

3i Brainstorming Event Paves Way for Innovative Design for Laparoscopic Device



CUSTOMER SITUATION

A large original equipment manufacturer (OEM) needed help redesigning a reusable laparoscopic surgical instrument. Its goal was to incorporate a “take-apart” design

into this surgical device to facilitate improved cleaning and sterilization.

The customer requirements for the design were challenging:

- The device user interface needed to be intuitive and robust for easy assembly in the sterile surgical field
- The solution had to apply to a family of surgical products, including backwards compatibility with existing products

The customer chose to work with Vention because of Vention’s expertise with laparoscopic surgical instruments and mechanism design, and ability to deliver a robust and manufacturable design solution.

VENTION SOLUTION



This project began with a 3i Project Booster Session, a refined brainstorming event that can deliver rapid response, creative concepts, and breakthrough solutions.

The 3i event (known as “Phase 0”) started with a “deep dive” to help the Vention team understand the customer’s surgical devices and technical challenges. The next step was a brainstorming session that generated 3 concepts. The team then formulated a strategy to assess the technical feasibility of the concepts.

After the 3i event, the customer decided to engage Vention to proceed to Phase 1A, Concept Refinement and Prototypes. The proposed solutions involved multiple tolerance stacks and complex mechanisms. The team used CAD layouts to simulate the mechanism and created functional prototypes for proof of concept.

In Phase 1B, Prototype Iterations, the team created additional prototypes for functional assemblies across 2 device platforms and multiple surgical accessories.

In Phase 1C, Concept Freeze, the team incorporated Design for Manufacturability and Assembly (DFMA) and assembly-level statistical tolerance analysis to ensure that the assembly mechanism was robust and that critical dimensions would hold their tolerances at process capability index 1.33.

Vention’s innovative design met the user needs for a robust and intuitive assembly mechanism. The project went from brainstorm sketch to concept freeze, resulting in a complete and manufacturable design solution.



OUTCOME

The 3i Project Booster Session helped the team to set a clear design direction at the outset, avoiding iterative design loops.

Vention completed the concept development project on time and within budget and met all technical goals. The Vention team then turned the project over to the customer’s internal team to complete the product development process.

Vention’s work significantly reduced the technical risk, which led to a more predictable product development cycle.

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The customer was very impressed with Vention's innovative design solution and gained a great deal of value from the 3i project and follow-on concept development work.

Vention has since conducted additional 3i events with this customer and has collaborated on other development programs.

Product Development Phases

0 – Concept Generation
(3i Project Booster Session)

1A – Concept Refinement and Prototypes

1B – Prototype Iterations

1C – Concept Freeze