Automation of Pizzelle Production

Overview
Bella Lucia is the only producer of gluten free pizzelle waffle cookies in the United States. Currently, the company is producing their product using an entirely manual process with 16 individual two-cookie irons running at all times. As demand for this product increases, Bella Lucia cannot produce enough cookies to increase their market and allow their business to grow. The team was tasked with designing an automated system for the cooking process that will increase production by 300 percent.

Objectives
Design an automated system for the cooking process of pizzelle cookies that will increase Bella Lucia’s production by 300%. This process includes three main parts: delivery of dough, cooking of dough, and removing of product.

Approach
- Gathered customer needs and requirements through contact with Maryann Cook, owner of Bella Lucia and our project sponsor. This included both phone calls and site visits.
- The team started by brainstorming different areas that automation could be added into the system.
- Existing pizzelle manufacturing processes at Little Pepis and REKO were used as a reference when designing this system.
- Bella Lucia in Altoona, PA was visited several times. The first visit was used to gather information and statistics about their current process in place. The team returned again to collect data to find optimal cooking time and cooking temperature, along with important variables.
- Variations in press capacity and cooking time were evaluated.
- CAD models of the preliminary system design were created.
- The team was able to provide Bella Lucia with the preliminary system design, equipped with many features that will be beneficial to their specific process. In addition, production improvement and gross sales improvement were calculated.

Outcomes
- 300 percent production increase, amounting in 7,000 more cookies being produced daily
- Reduced wasted by up to ten pound per day with elimination of edge removal step
- Decrease in amount of man labor per cookie
- Gross sales improvement by $5,356 daily
- Adaptive, expandable and isolated system that can produce multiple flavors simultaneously