IBM Telco

Predictive Customer Churn strategies

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Agenda

Background

Key findings

Additional steps

Summary

Next Steps

Questions

You wanted to identify customers who would churn to add in a save strategy

This project was to assess the important features that management should consider in developing customer retention programme.

We focussed on two main questions:

a) Can we accurately predict which customers will churn?
b) Which factors heavily relate churn and can be used in a save strategy?

With sub questions of:

a) How the model performs
b) The financial savings from its implementation

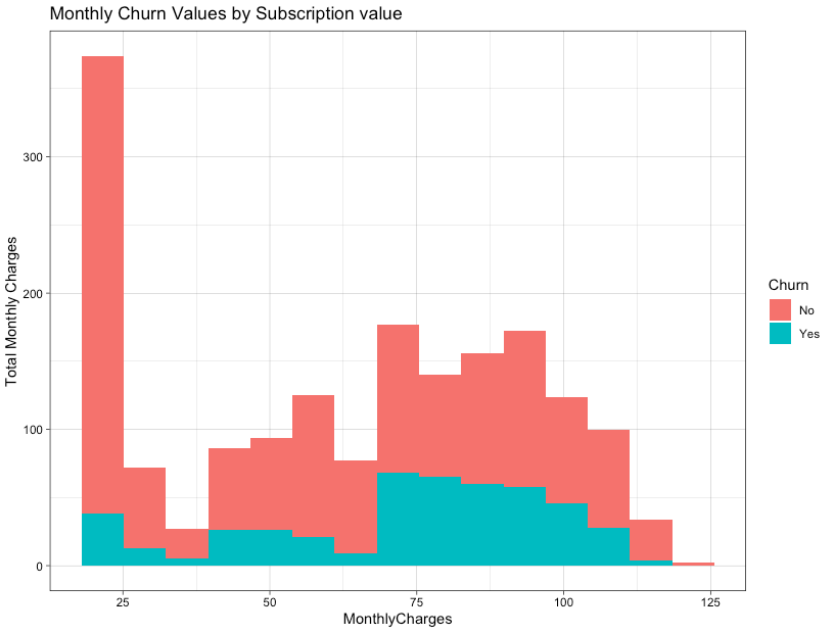
We determined that the approach could save £4,000 per month per 1,000 customers

We believe this because…

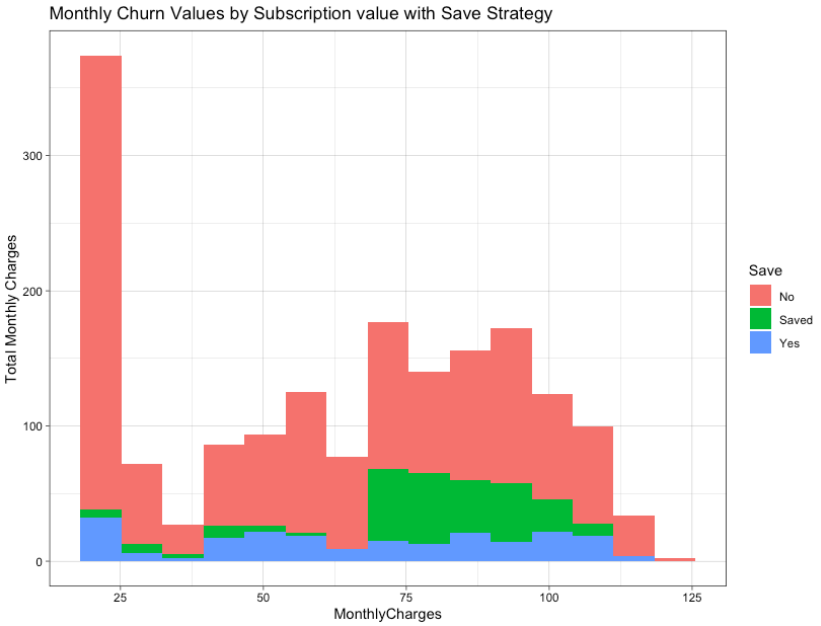
Key Findings

- £4000 in savings over first month per 1000 customers. Based on successfully 252 of 467.
- Model can identify 8 out of 10 customers' behave correct (stay or churn)
- Key features highlighted for customer retention programme are:
  - Contract Type
  - Payment Method

Without Retention Strategy



With Retention Strategy



Actual vs predicted savings performance for cohort of 1760 (example test set)

Summary

You asked:	Answer:
Can we predict churn customers?	Yes – Model can accurately identify potential churn customers.
Which churn factors can be used for retention?	They are – contract type and payment type
How model performs?	Well – Model can identify the behaviour of 8 out of 10 customers correctly (stay or churn)
Financial savings?	Yes – £4,000 per month per 1,000 customers.

Next steps

We can use this model to create a retention programme

Key Influencer	Situation and Result	Suggested Use
Contract Type	• The contract types are: Month-to-month, One year, Two year • **Month-to-month** has the highest churn	Offer discounted average monthly rates for 2 year and 1 year contracts to monthly and new customers.
Payment Type	• The payment methods are: Bank transfer (automatic), Credit card (automatic), Electronic check, Mailed check • **Electronic Check** Customers have a higher churn rate	Incentive **Electronic Check** customers to move Credit Card (automatic) with reward or discount

Potential next steps

Productionising the planned project

- The clear next step is to have the model in production so as to be ready for business use
- Establishing a stable production infrastructure to enable this can be as challenging as the creation of model code

Create and run Customer retention strategy

- Work with marketing to create a customer “save strategy” driven by model features and additional customer segmentation
- Design live test for churn model and save strategy.
- Implement strategy in live test

Other projects

- Customer segmentation
- Product recommendation and upselling

Questions?

Appendix

To assess the value of using the model we used a set of assumptions

Assumptions: based on values supplied by organisation and applied uniformly

Cost retention

- £20 per customer

Cost of Churn

- £100 per customer

Retention success

- 100% success rate

Definition: we define the value as below

Saved monthly revenue - (Unidentified Churn x Cost of Churn + Identified Churn x retention cost)

=

Actual net saving

EDA and Modelling Process (CRISP-DM)

1. Data Preparation

a) Missing data for TotalMonthly with tenure 0 imputed to 0.
b) All categorical variables
c) Difference between Tenure x MonthlyCharge and TotalCharge – highly correlated but not exact*
d) Gender removed as low influence variable.

2. Model Selection

a) Binary Classification problem: churn (1) or retain (0)
b) Explainable model required e.g. Decision Tree, Logistic Regression

3. Evaluation and Tuning

a) Logistic Regression selected as based on metric performance**
b) Modelled validated and tuned with Cross-Validation and hyper parameter optimisation, respectively

4. Deployment

a) Model written in package and version controlled
b) Unit tests and continuous integration added for quality monitoring

*Is there missing field? Monthly increases, Customers fines, etc.
** Precision, recall, accuracy

Model and Performance

a) Logistic regression model selected
b) Using feature set, excluding gender
c) All Categorical implemented as dummy variables

Feature Scores

Feature	Estimate	Std..Error	z.value	Pr...z..
tenure	-0.0621024	0.00737227	-8.4237763	3.65E-17
ContractTwo year	-1.446768	0.20337668	-7.113736	1.13E-12
ContractOne year	-0.6457614	0.12295241	-5.2521249	1.50E-07
TotalCharges	3.45E-04	8.31E-05	4.15425374	3.26E-05
PaymentMethodElectronic check	0.35423998	0.11068447	3.20044886	0.00137214
PaperlessBillingYes	0.24943427	0.08671088	2.87662005	0.00401959
DependentsYes	-0.2981046	0.10475951	-2.8456094	0.00443265
MultipleLinesYes	0.42276868	0.2037378	2.07506252	0.03798074
SeniorCitizen1	0.15097005	0.09748243	1.54868994	0.12145627
TechSupportYes	-0.3156324	0.20884249	-1.511342	0.13070133

Performance Metrics

Metrics	Estimate
accuracy	0.79431818
kap	0.44670142
sens	0.8863109
spec	0.53961456
precision	0.84202792
recall	0.8863109