Digital Pathology Transportation Case

Overview
DigiPath currently markets a low-budget and portable pathology microscope for biomedical use. Currently, traveling with the case incurs high airline baggage fees. DigiPath needs a new reduced-cost transportation system. This new case system will keep the microscope safe without compromising the portability and professionalism of the cases.

Objectives
Airline regulations state that all pieces of luggage must be under 62 in. in total dimension and 50 lbs. to reduce oversize fees. Sponsor needs dictate the case is also protective of the equipment, easy to travel with, and professionally organized for sales pitches and demonstrations.

Approach
- Customer needs were determined through discussions with the sponsor, and the following were determined to be the most important: cost, safety, portability, professionalism, organization, durability
- Various types of cases were researched and the Nanuk 960 and Nanuk 945 were chosen as the best choices using a pugh matrix
- The Nanuk 960 contained the microscope while the Nanuk 945 contained the computer, monitor, keyboard, and various cords
- Solidworks models were created to model the various foam interior designs
- COMSOL Multiphysics was used to perform impact analysis to ensure the safety of the contents of the cases
- High density and medium density foam were used improve the safety of the contents of the cases
- The foam was cut, adhered, and assembled to make two usable cases
- A ratchet strap was used to connect the two cases in order to make the system easier to transport
- Surveys were used to assess the portability, professionalism, and organization of the two cases
- The results indicated that the new case system was superior to the old case, and would save the sponsor money without compromising the safety of the microscope

Outcomes
- The sponsor saves $75 per one-way flight, with a return on investment of 47 one-way flights
- The interior of the cases is more professional and organized, which improves the image of Digipath to potential clients
- The two-case system is easier to transport than the old one-case system that was previously used by the sponsor
- The addition of high-density foam to the interior of the cases increases the safety for the microscope