

# **Fitness Center**

## **Initial Client Presentation**

Presented by  
Team 3



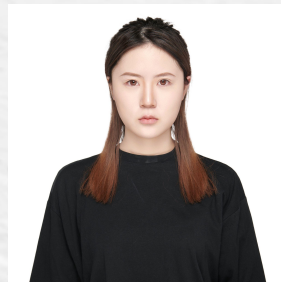
# Meet Our Team



**Hongxuan Zhao**  
Research Analyst



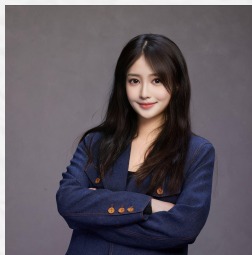
**Wisdom Chen**  
Data Scientist



**Rita Cui**  
Data Analyst



**Jessy Hu**  
Business Analyst

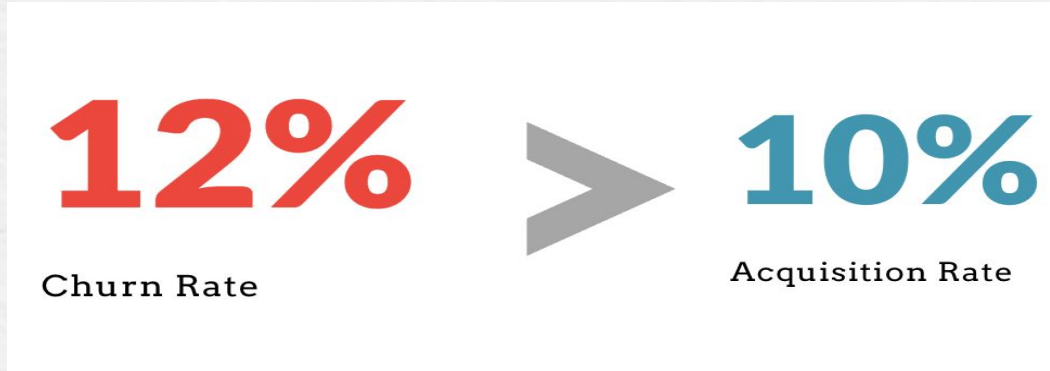


**Boya Zeng**  
Business Intelligence Analyst



**Colleen Jung**  
Data Scientist

# Problem Statement



1. Churn rate of **12%**
  - Surpasses the 10% acquisition rate
2. Negative impact on total revenue
3. Develop strategic plan to refresh the business and ensure its long-term sustainability

**01**

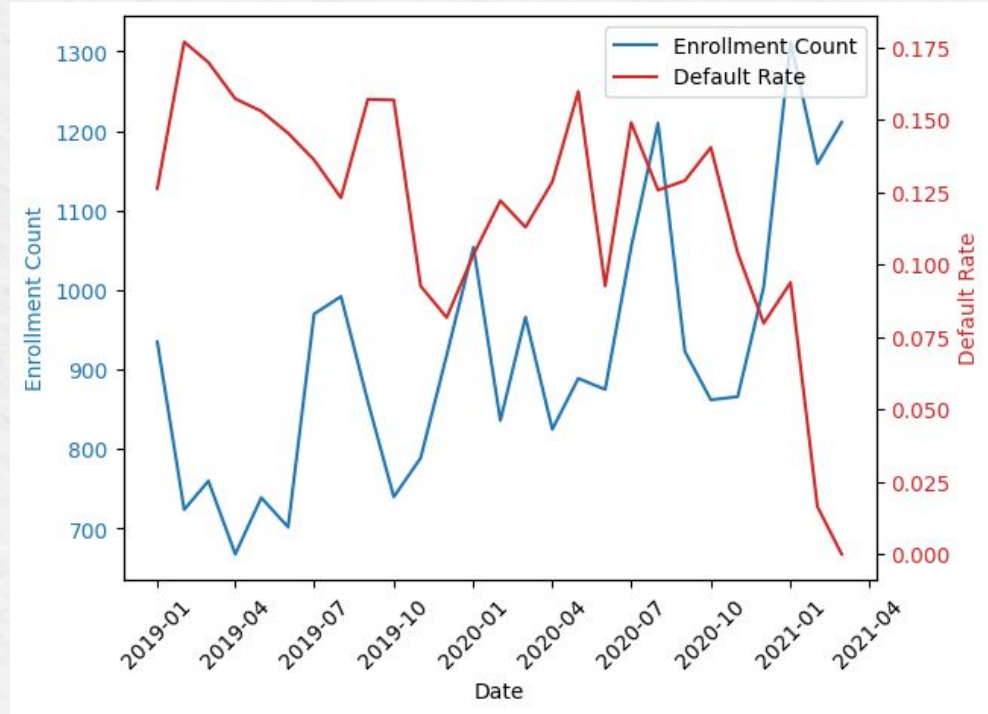
# **Visual & Insights**





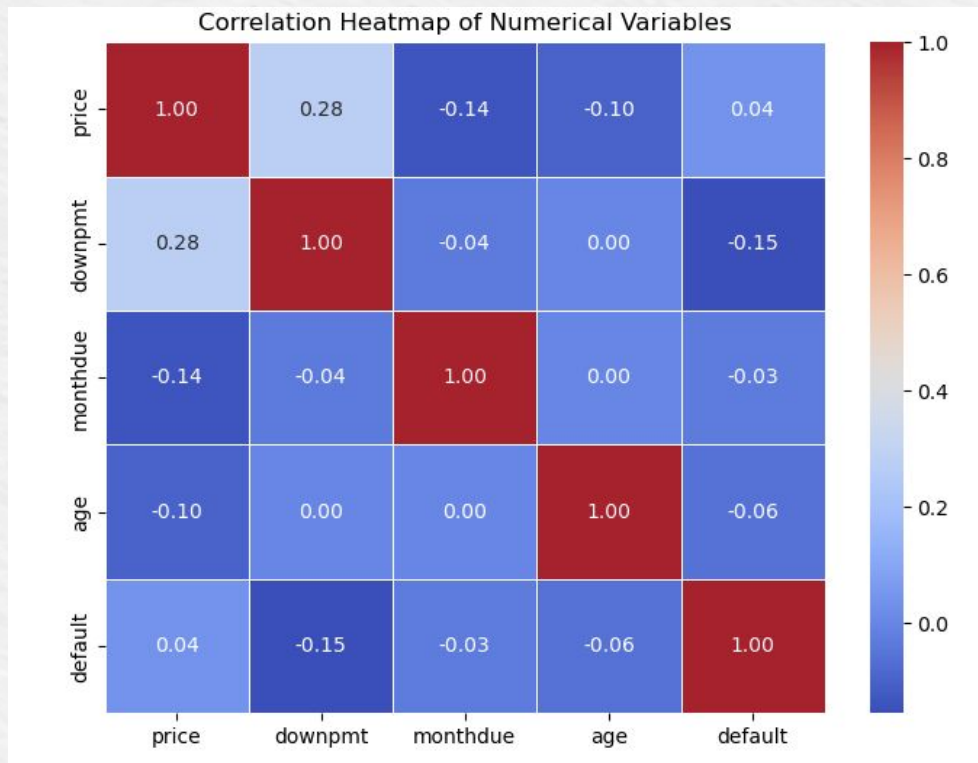
# Churn Rate vs. Enrollment Count

1. Members who registered later are less likely to quit
2. Increase in enrollment after covid-19



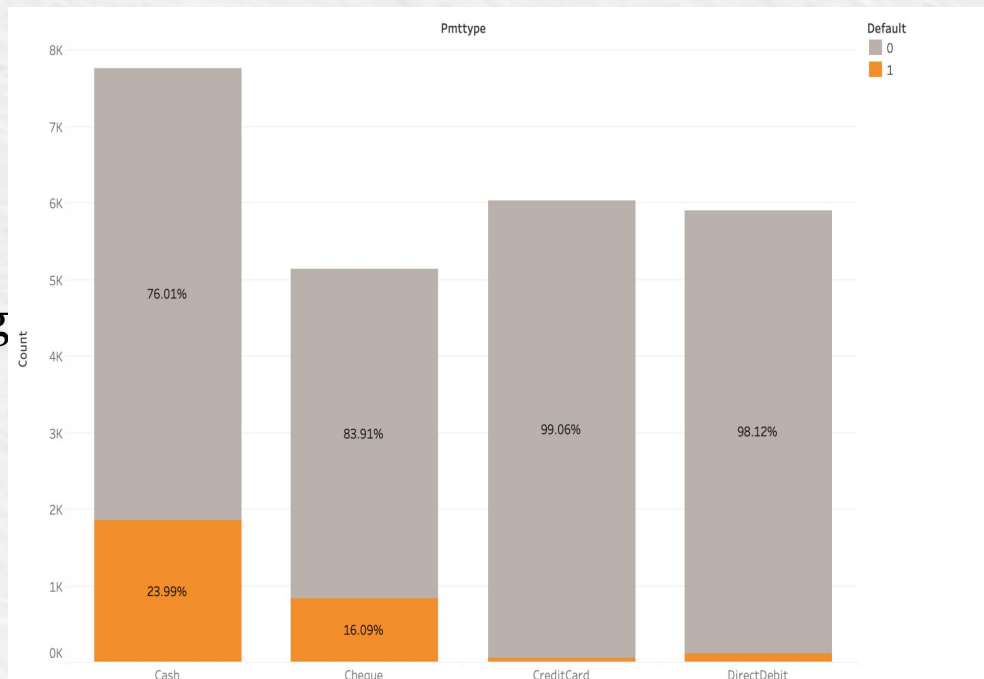
# Absence of Correlations

1. Numerical variables does not have strong correlations with churn
2. look into categorical variables instead



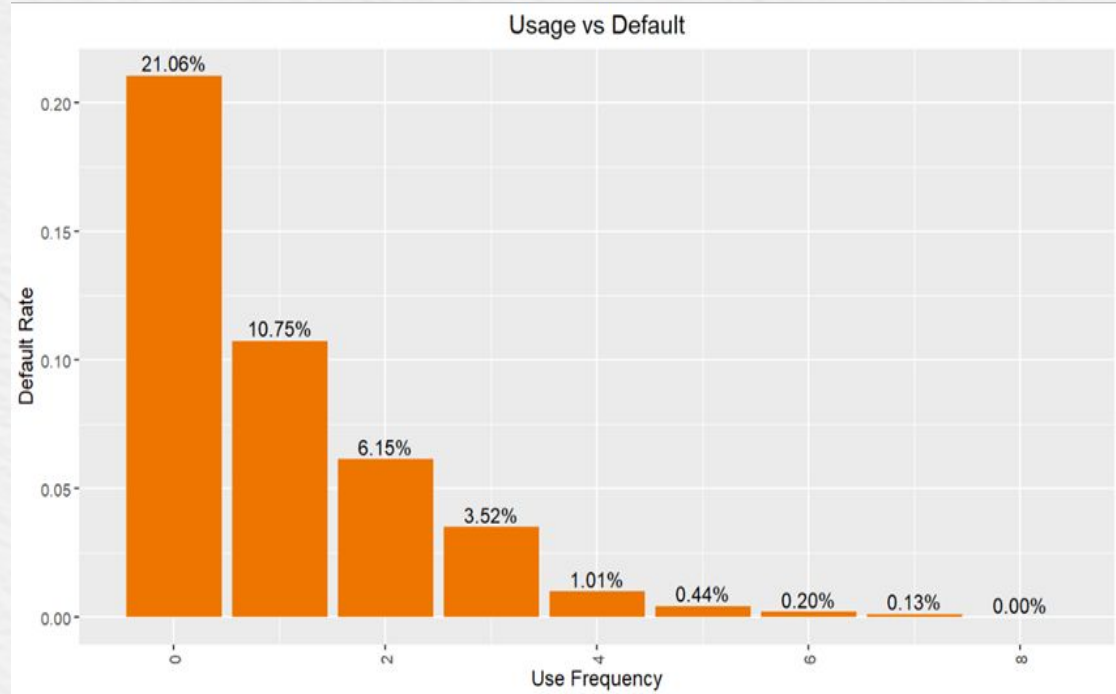
# Churn Rate vs. Payment Type

1. People who pay in cash and check would be more likely to quit
  - Easier to stop payments
2. More complex for people paying with cards to cancel memberships
  - Notice in advance
  - Need to cancel in-person



# Usage vs Default

1. People who use the fitness center less frequently are more likely to quit
2. strategy needed to stimulate the usage





**02**

# **Data Assessment**

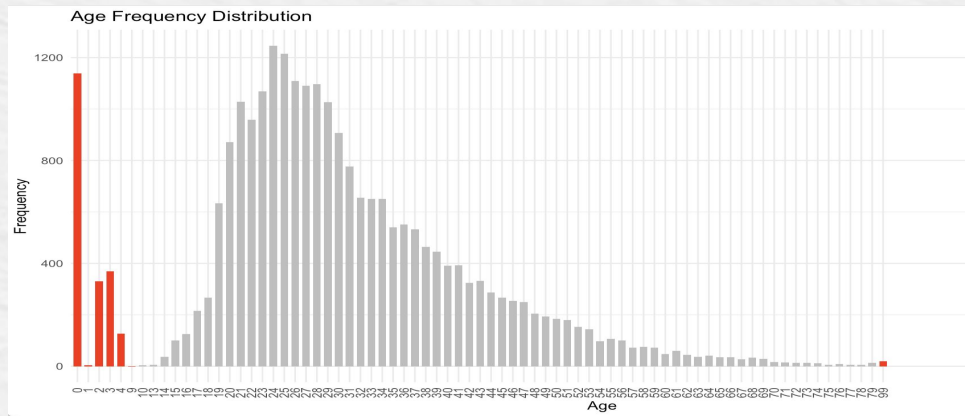


# Key Columns & Features

1. Enrolldt (Enrollment Date)
2. Default (Churn 1), Non-Default (Non-Churn 0)
3. Pmttype (Method of Payment by Members)
4. Use → Binned frequency of use (0 is lowest, 8 is highest frequency of use)
5. Age
6. Gender (Female → 1, Male → 0)

# Quality Concerns

~**2000** entris have  
age <10 or age>99

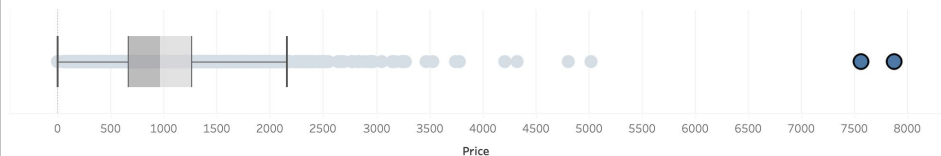


Entries with annual  
price over **\$7,000**

- Is it a special  
membership or  
could be data entry  
error?



Annual Cost Distribution



# Additional Data Needs

1. Variation for down payment values
  - One time fee
  - Regular basis (Monthly, Quarterly, Annually)
2. Membership Plans Details
  - Unlimited, Classic, Pay-As-You-Go, etc..



**03**

# **Methodology Selection**





# Model Selection

## **Two Approaches:**

### **1. Logistic Regression**

- Linear relationship
- Feature importance
- Interpretability

### **2. Decision Tree**

- Nonlinear relationships
- Mixed data types
- Robust model performance (less influenced by outliers)

**04**

# **Preliminary Results & Interpretations**



# Evaluation Metrics

## 1. F1-Score

- Harmonic mean of precision and sensitivity

## 2. Sensitivity

- The proportion of actual positive cases that are correctly predicted

## 3. Accuracy

- The proportion of correctly predicted cases

## 4. Precision

- The proportion of positive cases that are actually correctly predicted

# Implications of Potential Strategy

## 1. Promote usage

- Higher usage rate -> lower churn rate

## 2. Change payment methods

- Encourage customers to use card -> lower churn rate

## 3. Targeted Promotion

- Target on certain age group (e.g. young adults) -> lower churn rate, increase acquisition rate



# Thank you

