

# INDUSTRIAL, MANUFACTURING, & SYSTEMS ENGINEERING

## CAPSTONE PROJECT /INTERNSHIP SUMMARY



**Your Name:** Dewanna Jenkins, Elizabeth Silva, Maria Hernandez

**Type of Capstone (research, teaching, practical application):** Practical Application

**Capstone Project Title:** The Rockwell Duck Farm Supply Chain

**Year and semester:** Spring, 2016



Maria Hernandez, Elizabeth Silva, and Dewanna Jenkins

### INTRODUCTION

This project elaborates on the arena process model utilized to simulate the Rockwell Duck Farm supply chain. Presently, there is minimum variation in the measurement methods used in the Rockwell Duck Farm supply chain. Since spreadsheets are the main tools used, it is unclear if the current number of assets (farms) will satisfy future demand. Rockwell requires a more dynamic tool to assist with week-to-week forecast planning such as simulation which would account for the random nature of the processes which would also allow us to look for opportunities for improvement.

The project will focus on maximizing production output as close to 100,000 weekly of market ducks while minimizing yardage cost and assets such as hatching farms, growth and finish farms, etc. Also it is important to make sure the duck production runs smoothly, associated time is decreased, the yardage cost is reduced and the length of the queue is reasonable. This project consists of methodologies used to conduct the simulation test, such as the DMAIC and the push and pull methodology.

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Our goals were to create an elaborate model of the hatching farm that will accurately mimic the flow of production using Arena OptQuest Simulation Software and design a 3D visualization of the reduce model. Also we needed to evaluate the performances of the assets by making changes to the number of fixed assets in the Rockwell's system in order to improve the efficiency and meet demand. Lastly, we needed to perform optimization procedures to maximizing production output, minimizing yardage cost and assets such as hatchling farms and growth and finish farms.

### PROJECT OUTCOMES

Once the model was running smoothly, we used OptQuest for Arena to obtain the optimal solution for the distances between hatching farms, growth farms, finish only farms, and packer plants. Afterwards we created a series of experimental models to represent changes. This two model approach allowed us to see the impact of potential changes from deleting hatching farms, growth farms, and finish only farm. We then used the best worst case scenario to eliminate flows and farms that had the largest distances and who were not being fully utilized.

Our final weekly output rate for the optimized model was 101,346 ducks and after eliminating 11 Hatching Farms, 23 Growth Farms, and 35 Finish Only Farms, our final optimized average yardage cost was \$59,493,216.40. Our goals were met as we reduced the yardage cost around \$6 million.

### INDUSTRIAL ENGINEERING PROGRAM ASSESSMENT

Overall, our experience of the IE program at UTEP was good. Most of our professors were very knowledgeable and helpful. We learned and worked very hard during our college careers and were very pleased with what our future will bring. This program involved a lot of time, respect, hard work, and team work therefore we are confident when saying we have made a good choice in learning and becoming Industrial Engineers.

The only concern we had with this program though was the time spent learning different programs especially MatLab. We touched the basics of learning the program but not enough to confidently and successfully complete a semester project. We would recommend adding a class that deals specifically and only with different softwares and coding.