

# Capstone Presentation

Presented By  
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# Business Problem Understanding

## BUSINESS PROBLEM

- DTH provider facing heavy competition resulting in **customer churn**
- Loss of customers → Loss of Revenue
- 1 Account = Multiple Customers → Increased Loss
- Customer acquisition cost = 5 X customer retention cost
- 5% increment in customer retention can expand company revenue by more than 25%
- Loyal customers are 5x as likely to repurchase, 5x as likely to forgive, 4x as likely to refer, and 7x as likely to try a new offering
- According to a study by American Express, 33% of customers will consider switching companies after just one instance of poor customer service
- Currently the rate of churn for the DTH industry is 14-16% and our company's churn rate is at an alarming level of 16.84%

## OBJECTIVE

- Formulate various constructs that help to understand the factors leading to Customer Churn
- Predict customer churn in order to deliver segmented offers as part of a retention effort

# Business Problem Understanding

## SCOPE

- Understanding the impact of factors contributing to Customer Churn
- Key insights and business recommendations from EDA and modeling for the campaign
- Best performing model for churn prediction

## CONSTRAINTS

- The focus of previous retention campaigns is unknown – cashbacks, coupons
- Campaign Budget is needed to effectively provide business recommendations

# Modelling Approach Used & Why

## Initial Insights About Data

### Feature Info

Dataset contains **11260 rows** and **19 columns**

- 5 float
- 2 integer
- 12 object

### Missing Values

- 2675 account records having missing values
- **2.43%** of the total customer accounts

### Data clean up

- **10 attributes** required clean-up such as removal of special characters, spelling, column modifying/removing categories

### Outliers

- 10 out of 19 columns are found to have outliers in them

### Duplicates

- **259 duplicate** records present in the given data

### Target variable

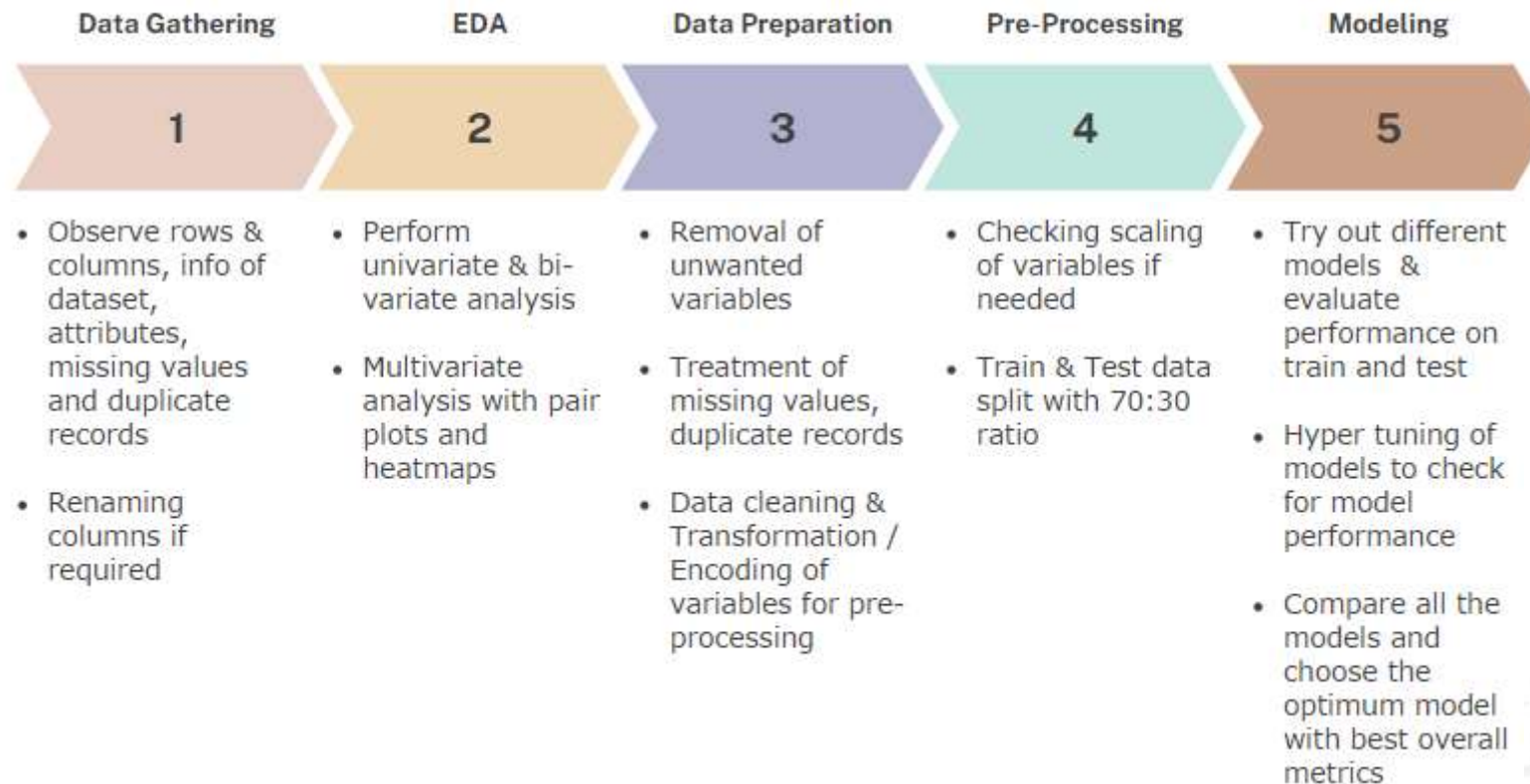
- Churned customers (**17%**) -> 1
- Active Customer (**83%**) -> 0

# Modelling Approach Used & Why

## Problem Type

- The problem described in the statement is a classification problem where the goal is to predict whether an account is likely to churn or not

## Modelling Approach





# Modelling Approach Used & Why

## Evaluation Metrics

Accuracy  
Precision  
Recall  
F1- Score

When predicting customer churn, consider the cost of false positives and false negatives. The best model **balances precision** (predicted positives that are actually positive) and **recall** (actual positives correctly predicted). The F1-score is a useful metric to evaluate the trade-off between these two metrics and to select the best model.

Recall is most significant here as the focus is minimizing FN. Based on recall values, optimum model should be finalized.

# Modelling Approach Used & Why

## Performance Metrics - Comparison

Model	Train Data					Test Data				
	Accuracy	Precision	Recall	F1	AUC	Accuracy	Precision	Recall	F1	AUC
Logistic Regression with Smote	0.78	0.42	0.82	0.56	0.87	0.78	0.42	0.82	0.55	0.85
Logistic Regression without Smote	0.88	0.75	0.41	0.53	0.87	0.88	0.75	0.44	0.56	0.85
Logistic Regression - Tuned	0.88	0.74	0.43	0.54	0.87	0.88	0.74	0.46	0.57	0.85
LDA	0.87	0.73	0.39	0.51	0.86	0.87	0.73	0.41	0.53	0.84
Ada Boost	0.9	0.76	0.58	0.66	0.91	0.9	0.74	0.6	0.66	0.90
Ada Boost - Tuned	1.00	1.00	1.00	1.00	1.00	0.97	0.96	0.86	0.91	0.93
Gradient Boost	0.92	0.85	0.63	0.72	1.0	0.91	0.79	0.59	0.68	0.93
Gradient Boost - Tuned	1.0	1.0	0.99	1.0	1.0	0.96	0.93	0.83	0.88	0.99
XG Boost	1.0	1.0	1.0	1.0	1.0	0.96	0.91	0.86	0.88	0.99
XG Boost - Tuned	1.0	1.0	1.0	1.0	1.0	0.98	0.95	0.91	0.93	0.99
Random Forest	1.0	1.0	1.0	1.0	1.0	0.96	0.96	0.82	0.88	0.99
Random Forest - Tuned	0.74	0.9	0.63	0.74	0.95	0.69	0.83	0.59	0.69	0.93
ANN	0.94	0.85	0.79	0.82	0.97	0.92	0.78	0.74	0.76	0.95
ANN - Tuned	0.98	0.98	0.98	0.98	0.99	0.88	0.87	0.89	0.88	0.98
KNN	0.99	0.97	0.94	0.96	0.99	0.96	0.89	0.85	0.87	0.96
KNN - Tuned	0.99	0.97	0.94	0.96	0.99	0.96	0.89	0.85	0.87	0.97
Bagging with Decision Tree	1.0	1.0	1.0	1.0	1.0	0.97	0.94	0.85	0.89	0.98

# Modelling Approach Used & Why

## Tuned XG Boost is the Best Model

Model	Train Data					Test Data				
	Accuracy	Precision	Recall	F1	AUC	Accuracy	Precision	Recall	F1	AUC
XG Boost - Tuned	1.0	1.0	1.0	1.0	1.0	0.98	0.95	0.91	0.93	0.99

**Recall**

**Precision**

**Accuracy**

**F1 - Score**

**AUC Score**

Has the **highest Test Recall**

Has the **second highest Test Precision**

Has the **highest Test Accuracy**

Has the **highest Test F1-Score**

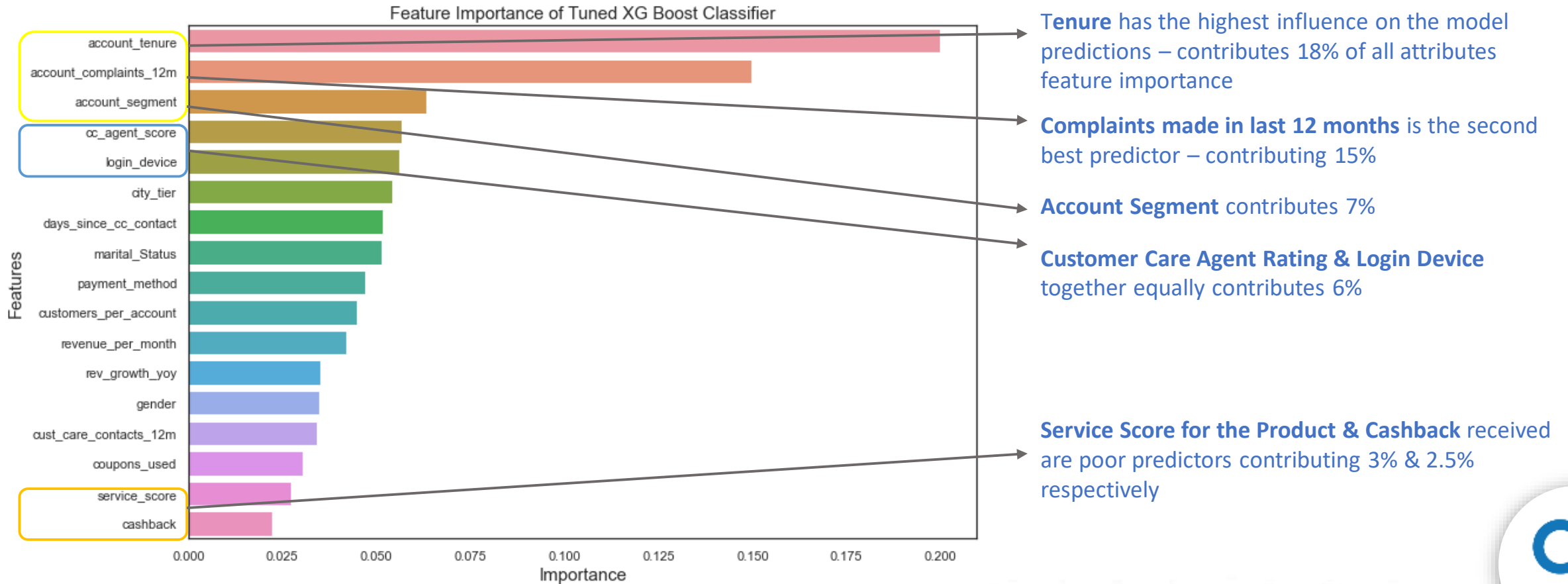
Has the **highest AUC Score**

- **Overall performance metrics are the best** among all
- High AUC indicates model is able to **distinguish between positive and negative instances** with a high degree of accuracy
- Due to this, the model is able to **make accurate predictions** and **avoid false positives and false negatives**



# Modelling Approach Used & Why

## Top Predictors for the Best Model



# Insights From Analysis

## Assumptions

The following assumptions have been made for units of certain features:

**Account Tenure:** Represented in months

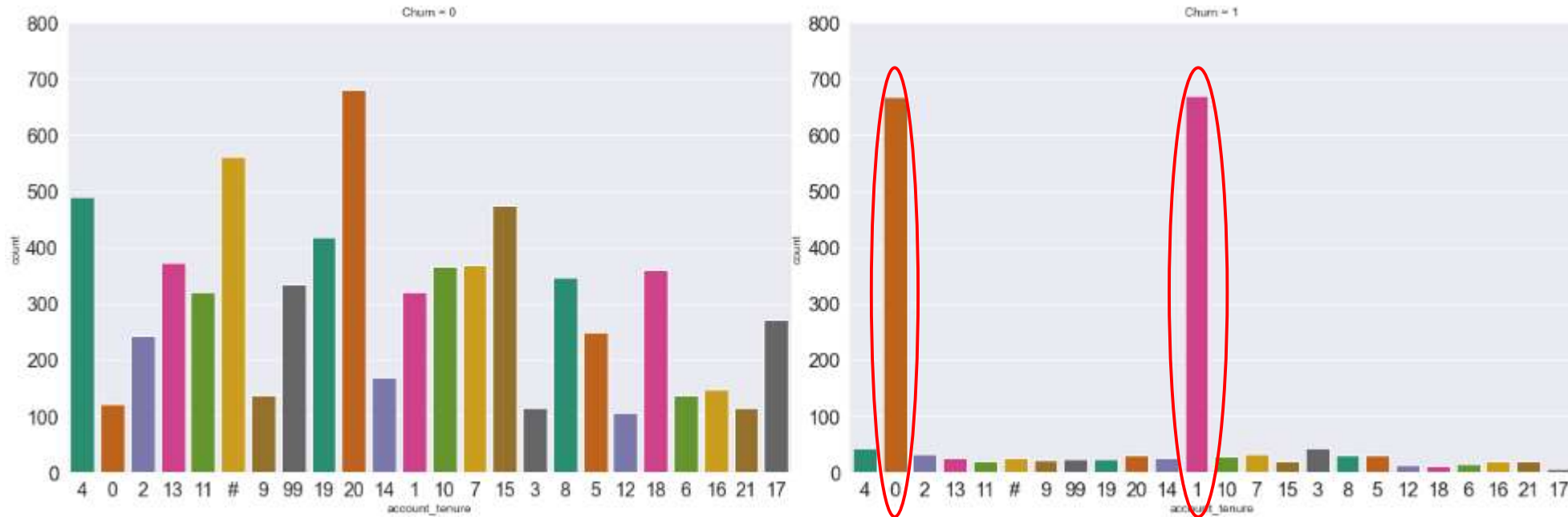
**Revenue per Month:** Average monthly revenue, measured in units of Rupees Year-over-Year

**Revenue Growth:** Measured in percentage (%)

**Cashback:** Measured in Rupees

# Insights From Analysis

## Higher Churn in New Customers



**Insight:** Churn is highest during the initial period of 0 to 2 months, it indicates that customers are not satisfied with the service or the overall experience during this period.

### Recommendation:

- Improve the onboarding process
- Ensure that the service quality during the initial period is of high quality
- Collect feedback from customers during the initial period to identify common issues and address them proactively

# Insights From Analysis

## Payment Method



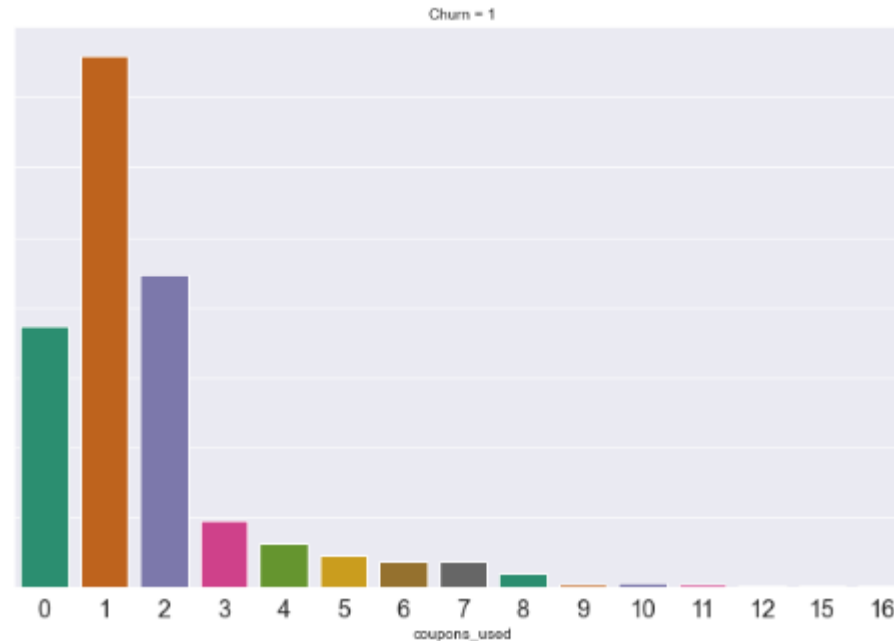
**Insight:** Using Debit Card and Credit Card have a higher churn rate than those using other payment methods. Conversely, customers using UPI or Cash on Delivery are less likely to churn

### Recommendation:

- Assess payment security for Debit Card & Credit Card
- Simplify payment process
- Offer cashback or discounts
- Continue to offer UPI & COD payment methods

# Insights From Analysis

## Coupons Used



**Insight:** Customers who were not provided any coupons or received less than 2 coupons are more inclined towards churning

### Recommendation:

- Increase coupon distribution
- Conduct A/B testing to determine which types of coupons are most effective in reducing churn. Use this information to optimize coupon distribution.



# Insights From Analysis

## Gender

- The churn rate is higher among male customers compared to female customers

## Service Score

- Surprisingly, customers who have given a service score of 3 are more likely to churn
- This may indicate that these customers had a neutral feeling towards the service provided by the company

## City Tier

- The city tier does not seem to have a significant impact on churn, although customers from tier 3 cities are more likely to churn compared to those from tier 1 or 2 cities.

## Customers per Account

- Accounts with 3 customers or more are likely to churn compared to those with other numbers of customers

## Login Device

- Customers who log in using a mobile are more likely to churn compared to those who log in using a computer

# Insights From Analysis

## Account Segment

- Customers in the regular plus segment are more likely to churn compared to those in other segments

## CC Agent Score

- Most customers who have rated the customer service agent with a score of 5 have churned, while those who have given a score of 1 have not churned as much
- Customers who have given a score of 3 have an equal chance of churning

## Marital Status

- Customers who are divorced are less likely to churn compared to those who are single or married

## Account Complaints in the last 12 Months

- The majority of customers who have registered a complaint have churned.

# Recommendations

- The DTH company can **provide better customer service to male customers** to increase their satisfaction levels. This can include training customer service representatives to address specific concerns that male customers might have. Company should continue to **provide excellent service to all customers**, regardless of their gender, to maintain high levels of customer satisfaction and reduce churn overall
- **Improve the customer service training** and **address complaints in a timely and effective manner**
- Analyze customer feedback. If possible **perform sentiment analysis on the given feedbacks**
- Company must ensure that **accounts with 3 or more customers receive excellent customer service** to increase their satisfaction levels. Offer loyalty programs to incentivize them to continue using the service.
- Should focus on **improving the user experience on their website**, especially for customers who log in using a mobile. This could involve optimizing the website for faster loading times, simplifying the navigation, or improving the design. Provide excellent customer support for mobile users. Consider using **mobile-specific engagement tactics**, such as push notifications or in-app messaging, to keep mobile users engaged and connected to your brand
- The company can also focus on **cross-selling and up-selling to existing customers, especially those in the regular plus segment**, to increase their loyalty and lifetime value. This can involve offering relevant services or products that complement their existing subscriptions
- The company may also want to investigate why customers who give a rating of 1 to Customer Care Agent Service are less likely to churn and try to replicate that positive experience for other customers.

# Recommendations

- **Target the single and married customers** with specific offers or promotions to increase their loyalty towards the company. Explore the possibility of offering specialized products or services for divorced customers
- Conduct further analysis to **identify common reasons for customer complaints** and take proactive measures to address those issues before they lead to customer dissatisfaction
- **Continuously monitor customer feedback** and implement improvements to enhance customer experience

**Based on spending and loyalty**, here is one potential way to **segment customers into four categories**:

- **High spenders, high loyalty**: These are customers who spend a lot of money with the company and have been loyal customers for a long time. They may be eligible for exclusive rewards and benefits.
- **High spenders, low loyalty**: These are customers who spend a lot of money with the company but have not been loyal customers for a long time. They may need additional incentives to continue shopping with the company.
- **Low spenders, high loyalty**: These are customers who do not spend a lot of money with the company but have been loyal customers for a long time. They may appreciate rewards and incentives to encourage them to spend more.
- **Low spenders, low loyalty**: These are customers who do not spend a lot of money with the company and have not been loyal customers for a long time. They may need more attention and engagement to keep them interested in the company.

**Thank You!**