

Creating an Innovative Surgical Tool

Case in Brief

Advanced Surgical Tools wanted to extend a successful product line into attractive adjacent markets. Using Strategyn's Outcome-Driven Innovation (ODI) methodology, the company was able to:

Discover hidden opportunities for value creation in soft tissue management

Create a new product—the JOC205 Coupled Arc Blade—that addressed the 21 underserved soft-tissue outcomes

Shave more than nine months off the overall original development schedule while significantly reducing capital expenditures

Client Challenge

In 2006, Advanced Surgical Tools (AST) wanted to extend a successful product line into attractive adjacent markets.¹ Surgical tools based on AST's Unity technology (technology that enables simultaneous cutting and coagulation) were optimized for and successful in particular surgical contexts (e.g., gynecological, colorectal, and gastrointestinal procedures), but needed modifications if they were to be used for exposure in joint replacement and spine surgeries—high-volume procedures for which AST had low market penetration.

Though the goal was clear, the path was uncertain. Galen Richardson, a design engineer for Unity R&D, recalls, "We used to start with solutions and go from there. We struggled to explain to surgeons what a Unity product does; we were trying to help them appreciate it. So in the past, we would give a prototype to surgeons and ask them what they thought. They would say, 'Make it smaller,' or 'Make it look like the competition.' It was hard to know what to focus on, and it was hard to sell the results to our management. They would say, 'How do you know surgeons would like this?'"

Surgeons tend to be risk averse and are unlikely to switch to a new product unless it has clear and compelling advantages, so AST knew that the success of their entry into the adjacent market would depend on the company's ability to uncover and address specific surgeon needs.

¹ All key facts, quotes, and other content are unchanged in this case study. However, names of the company, product, and individuals have been changed to respect a client policy that prohibits the endorsement of another company's services.



How Strategyn Helped

To find and address hidden market opportunities, AST applied Strategyn’s ODI methodology. Drawing on the responses of 38 surgeons, AST dissected the jobs of performing specific spine and joint replacement procedures, uncovering 208 desired outcomes (customer needs) related to spine surgery and 187 desired outcomes for hip and knee replacement surgeries. Among the outcomes uncovered were 80 outcomes related to soft-tissue management that were common to all types of spine and joint replacement surgery.

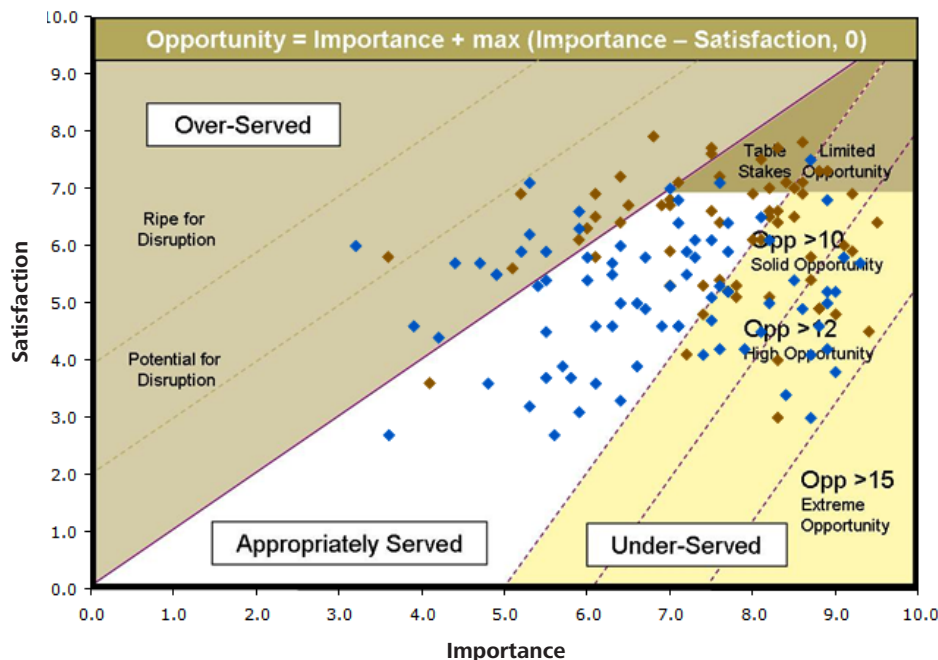
Next, using ODI-based quantitative research techniques, AST had 384 surgeons prioritize those needs. Subsequent data analysis revealed significant opportunities related to access to the surgical sites through soft tissue. The opportunity landscape revealed that for spine surgery, 25 of the 80 desired soft-tissue outcomes were underserved and therefore represented potential opportunities. This was true for 27 of the 80 desired soft-tissue outcomes for joint replacement surgery. Stephanie Meyer, AST’s director of product development, notes that prior to working with Strategyn, “we did not believe there was that much opportunity in soft-tissue management for ortho access, but the ODI data showed us the possibilities.”

“Strategyn’s outcome-driven approach to innovation strategy is really robust. It grounded different players within AST and made our views consistent. It gave us very clear targets for innovation, and engineers were freed up to work within this agreed-upon space.”

—Reggie Garrison, Project Director, Unity R&D

Knowing where to focus its efforts dramatically simplified AST’s idea generation process, and this was the key to the company’s success. The idea generation team focused on 21 underserved outcomes related to soft-tissue access that were common to both spine and joint replacement surgery. They systematically generated ideas that would better satisfy these needs, cascading customer outcomes into product spec requirements, engineering requirements, and components requirements.

The Opportunity Landscape



The opportunity landscape for soft-tissue outcomes revealed a number of opportunities for value creation. There are over 15,000 surgeons in the United States who specialize in spine surgery, and nearly one million knee and hip joints are replaced each year, making these attractive markets for AST.

To learn more about the opportunity landscape, see Anthony W. Ulwick, *What Customers Want* (New York: McGraw-Hill, 2005).

In addition, the ODI analysis revealed opportunities to save effort and cost by avoiding investments in outcomes that were already adequately served by current solutions or that were simply not important to surgeons. For example, based on the ODI opportunity landscape, AST de-emphasized plans for some ergonomic features, such as an integrated hand switch and the ability to telescope, in favor of unmet clinical outcomes that were most important to the surgeons. Richardson reports, “We saw that a lot of the features that we were focusing on were just bells and whistles, according to the opportunity data. We trimmed down the project to meet the big requirements. Basically, we ended up making physical changes to the blade that improved both hemostasis [the halting of bleeding] and the robustness of the blade in comparison to electrocautery and the prior Unity blade. With one design feature, we ended up addressing 21 outcomes.”

The ODI-guided process was far more efficient than AST’s prior approach. In the past, product development had been an iterative process: engineers would put prototypes before customers and then adjust the prototypes based on customers’ reactions. Richardson states, “The consistency in the ODI statements really brought discipline to the process—and we had the outcomes in the customer’s language; for example, ‘Minimize the time the surgical field is obscured due to bleeding.’ Our old process would not get down to this level of detail; it would instead jump to a product feature, like the size of the product. In the past, if we found that we couldn’t meet the size the customer asked for, then we would have to go back to the customer and ask again.”



“Before working with Strategyn, we did not believe there was that much opportunity in soft-tissue management for ortho access, but the ODI data showed us the possibilities.”

—Stephanie Meyer, Director of Product Development

The Results

AST created a new product—the JOC205 Coupled Arc Blade—that addressed the 21 underserved soft-tissue outcomes that Strategyn’s ODI process uncovered. Remarkably, AST accomplished this while shaving more than nine months off the overall original development schedule and while significantly reducing capital expenditures, resulting in approximately 50% savings.

A key benefit of the ODI approach was that the development team was able to focus tests of different blade variations on specific unmet surgeon outcomes. Focusing on the outcomes that represented the greatest opportunities reduced the number of experiments that were needed to demonstrate the efficacy of the JOC205 blade. As Richardson shares, “We were able to start focusing our testing on those key measurements right away. If we had built prototypes and worked with solutions like we used to, then test development would have lagged. We knew what we needed to measure.” The ultimate design of the JOC205 blade is novel. It significantly raises the bar for hemostasis while also addressing high-opportunity outcomes involving the robustness of the blade, optimal cutting speed, and the ability to minimize lateral thermal damage.

As a side benefit, the ODI process also provided the product development group with solid justification when asking management for funding to conduct specific tests. Reggie Garrison, a project director at AST, shared that prior to working with Strategyn, it was common during product development for management to ask where particular requirements came from or what percentage of customers needed a product feature. “You would have to go back to get the data,” Garrison says. “But these questions never came up during this project because we had the opportunity data available.”

“The geometry of the actual blade tip is very different. The geometry arose out of the ODI process. The blade has specific features that relate to specific outcomes. On a range of outcomes related to hemostasis, initial evidence suggests that we can seal 20 times more vessels than electrocautery.”

—Reggie Garrison, Project Director, Unity R&D

AST launched the JOC205 in late 2008 to a small, focused target audience of spine and joint replacement surgeons. Early feedback shows that these surgeons clearly recognize and are attracted to the benefits that the product provides. Experiments demonstrate its advantages relative to competitive products on the key, previously unmet outcomes. Because these advantages have a scientific basis and can be tied back to specific customer outcomes, AST has emphasized them in advertising and sales materials. Already, awareness of the JOC205 is growing among spine and joint replacement surgeons, and market adoption is showing good momentum.

“Strategyn’s Outcome-Driven Innovation approach enabled AST not only to develop a product that is exciting to targeted surgeons, but it also helped us to understand what our portfolio should be for long-term success.”

—Stephanie Meyer, Director, Product Development, Advanced Surgical Tools

Learn More

Strategyn is an innovation consulting firm specializing in the management of innovation. To learn how to make Strategyn’s Outcome-Driven Innovation methodology the cornerstone of your company’s corporate innovation efforts, visit strategyn.com.

Publications that explain the details behind Strategyn’s methodology include:

- Anthony Ulwick, *What is Outcome-Driven Innovation?*, (White paper, March 2009).
- Anthony W. Ulwick, *Turn Customer Input into Innovation*, *Harvard Business Review* 80, No. 1 (January 2002).
- Anthony W. Ulwick, *What Customers Want*, (New York: McGraw-Hill, 2005).
- Anthony W. Ulwick and Lance Bettencourt, *Giving Customers a Fair Hearing*, *MIT Sloan Management Review* 49, No. 3 (Spring 2008).
- Lance Bettencourt and Anthony W. Ulwick, *The Customer-Centered Innovation Map*, *Harvard Business Review* 86, No. 5 (May 2008).
- Lance Bettencourt, PhD, *Service Innovation: How to Go From Customer Needs to Breakthrough Services*, (New York: McGraw-Hill, 2010).

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