FedEx Zero Package Stop Elimination

Overview
FedEx Ground retrieves packages every day from customers nationwide. Sometimes, these customers have no packages for the driver. These events are called Zero Package Stops (ZPS) and they are a waste of time and resources. Our sponsor tasked us with predicting these events in advance using prior customer data.

Objectives
• Design and develop a Java program that predicts the likelihood of a ZPS for a customer on a given day. The program should track its own accuracy over time.
• Create a web interface to the software that Customer Support might use in the future.

Approach
• First, we met with our sponsors on-site to discuss the problem at length and define concrete goals and deliverables for the project.
• We then communicated weekly with our sponsors amidst four "sprints" of programming and feature implementation. We wound up implementing a total of six algorithms for prediction, along with a weighted averaging system for merging the results into a useable recommendation.
• Some features proved to be too ambitious to implement in the time given, like certain advanced machine learning techniques, and were summarily dropped from our feature list.
• Toward the end, we cleaned up the interface to our program and mocked up a web interface. Although non-functional, the mockup served to demonstrate what a human interface to the program could look like.
• We spent a lot of time in the final week distilling the problem to its core in order to pitch our idea and prototype to management at FedEx. This was met with enthusiastic response, and also resulted in an effective poster for the showcase.

Outcomes
• FedEx now has prior art to work from for improving our prototype before deploying it in production.
• With our current accuracy rate, FedEx could save up to 1.8 million dollars if they successfully act upon our program's recommendations.