

Title: Churn Detection/Prediction for Transportation Firm

Motivation / Background

Transportation companies benefit from having consistent volume per lane/origin for transportation optimization. However, many factors are contributing to the **disappearance of expected demands**.

The disappearance of expected demands is typically referred to as “**Churn**”.

The company wants to find a model to predict before such Churn will occur and potentially reduce the chance or manage its resources for such events.

Key Question / Hypothesis

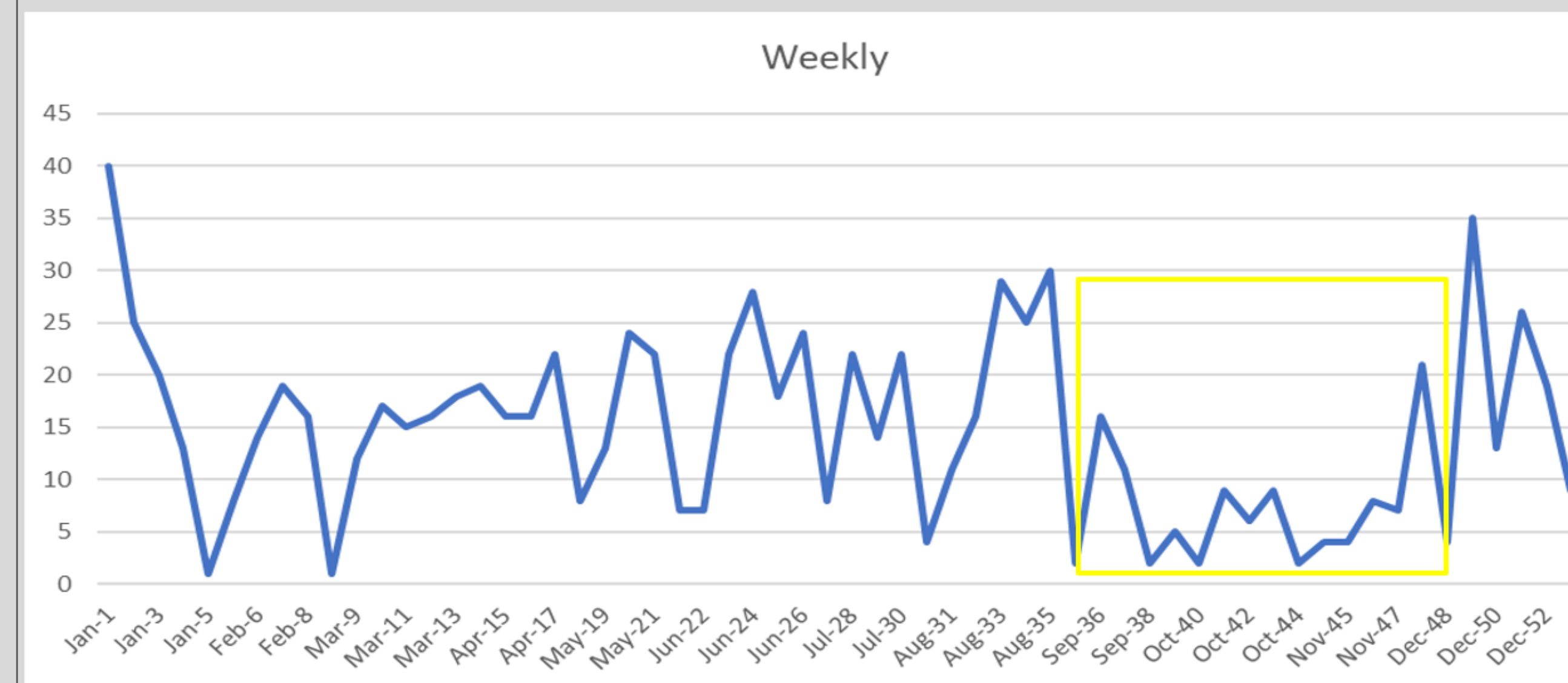
1. How can we precisely and clearly **define** churn?
2. How can we **predict** when a customer (or Customer-Origin or Customer-Origin-Destination) will churn?
3. How can we **reduce** customer churn?

Relevant Literature

Multiple methods for predicting churns. Most research are based on the **machine learning** in telecommunication industry **Decision trees and logistic regression** are two very popular algorithms in customer churn prediction

- strong predictive performance
- good comprehensibility

Churn Detection Sample – 93303_98712



The Problem

What would be agreed upon the organization as the sign for Churn?

- If the volume drops for 1 week and come back up, is that Churn?
- If the company cancel the lane agreement by itself, would that be Churn?
- If volume drops only by half, isn't that Churn?

Methodology

Granularity – Lane/origin/customer Level Churn

Time Period – Weekly

Base Volume – 26 month rolling average vs quarterly maximum

Detection Method: 8-week cumulative z-score vs 4-week sum

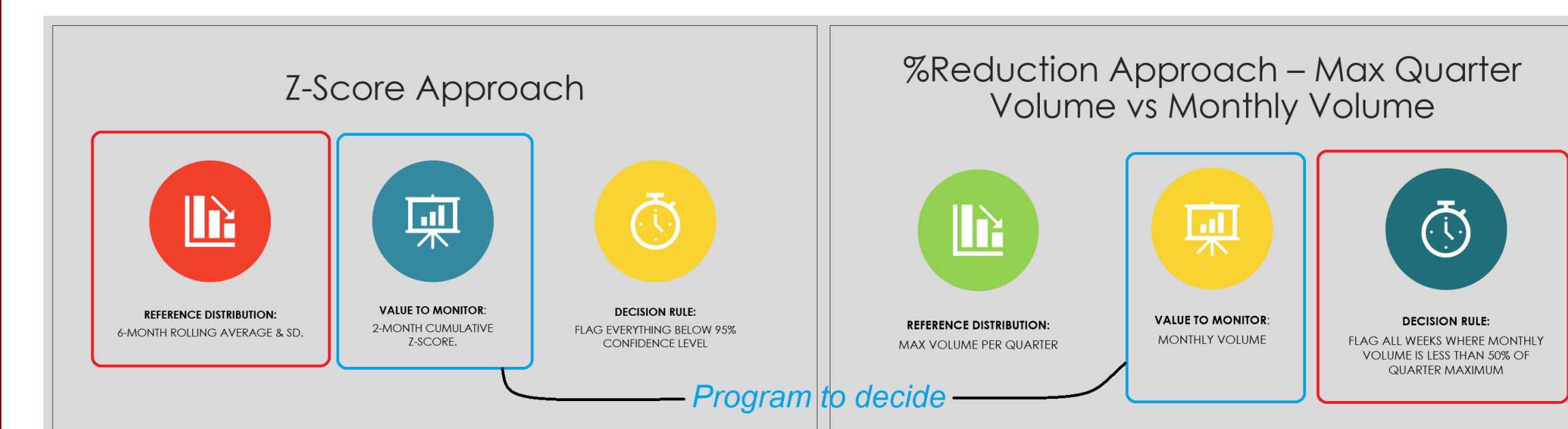
Drop Trigger – >95% confidence interval vs <50% of quarterly maximum

Duration for trigger – 2 months (8 weeks) vs 1 month (4 weeks)

Initial Results

Churn is any **reduction of volume by 50%**.

Churn detector will first be coded in **Python** with adjusted **parameters** for trigger duration and etc.



Expected Contribution

The prediction for Churn will allow company to **manage the unexpected reduction in demands**:

- More sale by better **service quality**
- Improve the **efficiency** of resources allocation since Churn is better predicted ahead of time
- **Key factors** that affect and do not affect Churn are better understood.

