The Miller – The Innovation Machine

Overview
Productivity in industrial setting has stagnated despite a steady improvement of technology. This stagnation is a combines lack of problem visualization, quantifiability, and standardization. In order to improve industrial productivity, specifically with CNC milling, our team was tasked with creating a smart CNC milling setup cart with integrated diagnostic software designed for production improvement of the milling process.

Objectives
● Create a modular, transportable, modern looking prototype of the CNC milling setup cart
● Create a CAD design of the cart in Creo Parametric
● Review of the work processes that can be performed with the cart
● Create Azure Database with tables to store resource elements (RE’s)
● Create PowerApps to upload, search and view RE’s and production systems (PS’s)
● Create a Visio plugin to take RE information from Database for visualization
● Create Dashboards in Power BI to analyze and optimize PS’s

Approach
● The traditional cart designs were examined by the team members and new designs were brainstormed and reviewed until the final design was achieved
● CAD models of the cart were created using Creo Parametric software
● The hardware component consisted of the physical cart that contains the following aspects: easily transported, modularity and modern aesthetics
● RE’s were used to building digital production systems (DPS)
● These DPS’s are then able to be visualized through Microsoft Visio and analyzed for inefficiencies and optimized through Power BI

Outcomes
● “The Miller” is able to increase productivity and reduce cost and time of CNC machining operations, which prepare manufacturers for the upcoming industrial revolution.
● The cart’s modular design gives customers full customizability to fulfill the specific needs of their machine shops.
● In the future, this modular design can enable creation of additional cart designs with a choice of desired configurations that link to the concept of mass customization.
● “Eli” BI graphs are used to show current efficiency vs. future efficiency based off of cost and upgraded technology of new software or tools.
● By using the DRE building blocks, companies can model any future upgrade and determine viability.