Optimization of a Rear Folding Seat for Comfort and Fold Flat Angle

Overview
A rear folding seat from a 2017 Ford Explorer is tested and redesigned to optimize comfort and fold flat angle. A SolidWorks model and physical prototype of the redesigned seat are created. The existing and redesigned seats are compared using methodologies formulated to quantify comfort to user and fold flat angle.

Objectives
The team is tasked with developing test methods for an existing rear folding seat from the 2017 Ford Explorer. The seat is redesigned with the goals of increasing comfort and decreasing fold flat angle, and a physical prototype is created along with a solidworks model of the redesign.

Approach
• Created an online customer needs survey based on customer knowledge about rear seats.
• Users sat in original seat and completed a survey about what they would improve.
• Concepts were generated based on customer survey results.
• Patents were reviewed for headrest designs and regulations were studied.
• A final concept was selected and a SolidWorks model was created.
• The team visited the Ford plant and received feedback on selected concepts.
• A Ford Explorer seat was modified to reflect the chosen concept.
• The fold flat angle and thickness were measured for the original and redesigned seat.
• A final customer survey was completed to compare comfort of the original and redesigned seat.

Outcomes
• The fold flat angle of the seat is kept at zero, the same as the original seat.
• The thickness of the seat when folded is reduced by 3 inches, increasing cargo space in the back of the seat.
• The redesign utilized existing products in a way that manufacturing processes don’t need to be modified.
• The seat creates the opportunity for side bolsters on seats to be increased in size, creating a more comfortable user experience.
• The redesign introduces a new, more comfortable headrest design that can be implemented on future models.