Overview
Current diaper packaging is developed in the form of either cardboard boxes or plastic bags; both unhealthy for the environment and unoriginal to consumers. Since millennials are growing to be in charge of the market, products are changing to better represent their new buyers. Today’s marketplace revolves more heavily around environmentally friendly, innovative products, which leads companies to search for new strategies to brand their products to grab the attention of millennials.

Objectives
Our objective was to design a baby diaper packaging that would be environmentally friendly, innovative to the current approach of packaging diapers, and market well to millennials.

Approach
- Sponsors needs were determined by talking with our sponsors during weekly Skype calls. We determined that the sponsors wanted an idea that has not been seen in the current market while using material that can be 100% reusable.
- Customer needs were determined by sending out customer surveys regarding current baby diaper packaging to those known to have children. We determined that the most important needs to consumers were price and the transportation such as handles for carrying.
- Each team member generated concepts using these needs and we chose the final design based on weights given to each need and a concept-scoring chart. We determined the design that featured a handle, three perforated sections for easy-removal of diapers, and a new image was the best concept to meet both the customer and sponsor needs.
- The material was chosen through analysis of many eco-friendly materials and their properties. We determined HDPE (High Density-Polyethylene) to be the best material for the design due to its low coefficient of friction and its usability in SCA’s current manufacturing plant.
- Two physical prototypes were made to resemble the design concept. The final prototype designed focused on the ease-of-use for consumers to remove diapers as well as features logos of both SCA and Penn State, highlighting the collaboration.

Outcomes
- Customer and sponsor needs were met
- The design is better suited for millennials and has not been seen before
- The packaging can be used after purchase and easily recyclable
- The design features easy-to-use features to use and manufacture
Overview
The Bowling Green, KY factory owned by SCA to produce their incontinence products currently uses an automation process that requires constant human power and attention to load the rolls of raw material into the process. By doing so, the process is less efficient than a fully autonomous process, spending more time loading and more money paying for labor costs with the added costs of the machinery.

Objectives
Our objective was to design an automation that could autonomously load heavy rolls of raw material into the assembly line process and remove the core once the roll was void of material.

Approach
- Sponsors needs were determined by talking with our sponsors during weekly Skype calls. We determined that the sponsors wanted an original idea that has not been seen in current factory assembly lines and was completely autonomous without much human interaction.
- Each team member generated concepts using these needs and we chose the final design based on weights given to each need and a concept-scoring chart. We determined the design that featured a gantry crane system with worm gears and a cylinder for easy handling of the material rolls was the best concept to meet sponsor needs.
- The material was chosen through analysis of typical materials used in factory machinery. We determined coal-rolled steel to be the best material for the design due to its strength and wear resistance in industrial applications.
- SolidWorks models were generated to provide a detailed understanding of the concept. This model allowed for finite element analysis and a time study on the concept to determine usability in the factory.
- Further modifications will be completed by future teams in other engineering fields to solidify the design and determine the feasibility if implemented.

Outcomes
- The sponsor will save money from the cost of employees if design is implemented.
- Manufacturing/production times were reduced by 35 seconds in a cycle as a result of this project.
- The design is an innovative approach not regularly used in factories.
- Sponsors needs were met for the design.
- The design features an autonomously run machine to load and discard rolls of raw material.