Optimization of Resin Compounding Plant

Overview
Delphi Packard is a leading global supplier of electronics and technologies for automotive and other segments of the industry. Delphi’s Plant 7, located in Warren, Ohio, is a plastic and resin compounding plant. The main purpose of this project was to perform an economic analysis on Delphi’s current production and manufacturing process and evaluate any possible solutions to increase production capacity since they are currently outsourcing some of their products due to capacity constraints.

Objectives
The objective of the team was to explore all possible solutions that would lead to an increase in the production and manufacturing capacity of Delphi’s plant 7. The solution that would lead to an increase in capacity should also be economically while compromising with the plant’s constraints.

Approach
Some of the solutions needed to be explored were:
- Implementing an Inventory Policy
- Altering the Production Schedule
- Altering the Work Schedule
- Adding an Underwater Pelletizer
- Adding a New Manufacturing Line

Using the Analytic Hierarchy Process the PSU team determined which solutions were had a better chance to succeed. It was determined that adding a new line could be the best solution and therefore the team put most of its efforts and resources on this solution, while checking the feasibility of the other solutions. Excel Spreadsheets were created to perform an engineering economic analysis as well as to predict the plant’s capacity in the different scenarios.

Outcomes
The only feasible solution the team could was adding a new line. The results from adding a new line were as follows:
- 98% increase in production capacity
- Elimination of overtime hours
- 11.25 million pounds of previously outsourced products now insourced
- New Line (92mm Extruder) pays itself off in 2.77 years