Material Display System for Stuckeman Family Building

Overview
The Penn State Architecture Department has a subscription to Material ConneXion’s facility in New York City. Material ConneXion provides them with sample material boards which they use for material classes and are looking to expand so that students use them for reference on projects. The Department would like a way to better display these material boards, and have a better way of managing their use so that students and faculty can more easily interact with and learn about these materials.

Objectives
Design a mobile, aesthetically pleasing, and durable display system. Project requires an easy means of adding or removing the material boards, and the ability to store more material boards if the Arch. Dept. will be looking to expand subscription in the future.

Approach
- Found design constraints on mobility (elevator size, doorway size, hallway size)
- Patent reviews, on campus examples (Library displays, other Arch. Dept. displays, etc.)
- Material ConneXion NYC trip, see other display boards, their display systems
- Student and faculty survey to better understand customer needs
- Concept Generation through CAD Models
- Concept selection, scoring, etc.
- Material Gathering, vendors found quotes obtained, materials bought (ongoing through fabrication process)
- Budget shift (Initial expected budget of about $2,500 budget reduced to $1,220+cost of NYC trip)
- New concept design and reselection
- Concept Force and Fatigue analysis
- Prototype fabrication: small scale paper and balsa wood model, half scale plywood model
- Project fabrication: Cleaning/Welding/Drilling/Painting I-Beams, Sizing/Cutting/Drilling/ wood
- Tip testing, weight testing performed, results analyzed and validated as compared to expected use
- Model displayed at Showcase, moved and put into Stuckeman Building for use

Outcomes
- Single location for all material boards
- Display integrated into environment of Stuckeman Building (Arch. Dept.)
- Display mobile and able to be used in classroom or student interaction
- Lock mechanism for student accountability for use of boards
- Ability to change boards around, and room for expansion/further development of display
- Final cost under $900.00