Claim Management

One of the prevailing issues currently faced by companies revolves around the effective management of customer claims. The typical turnaround time for customer claims and corresponding resolutions is currently within the range of 20 to 30 days. However, an exacerbating concern emerges when the claim processing period extends further, reaching a span of 30 to 40 days. This extended duration not only prompts customer dissatisfaction but also has the adverse effect of casting a negative light on the company. The prolonged claim processing time is perceived as a lack of responsiveness to customer needs, consequently impacting the company's image and customer relations. Addressing and streamlining this aspect of claim management is imperative for the company's reputation and customer satisfaction.

Within the scope of this project, I have employed statistical principles utilizing MiniTab for a comprehensive analysis of the prevailing situation. The objective is to identify patterns, trends, and key insights that will inform the development of an effective solution aimed at minimizing claim processing time.

Dataset Overview:

The dataset encompasses the following essential variables:

Time: This refers to the Lead Time required to bring the claim to closure. The dataset encompasses a range of values from 1 to 20 units, with a total of 1130 observations.

Office: Identifying the particular office, denoted as either A or B, responsible for claim management within the company.

Claim Type: Categorizing the nature of the claim into four distinct types:

a. Failure Non-Solved

b. Dealer Incorrect Behavior

c. Spare Parts Availability

d. Another instance of Failure Non-Solved

So, basically there are 1130 observations with two types of offices and four types of claim. The total number of combinations are 4*2 = 8 combinations of office and claim with 1130 observations.

Objective:

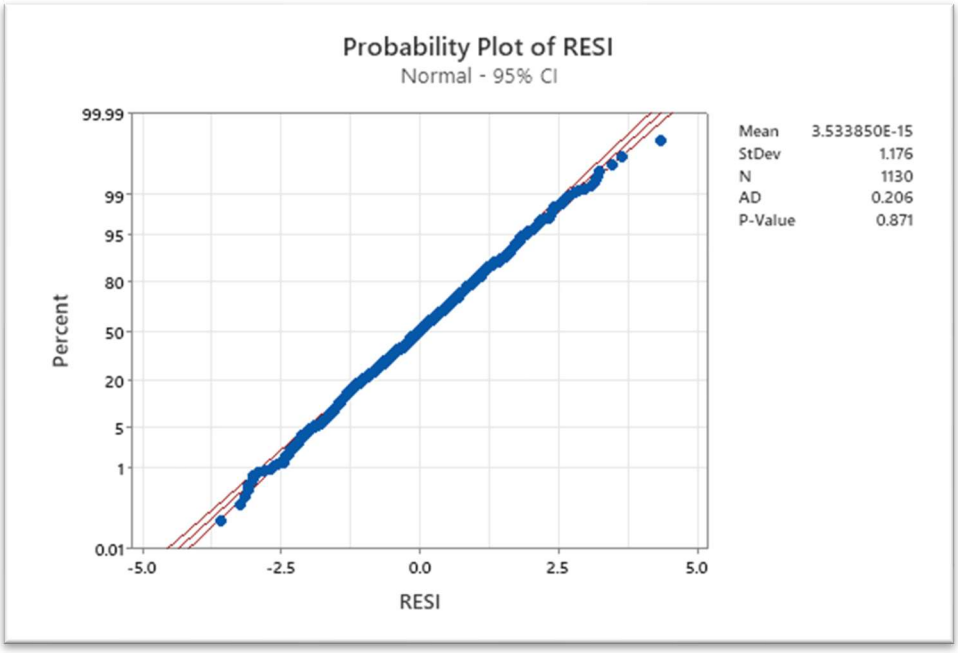
The goal is to examine the potential impact of both claim types and the managing office on the lead time of the claim resolution. This analysis aims to uncover the individual or any correlations or dependencies between these variables on the Lead Time of the claim lead time.

Methodology

Initial Analysis: Residuals

First of all we will analyze the Residuals which basically represents the difference between the average for the first condition at each specific values. A normal distribution of residuals is important for the validity of statistical inferences and predictions based on the model. It allows for more accurate estimation of confidence intervals, hypothesis testing, and prediction intervals. In simpler terms, a normal distribution of residuals indicates that the model is a good fit for the data, and the assumptions underlying the statistical analyses are met.

The first step involved conducting a General Linear Model to find the residuals of the time variable. Subsequently, a Probability Plot of Residuals test was performed to further scrutinize the results. The outcome of this analysis is presented below.



The result on the right show that the residuals are normally distributed since the P-Value is 0.871 which is greater than 0.005 (minimum threshold value for p-value).

Since the residuals are normally, we can go for further analysis and the results will be more robust.

With the confirmation of normality in the residuals, we are poised to proceed with subsequent analyses. This assurance of a normal distribution enhances the reliability and robustness of the forthcoming results, reinforcing the validity of our analytical endeavors.

General Linear Model

With p-values consistently below 0.005 for each factor, it is substantiated that all the factors are statistically significant. This implies a meaningful impact of these factors on the time variable, signifying their influence in determining claim processing durations.

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
office	1	1230	1230.13	884.38	0.000
type of claim	3	3033	1010.90	726.77	0.000
office*type of claim	3	11725	3908.43	2809.91	0.000
Error	1122	1561	1.39		
Total	1129	17894			

The visual representation on the right underscores the significance of both the Office and Type of Claims. Notably, the most influential factor is the interaction between Office and Type of Claim. This is evident in the higher Adjusted Mean Squares (Adj MS) and F-Value associated with the interaction, indicating that the combined effect of these two factors has a more pronounced impact compared to each factor in isolation. In essence, it emphasizes the synergistic influence of the interaction between Office and Type of Claim on the outcome.

The R-squared (R-sq) metric, representing the explanatory power of independent variables, is notably high at 91.2%. This underscores the collective influence of Office and Types of Claim, contributing significantly to the observed variability in the dependent variable within the model.

Model Summary

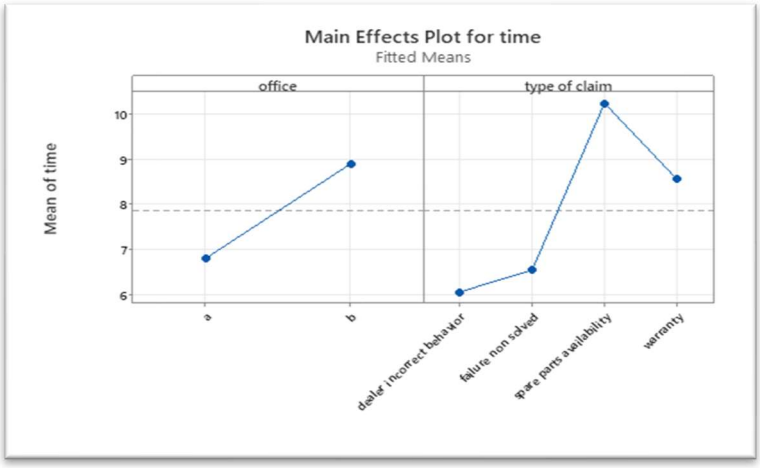
S	R-sq	R-sq(adj)	R-sq(pred)
1.17938	91.28%	91.22%	91.15%

Tukey Analysis:

- **Factorial Plots for time**

The picture on the right shows the effect on variability of time for the two types of factors.

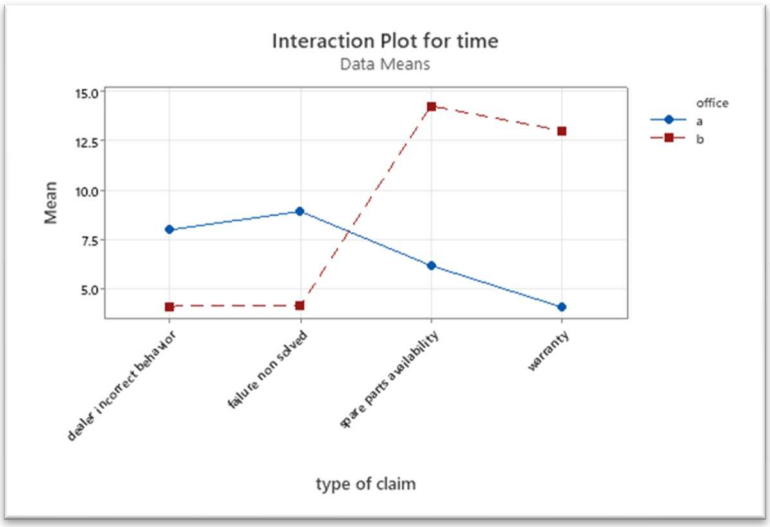
The left side shows Office B has a bigger impact than Office A. On the right, it's about the type of claims. Dealer Incorrect Behavior and Failure Non-Solved don't affect much, but Spare Parts Availability has the biggest impact.



- **Interaction Plot for time**

The result on the left is more effective than the previous since it represents more clear picture than the previous one and also include interaction of the factors.

Office A demonstrates superior performance in warranty and spare parts availability in contrast to Office B. Conversely, Office B excels in addressing dealers' incorrect behavior and resolving failure non-solved situations. This distinction highlights the specific strengths of each office in handling distinct aspects of the operational context.



Conclusion

- The analysis reveals that Office and Types of Claim management collectively contribute to 91.2% of delays in Lead Time, leaving 8.8% attributed to other factors. Therefore, strategic attention should be directed towards optimizing these two key factors.
- Office A demonstrates superior performance compared to Office B. Notably, Spare Parts Availability in Office B plays a pivotal role in causing high Lead Time. Therefore, a strategic focus on improving the performance of Office B, particularly in enhancing spare parts availability, is recommended.
- Furthermore, Spare Parts Availability and warranty of Office B, contributes to the longest lead time. Meanwhile, failure non-solved scenarios result in the longest lead time in Office A. Addressing these specific areas is essential for effective intervention and optimization of lead time management.