Cell2Cell Churn Modeling

Group F
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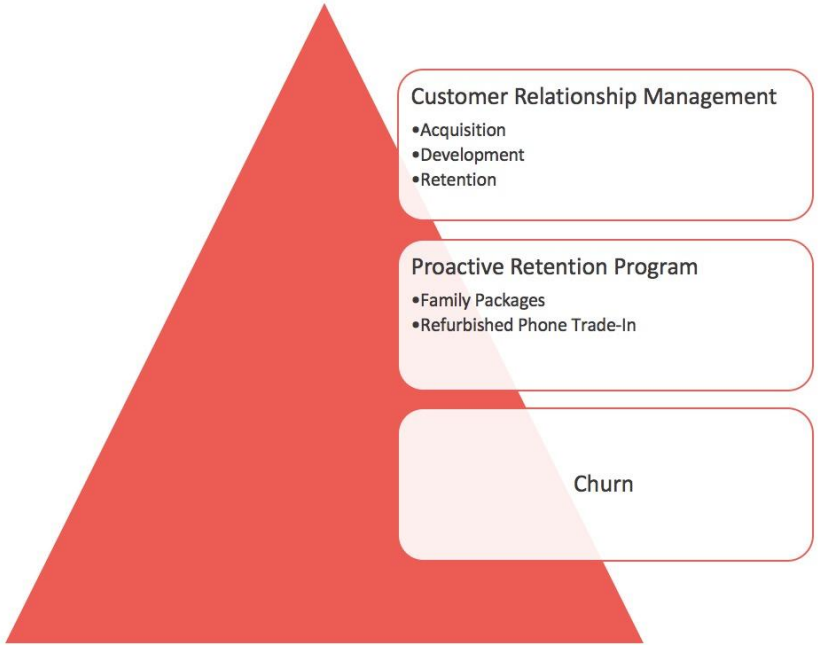
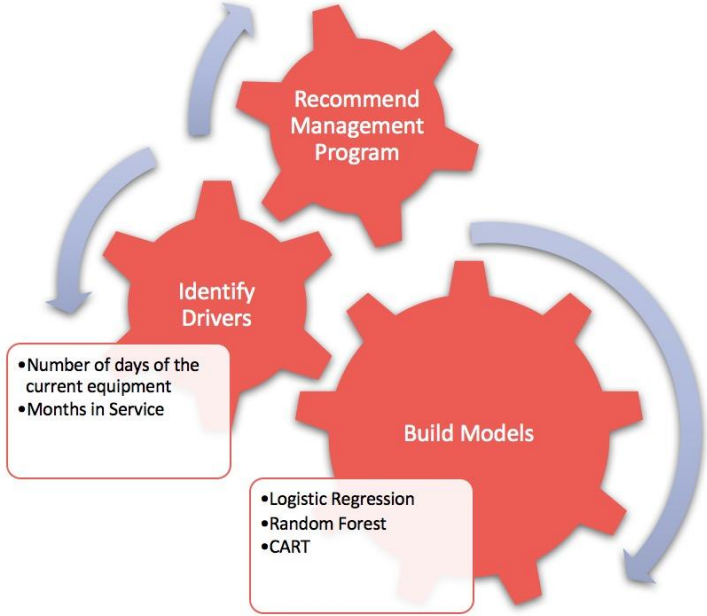
INTRODUCTION





OVERVIEW

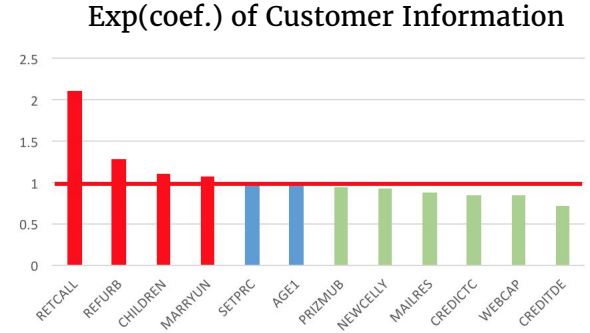
- Algorithm: Logistic Regression, CART, Random Forest
- Statistical Program: SPSS, R
- Sample: 56.3% Calibration, 43.7% Validation
- Model - Logistic Regression
  - Variables selection: Forward Stepwise
  - Multicollinearity test (28 selected from 32 variables)
  - Build the model with calibration sample
  - Predict the probability of churning for validation sample

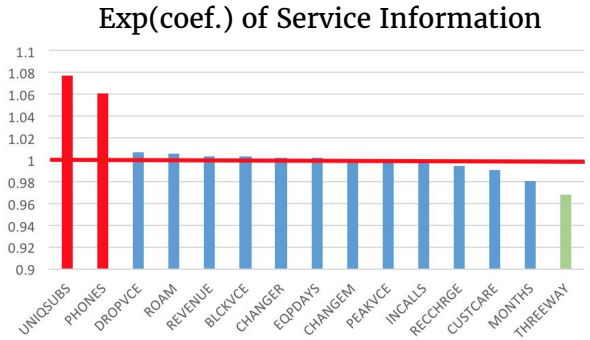
OVERVIEW

- Models - CART & Random Forest
  - Build a decision tree with calibration sample
  - Churning Prediction for validation sample: predict whether a customer would churn (Y/N)
- Results
  - Compare AUC
  - Combine two models → Calculate LIFT
- Customer Lifetime Value (CLV)
  - Segment Customers into 3 groups by revenue
  - Calculate Customer Lifetime Value of every group
- Incentives
  - Family Packages
  - Refurbished Phone Trade-In

RESULTS - Logistic Regression

28 variables selected by Forward Stepwise, 27 are significant in model.





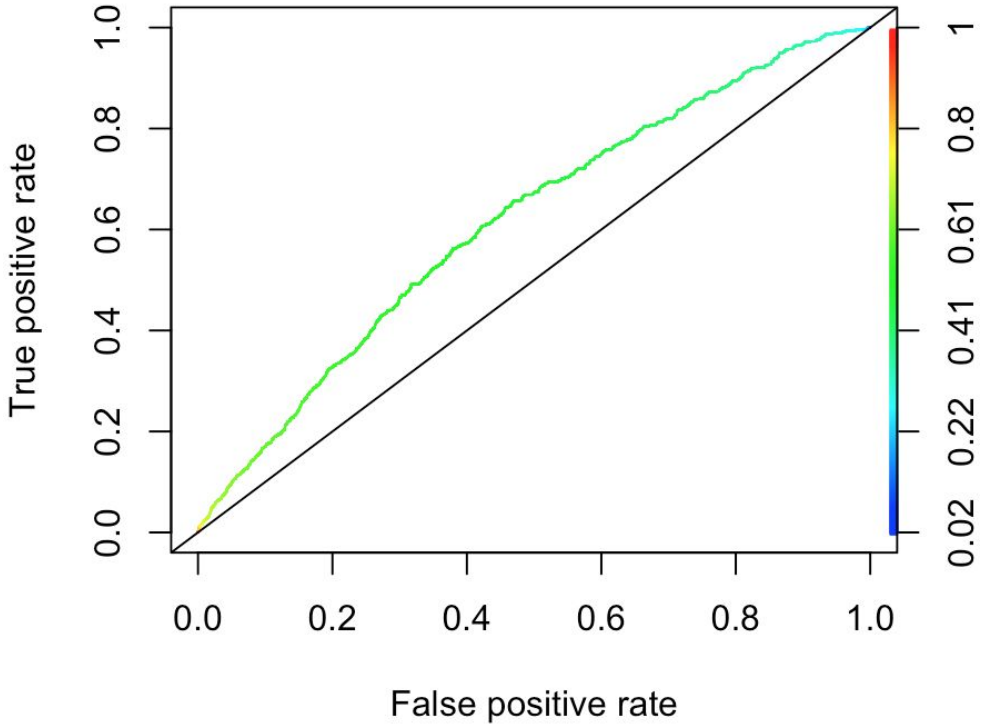
Findings:

1. 27 variables are significant.
2. 6 red bars have biggest positive influence on churn rate.
3. 7 green bars have biggest negative influence on churn rate.

Insights:

1. Customer profile has larger influence on churn result than the company service does.
2. Customer more likely to churn: more calls to retention team, care more about children, handset is refurbished, more unique subs, more handsets issued.
3. Customer less likely to churn: medium or low credit rating, response more to mail orders, handset is web capable, new cell phone user, live in suburb.

RESULTS – Logistic Regression

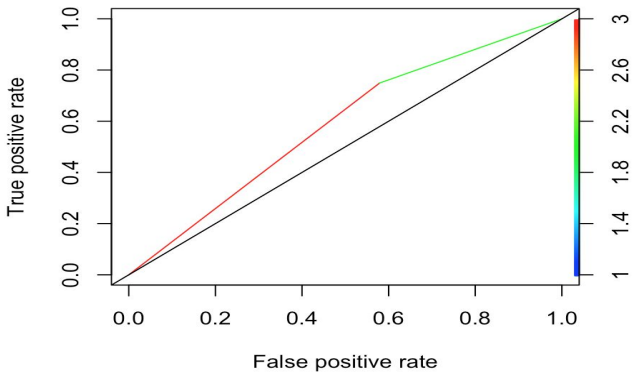


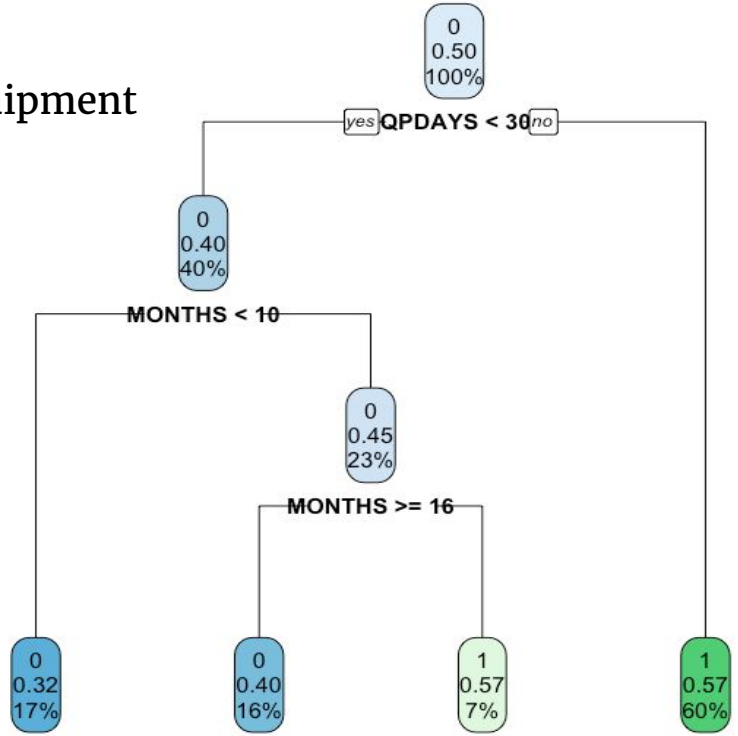
AUC: 0.615

- 61.5% of randomly chosen positive examples rank above randomly chosen negative examples.

RESULTS - CART

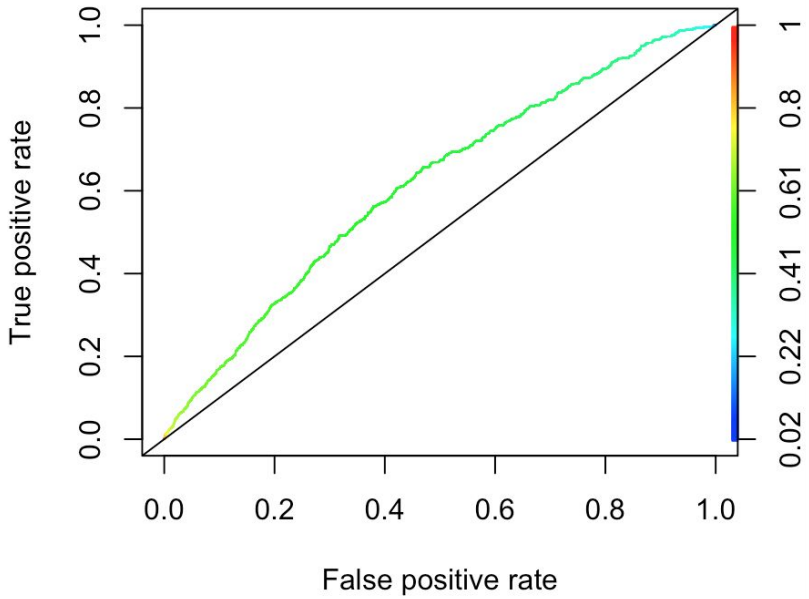
- Decision Tree
- Influential factors
  - QPDAYS: Number of days of the current equipment
  - MONTH: Month in service
- Prediction Assessment
  - AUC: 0.585
  - ROC Curve



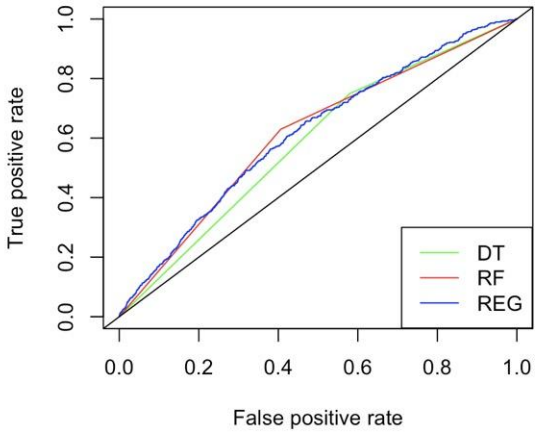


RESULTS - Random Forest

- Random Forest
- Influential factors
  - QPDAYS: Number of days of the current equipment
  - MOU: Mean monthly minutes of use
- Prediction Assessment
  - AUC: 0.613
  - ROC curve



IMPLICATIONS



$$Predicted\ Prob_{Random\ Forest} \times Predicted\ Prob_{Logistic\ Regression}$$

Compare AUC

- Random forest
- Decision Tree
- Logistic regression

Combine models

- Random forest & Logistic regression

Calculate LIFT

- Top **10%** of customers are target customers with the retention offer to be **118%** (LIFT=2.18) more likely to churn than the average customer

RESULTS - CLV

Customers were stratified by revenue. **Marketing budget for each segment should be less than its CLV.**

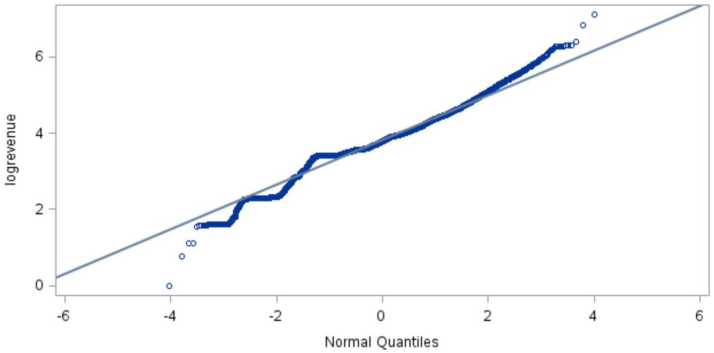
Assumptions：1) margin=revenue*0.7 (contribution rate)

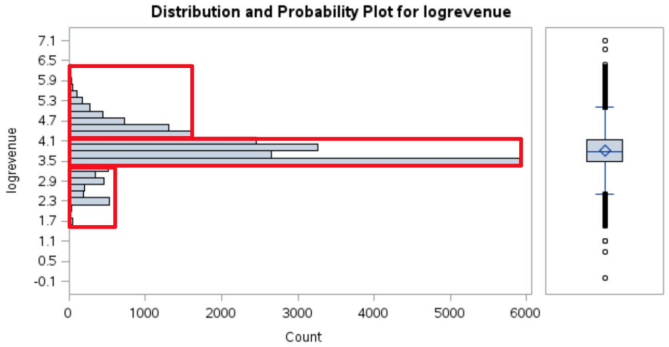
2) Interest rate=0.1

Retention rate=(1-monthly_churn_rate)^12=0.78

CLV=margin*(1+i)/(1+i-r)

Log(rev)	Rev	Avg_rev	Margin	CLV	Pct
>=log(4.2)	>=67	108	76	261	22%
log(3.4)< log(rev)< log(4.2)	30<rev<67	43	30	103	67%
<=log(3.4)	<=30	18	13	45	11%





INCENTIVES

- Family Packages
  - Customers with children in the household, and customers whose marital status is unknown, are more likely to churn
  - Targeting these customers with Family Discount Bundles or Spouse Referral Bonuses can reduce the number of customers lost in these categories, and reduce the number of customers whose marital statuses are unknown (then these customers can be dealt with accordingly)
- Refurbished Phone Trade-In
  - Customers with refurbished handsets are more likely to churn, so getting them on a brand new device will reduce churn
  - Customers with refurbished phones can participate in a trade-in program where credit is put toward a new phone
  - Newer customers could be offered discounts on new phones for renewing contracts with Cell2Cell