

# Streamlining the Parcel Rating Process With Customer Data Automation

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## Purpose

The purpose of this Capstone project is to provide Green Mountain Technology with an automated tool for processing customer data files. This was accomplished by creating a Python-based decision support tool and a non-linear optimization model to be used for parcel rating and package sizing respectively. The key results of this project are a reduction in the time spent analyzing customer data and a reduction in overall cost from additional handling surcharges.

## Background

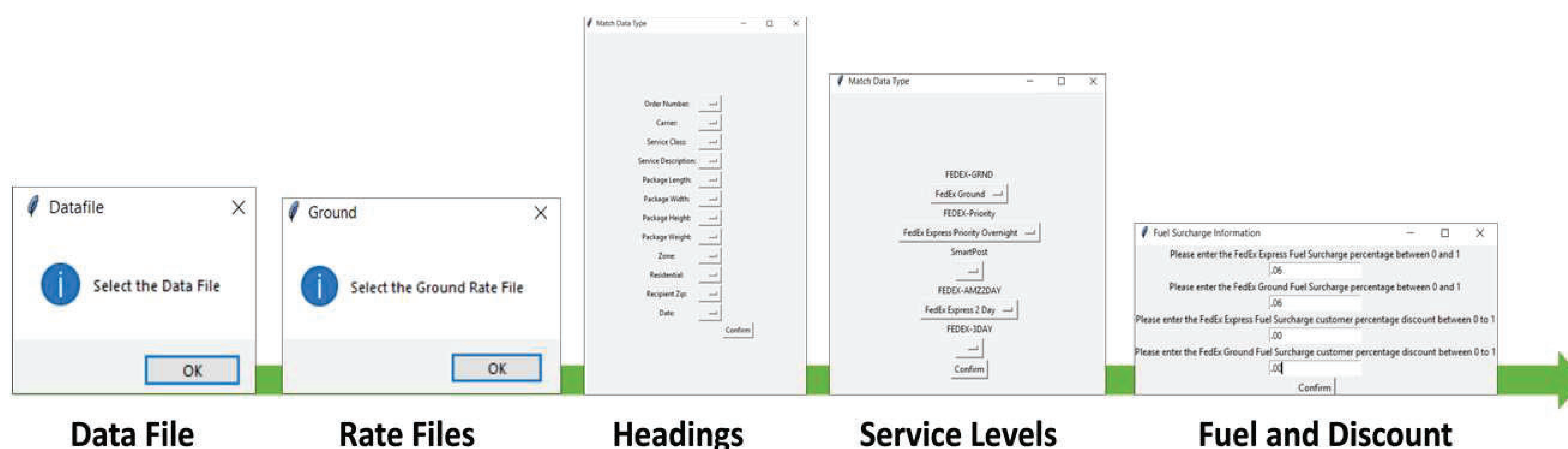
Green Mountain Technology is a parcel auditing and consulting company located in Memphis, Tennessee. Their customers are large e-commerce retailers who ship a minimum of four million parcels per year. This project focuses on Green Mountain Technology's consulting process.

## Process Mapping



This process map was created through a series of interviews with Green Mountain Technology's Solutions Engineers and shows the general flow of the rate generation process used for customer data within the overall consulting process.

## Interface Flow



## Optimization

### Objective:

Minimize Cost Associated with Additional Handling and Oversized Surcharges

### Key Constraints:

New Package Volume  $\geq$  Tolerance \* Original Package Volume

New Package Volume  $\leq$  Original Package Volume

New Package Dimensions  $>$  Original Package Dimensions - 2

New Dimensions  $<$  Original Package Dimensions + 2

New Length  $\geq$  New Width  $\geq$  New Height

New Dimensions  $\leq$  Oversized Limits

New Dimensions  $\leq$  Additional Handling Limits

## Optimization Results

Tolerance Placed on Volume Constraint	Cost	Number of Additional Handling Surcharges	Number of Oversized Surcharges	Cost Reduction
100%	4180.5	183	19	2.21%
99%	1566	36	12	63.37%
98%	1381.5	29	11	67.68%
97%	1264.5	27	10	70.42%
96%	864	24	6	79.79%
95%	774	24	5	81.89%
-	-	-	-	-
79%	414	24	1	90.32%
0%	414	24	1	90.32%

### Total Cost Reduction

