# INDUSTRIAL, MANUFACTURING, & SYSTEMS ENGINEERING

## CAPSTONE PROJECT /INTERNSHIP
SUMMARY

**Your Name:** Daniel Borunda, Adriana Dominguez Gonzalez, Luis Hernandez

**Type of Capstone (research, teaching, practical application):** Senior Design Project

**Capstone Project Title:** Designing a layout to optimize material and information flow at a recycling center

**Year and semester: Fall 2015**

Adriana Dominguez Gonzalez, Daniel Borunda, and Luis Hernandez

## INTRODUCTION

Lopez Scrap Metal, Inc. is a recycling center which processes ferrous and nonferrous metals. This company has experiences a major growth in the recent years.

- The problem that they had was that some methods or processed for delivering certain outputs have remained the same throughout the years. The increasing number of operations and processes due to the growth of the company, and the lack of revising and redesigning their processes and methods for improvement, leads to bottlenecks in terms of material and information flow.

- Our goal was to optimize the copper flow, reducing the distances associated with their material handling by designing a new layout and to clearly define work and storage areas.

- This goal was obtained after by doing a three months study, we were able to get a solution, the company wanted our idea and they implemented.

To obtained this goal we focused on one of the metals that they work with, which was the copper, we focused on this because is the one that bring most revenue to the company, This is because there is a high volume of production for copper (around 4500 lbs/ hr). This process run 24 hrs per day, 3 shifts per day, 6 days of the week and it is run by 4 operators per shift. The price per pound is around $ 2.36 dlls.

- The other reason why we focused on the copper flow is because all the products that this company work with are commodity price products, the price vary from one day to another so we want them to produce the amount of copper mark per day.
- The way that we manage our time, is that we were working with the company all Thursdays (one shift per week). We went to take all the information need to work all the rest of the week and we were managing and uploading all the information collected in the week via One- Drive which is a place for all our work files and they can easily collaborate on files with Office Online integration.

## PROJECT OUTCOMES

In order to optimize the copper flow, reduce the distances associated with their material handling by designing a new layout and to clearly define work and storage areas we started to approach one of the main problems that we found out as critical for our project which was the time that a trailer full or empty takes to enter to the company to unload or load material.

- The system that they had was a hand written system by one person which his role was to register the entrance of the trailer by taking some attributes about the driver or the trailer.

  We bring out a solution to that system and we make around 1080 observations in order to input that data on excel and develop a Macro Excel File using the Microsoft Visual Basic for Applications. We optimize the registration method and some benefits that this brought to the company was the automation, time saving, standardization, less room for input mistakes and room for new analysis.

To optimize the material flow we made an analysis based on distances, we evaluate the two types of flows the PVC and the Insulated wire, we apply some learned concepts about the Industrial Layout class. We brought a solution by changing the layout, we reduce have of the trail distance and not only that we made a reduction in terms of cost of about 24.10 % of money spent in a year.

Our project was implemented and we were happy to see that all effort put it through all the semester was good enough for them to do it. We had very good feedbacks, they were so happy because of the

reduction and for the benefits that we got of all our project was the knowledge of facing a real life problems, the experience learned in three months, and the people that we knew was so kind that they told us that if we had a problem or question later related to all of this they will always have the doors open to help us or answer a question

**INDUSTRIAL ENGINEERING PROGRAM ASSESSMENT**

We as a team enjoyed this Senior Design Class because of the opportunity that we had to do our project in a Local company, we were able to get more knowledge about what an industrial engineer do and we were able to deal with the actual real life problems.

The most important thing here is to do not forget the use of many applications learned on different classes because those tools are the ones useful to bring a solution every time the company needs it.

We won't change anything because this is a class were you will face with real life problems. This is an interesting class because you start mixing what you have learned so far in order to bring a solution for a company, so with a different perspective based on theory and calculations solved a problems and accomplish the company goals.