



# Re-shoring and Supply Chain Disruption

## Boston Engineering Founders Discuss Impacts and Strategic Responses

### Introduction & Summary

The reshoring trend is transforming the way product companies think about their supply chains and manufacturing strategies. What began as a response to rising labor costs and geopolitical risks has accelerated in the wake of the pandemic, revealing vulnerabilities in global supply chains and prompting companies to reevaluate their sourcing, production, and distribution models.

In this interview, Boston Engineering's founders, Mark Smithers (Chief Technology Officer) and Bob Treiber (President), share insights into the key drivers behind reshoring, the real-world challenges, and how companies can adapt to take advantage of the changes. Drawing from decades of experience in defense, medical, and commercial sectors, they explore the practical implications of reshoring for operations executives, product managers, and C-suite leaders alike.

### How to use this Article

This article highlights actionable strategies, including the use of advanced technologies like digital twins, AI, and automation, to navigate these disruptions and to prepare for future market demands. The Boston Engineering founders share examples of how their work has enabled companies to redesign products, to secure supply chains, and to optimize processes for domestic manufacturing.

The Q&A provides a valuable roadmap for decision-makers seeking to understand reshoring's impact on their industries and how to leverage it as a competitive advantage. Whether you're facing workforce shortages, navigating policy changes, or striving to modernize your operations, this conversation offers concrete solutions to tackle today's challenges and to position your business for long-term success.

We hope you find the following informative and insightful.

## Questions & Answers



### Q: What is driving the current reshoring trend?

**Mark Smithers:** Reshoring isn't just a reaction to tariffs or recent trade policies—it's been in motion for years. Initially, companies offshored to countries like China for cost savings. However, as wages increased overseas, the cost-benefit narrowed. Over time, companies began reassessing the risks associated with offshore production, including quality issues, shipping delays, and geopolitical instability. The pandemic underscored these vulnerabilities, emphasizing the need for secure and controllable supply chains.

Take for example a cardiac stent manufacturer that needed to reassure production after counterfeit stents were discovered overseas, compromising patient safety and leading to costly recalls. Domestic manufacturing allowed better oversight and ensured compliance with FDA standards.

### Q: How have events like the pandemic impacted reshoring efforts?

**Smithers:** The pandemic exposed critical weaknesses in global supply chains. For instance, disruptions to the availability of semiconductors, materials, and other vital components had a cascading effect on industries. This spotlighted the need for domestic production to reduce dependency on foreign sources. Policies like the CHIPS Act and Buy America incentives have since accelerated this trend by prioritizing local manufacturing of essential components.



In defense, The CHIPS Act has led to increased domestic production of semiconductors critical for advanced radar systems. Before reshoring, delays in chip imports caused months-long interruptions in system upgrades for naval vessels.

### Q: What challenges do companies face when reshoring manufacturing?

**Bob Treiber:** Reshoring is more than just moving production locations—it often requires a redesign of products and manufacturing processes. Many products originally designed for low-cost, manual labor overseas must be re-engineered for automation to suit the higher-wage U.S. workforce. Additionally, companies must rebuild domestic supply chains, which can involve extensive compatibility studies, testing, and updates to assembly processes.

**Smithers:** Workforce shortages are another challenge. With an aging population and fewer skilled workers available, manufacturers need to invest in upskilling their workforce or adopt technologies that reduce reliance on manual labor. Picture how, say, a power tool company would need to redesign its assembly line to integrate robotics and reduce reliance on manual labor. Previously, their overseas factory relied on hand assembly; in the U.S., they would implement a robotic system to automate repetitive tasks, increasing efficiency while overcoming labor shortages.

**Q: What industries are most affected by reshoring?**

**Treiber:** Medical devices and defense are the two key sectors. Both have strong incentives to maintain local production due to concerns about security, counterfeiting, and quality control. For instance, counterfeit chips or medical devices like stents can pose severe risks. That's why these industries have been early adopters of reshoring.

**Q: How can companies future-proof their supply chains?**

**Smithers:** Resilience is critical. Companies need to design products and systems that can adapt to changes in trade policies, labor costs, and global supply chain dynamics. This involves using digital tools like digital twins to simulate production, test designs virtually, and optimize manufacturing processes. These tools not only improve efficiency but also allow companies to anticipate and adapt to future challenges.

**Treiber:** Companies should also evaluate their supply chain dependencies and build redundancy into their sourcing strategies. Digitalization and advanced analytics can play a big role in identifying risks and opportunities for improvement.

Digital twins are one way to efficiently explore changes to a supply chain. Consider a manufacturer which is planning for a switch to new U.S.-based material suppliers. Adopting digital twins to simulate the production environment allows for testing of potential changes while planning for new inputs. By eliminating costly prototyping and multiple iterations of tooling, plus minimizing production disruptions, the approach significantly reduces costs and transition time.

**How does Boston Engineering support companies in reshoring?**

**Treiber:** We help companies redesign products and processes for domestic manufacturing. Our expertise in automation, AI, and digital tools enables businesses to adapt quickly and cost-effectively. For example, we've used digital twins to simulate complex manufacturing processes, allowing companies to test and to refine designs virtually before investing in physical prototypes.

**Smithers:** Additionally, we offer solutions to address workforce challenges. Tools like Mixed Reality Expert Guidance (MREG) and advanced optical character recognition (OCR) technologies help capture knowledge, reduce manual labor, and improve productivity.



**Q: What are the long-term benefits of reshoring?**

**Smithers:** Reshoring strengthens economic and national security, creating more stable supply chains and reducing reliance on foreign entities. It also fosters innovation by encouraging companies to adopt advanced manufacturing technologies.

**Treiber:** It's also an opportunity for companies to modernize. By redesigning products and systems for local production, businesses can create more efficient, sustainable operations while staying competitive in a rapidly changing market.

If, let's say, a drone manufacturer reshored production to the U.S., they would be integrating advanced robotics into their assembly line, reducing production times and improving security for their critical avionics systems. These are skills we should be building to use in more and more industries.

**Q: What advice would you give to companies navigating these changes?**

**Treiber:** Think beyond short-term fixes. Reshoring is an opportunity to reassess your entire product design and manufacturing strategy. Invest in automation, digital tools, and workforce development to position yourself for long-term success.

This was the approach we took with a diagnostics device manufacturer a few years ago which leveraged Boston Engineering's expertise to integrate automation into its production process, cutting lead times and enabling rapid scaling for pandemic response kits. This helped it through those uncertain times.

**Smithers:** Also, consider the broader system. Reshoring doesn't just mean moving manufacturing back—it means redesigning for resilience. Boston Engineering can help you tackle these challenges holistically, ensuring you're prepared for whatever comes next.

In the end, reshoring and supply chain disruption present challenges, but with the right strategies and tools, companies can turn these challenges into opportunities.





## About The Participants

### Mark Smithers

Mark Smithers, a founding member of Boston Engineering, leads the company's strategic development activities. He oversees the project management operation for the business and leads activities for the company's technology/IP creations. Mark combines his experience as a systems engineer and innovator with business expertise to help guide customers towards commercialization success. Mark holds a bachelor's degree in mechanical engineering from University of Lowell in MA and master's degree in mechanical engineering from Northeastern University in Boston. He is a former chairman of the New England SEMI Group, a charter member of the MassTLC Robotics Cluster, a charter member of AUVSI New England, a member of the New England Innovation Alliance, and a former Chairman of the MassMEP board of directors; now a strategic advisor.

### Bob Treiber

Robert (Bob) Treiber has been president of Boston Engineering since co-founding the company in 1995. His leadership and visionary thinking propels new technologies forward and ensures that a systems approach to engineering underlies all projects. Bob holds bachelor and master degrees in electrical engineering from Tufts University and an MBA from Babson College. He serves as a director for the Tufts Gordon Institute's Industry Advisory Council, the Tufts Department of Electrical and Computer Engineering External Advisory Board, and the National Small Business Association.

## About Boston Engineering

Founded in 1995 and headquartered in Waltham, Massachusetts, Boston Engineering boasts over 25 years of transformative expertise at the intersection of engineering and technology. Positioned in the thriving tech hub of Greater Boston, the company has become a trusted partner in guiding clients through the entire product development lifecycle.

Adapting to evolving technological landscapes, Boston Engineering's success is marked by its continuous innovation and integration of cutting-edge technologies. The company's legacy is defined by a passion for problem-solving and a customer-centric approach, solidifying its position as a trailblazer in engineering consultancy. As Boston Engineering continues to shape the future of technology, its commitment to excellence and client success remains unwavering, making it a key player in driving innovation in industry.



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