Factory Design Optimization

Overview
Autodesk gave our team the challenge to design a factory layout using their Factory Design Ultimate Suite 2013 software. This factory was designed to be able to machine and assemble an engine block, in which Autodesk provided the 3D drawings of. Using software included in the suite, such as Autodesk Inventor, AutoCAD, Navisworks Manage, and a beta software called Process Sim 360, the team was able to design our factory. While doing this project, the team provided Autodesk with recommendations and comments on the usability and functionality of the software.

Objectives
1. To use Autodesk Factory Design Suite to design a plant that will allow the machining and assembly of an engine block and assembly of its subassembly components. The engine block will be anodized, machined, honed, deburred, cleaned, and inspected.
2. 50,000 motors will have to be produced by March 14, 2013 and provisions should be made to be able to double this order. A rejection rate of 2% is required.
3. To evaluate the Factory Design Suite and Process Sim 360 software, the evaluation will have a focus on the User Interaction with the software.
4. To provide any recommendations, comments, or improvements to the software products.

Approach
In order to design the layout, research was conducted on the equipment required to perform all of the necessary processes to machine the engine block and process times for each were determined. Upon determination of the processing times, the first iteration of the layout was conducted in Process Sim 360. Additional equipment was added to the initial layout in order to increase the daily production rate. As the equipment was added, newer iterations were tested until an adequate layout was designed. Upon determination of an adequate layout, the design was developed in AutoCAD Architecture. Required machines had to be modeled in AutoCAD Inventor to be added in our layout as assets. The final layout was then synced to Inventor, so the 3D model could appear.

Outcomes
- Simulation of the layout was created using Process Sim 360.
- Autodesk AutoCAD, Inventor, and Navisworks Manage were used to create and show the final layout of the factory.
- The factory will result in machining and assembling 50,000 RC motors beginning December 17, 2012 and ending March 14, 2013 with a 2% rejection rate.
- Recommendations and comments were provided with thorough explanations.