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**A2: Individual Assignment**

2194 Words

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# **Introduction**

The meaning of the word ‘churn’ within the business context means the customer change from one business to another, who provide the same or similar service (Cambridge dictionary, 2022). In the recent years, customer churn has been an increasing problem for many businesses, especially those in the telecom service industry and many are struggling to find working strategies to overturn this trend (Amin et al, 2016). Telco is also a telecom company, also facing high customer churn rates and is looking for ways to overturn this trend within their company. In this report, the customer data of Telco will be analysed to identify the reasons for current rates of customer churn, which will be followed by strategy suggestion to reduce churn and future improvements in data collection and churn prevention.

# **Initial analysis**

To better understand the reasons for customer churn, it is important to firstly describe the dataset given on a basic level. The dataset includes data of 7042 customers, their IDs unique to each customer, and demographic data, which shows that there are 50.5% are males, 16.2% are seniors, 48.3% have a partner, and 29.9% are dependant. Further, the dataset includes information about their tenure length, with the mean being 32.37 months, and information regarding what services are being bought, such internet type, online security, etc. (Appendix 1). Further, the dataset includes the contract type that the customers have, which includes ‘month-to-month’ (55% of all customers), ‘One-year’ (20.9%) and ‘Two-year’ (24.1%). Further, dataset includes whether the customers use paperless billing, of which only 59.23% do, as well as the exact payment type that is being used (Appendix 2). Furthermore, there is data regarding monthly and total charges per customer, with the mean being 64.76 and 2283.3, respectively. Lastly, the dataset includes whether the customer has churned or not, with 27.6% being ‘Yes’, a survey result of the Telco services, raging from 1 to 5 with mean being 3.29, and the region and manager of that region. It should be noted that that each customer is assigned only for 1 region, and there is only 1 manager per region, with 5 regions in total.

After reviewing the data, it was found that there is no need to clean the data, and if there are any ‘null’ values, a function would be used to skip them over. However, to better understand customer charge rates, monthly and total charges were split into quartiles, with:

Monthly charge being:

Quartile 1 – 35.5 or less

Quartile 2 – 70.35 or less, but more than 35.5

Quartile 3 – 89.85 or less, but more than 70.35

Quartile 4 – more than 89.85

Total charges quartiles being:

Quartile 1 – 401.45 or less

Quartile 2 – 1397.475 or less, but more than 401.45

Quartile 3 – 3794.7375 or less, but more than 1397.475

Quartile 4 – more than 3794.7375

# **Main drivers of customer churn**

With basic analysis done, we analyse against which variables when compared, we can see a high customer churn rate. First of all, it should noted that there were no significant differences in churn rates between customer demographics, or region and their assigned manager, except for customers that are seniors, of whom many churn. When looking deeper into the reasons for, we discover that for the same reasons not only seniors churn, as many as much non-senior customers using Fiber Optic are churning, half in the case of seniors (churned customers represented by orange bar here and forward).

*A graph with blue and orange bars

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*Figure 1. Customer churn vs Senior or Not customers per Internet type*

Including additional variables, such as Online security, Online backup and Device protection present that customers not having these, however having internet, whether it is DSL or Fiber optic, are more likely to churn, especially in the case of seniors, where the number of churned reaches more than those that have not yet churned in the case of seniors.

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*Figure 2 Customer churn vs Senior or Not customers per Online security (yes or no)*

*A graph of a number of people

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*Figure 3 Customer churn vs Senior or Not customers per Online backup (yes or no)*

*A graph of different colored bars

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*Figure 4 Customer churn vs Senior or Not customers per Device protection (yes or no)*

Looking at churned customers per Service type and per Online security, we can see that Fiber optic customers in general are more likely to churn, and it is especially the case if they do not have any additional services. This sets us up perfectly for predictive analysis.

*A graph of different colored bars

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*Figure 5 Customer churn vs Senior or Not customers per Online Security (yes or no)*

However, before moving forward, a few other different metrics should be looked at. At the figure below we can see that all customers who rated Telco services 1 or 2 have churned, while the number is around 40% for those that rated 3, and none for those who rated 4, 5 or did not rate.

*A graph of a customer survey rating

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*Figure 6. Customer churn number per survey rating*

If internet type is included into the chart, there are significantly more dissatisfied customers when they are using fiber optic. This shows that there are major issues with fiber optic internet type, especially when no other additional options are chosen.

*A graph of a customer survey

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*Figure 7. Customer churn per internet type per survey rating*

Introducing the “monthly charge quartile” that was assigned to each customer, we can also see that as customer spending increases, customer churn as well, presumably because customers are expecting more for their spending, however their demands in their view are not met.

*A graph with blue and orange bars

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*Figure 8. Customer churn per monthly charge per survey rating*

Lastly, it should be also noted that while Electronic Check is the most popular way to pay, however, also nearly 40% of such customers have churned. This shows that there might be some issues with Electronic Check payments method.

*A graph of a payment method

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*Figure 9. Churned customers per payment method*

# **Strategies to reduce customer churn**

The predictive analytics were done by building a probability decision tree with AI. Some data, that seemed to be irrelevant was removed, such as CustomerID, gender, whether they have a partner, their region and manager, and their total charge and monthly charge columns, being replaced by quartile column that was made before. The data was 70-30 for training, and the result gave a decision tree with 91% accuracy. However, the reason for this is that the variable “survey” overwhelmingly had the biggest influence and showed that customers giving a rating below 2.5 (realistically 2) have a 100% chance to churn, while those giving 4 or more, 0% chance. This is quite expected considering the previous findings in figure 6. It also gives us a better insight by showing that customers who rate Telco at 3, have around 65% chance of churning if they use fiber optic, and around 35% if DSL. Further, there is an increase in churn rates if the customer is on one-year contract.

*A diagram of a survey

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*Figure 10. decision tree.*

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*Figure 11. decision tree weights.*

However, assuming Telco will not be casually conducting surveys, as this is an additional cost, we can try looking at what other criteria’s have an impact on customer churn, to prevent future churn. Looking at the decision tree generated (with 79% accuracy) without survey results, we can see that our main predictor becomes contract length. This is quite normal considering that the reason for customers picking month-to-month plan is that they are not planning to keep it long-term.

*A diagram of a company

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*Figure 12. Second decision tree.*

*A screenshot of a computer

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*Figure 13. Weights of the second decision tree.*

However, the second most important variable is Internet Service (or internet type) since, with the simulator results showing that 87% of customers, who pick fiber optic without tech support churn, while it is only 23% for those that pick fiber optic with customer support. Even if the customer stays for longer than 1.5 months, there is a 55% that they will churn if they do not have tech support, in a case where their monthly charge is between quartile 2 and 3. In such case, contract type, that is month-to-month, and internet service, that is fiber optic, become the two main influencing factors increasing the likelihood of customer churn, while tenure length becomes the main supporting factor for customer retention.

Moving on from fiber optic internet, to DSL, the customer churn rate for the same 1.5 months is 50%, while with tech support decreases to 36%. Such comparison, when using same tenure duration, shows that most likely, DSL network is easier to set up, while fiber optic is more difficult to start off with, however offers better experience long-term. Regardless, the contract length agreed plays the most significant role in such simulated scenario when it comes to customer retention, followed by whether there is tech support available.

# **Strategy to reduce churn**

Looking at the findings and proposition, the main two reasons for customer churn are internet service satisfaction and contract length. Talking about internet service first, it was primarily noted that most customers churn within first 1-2 months, when they do not have tech support. While it is unknown why customers do not choose tech support, whether it is the price, or belief that they will do without it, providing tech support for the first two months at no charge for all customers. Decision tree simulation shows that by implementing such strategy and providing free tech support in the first months of the use could decrease the customer churn rates by around 60-80%. However, it should be noted, that an exact number cannot be given, as clearly there are issues with the fiber optic and DSL service itself, at least early into the service use, which is what is causing so many negative reviews. This fact is reinforced further by noting that customers on a yearly, or two-year contract churn significantly less, even if they do not have customer support, meaning that they “get over” the problem that many have at the start. Also, the reason why all customers should be provided free tech support in the first months, not only those on a month-to-month contract, is because otherwise it might serve as an additional incentive for new customers to not pick the yearly contract.

Since it was mentioned that survey results on telco services indicate that there are issues with fiber optic and DSL internet types, another option would be to try and resolve these issues and make the first few months have a more positive user experience. The goal of improvements should be specifically aimed towards customers without tech support, as to maximize customer satisfaction and minimize customer churn. Additionally, while it is not clear what exactly are the issues that could be happening early in the service use, it could be expected that improvements would trickle down to users of other contracts, which would have some positive effect on them as well.

Talking about longer contracts, another option would be making yearly or longer contracts harder to resist. This could be done by offering various incentives for the first few months, as optional benefits to the internet that Telco provides, like device protection and so on. As customers would sign up for the yearly contract, they would have to “sit out” the unpleasant first few months before becoming used and happy (or happier at least) with the service. If taken into account the fact that some customers chose month-to-month contract purely because they will choose another provider soon, or are not sure about Telco, the option to incentivize customers to stay longer could lead to more people becoming “accustomed” to Telco and deciding to stay even after the contract is done. However, there is limited information on how much internet service types and various additional services cost and what are the profit margins, as only total monthly charge sum is given, thus it is not clear to which extend it could be feasible, especially considering that most likely more that one additional service should be offered at no cost for the start, and one of these could be the tech support, meaning that there is an overlap of pros and cons of the strategy.

# **Proposed strategy**

Considering that more data can increases the likelihood of a good decision (Provost & Fawcett, 2013), the strategy of providing free tech support for fiber optic and DSL customers for the first 2 months would be recommended, as there are the most data compared to the number of unknown variables. Such strategy is the most direct at aiming at customer churn and offers only to give a single additional service for a few months, in exchange increasing customer satisfaction. If other additional internet services cost around the same, this would also offer the best value from the perspective of telco, would not only keep the customers on the month-to-month contract but would also provide the opportunity for Telco to promote the yearly plans. Lastly, it is the only strategy that provides a relatively accurate prediction, of decreasing customer churn by 60-80% in the first 1.5 months.

# **Limitations and future churn assessment**

To better understand reasons for customer churn in the future, Telco should consider firstly including the prices of each service, as well as the profit margins that it gets, as this would allow to look for more intricate strategies that would balance between keeping customers satisfied and company costs low. Such strategy would allow to also track not only which customers spend the most, but instead, who bring the most profits, and focus on retaining these. Further, more specific data regarding internet services could help reveal what are the specific issues with fiber optic and DSL: whether it is internet blackouts, slow speeds, customers under or overusing their network compared to the internet speed that they have. One way that it could be found out would be by collecting and providing more data via a more refined and in-depth survey, by asking their use experience per service that they have, instead of a broad single question. Lastly, Telco could provide information regarding previous providers of the customer and how long they have stayed with them (if possible) as this could identify if the customer is frequent to hopping service providers for any reason, as this would allow to tailor to tailor the offers to each customer, ensuring that both, customer satisfaction (and thus retention) and profitability are maximized.

# **References**

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# Appendixes

Appendix 1

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Appendix 2

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