**Predicting Customer Churn in Internet Service Provider Startup Enterprises Caused by Network Downtime**

**Introduction**

Startup telecommunication companies need help retaining their newly acquired customers due to the frustration with the performance of service providers, including reasons such as complicated billing, spam marketing, poor customer service, internet speeds, connectivity, or high plans. Consequently, telecommunication companies have a high customer churn rate. When starting, the company must generate revenue to offset the cost of setting up the extensive fixed infrastructure and legal processes. Hence, customer churn puts the company at a loss of money and time invested.

**Problem Statement**

Telecommunication startup companies have a target to convert their newly acquired customers into loyal customers. Loyal customers reduce costs incurred when reaching new customers and establishing the company. Altogether, this leads to the profitability of the company.

In the telecommunication sector, the cost of customer acquisition is high. For startup businesses, network downtime is one of the causes of the loss of the consumer base. Network downtime occurs when a network is inaccessible due to a particular system, application, or total network failure. Maintenance activities, unexpected technical failures, or power cuts can cause it. Network downtime leads to customer churn due to the unreliability of the services on offer. As a result, the consumers lack confidence in the services provided, causing them to switch to other competing alternative services.

In this case, it costs the company more to acquire new clients than to retain the existing ones.

**Objectives of the study**

1. To predict customers likely to churn due to network downtime.
2. To detect which access points are likely to experience network downtime.
3. To conduct behavioral segmentation analysis of different consumer groups.
4. To identify the frequency of network downtime experienced by different consumer groups.

**Questions**

1. What is the rate of customer churn for the company?
2. What is the rate of customer churn due to network downtime?
3. What is the frequency of network downtime experienced by the access points?
4. What types of network downtime does the company experience?
5. What are the different consumer groups?

**Data requirements**

1. Geolocation data – This will most preferably be a real-time data stream. The intention will be to determine the customers’ locations from the access point locations. This data will also assist in identifying access points that are affected by network downtime.
2. Customers’ historical sales data – to check the customers’ behavior from usage and purchase behavior, time, and location characteristics.
3. Customer churn data – To predict customers’ likely to churn and check customer loyalty.
4. Network Log data including Maintenance activities data, unexpected technical failures data, and power cuts data – to predict and detect network downtime.

**Proposed Methods/Procedures**

The project will follow the following steps:

1. Understanding the business and the data available.
2. Developing a data storage area, i.e., cloud platform or on-premises data servers
3. Developing the data pipelines
4. Setting up the data warehouse/Lake
5. Conducting the ETL/ ELT process
6. Carrying out data analysis of the data/
7. Creating the dashboards for the engineering and marketing teams
8. Building machine learning models to perform behavioral segmentation to detect churn and network downtime
9. Deploying the best-performing models on the respective dashboards

**Proposed Solution**

1. To develop a data warehouse and data pipelines for data storage and analytics of sales and marketing data, and network log data.
2. To build machine learning models to detect anomalies, conduct behavioral segmentation and predict customers about to churn.
3. To create an analytics dashboard for the engineering team to assist with network maintenance and send alerts of predicted or detected network failures.
4. To create a customer analytics dashboard for the marketing team to assist in customer churn prediction and behavioral segmentation.

The intended period of the research will be 12 months. Still, within the period, different project solutions will be established and can contribute to various business activities. The researcher will do most of the work remotely and on-site visits, mainly on weekends.

The researcher will provide monthly report updates to the administration as the project progresses. The project will require financial input, which the administration and researcher will discuss in a budget proposal.