Oracular Consulting

Unit Three Memo Problem

To:	Analysis Staff
From:	Marketing Director
Date:	August 25, 2014
Re:	Modeling the unloading process at StateEx

Now it's time to get into the real aspect of our work for StateEx: modeling the process of unloading the trucks. Attached is a data file showing how the unloading process works not only at the primary warehouse, which has a loading dock, but also at the endpoints of the delivery process. These data are aggregated, showing information from many different data collection forms in a single spreadsheet for analysis, with one row of data on each delivery. After examining the data file carefully, develop a brief explanation of what we might expect the impact of each of the explanatory variables to be on the total unloading time. The point here is not to be perfect, but to develop some intuition about the data and the relationships you expect to see.

Begin your modeling by determining the most relevant variables that affect the unloading time and formulate some simple models (one variable) with the most relevant variables and explain what these models indicate about the unloading process. This will give us a starting point for the deeper analysis. Be sure to compare these models in detail.

Once you've identified the basic models and explained what they tell us, formulate a full regression model for the unloading times. Then refine this model by eliminating the insignificant variables from the model. Be sure you drop the least significant variables one at a time, since the significance of the other variables will change as you eliminate insignificant ones. Some of the important variables may be categorical, so make sure you deal with those variables correctly in your models as well. There may also be a numerical variable which could be treated categorically, so investigate this briefly. Make sure that you identify any outliers in the residual plots; we may need to investigate these further.

Your final report should contain a comparison of the models you formulate in terms of accuracy in fitting the data, accuracy in predicting other observations, and what they explain about the unloading process at StateEx.

You should conclude with a recommendation for the StateEx manager. This recommendation should include how to estimate crew sizes for a particular delivery and it should contain some rules of thumb for determining if the unloading crews are slacking off.

Attachment: StateEx_Deliveries.xls