

Customer Churn Risk: Insights and modelling

Client: **Swan Teleco**

Team: **Quacktical Insights**



Who Are Swan Teleco's Churners?

Demographics

- Customers **without dependents** are 400% more likely to churn, perhaps because they have simpler plans which makes switching plans easier.
- Customers **without a partner** on their plan are 68% more likely to churn, for the same reasons as above.
- Senior citizens** are 77% more likely to churn. It could be due to a more limited income (i.e. pension) leading to churning.
- Customer gender has only a small effect. Women are 3% more likely to churn.

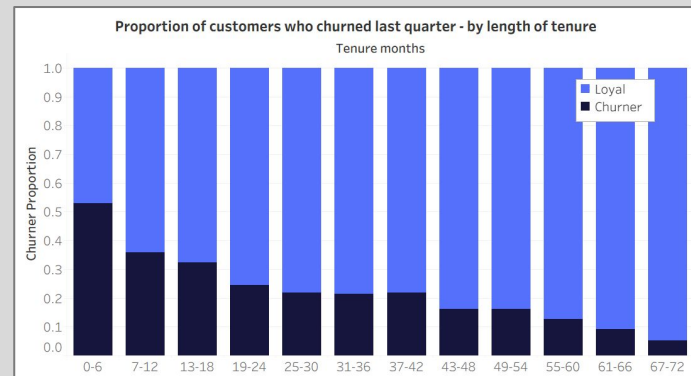
Monthly Tariff

- Customers on **high tariffs** (\$70-100) are disproportionately likely to churn, perhaps due to dissatisfaction with the high price.
- Customers on low tariffs (less than \$30) are much less likely to churn.



Tenure

- Just over half of **new customers** (up to 6 months' tenure) left Swan Teleco last quarter.
- Customers with longer tenure are increasingly likely to remain loyal.
- Of the oldest customers (4.5 to 5 years' tenure), only 5% churned.



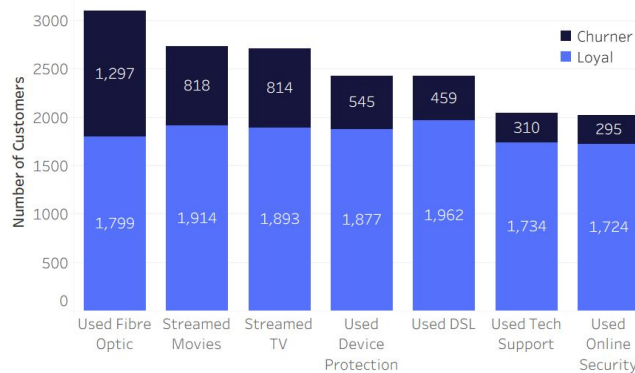
- Loyal customers had accumulated 67% higher total charges than those who churned. This is linked to their having been with Swan Teleco for longer, on average.

What Products Are Churners Using? • How Are They Paying?

Products

- 42% of **Fibre Optic** users churned
- Only 15% of Online Security users churned
- Higher-priced products may have higher churn rates

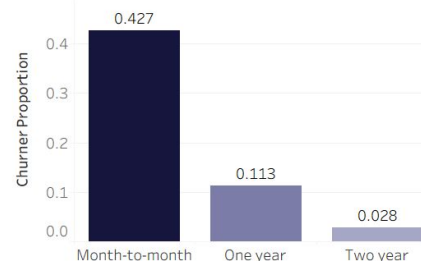
Products Used by Churners and Non-Churners



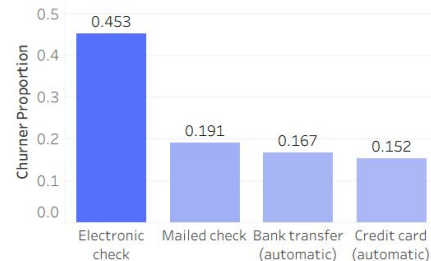
Payments

- Customers on **month-to-month** contracts are 15x more likely to churn than those on 2-year contracts.
- Customers paying by **electronic check** are approximately 3x more likely to churn than those with automatic payments.
- Longer contracts and automated payments are associated with more loyal customers. Perhaps because it is more difficult to leave these arrangements, or because customers who intend to stay longer choose these options.

Contract Type



Payment Method

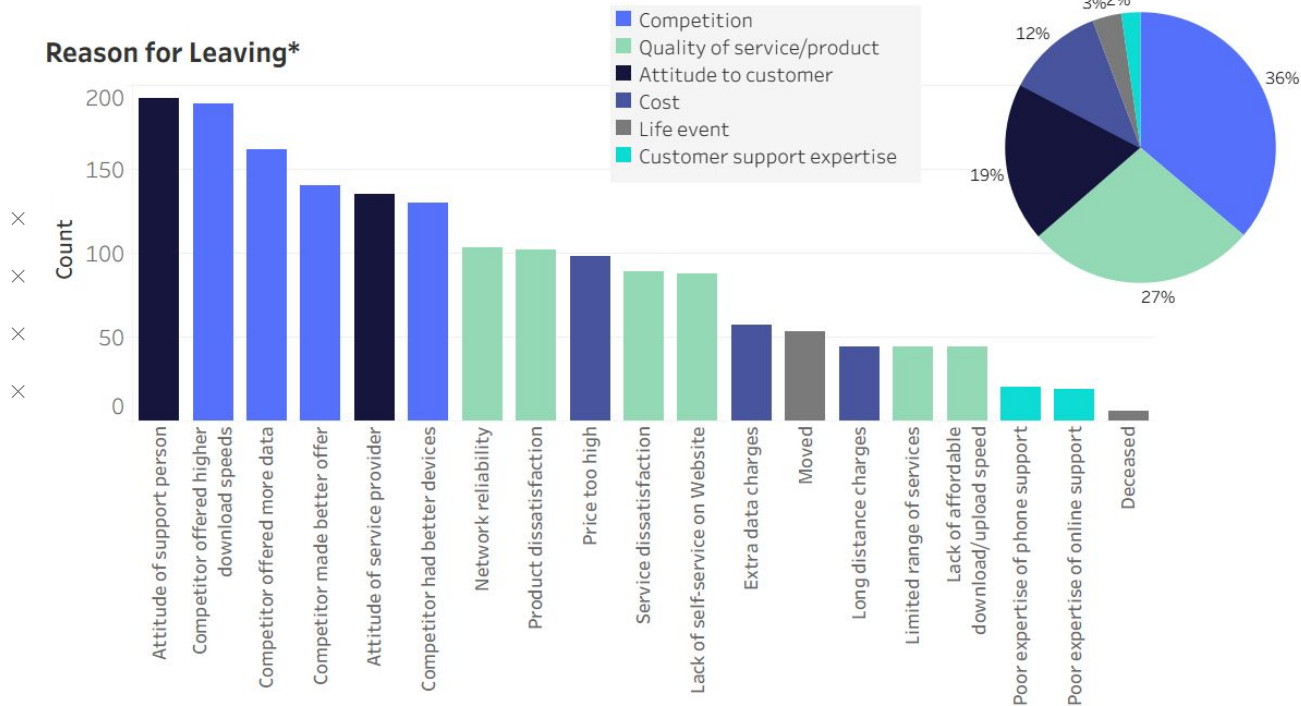


Two year contracts are the factor most closely associated with a reduction in churn rate.

The New Customer Team should be incentivised to sign up new customers to two year contracts.

Why Do Customers Leave Swan Teleco?

Reason for Leaving*



*Note: excludes nulls and customers who responded "Don't know"

Reasons for leaving

- **Better offers from competitors** was the most common underlying reason (36%).
- Improvement in **attitude towards customers** is identified as relatively straightforward potential area for improvement.
- The data indicates that customer service teams are very competent, but may be rude to customers.
- 27%* of churners were predominantly dissatisfied with their product(s) or service(s). Swan Teleco should investigate common issues or limitations, e.g. in Fibre Optic provision.

Customer Churn Risk Model

Random Forest Classifier

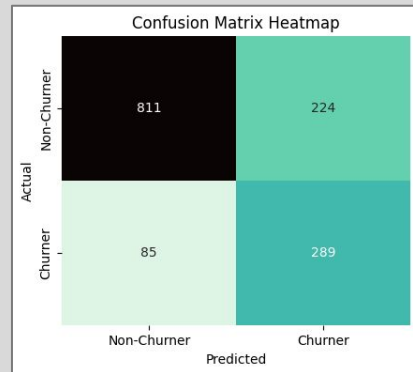
- Several classifier methods were tested, and the Random Forest classifier was found to be the most suitable.
- It is a machine learning algorithm that uses multiple decision trees to make better predictions.
- This ensemble learning technique combines the classifications from multiple decision trees, improving accuracy and reducing errors.

Hyperparameter Optimization

- The default parameters of the Random Classifier Model will rarely return the most accurate model.
- Model uses a **Grid Search Cross Validation** method to determine the best model parameters.
- **Recall** score was used to judge the best model due to the imbalance in the number of churners and non-churners making accuracy unsuitable.

Model Evaluation

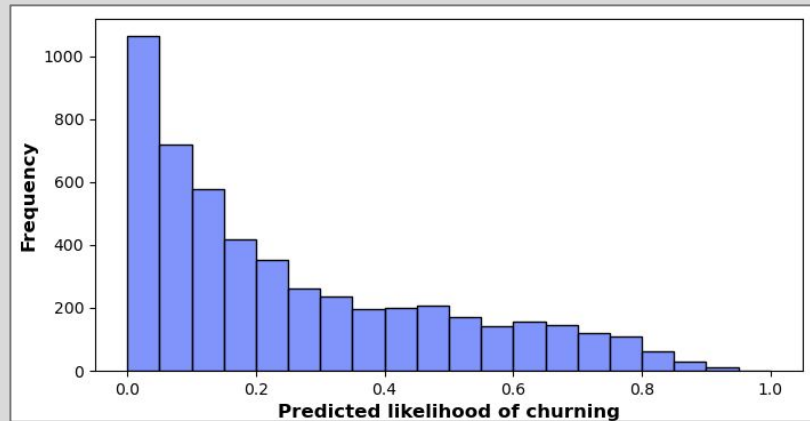
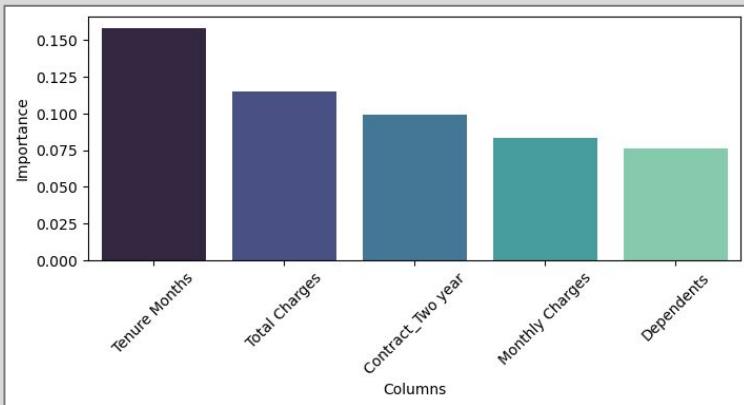
- Summary of the performance of the optimised model on test data. Taking the weighted average values.
 - **Recall** = 0.78
 - **F1-score** = 0.79
 - **Precision** = 0.81
- The model performs consistently across metrics. This is a good indicator of model stability.
- The **confusion matrix** evaluates model performance by comparing predicted and actual outcomes
- A **high number of false positives** indicates the model misidentifies some current customers as churners. Some additional refinement is required to prevent unnecessary retention efforts



Model Output

High Churn Risk Factors

- The model estimates the likelihood of each customer churning based on their data.
- It identifies **length of tenure, total charges** and **two year contracts** as the strongest predictors of customer churn, consistent with the initial analysis.
- The relative model importances of the top 5 predictors are shown below.



Results Summary

- The 500 existing customers predicted to be most likely to churn are listed in order (from most to least likely) in the file **"500_Most_Likely_to_Churn.csv"**.
- The churn risks for all existing customers are listed in the file **"Churn_Risk_All_Customers.csv"**.
- The distribution of churn risk modelling results (for all existing customers) is presented above.

Key Takeaways

- Factors associated with high churn rates include **high monthly tariffs, electronic check payments, and new customers**
- New customers should be encouraged to accept **two year contracts**
- Improving **attitudes towards customers** is recommended as a method to improve retention
- Our Random Forest model can predict churners to a high degree of accuracy (**78%**)
- Model predictions are provided, for all existing customers and for the 500 highest-risk customers, in CSV format

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