Lee Industries is a growing leader in the processing systems equipment industry and with the proper implementation of some industrial engineering principles could continue to increase growth at an exponential rate. As Lee Industries grows as a mass customization manufacturing facility, their production techniques must rise to the challenge. Due to increasing demand of Lee Industries products there is a need for a simulation model to help identify bottlenecks, analyze effects of different demand scenarios on shop floor operations, and identifying needed process improvements. The overall project objective was to develop a discrete event simulation model that accurately depicted Lee Industries current shop floor.

Throughout this project the team has identified that due to the custom job shop nature of Lee Industries’ operations it is extremely difficult to model the entire shop floor operations. By reducing the scope of the project to include only the kettle product line the team was able to create a usable model in the constrained period of time. The model that was developed could also serve as a stepping-stone to create future models. The team found that with the processing times provided throughput was nearly impossible while using a lognormal distribution to account for the variability in actual processing times. Different experiments were run that would represent the improvement of certain processes such as automation of bowl welding, improvements & increase of resources in grinding, as well as more efficient material handling devices.

Each experiment performed resulted in an increased throughput in the manufacturing of kettles. The team recommends reviewing the identified bottlenecks of grinding, welding, and assembly for process improvement projects such as the ones stated. Also to make possible movements of workstations to create a more linear flow around the shop floor; mainly moving the bowl welding station closer to the trimming and grinding station. Finally, the team recommends that Lee Industries continues with simulation modeling, and grows and improves the current model. Modeling work could include other product lines as well as combining product lines to create and entire manufacturing facility. Due to the time constraints of the project, the team was unable model certain aspects of the facility, such as, different product lines (tanks, horizontal blenders, etc.), engineering design time, and customization of kettles. The team also believes it would be beneficial to model specific products that removes the variability of size and customization. This style of model would produce more useful results with fewer assumptions and more concrete evidence.