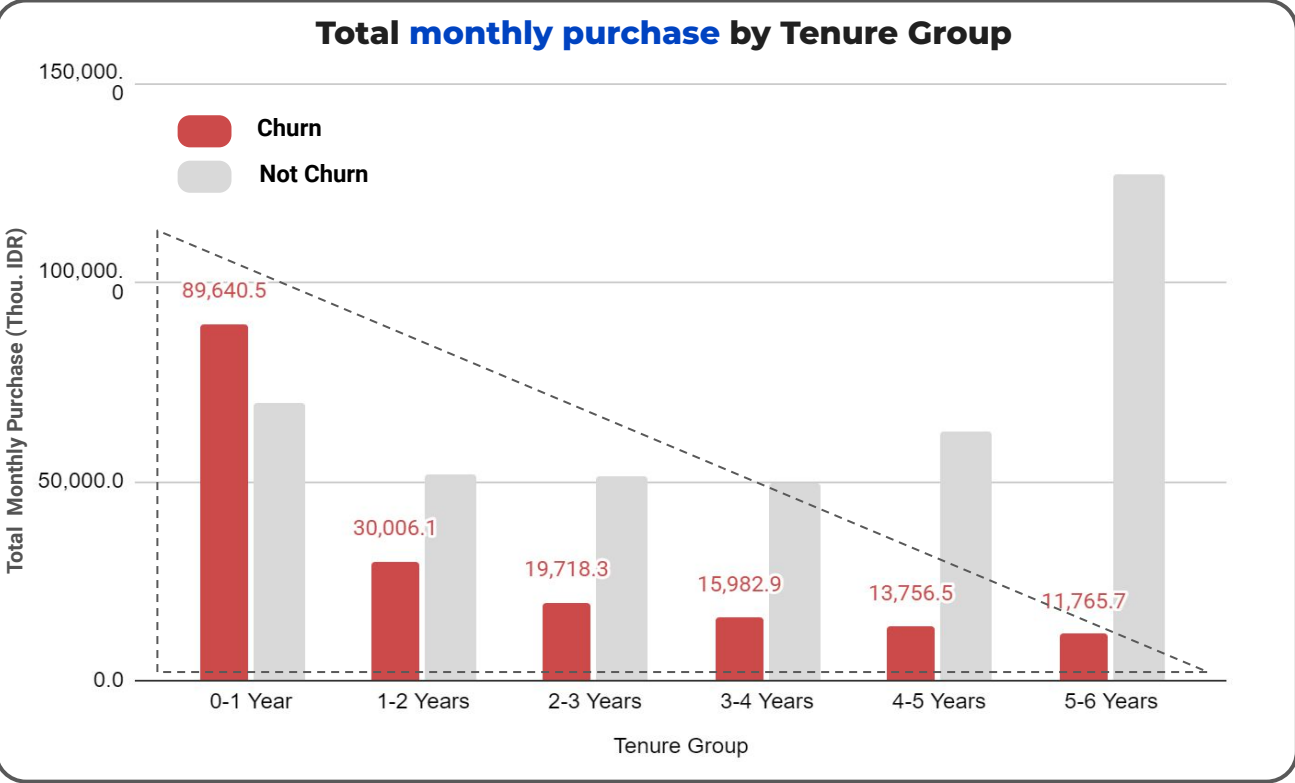
**Churn customers** have high average monthly purchase with more than **95 thousand IDR**

- Tend to spend more money but have low CLTV due to low number of transactions
- We can assume that churn customers are new customers who spend large amounts of money

If we spent a **lot costs on customer acquisition for these customers**, it can lead to a high cost of acquiring these high monthly purchasing but short-lived customers. **High acquisition costs can significantly reduce CLTV.**

# Churn Customer: The short lifespan and high purchases

**Churned customers** might have made significant purchases during their short time as active customers. Their high **monthly purchases are not sustainable over a longer period**



Several factors can contribute to this scenario:

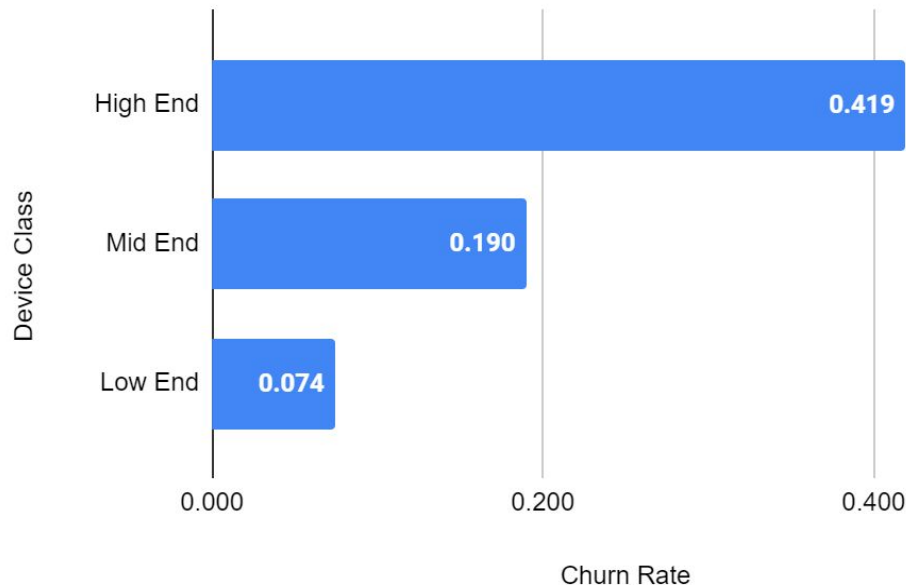
- Promotion-Driven: attracted by discounts, promotions, or one-time deals
- Product Fit or Quality Issues
- Lack of Personalization: it may not create a strong emotional connection with customers.

Tenure Group	Churn Rate (%)
0-1 Year	0.47
1-2 Years	0.29
2-3 Years	0.22
3-4 Years	0.19
4-5 Years	0.14
5-6 Years	0.07

**Personalized experiences often lead to higher loyalty and CLTV.**

# 41% of the customers with **High-End Devices** are churned

Churn rate by **Device Class**



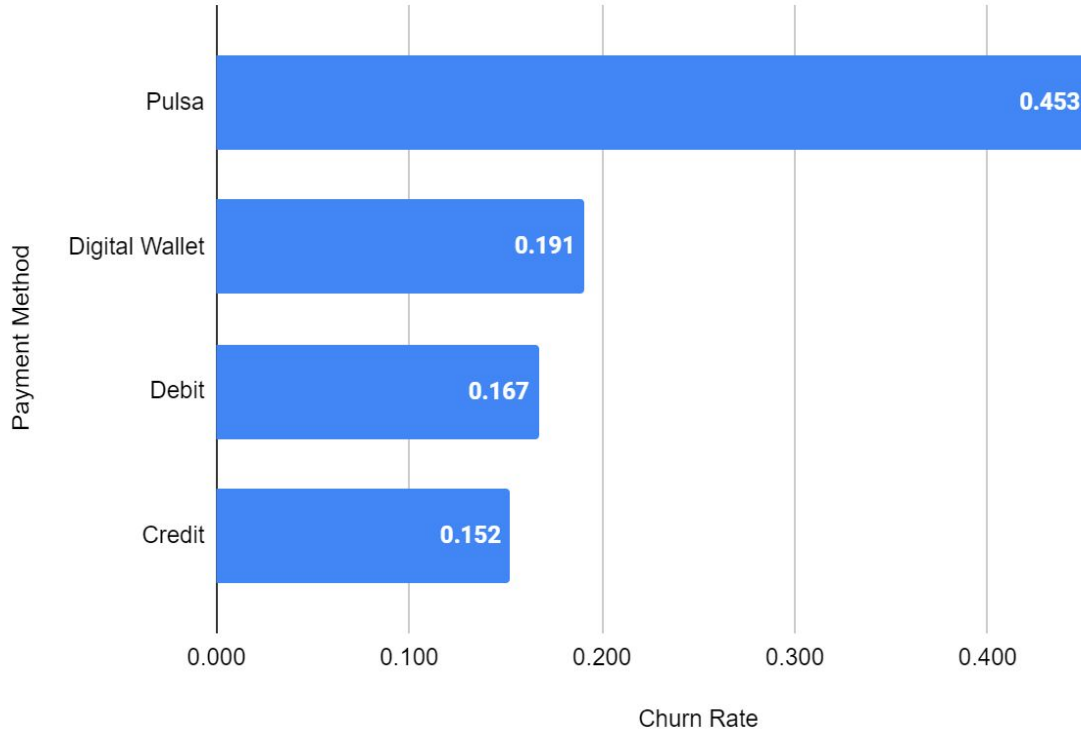
Customers with **High End device** are the most likely to churn. With churn rate in **0.41** have **big differences to Mid and Low End Devices**

Several factors why the High-End is the most likely to churn:

- **Unmet Expectations:** Customers with high-end devices are used to have high expectations. They more quickly to churn when experiencing slow speed, network issues, etc.
- **Demanding Usage:** are likely to use our service with high intensive-resource such as online gaming, 4K video
- **Awareness to alternatives:** are more aware for research and switch to a competitor if they perceive a better deal elsewhere.

# 45% of the customers using pulsa as payment method are churned

Churn rate by Payment Method



Customers who are using **Pulsa** as payment method are the most likely to churn. **45% of customers using Pulsa are churned**

There are several factors:

- **Prepaid Feature (Prabayar):** customers using Pulsa used to associated with a prepaid model, where customers need to top up their credit balance regularly. They may be more flexible and cost-conscious. They also find a better deal to the competitor if they are dissatisfied
- **Price sensitivity:** they may be more price-sensitive and actively seek cost-effective options.

# Clustering

The background of the slide is a solid blue color. On the left and right sides, there are decorative elements consisting of a network of white lines and dots, resembling a molecular structure or a data network. The central part of the slide is a large, solid blue rectangle where the word 'Clustering' is written in a large, white, sans-serif font.

# Clustering

## The Challenging Churners



Customers with the highest churn and lowest CLTV, new customers with the shortest tenure months

## The Loyal Shoppers






Moderate churn, monthly purchase, and CLTV with relatively high loyalty

## The High-Value



The high-value and long term customers with the lowest churn, old customers with the longest tenure months

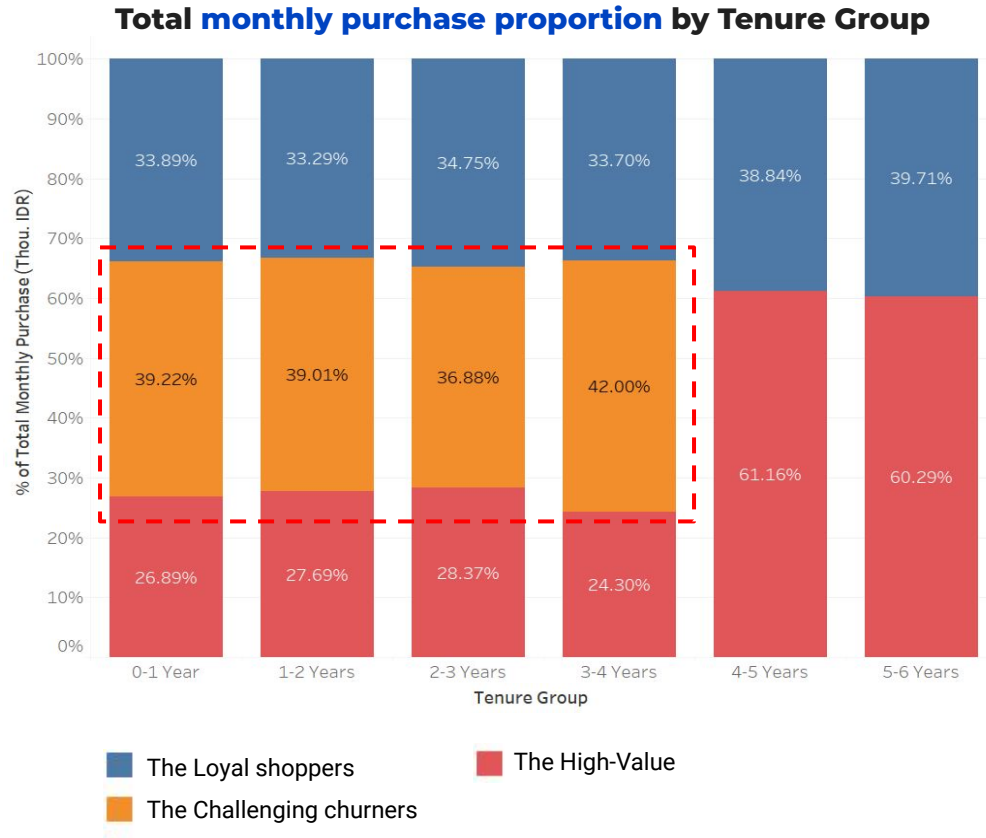
			
Total Customers	1871	2536	2636
Churn Rate	0.34	0.26	0.22
Avg. Monthly Purchase (Thou. IDR)	79.17	83.92	88.01
Avg. CLTV (Predicted Thou. IDR)	3625	5638	7287
Avg. Tenure Months	18	34	41

**The Challenging Churners** faces challenge in retaining customers(18 avg. tenure months), has higher churn rate (34%) and lowest value among other customers

**The Loyal Shoppers** and **The High-Value** segments give high average of CLTV indicating retaining these customers can lead to substantial long-term revenue



# High contribution from **The Challenging churners**



**The challenging churners** give a relatively big monthly purchase proportion (above **35%** contribution) with **tenure < 4 years**

- It can be assumed that these customers are interested in the promotion for a short time

Strategies to improve customer retention, such as **better onboarding, personalized offers, and addressing customer pain points**, are crucial for this cluster.

# Video products as the most preferred one

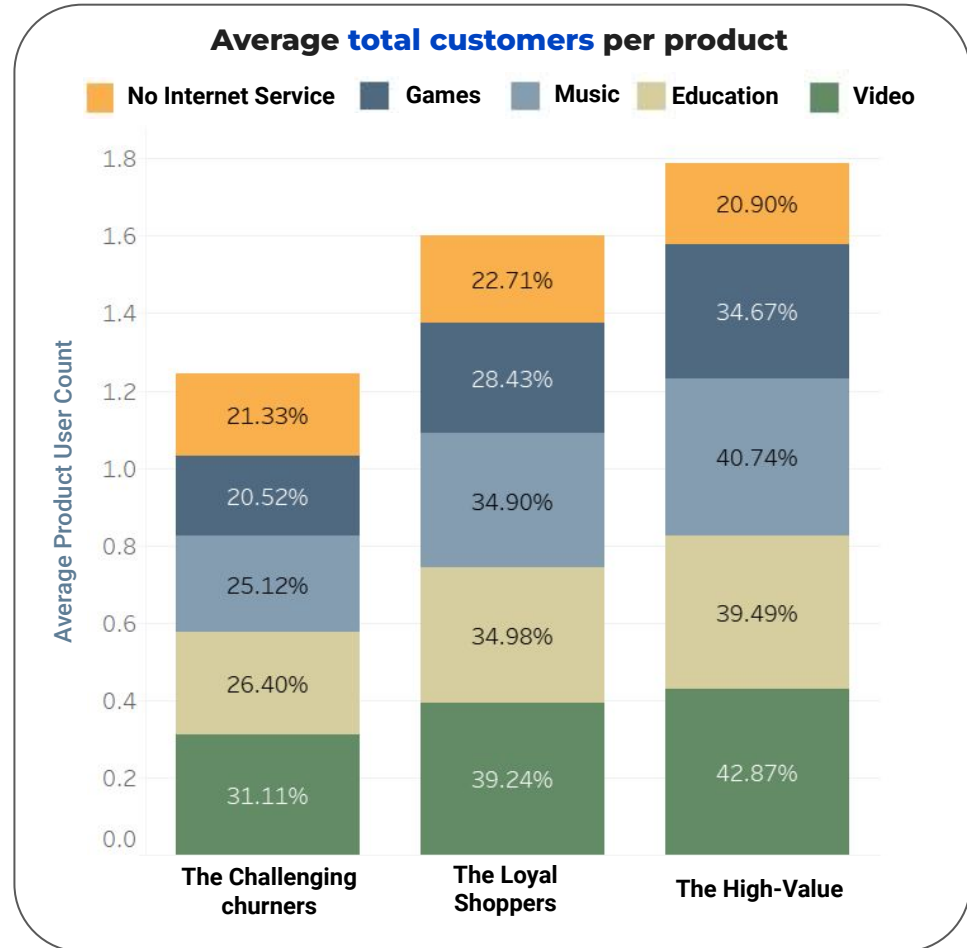
Each segment has the same product preference, where **Video Product** is the highest average used with more than **30% user count** in every segments

## Top product preference per segment:

- **The Challenging Churners:** Video and Education
- **The Loyal Shoppers:** Video and Education
- **The High-Value:** Video and Music

## Campaign recommendations

- Video streaming bundles: offer special internet packages with high speed connections for video streaming
- Education packages: create market packages specifically for educational purposes
- Video and Music bundles: combining product access for subscription





# **Business Recommendations**

# Action Plan For **The Challenging Churners**

## The Challenging Churners



Prevent churn and prevent customers switch to competitors by building **long-term relationship, emphasize trust, and ongoing value**

### Action :

1. **Price optimization** due to the challenging customers are more promo-sensitives. Provide more cost-effective options to these high spenders at the start
  - Video and education bundles
  - Video streaming bundles
2. **Personalized Campaign** to create continuous engagement and aligning the product preferences to this segment
3. **Conduct a comprehensive analysis** to understand the reason behind the high churn rate and gather feedback through surveys or forms

# Action Plan For **The Loyal Shopper**

## The Loyal Shoppers



Increasing value and retaining customers by **providing benefits** in return for each **transaction customers** to raise user status to **High-Value Customers**

### Action :

1. **Loyalty Program** as reward their ongoing loyalty points, discounts, or exclusive perks
2. **Personalized Offers** and incentives. Offer discounts, promotions and campaign aligned to their product preferences
  - Video and education bundles
  - Exclusives Streaming options
  - Internet packages for education purposes

Customers are considered **The Loyal Shoppers** when they have a CLTV value in **5500 - 7200 Thousand IDR**

# Action Plan For **The High-Value**

## The High-Value



Increase the **number of purchases and maintain customer value with brand awareness**. Provide loyalty rewards and cross-promotions

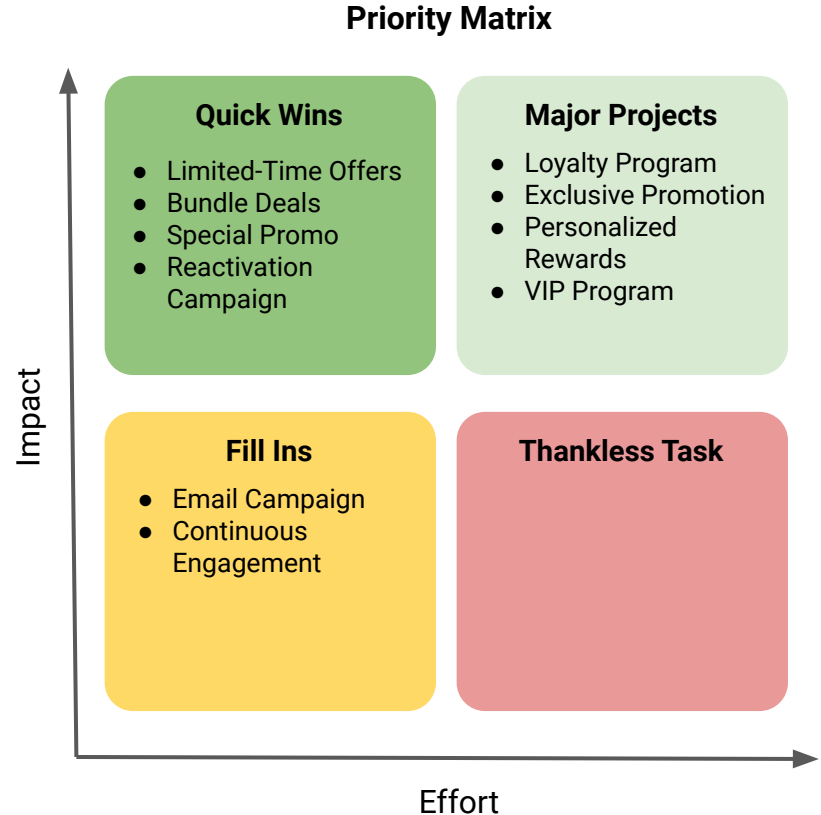
### Action :

1. **VIP Programs**, create the exclusive premium programs to give more benefit, personalized services and priority to access new features or products
2. **Customized Products or Services**, offer customization options based on their needs to strengthen the loyalty
3. **Personalized Engagement**, personalized campaign based on their preferences and relevant experience
  - Entertainment Packages for video and music streaming
  - Premium music access

Customers are considered **The High-Value** when they have a CLTV value **more than 7200 thousand IDR**.

# Recommendations

- **Limited-Time Offers**  
To respond the new customers who spend much just when a promo or discount is offered then churn. Create sense of urgency by introducing limited-time offers
- **Loyalty Programs**  
Build strong connections to high-value and loyal customers by providing incentives as reward their ongoing loyalty
- **Bundle Deals**  
Packaged products based on their preference and providing additional value to incentives repeat purchases
- **Exclusive Promotion**  
Giving early access to loyal and high-value customers to encourage them to stay engaged
- **Special Promo**  
Respond to our customers who are using Pulsa as a payment method that is likely to churn. They actively seek cost-effective options then we can provide a competitive price
- **Reactivation Campaign**  
Launch reactivation campaigns that target these high spenders with compelling offers and messages designed to bring them back



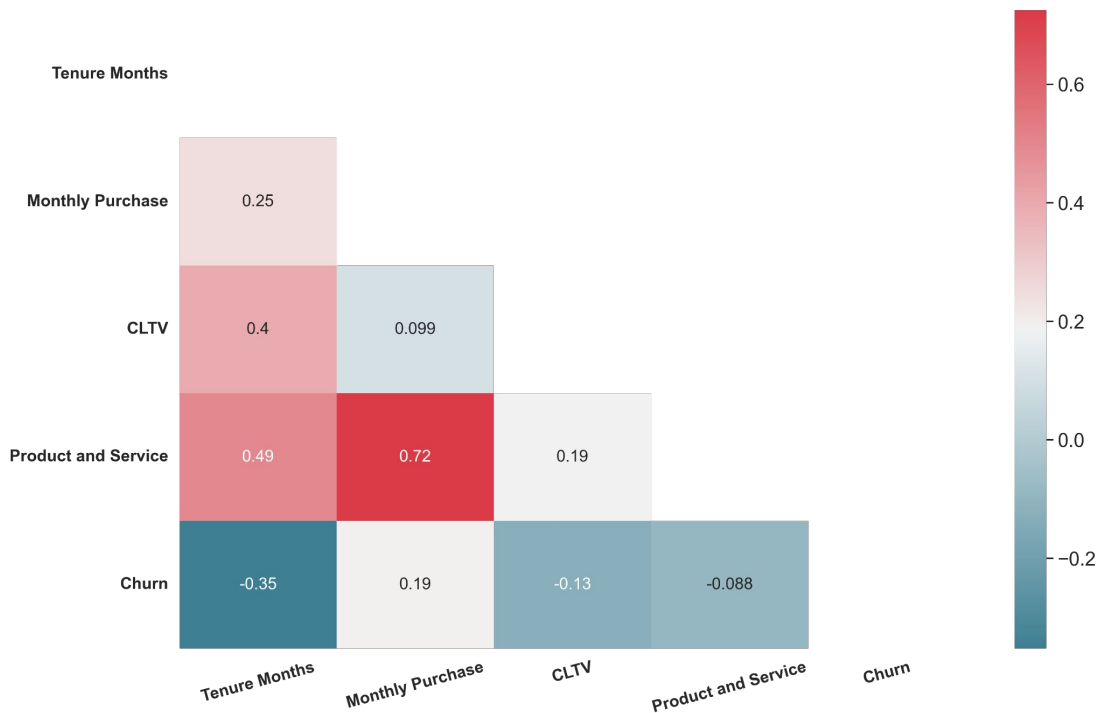
**Thank You!**



# Appendices

# Variable Correlation

## Pearson correlation at numerical data



The correlation coefficient between Churn and other variables are as follows:

- Tenure Months: -0.352229 (negative correlation)
- Monthly Purchase: 0.193356 (positive correlation)
- CLTV: -0.127463 (negative correlation)
- Product and Service: -0.087698 (negative correlation)

Then:

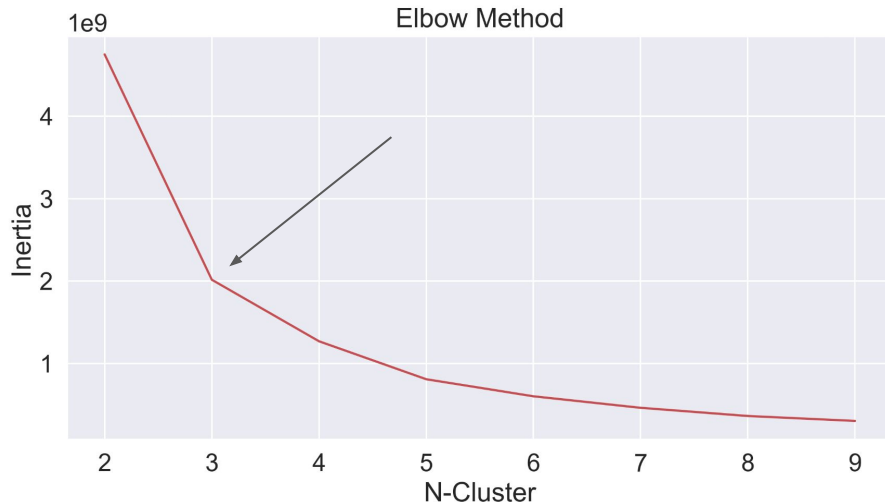
- Longer tenure reduces churn likelihood.
- Higher monthly spending increases churn risk, which is counterintuitive.
- Higher CLTV leads to lower churn rates, indicating valuable customers are more likely to stay.
- Greater product/service usage is linked to lower churn probability

# Why Clustering?

- 1. Segmentation of Customer Base.** Clustering helps to group customers with similar characteristics together. This can provide valuable insights into different customer segments and their behavior. For example, it can identify groups of customers who predominantly use specific products or services, or those who have similar spending patterns.
- 2. Identifying High-Risk Customer Segments.** Clustering can identify segments of customers who are at a higher risk of churning. For instance, if a particular cluster tends to have lower tenure, higher call center usage, and lower CLTV, it may indicate a segment that needs targeted retention efforts.
- 3. Tailored Marketing and Retention Strategies.** Understanding customer segments through clustering allows for the customization of marketing and retention strategies. For example, different segments may respond differently to promotions, incentives, or personalized communication. Clustering can help optimize these strategies for maximum effectiveness.
- 4. Resource Allocation.** Clustering helps in allocating resources efficiently. For example, if we identify a segment of customers with high CLTV who are at risk of churning, we might want to allocate more resources towards retaining them compared to a segment with lower CLTV.

# K-means Clustering

How is the number of clusters determined?



## Elbow Methods

is a simple way to help us figure out the best number of groups or "clusters" in a dataset

1. When we look at the graph, we're looking for a point where the decrease in inertia starts to slow down. It looks like a bending arm, which is why it's called the "elbow"
2. The number of clusters at the "elbow" point is a good choice because it means that adding more clusters doesn't give us much better grouping of the data.
3. From the picture on the side we can conclude that the elbow point is located at number 3, then we can decide that the suit number of clusters in our dataset is 3

# DASHBOARD



Telkomsel

## Cluster Churn Dashboard

Cluster  
All

### Total Customer

7,043

### Total User Churn

1,869

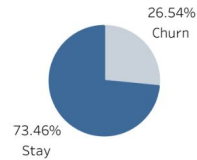
### Total Revenue

Rp592.951,58

### Avg Revenue

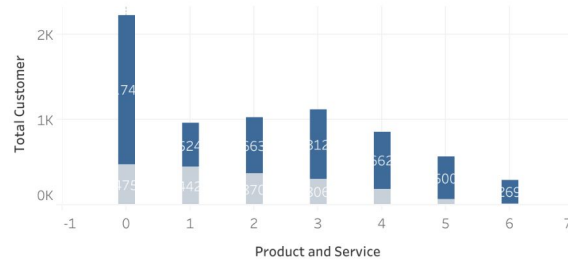
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### Customer Churn

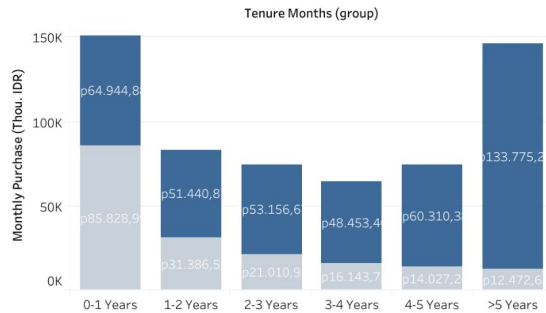


Churn Label  
Churn  
Stay

### Churn by Total Product and Service



### Total Monthly Purchase by Churn & Tenure



### Churn by Tenure Group



### Cluster Information :

- 0 - The Challenging Churners
- 1 - The Loyal Shoppers
- 2 - The High-Value